

BEFORE THE METRO COUNCIL

FOR THE PURPOSE OF AMENDING THE)
METRO URBAN GROWTH BOUNDARY,) ORDINANCE NO. 02-969B
THE REGIONAL FRAMEWORK PLAN AND)
THE METRO CODE IN ORDER TO)
INCREASE THE CAPACITY OF THE)
BOUNDARY TO ACCOMMODATE) Introduced by the Community Planning
POPULATION GROWTH TO THE YEAR) Committee
2022)

WHEREAS, state law requires the Metro Council to assess the capacity of the urban growth boundary (“UGB”) every five years and, if necessary, increase the region’s capacity to accommodate a 20-year supply of buildable land for housing; and

WHEREAS, the Council and the Land Conservation and Development Commission agreed that the Council would undertake the assessment and any necessary action to increase the capacity of the UGB as part of the state’s periodic review process; and

WHEREAS, Task 2 of the periodic review work program calls for completion of the same assessment of capacity and increase in capacity, if necessary, by December 20, 2002; and

WHEREAS, the Council determined a need for 220,700 new dwelling units to accommodate the forecast population increase of 525,000 and for 14,240 acres to accommodate the forecast employment increase of 355,000 jobs for the three-county metropolitan region by the year 2022; and

WHEREAS, the Council determined that the existing UGB has the capacity to accommodate 177,300 new dwelling units and 9,315 acres for new jobs; and

WHEREAS, policy measures to protect Industrial Areas within the existing UGB can accommodate additional new jobs; and

WHEREAS, policy measures to strengthen Regional and Town Centers as the hearts of the region’s communities can accommodate an additional 6,000 units of needed housing; and

WHEREAS, expansion of the UGB in the Damascus, Gresham, Oregon City, West Linn, Wilsonville, Sherwood, Tigard, Beaverton, King City, Hillsboro, Cornelius, Bethany and Portland areas can accommodate the balance of this needed housing and land for new jobs; and

WHEREAS, the Council consulted its Metropolitan Planning Advisory Committee and the 24 cities and three counties of the metropolitan region and considered their comments and suggestions prior to making this decision; and

WHEREAS, Metro conducted five public workshops in locations around the region to provide information about alternative locations for expansion of the UGB and to receive comment about those alternatives; and

WHEREAS, Metro published, on August 25, 2002, notice of public hearings before the Council on the proposed decision in compliance with Metro Code 3.01.050; and

WHEREAS, the Metro's Community Planning Committee and the Metro Council held public hearings on the proposed decision on October 1, 3, 10, 15, 22, 24, and 29 and November 21, 2002, and considered the testimony prior to making this decision; now, therefore,

THE METRO COUNCIL HEREBY ORDAINS AS FOLLOWS:

1. Title 1, Requirements for Housing and Employment Accommodation, of the Urban Growth Management Functional Plan ("UGMFP") is hereby amended as indicated in Exhibit A, attached and incorporated into this ordinance, in order to ensure that the UGB continues to provide capacity to accommodate housing and employment growth.
2. Policy 1.16 is hereby added to the Regional Framework Plan ("RFP"), as indicated in Exhibit B, attached and incorporated into this ordinance, in order to protect residential neighborhoods pursuant to Measure 26-29, enacted by voters of the district on May 21, 2002.
3. Title 12, Protection of Residential Neighborhoods, as set forth in Exhibit C, attached and incorporated into this ordinance, is hereby adopted as part of the UGMFP in order to implement Policy 1.16 of the RFP to protect residential neighborhoods pursuant to Measure 26-29.
4. Policies 1.4.1 and 1.4.2, as indicated in Exhibit D, and the accompanying map of Regionally Significant Industrial Areas, as indicated on Exhibit E, are hereby added to the RFP, both exhibits attached and incorporated into this ordinance, in order to increase the efficiency of the use of land within the UGB for industrial use.

5. Title 4, Industrial and Other Employment Areas, of the UGMFP is hereby amended as indicated in Exhibit F, attached and incorporated into this ordinance, in order to implement Policies 1.4.1 and 1.4.2 of the RFP to increase the efficiency of the use of land within the UGB for industrial use.
6. Policy 1.15 is hereby added to the RFP, as indicated in Exhibit G, attached and incorporated into this ordinance, in order to increase the efficiency of the use of residential land within the UGB as it existed prior to adoption of this ordinance and within areas added to the boundary by this ordinance.
7. Title 6, Regional Accessibility, of the UGMFP, is hereby re-titled as Central City, Regional Centers, Town Centers and Neighborhood Centers and amended, as set forth in Exhibit H, attached and incorporated into this ordinance, in order to implement Policy 1.15 of the RFP by strengthening the roles of centers as the hearts of the region's communities and to improve the efficiency of land use within centers.
8. Performance measures are hereby adopted, as set forth in Item 1 in Appendix A, "Performance Measures to Evaluate Efforts to Improve Land Use Efficiency", to evaluate the progress of efforts to achieve the 2040 Growth Concept and of actions taken in this ordinance to improve the efficiency of the use of land within the UGB.
9. Policy 1.9 is hereby added to the RFP, as indicated in Exhibit J, attached and incorporated into this ordinance, in order to ensure, to the extent practicable, that expansion of the UGB will enhance the roles of Regional and Town Centers in the region.
10. Chapter 3.01 of the Metro Code, Urban Growth Boundary and Urban Reserve Procedures, is hereby amended, as indicated in Exhibit K, attached and incorporated into this ordinance, in order to implement Policy 1.9 of the RFP and to clarify the authority of the Metro Council to place conditions on addition of territory to the UGB.
11. Section 3.07.1110 of Title 11, Urban Growth Boundary Amendment Urban Reserve Plan Requirements, of the UGMFP, is hereby amended as indicated in Exhibit L, attached and incorporated into this ordinance, in order to protect land added to the UGB as Regionally Significant Industrial Area from incompatible use during the planning for urbanization of the land.
12. The Metro UGB is hereby amended to include all or portions of the Study Areas, shown on Exhibit N and more precisely identified in the Alternatives Analysis Report, Item 6 in Appendix A, subject to the conditions set forth in Exhibit M, both exhibits attached and incorporated into this ordinance, in order to accommodate housing and employment that cannot be accommodated within the UGB as it existed prior to adoption of this ordinance.

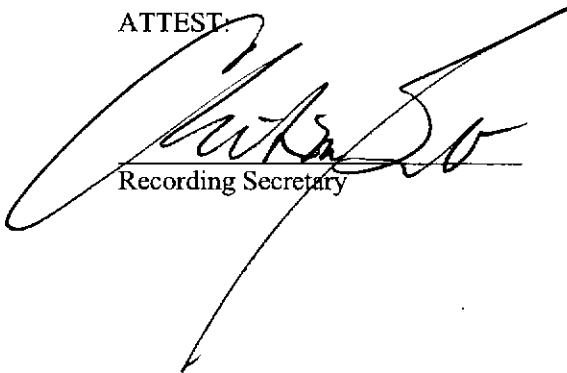
13. The Metro UGB is hereby amended to include those lands described in the Technical Amendments Report and accompanying maps, Item 7 in Appendix A, to make the UGB coterminous with nearby property lines or natural or built features in order to make the UGB function more efficiently and effectively.
14. Appendix A, attached and incorporated into this ordinance, is hereby adopted in support of the amendments to the UGB, the RFP and the Metro Code in sections 1 through 12 of this ordinance. The following documents comprise Appendix A:
 1. Performance Measures to Evaluate Efforts to Improve Land Use Efficiency
 2. Regional Employment Forecast 2000 to 2030
 3. 2002-2022 Urban Growth Report: Residential Land Need Analysis
 4. 2002-2022 Urban Growth Report: An Employment Land Need Analysis
 5. Map Atlas Memorandum and Maps
 6. 2002 Alternative Analysis Study
 7. Technical Amendments Report
 8. Housing Needs Analysis
15. The Findings of Fact and Conclusions of Law in Exhibit P, attached and incorporated into this ordinance, explain how the supporting documents described in section 14 of this ordinance demonstrate that the amendments to the UGB, the RFP and the Metro Code in sections 1 through 11 of this ordinance comply with state law and the RFP.

ADOPTED by the Metro Council this 5th day of December, 2002.



 Carl Hosticka, Presiding Officer

ATTEST:



 Recording Secretary

Approved as to Form:



 Daniel B. Cooper, General Counsel

Exhibit A to Ordinance No. 02-969B

TITLE 1: REQUIREMENTS FOR HOUSING AND EMPLOYMENT ACCOMMODATION

3.07.110 Purpose and Intent

One goal of the Framework Plan is the efficient use of land. Title 1 intends to use land within the UGB efficiently by increasing its capacity to accommodate housing and employment. Title 1 directs each city and county in the region to consider actions to increase its capacity and to take action if necessary to accommodate its share of regional growth as specified in this title.

(Ordinance No. 97-715B, Sec. 1.)

3.07.120 Housing and Employment Capacity

- A. Each city and county shall determine its capacity for housing and employment in order to ensure that it provides and continues to provide at least the capacity for the city or county specified in Table 3.01-7. Local governments shall use data provided by Metro unless the Metro Council or the Chief Operating Officer determines that data preferred by a city or county is more accurate.
- B. A city or county shall determine its capacity for dwelling units by cumulating the minimum number of dwelling units authorized in each zoning district in which dwelling units are authorized. A city or county may use a higher number of dwellings than the minimum density for a zoning district if development in the five years prior to the determination has actually occurred at the higher number.
- C. If a city annexes county territory, the city shall ensure that there is no net loss in regional housing or employment capacity, as shown on Table 3.07-1, as a result of amendments of comprehensive plan or land use regulations that apply to the annexed territory.
- D. After completion of its initial determination of capacity, each city or county shall report changes in its capacity by April 15 of the first calendar year following completion of its initial determination and by April 15 of every following year.

(Ordinance No. 97-715B, Sec. 1.)

3.07.130 Design Type Boundaries Requirement

For each of the following 2040 Growth Concept design types, city and county comprehensive plans shall be amended to include the boundaries of each area, determined by the city or county consistent with the general locations shown on the 2040 Growth Concept Map:

Central City--Downtown Portland is the Central City which serves as the major regional center, an employment and cultural center for the metropolitan area.

Regional Centers--Seven regional centers will become the focus of compact development, redevelopment and high-quality transit service and multimodal street networks.

Station Communities--Nodes of development centered approximately one-half mile around a light rail or high capacity transit station that feature a high-quality pedestrian environment.

Town Centers--Local retail and services will be provided in town centers with compact development and transit service.

Main Streets--Neighborhoods will be served by main streets with retail and service developments served by transit.

Corridors--Along good quality transit lines, corridors feature a high-quality pedestrian environment, convenient access to transit, and somewhat higher than current densities.

Employment Areas--Various types of employment and some residential development are encouraged in employment areas with limited commercial uses.

Industrial Areas--Industrial areas are set aside primarily for industrial activities with limited supporting uses.

Regionally Significant Industrial Areas--Industrial areas with site characteristics that are relatively rare in the region that render them especially suitable for industrial use.

Inner Neighborhoods--Residential areas accessible to jobs and neighborhood businesses with smaller lot sizes are inner neighborhoods.

Outer Neighborhoods--Residential neighborhoods farther away from large employment centers with larger lot sizes and lower densities are outer neighborhoods.

(Ordinance No. 97-715B, Sec. 1.)

3.07.140 Measures to Increase Development Capacity

A. Each city and county shall adopt a minimum dwelling unit density, as prescribed in this subsection, for each zoning district in which dwelling units are authorized inside the UGB:

1. Any city or county minimum density standard deemed to comply with the Urban Growth Management Functional Plan pursuant to section 3.07.810 prior to January 1, 2003, shall be deemed to comply with this subsection.
2. A city or county shall not approve a subdivision or development application that will result in a density below the minimum density for the zoning district.
3. A city or county may change the dwelling unit density of any zoning district so long as the zoning district continues to comply with this subsection and so long as the city or county continues to provide at least the overall capacity for housing for the city or county specified in Table 3.07-1.

B. A city or county shall not prohibit the partition or subdivision of a lot or parcel that is at least twice the size of the minimum size for new lots or parcels in any zoning district in which dwelling units are authorized.

C. A city or county shall authorize the establishment of at least one accessory dwelling unit for each detached single-family dwelling unit in a zoning district and for each detached or attached single-family dwelling unit in a Regional Center or Station Community. The authorization may be subject to reasonable regulation for siting and design purposes.

D. In order to assist Metro to evaluate the effectiveness of Title 1 in aid of accomplishment of the 2040 Growth Concept, and to comply with state progress reporting requirements in ORS 197.301, by

April 15 of each even-numbered year beginning 2004, each city and county shall report to Metro the actual density of new residential development per net developed acre authorized in those zoning districts that allow residential development in the preceding 24 months.

(Ordinance No. 97-715B, Sec. 1.)

3.07.150 Transfer of Capacity

A. A city or county may amend its comprehensive plan and land use regulations to transfer capacity for housing or employment shown on Table 3.07-1 to another city or county inside the UGB upon a demonstration that:

1. The transfer complies with the policies of the Regional Framework Plan;
2. The transfer will not reduce the capacity of the region for housing or employment specified on Table 3.07-1;
3. The housing or employment capacity to be transferred is reasonably likely to occur at the receiving site within the 20-year planning period of Metro's last UGB capacity review under ORS 197.299; and
4. The transfer does not move capacity from a designated Center to an Inner or Outer Neighborhood, or from a Regional Center to a Town Center.

B. A city or county may seek a transfer of capacity as authorized in subsection A by filing an application on a form provided for that purpose by Metro. After receipt of a complete application, Metro shall set the matter for a public hearing before the Metro Council and shall notify MPAC and those persons who request notification of requests for transfers of capacity.

C. The Metro Council shall hold a public hearing to consider the request for a transfer of capacity. Any person may participate in the hearing. The Metro Council may set terms and conditions upon approval of a transfer so long as they relate to the criteria in subsection A and are incorporated into the Metro Council's order.

D. The Metro Council shall issue an order with its conclusions and analysis and send a copy to the local governments involved in the transfer and any person who participated in the hearing before the Metro Council. Any person who participated in the hearing may seek review of the Metro Council's order as a land use decision under ORS 197.015(10)(a)(A).

(Ordinance No. 97-715B, Sec. 1. Amended by Ordinance No. 01-925E, Sec. 4.)

3.07.160 Local Plan Accommodation of Expected Growth Capacity for Housing and Employment—
Performance Standard

All cities and counties within Metro shall demonstrate that:

- A. The provisions required in section 3.07.140 of this title have been included in comprehensive plans and implementing ordinances; and
- B. Using the computation method in section 3.07.120, calculated capacities will achieve the target capacities for dwelling units and full-time and part-time jobs contained in Table 3.07-1; and

- C. Effective measures have been taken to reasonably assure that the calculated capacities will be built for dwelling units and jobs; and
- D. Expected development has been permitted at locations and densities likely to be achieved during the 20-year planning period by the private market or assisted housing programs, once all new regulations are in effect.

(Ordinance No. 97-715B, Sec. 1.)

3.07.170 Design Type Density Recommendations

- A. For the area of each of the 2040 Growth Concept design types, the following average densities for housing and employment are recommended to cities and counties:

- Central City - 250 persons per acre
- Regional Centers - 60 persons per acre
- Station Communities - 45 persons per acre
- Town Centers - 40 persons per acre
- Main Streets - 39 persons per acre
- Corridor - 25 persons per acre
- Employment Areas - 20 persons per acre
- Industrial Areas - 9 employees per acre
- Regionally Significant Industrial Area - 9 employees per acre
- Inner Neighborhoods - 14 persons per acre
- Outer Neighborhoods - 13 persons per acre

(Ordinance No. 97-715B, Sec. 1.)

Table 3.07-1 Zoned Capacity for Housing and Employment Units – Year 1994 to 2017 Section 3.07.120(A)(1)(b)		
City or County	Dwelling Unit Capacity	Job Capacity
Beaverton	13,635	21,368
Cornelius	1,285	3,054
Durham	243	522
Fairview	2,929	7,063
Forest Grove	3,054	5,943
Gladstone	880	1,569
Gresham ³	20,020	27,679
Happy Valley ⁴	5,705	1,418
Hillsboro ⁵	16,106	59,566
Johnson City	38	82
King City ⁶	461	470
Lake Oswego	4,049	13,268
Maywood Park	12	5
Milwaukie	3,188	3,650
Oregon City	9,750	8,298
Portland ³	72,136	209,215
Rivergrove	20	0
Sherwood	5,216	9,518
Tigard	6,308	17,801
Troutdale	3,260	7,222
Tualatin ⁷	4,054	12,301
West Linn	3,732	1,935
Wilsonville ²	4,425	15,030
Wood Village	458	1,074
Clackamas County ^{1,3}	13,340	31,901
Multnomah County ⁸	0	0
Washington County ¹	51,649	55,921
Regional Total	246,053	516,873

¹Standards apply to the urban unincorporated portion of the county only.

² Wilsonville has not completed its capacity analysis (as of October 2002), 1996 Title I data used.

³Includes capacity for Pleasant Valley Concept Plan, former Urban Reserve Nos. 4 and 5.

⁴Includes capacity for former Urban Reserve Nos. 14 and 15.

⁵Includes capacity for former Urban Reserve No. 55.

⁶Includes capacity for former Urban Reserve No. 47.

⁷Includes capacity for former Urban Reserve No. 43.

⁸Capacity for unincorporated Multnomah County is included in the capacities of the Cities of Gresham, Portland and Troutdale.

Exhibit A to Ordinance No. 02-969B

TITLE 1: REQUIREMENTS FOR HOUSING AND EMPLOYMENT ACCOMMODATION

3.07.110 Intent

~~State law and Metro Code require that the Metro urban growth boundary (UGB) have sufficient capacity to accommodate the expected growth for 20 years. It is Metro policy to minimize the amount of urban growth boundary expansion required for the expected population and employment growth by the year 2017 consistent with all Statewide Goals. To further that policy, it is beneficial and desirable for Metro to require actions intended to increase the capacity for development of land within the UGB. Increasing the capacity of land within the UGB will include requiring changes for appropriate locations in both the rate of development permitted per acre (zoned density) and the rate at which housing and employment are actually built within the UGB. Development consistent with the design types of the Metro 2040 Growth Concept will focus these efforts. As a matter of regional policy, each city and county must contribute its fair share to increasing the development capacity of land within the UGB.~~

~~Metro will work with local jurisdictions to develop a set of region wide community development code provisions, standards and other regulations which local jurisdictions may adopt that will help implement the 2040 Growth Concept and this functional plan. Included in this project will be a review of development standards in support of smaller lots and more flexible use of land, strategies to encourage land assembly, more flexible zoning and improvements in the pre-application process to ensure timely and thorough review and to provide for early involvement by the public to address neighborhood concerns and assure community acceptance of these changes.~~

3.07.110 Purpose and Intent

One goal of the Framework Plan is the efficient use of land. Title 1 intends to use land within the UGB efficiently by increasing its capacity to accommodate housing and employment. Title 1 directs each city and county in the region to consider actions to increase its capacity and to take action if necessary to accommodate its share of regional growth as specified in this section title.

(Ordinance No. 97-715B, Sec. 1.)

3.07.120 Methods to Increase Calculated Capacity Required for All Cities and Counties

~~All cities and counties within Metro are required to include within their comprehensive plans and implementing ordinances the following provisions:~~

- ~~A. Cities and counties shall apply a minimum density standard to all zones allowing residential use as follows:~~
- ~~1. a. Provide that no development application, including a subdivision, may be approved unless the development will result in the building of 80 percent or more of the maximum number of dwelling units per net acre permitted by the zoning designation for the site; or~~

- ~~b. Adopt minimum density standards that apply to each development application that vary from the requirements of subsection 1.a., above. However, for the purpose of compliance with Table 3.07-1, only those dwelling units that are allowed at these minimum density standards shall be counted for compliance with the calculated capacities of Table 3.07-1.~~
- ~~2. The minimum density standard may be achieved by use of a small lot district where an average lot size of 5000 to 6200 square feet allows flexibility within that range on development applications, so long as the district remains in compliance with the minimum density standard used to calculate capacities for compliance with Table 3.07-1 capacities.~~
- ~~3. No comprehensive plan provision, implementing ordinance or local process (such as site or design review) may be applied and no condition of approval may be imposed that would have the effect of reducing the minimum density standard.~~
- ~~4. For high density zones with maximum zoned density higher than 37 dwelling units per net acre, the minimum residential density may be 30 dwelling units per net acre.~~
- ~~5. This minimum density requirement does not apply (1) outside the urban growth boundary, (2) inside areas designated as open space on the attached Open Spaces Map¹; and (3) inside areas designated as unbuildable on the attached Open Spaces Map. The maximum zoned density does not include the density bonus for zones that allow them.~~
- ~~B. Cities and counties shall not prohibit partitioning or subdividing inside the Metro urban growth boundary where existing lot sizes are two or more times that of the minimum lot size in the development code.~~
- ~~C. Cities and counties shall not prohibit the construction of at least one accessory unit within any detached single family dwelling that is permitted to be built in any zone inside the urban growth boundary. Reasonable regulations of accessory units may include, but are not limited to, size, lighting, entrances and owner occupancy of the primary unit, but shall not prohibit rental occupancy, separate access, and full kitchens in the accessory units.~~

3.07.120 Housing and Employment Capacity

A. Each city and county shall determine its capacity for housing and employment in order to ensure that it provides and continues to provide at least the capacity for the city or county specified in Table 3.01-7. Local governments shall use data provided by Metro unless the Metro Council or its designee the Chief Operating Officer determines that data preferred by a city or county is more accurate.

B. A city or county shall determine its capacity for dwelling units by cumulating the minimum number of dwelling units authorized in each zoning district in which dwelling units are authorized. A city or county may use a higher number of dwellings than the minimum density for a zoning district if development in the five years prior to the determination has actually occurred at the higher number.

C. If a city annexes county territory, the city shall ensure that there is no net loss in regional housing or employment capacity, as shown on Table 3.07-1, as a result of amendments of comprehensive plan or land use regulations that apply to the annexed territory.

¹ All "attached" documents referenced in this chapter are on file in the Metro Council office.

D. After completion of its initial determination of capacity, each city or county shall report changes in its capacity by December 31-April 15 of the first calendar year following completion of its initial determination and by December 31-April 15 of every following year.

(Ordinance No. 97-715B, Sec. 1.)

3.07.130 Design Type Boundaries Requirement

For each of the following 2040 Growth Concept design types, city and county comprehensive plans shall be amended to include the boundaries of each area, determined by the city or county consistent with the general locations shown on the 2040 Growth Concept Map:

Central City--Downtown Portland is the Central City which serves as the major regional center, an employment and cultural center for the metropolitan area.

Regional Centers--~~Nine~~Seven regional centers will become the focus of compact development, redevelopment and high-quality transit service and multimodal street networks.

Station Communities--Nodes of development centered approximately one-half mile around a light rail or high capacity transit station that feature a high-quality pedestrian environment.

Town Centers--Local retail and services will be provided in town centers with compact development and transit service.

Main Streets--Neighborhoods will be served by main streets with retail and service developments served by transit.

Corridors--Along good quality transit lines, corridors feature a high-quality pedestrian environment, convenient access to transit, and somewhat higher than current densities.

Employment Areas--Various types of employment and some residential development are encouraged in employment areas with limited commercial uses.

Industrial Areas--Industrial areas are set aside primarily for industrial activities with limited supporting uses.

Regionally Significant Industrial Areas--Industrial areas with site characteristics that are relatively rare in the region that render them especially suitable for industrial use.

Inner Neighborhoods--Residential areas accessible to jobs and neighborhood businesses with smaller lot sizes are inner neighborhoods.

Outer Neighborhoods--Residential neighborhoods farther away from large employment centers with larger lot sizes and lower densities are outer neighborhoods.

(Ordinance No. 97-715B, Sec. 1.)

3.07.140 Requirements to Increase Capacity If Recent Development At Low Density

~~A. All cities and counties shall determine whether actual built densities for housing during 1990-1995 were less than 80 percent of maximum zoned densities. The 1990-1995 actual built densities within cities and counties inside the urban growth boundary shall be compared with zoned densities for housing units during that period.~~

~~Residential developments to be analyzed shall be those which were permitted by a land use action and constructed during the period from 1990 to 1995, and residential density shall be measured in households per net developed acre.²~~

~~B. If the comparison of actual built densities to maximum zoned densities for the period 1990-1995 indicates that actual built densities were less than 80 percent of maximum zoned densities, the city or county shall also demonstrate that it has considered and adopted at least two of the following methods to increase capacity:~~

- ~~1. Financial incentives for higher density housing;~~
- ~~2. Provisions permitting additional density beyond that generally allowed in the zoning district in exchange for amenities and features provided by the developer;~~
- ~~3. Removal or easing of approval standards or procedures;~~
- ~~4. Redevelopment and infill strategies; and~~
- ~~5. Authorization of housing types not previously allowed by the plan or regulations.~~

3.07.140 Measures to Increase Development Capacity

A. Each city and county shall adopt a minimum dwelling unit density, as prescribed in this subsection, for each zoning district in which dwelling units are authorized inside the UGB:

1. Any city or county minimum density standard deemed to comply with the Urban Growth Management Functional Plan pursuant to section 3.07.810 prior to January 1, 2003, shall be deemed to comply with this subsection.
2. A city or county shall not approve a subdivision or development application that will result in a density below the minimum density for the zoning district.
3. A city or county may change the dwelling unit density of any zoning district so long as the zoning district continues to comply with this subsection and so long as the city or county continues to provide at least the overall capacity for housing for the city or county specified in Table 3.07-1.

B. A city or county shall not prohibit the partition or subdivision of a lot or parcel that is at least twice the size of the minimum size for new lots or parcels in any zoning district in which dwelling units are authorized.

² See Title 10, Definitions.

C. A city or county shall authorize the establishment of at least one accessory dwelling unit for each detached single-family dwelling unit in a zoning district and for each detached or attached single-family dwelling unit in a Regional Center or Station Community. The authorization may be subject to reasonable regulation for siting and design purposes.

D. In order to assist Metro to evaluate the effectiveness of Title 1 in aid of accomplishment of the 2040 Growth Concept, and to comply with state progress reporting requirements in ORS 197.301, by April 15³⁰ of each odd-numbered even-numbered year beginning 2004, each city and county shall report to Metro the actual density of new residential development per net developed acre authorized in those zoning districts that allow residential development in the preceding 24 months.

(Ordinance No. 97-715B, Sec. 1.)

3.07.150 Determination of Calculated Capacity of Housing Units and Jobs

The purpose of this section is to require each city and county within the Metro region to determine the housing and employment capacity of its existing comprehensive plan and implementing ordinances, determine calculated capacity for dwelling units and jobs by the method in this section, and increase calculated capacity, if necessary, to achieve the functional plan capacities in Table 3.07-1. Each city and county within the Metro region is hereby required to complete the following steps:

A. ~~Determine the calculated capacity of dwelling units and jobs by the year 2017 using the zoned capacity³ of its current comprehensive plan and implementing ordinances.~~

1. ~~Cities and counties shall use Metro estimates of vacant land, and land likely to redevelop, unless they have data that they believe is more accurate. In this case, the city or county may provide Metro the following:~~

a. ~~The source of the data;~~

b. ~~The reasons that the locally developed data is a more accurate estimate than the Metro estimate of vacant and redevelopable land;~~

c. ~~The database from which the above were derived;~~

d. ~~The database of committed development lands.~~

~~Cities and counties may use their data, subject to acceptance by the Metro Council or its designee, after the Executive Officer determines that the city or county data may be more accurate than the Metro data. The Executive Officer shall notify the Metro Council of each instance in which the data submitted by a city or county is determined by the Executive Officer to be less accurate than Metro data.~~

2. ~~In determining the calculated capacity of existing comprehensive plans and implementing ordinances, cities and counties shall not use a calculated capacity for dwelling units of more than 80 percent of maximum zoned residential density, unless:~~

a. ~~Actual experience in the jurisdiction since 1990 has shown that development has occurred at density greater than 80 percent of zoned residential density; or~~

³ See Title 10, Definitions, "zoned density" and "calculated capacity."

- b. ~~Minimum density standards are adopted or proposed for adoption in the zoning code that require residential development at greater than 80 percent of maximum zoned residential density.~~
 - 3. ~~Cities and counties calculating capacity through the use of density bonus provisions may consider transfers, including off-site transfers, only upon demonstration that previous approvals of all density transfers within the past 5 years have resulted in an average of at least 80 percent of maximum zoned densities actually being built.~~
 - 4. ~~The capacity calculation shall use only those development types that are allowed in the development code. Any discretionary decision must not diminish the zoned density if it is to be counted as a part of calculated capacity; and~~
 - 5. ~~Cities and counties, in coordination with special districts, shall demonstrate that they have reviewed their public facility capacities and plans to assure that planned public facilities can be provided, to accommodate the calculated capacity within the plan period.~~
- B. ~~Calculate the increases in dwelling unit and job capacities by the year 2017 from any proposed changes to the current comprehensive plans and implementing ordinances that must be adopted to comply with section 3.07.120 of this title and add the increases to the calculation of expected capacities.~~
- C. ~~Determine the effect of each of the following on calculated capacities, and include any resulting increase or decrease in calculated capacities:~~
- 1. ~~Required dedications for public streets, consistent with the Regional Accessibility Title;~~
 - 2. ~~Off-street parking requirements, consistent with this functional plan;~~
 - 3. ~~Landscaping, setback, and maximum lot coverage requirements;~~
 - 4. ~~The effects of tree preservation ordinances, environmental protection ordinances, view preservation ordinances, solar access ordinances, or any other regulations that may have the effect of reducing the capacity of the land to develop at the zoned density;~~
 - 5. ~~The effects of areas dedicated to bio-swales, storm water retention, open space dedications, and other requirements of local codes that may reduce the capacity of the land to develop at the zoned density.~~
- D. ~~If any of the calculated capacities are determined to be less than any of the city or county target dwelling unit and job capacities in Table 3.07-1, either jurisdiction-wide or in mixed-use areas, or both, then the city or county shall comply with the performance standards in section 3.07.160 of this title by amending its comprehensive plans and implementing ordinances to increase calculated capacities, as needed, to comply with the calculated capacities required in Table 3.07-1.~~

3.07.150 Transfer of Capacity

A. A city or county may amend its comprehensive plan and land use regulations to transfer capacity for housing or employment shown on Table 3.07-1 to another city or county inside the UGB upon a demonstration that:

1. The transfer complies with the policies of the Regional Framework Plan;
2. The transfer will not reduce the capacity of the region for housing or employment specified on Table 3.07-1;
3. The housing or employment capacity to be transferred is reasonably likely to occur at the receiving site within the 20-year planning period of Metro's last UGB capacity review under ORS 197.299; and
4. The transfer does not move capacity from a designated Center to an Inner or Outer Neighborhood, or from a Regional Center to a Town Center.

B. A city or county may seek a transfer of capacity as authorized in subsection A by filing an application on a form provided for that purpose by Metro. After receipt of a complete application, Metro shall set the matter for a public hearing before the Metro Council and shall notify MPAC and those persons who request notification of requests for transfers of capacity.

C. The Metro Council shall hold a public hearing to consider the request for a transfer of capacity. Any person may participate in the hearing. The Metro Council may set terms and conditions upon approval of a transfer so long as they relate to the criteria in subsection A and are incorporated into the Metro Council's order.

D. The Metro Council shall issue an order with its conclusions and analysis and send a copy to the local governments involved in the transfer and any person who participated in the hearing before the Metro Council. Any person who participated in the hearing may seek review of the Metro Council's order as a land use decision under ORS 197.015(10)(a)(A).

(Ordinance No. 97-715B, Sec. 1. Amended by Ordinance No. 01-925E, Sec. 4.)

3.07.160 Local Plan Accommodation of Expected Growth Capacity for Housing and Employment— Performance Standard

All cities and counties within Metro shall demonstrate that:

- A. The provisions required in section ~~3.07.120~~ 3.07.140 of this title have been included in comprehensive plans and implementing ordinances; and ~~that~~
- B. Using the computation method in section ~~3.07.150~~ 3.07.120, including the minimum residential density provisions required in section 3.07.120, that calculated capacities will achieve the target capacities for dwelling units and full-time and part-time jobs contained in Table 3.07-1, including both jurisdiction-wide expected capacities and capacities for mixed-use areas; and ~~that~~
- C. Effective measures have been taken to reasonably assure that the calculated capacities will be built for dwelling units and jobs; and ~~that~~

- D. Expected development has been permitted at locations and densities likely to be achieved during the 20-year planning period by the private market or assisted housing programs, once all new regulations are in effect.

(Ordinance No. 97-715B, Sec. 1.)

3.07.170 Design Type Density Recommendations

- A. For the area of each of the 2040 Growth Concept design types, the following average densities for housing and employment are recommended to cities and counties:

Central City - 250 persons per acre
Regional Centers - 60 persons per acre
Station Communities - 45 persons per acre
Town Centers - 40 persons per acre
Main Streets - 39 persons per acre
Corridor - 25 persons per acre
Employment Areas - 20 persons per acre
Industrial Areas - 9 employees per acre
Regionally Significant Industrial Area - 9 employees per acre
Inner Neighborhoods - 14 persons per acre
Outer Neighborhoods - 13 persons per acre

(Ordinance No. 97-715B, Sec. 1.)

Table 3.07-1 Target Capacity for Housing and Employment Units - Year 1994 to 2017 (Section 3.07.120(A)(1)(b))				
City or County	Dwelling Unit Capacity ¹	Job Capacity	Mixed Use Areas ²	
			Dwelling Unit Capacity	Job Increase
Beaverton	15,021	25,122	9,019	19,084
Cornelius	1,019	2,812	48	335
Durham	262	498	0	0
Fairview	2,921	5,689	635	2,745
Forest Grove	2,873	5,488	67	628
Gladstone	600	1,530	20	140
Gresham	16,817	23,753	3,146	9,695
Happy Valley	2,030	1,767	52	245
Hillsboro	14,812	58,247	9,758	20,338
Johnson City	168	180	0	0
King City	182	241	55	184
Lake Oswego	3,353	8,179	446	3,022
Maywood Park	27	5	0	0
Milwaukie	3,514	7,478	2,571	6,444
Oregon City	6,157	8,185	341	2,341
Portland	70,704	158,503	26,960	100,087
River Grove	(15)	41	0	0
Sherwood	5,010	8,156	1,108	3,585
Tigard	6,073	14,901	981	8,026
Troutdale	3,789	5,570	107	267
Tualatin	3,635	9,794	1,248	2,069
West Linn	2,577	2,114	0	594
Wilsonville	4,425	15,030	743	4,952
Wood Village	423	736	68	211
Clackamas County ³	19,530	42,685	1,661	13,886
Multnomah County ³	3,089	2,381	0	0
Washington County ²	54,999	52,578	13,273	25,450
	243,993	461,633		

¹—Based on Housing Needs Analysis. Applies to existing city limits as of June, 1996. Annexations to cities would include the city assuming responsibility for Target Capacity previously accommodated in unincorporated county.

²—Mixed use areas are: Central City—about 250 persons per acre; regional centers—about 60 ppa; town centers—40 ppa; station communities—about 45 ppa; main streets—about 39 ppa.

³—Standards apply to the urban unincorporated portion of the county only. At the request of cities, Metro may also supply targets for planning areas for cities in addition to the existing boundary targets cited above. (Ordinance No. 97-715B, Sec. 1.)

Table 3.07-1		
Zoned Capacity for Housing and Employment Units – Year 1994 to 2017		
Section 3.07.120(A)(1)(b)		
City or County	Dwelling Unit Capacity	Job Capacity
<u>Beaverton</u>	13,635	21,368
<u>Cornelius</u>	1,285	3,054
<u>Durham</u>	243	522
<u>Fairview</u>	2,929	7,063
<u>Forest Grove</u>	3,054	5,943
<u>Gladstone</u>	880	1,569
<u>Gresham</u> ³	20,020	27,679
<u>Happy Valley</u> ⁴	5,705	1,418
<u>Hillsboro</u> ⁵	16,106	59,566
<u>Johnson City</u>	38	82
<u>King City</u> ⁶	461	470
<u>Lake Oswego</u>	4,049	13,268
<u>Maywood Park</u>	12	5
<u>Milwaukie</u>	3,188	3,650
<u>Oregon City</u>	9,750	8,298
<u>Portland</u> ³	72,136	209,215
<u>Rivergrove</u>	20	0
<u>Sherwood</u>	5,216	9,518
<u>Tigard</u>	6,308	17,801
<u>Troutdale</u>	3,260	7,222
<u>Tualatin</u> ⁷	4,054	12,301
<u>West Linn</u>	3,732	1,935
<u>Wilsonville</u> ²	4,425	15,030
<u>Wood Village</u>	458	1,074
<u>Clackamas County</u> ^{1,3}	13,340	31,901
<u>Multnomah County</u> ⁸	0	0
<u>Washington County</u> ¹	51,649	55,921
Regional Total	246,053	516,873

¹ Standards apply to the urban unincorporated portion of the county only.

² Wilsonville has not completed its capacity analysis (as of October 2002), 1996 Title 1 data used.

³ Includes capacity for Pleasant Valley Concept Plan, former Urban Reserve Nos. 4 and 5.

⁴ Includes capacity for former Urban Reserve Nos. 14 and 15.

⁵ Includes capacity for former Urban Reserve No. 55.

⁶ Includes capacity for former Urban Reserve No. 47.

⁷ Includes capacity for former Urban Reserve No. 43.

⁸ Capacity for unincorporated Multnomah County is included in the capacities of the Cities of Gresham, Portland and Troutdale.

Exhibit B to Ordinance No. 02-969B

New Regional Framework Plan Policy pursuant to Measure 26-29

Policy 1.16 Residential Neighborhoods

The livability of existing residential neighborhoods is essential to the success of the 2040 Growth Concept. In order to protect and improve the region's existing residential neighborhoods, Metro shall take measures to:

- Protect residential neighborhoods from air and water pollution, noise and crime.
- Make community services accessible to residents of neighborhoods by walking, bicycle and transit, where possible.
- Facilitate the provision of affordable government utilities and services to residential neighborhoods.

Metro shall not require local governments to increase the density of existing single-family neighborhoods identified solely as Inner or Outer Neighborhoods.

Exhibit B to Ordinance No. 02-969B

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- Facilitate the provision of affordable government utilities and services to residential neighborhoods.

Metro shall not require local governments to increase the density of existing single-family neighborhoods identified solely as Inner or Outer Neighborhoods.

Exhibit C to Ordinance No. 02-969B

New Metro Code to implement Policy 1.16 of the Regional Framework Plan

TITLE 12: PROTECTION OF RESIDENTIAL NEIGHBORHOODS

3.07.1210 Purpose and Intent

Existing neighborhoods are essential to the success of the 2040 Growth Concept. The intent of Title 12 of the Urban Growth Management Functional Plan is to protect the region's residential neighborhoods. The purpose of Title 12 is to help implement the policy of the Regional Framework Plan to protect existing residential neighborhoods from air and water pollution, noise and crime and to provide adequate levels of public services.

3.07.1220 Residential Density

Metro shall not require any city or county to authorize an increase in the residential density of a single-family neighborhood in an area mapped solely as an Inner or Outer Neighborhood pursuant to Metro Code section 3.07.130 prior to May 22, 2002.

3.07.1230 Access to Commercial Services

- A. In order to reduce air pollution and traffic congestion, and to make commercial retail services more accessible to residents of Inner and Outer Neighborhoods, a city or county may designate in its comprehensive plan and land use regulations one or more Neighborhood Centers within or in close proximity to Inner and Outer Neighborhoods to serve as a convenient location of commercial services.
- B. To ensure that commercial development serves the needs of the residents of Inner and Outer Neighborhoods but does not generate excessive traffic, noise or air pollution, a city or county that designates a Neighborhood Center shall adopt limitations on the scale of commercial services in Neighborhood Centers. In a Neighborhood Center, a city or county shall not approve:
 - 1. A commercial retail use with more than 20,000 square feet of gross leasable area in a single building; or
 - 2. Office commercial uses with more than 10,000 square feet of gross leasable area in a single building or on a single lot or parcel.

3.07.1240 Access to Parks and Schools

- A. Each city and county shall, within two years following adoption by the Metro Council of a process and criteria for such standards, establish a level of service standard for parks and greenspaces that calls for a park facility within a specified distance of all residences.
- B. To make parks and greenspaces more accessible to residents of Inner and Outer Neighborhoods and all residents of the region, each city and county shall provide for access to parks and greenspaces by walking, biking and transit, where transit is available or planned.

- C. To make parks and schools more accessible to neighborhood residents, to reduce traffic, and to use land more efficiently, cities, counties, park providers and school districts shall, where appropriate, provide for shared use of school facilities for park purposes and of park facilities for school purposes.
- D. To make public schools more accessible to neighborhood residents, cities, counties and school districts shall prioritize school sites that are near concentrations of population and are connected to those concentrations by safe and convenient walking, biking and, where transit is available or planned, transit facilities.

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B. To ensure that commercial development principally serves the needs of the residents of Inner and Outer Neighborhoods, but does not generate excessive traffic, noise or air pollution, each a city and or county that designates a Neighborhood Center shall adopt limitations on the scale of commercial services in Neighborhood Centers. In a Neighborhood Center, a city or county shall not approve:

1. A commercial retail use with more than 20,000 square feet of gross leasable area in a single building; or
2. Office commercial uses with more than 10,000 square feet of gross leasable area in a single building or on a single lot or parcel.

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- C. To make parks and schools more accessible to neighborhood residents, to reduce traffic, and to use land more efficiently, cities, counties, park providers and school districts shall, where appropriate, provide for shared use of school facilities for park purposes and of park facilities for school purposes.
- D. To make public schools more accessible to neighborhood residents, cities, counties and school districts shall prioritize school sites that are near concentrations of population and are connected to those concentrations by safe and convenient walking, biking and, where transit is available or planned, transit facilities.

Exhibit D to Ordinance No. 02-969B

New Regional Framework Plan Policy on Economic Opportunity

According to the Regional Industrial Land Study, economic expansion of the 1990s diminished the region's inventory of land suitable for industries that offer the best opportunities for new family-wage jobs. Sites suitable for these industries should be identified and protected from incompatible uses.

1.4.1 Metro, with the aid of leaders in the business and development community and local governments in the region, shall designate as Regionally Significant Industrial Areas those areas with site characteristics that make them especially suitable for the particular requirements of industries that offer the best opportunities for family-wage jobs.

1.4.2 Metro, through the Urban Growth Management Functional Plan, and local governments shall exercise their comprehensive planning and zoning authorities to protect Regionally Significant Industrial Areas from incompatible uses.

Exhibit D to Ordinance No. 02-969B

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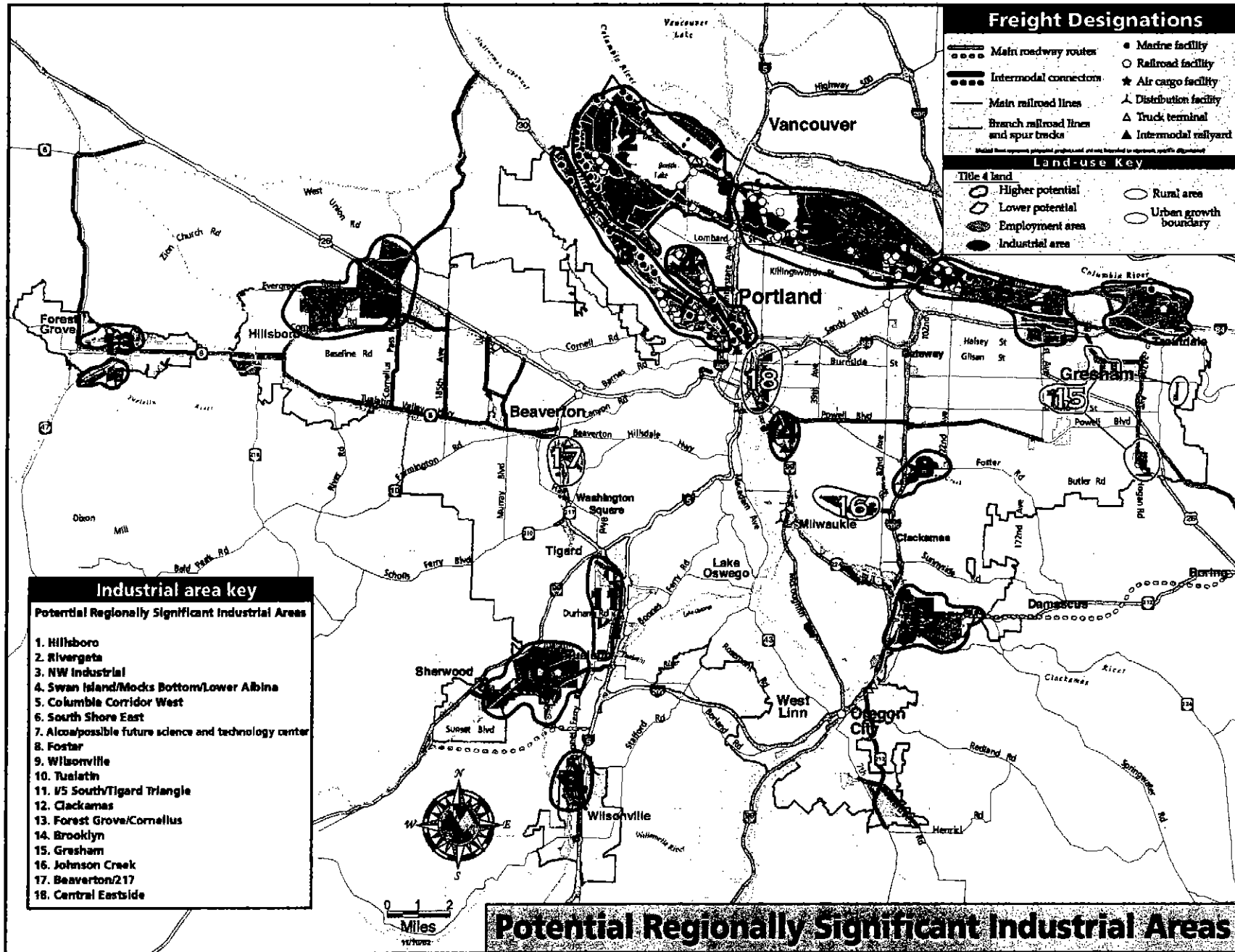


Exhibit F to Ordinance No. 02-969B

TITLE 4: INDUSTRIAL AND OTHER EMPLOYMENT AREAS

3.07.410 Purpose and Intent

The Regional Framework Plan calls for a strong economic climate. To improve the region's economic climate, the plan seeks to protect the supply of sites for employment by limiting incompatible uses within Industrial and Employment Areas. To protect the capacity and efficiency of the region's transportation system for movement of goods and services, and to promote the creation of jobs in centers, the plan encourages efficient patterns and mixes of uses within designated Centers and discourages certain kinds of commercial retail development outside Centers. It is the purpose of Title 4 to achieve these policies. Metro will consider amendments to this title in order to make the title consistent with new policies on economic development adopted as part of periodic review.

3.07.420 Protection of Regionally Significant Industrial Areas

- A. Regionally Significant Industrial Areas are those areas that offer the best opportunities for family-wage industrial jobs. Each city and county with land use planning authority over areas shown on the Generalized Map of Regionally Significant Industrial Areas adopted in Ordinance No. 02-969 shall derive specific plan designation and zoning district boundaries of the areas from the Map, taking into account the location of existing uses that would not conform to the limitations on non-industrial uses in subsection C, D and E of this section and the need of individual cities and counties to achieve a mix of types of employment uses.
- B. Each city and county with land use planning authority over an area designated by Metro on the 2040 Growth Concept Map, as amended by Ordinance No. 02-969, as a Regional Significant Industrial Area shall, as part of compliance with section 3.07.1120 of the Urban Growth Management Functional Plan, derive plan designation and zoning district boundaries of the areas from the Growth Concept Map.
- C. After determining boundaries of Regionally Significant Industrial Areas pursuant to subsections A and B, the city or county shall adopt implementing ordinances that limit development in the areas to industrial uses, uses accessory to industrial uses, offices for industrial research and development and large corporate headquarters in compliance with subsection E of this section, utilities, and those non-industrial uses necessary to serve the needs of businesses and employees of the areas. Ordinances shall not allow financial, insurance, real estate or other professional office uses unless they are accessory to an industrial or other permitted use.
- D. Notwithstanding subsection C, a city or county shall not approve:
 - 1. A commercial retail use with more than 20,000 square feet of retail sales area in a single building or in multiple buildings that are part of the same development project; or
 - 2. Commercial retail uses that would occupy more than five percent of the net developable portion of all contiguous Regionally Significant Industrial Areas.

- E. As provided in subsection C of this section, a city or county may approve an office for industrial research and development or a large corporate headquarters if:
1. The office is served by public or private transit; and
 2. If the office is for a corporate headquarters, it will accommodate for the initial occupant at least 1,000 employees.
- F. A city or county may allow division of lots or parcels into smaller lots or parcels as follows:
1. Lots or parcels less than 50 acres may be divided into any number of smaller lots or parcels;
 2. Lots or parcels 50 acres or larger may be divided into smaller lots and parcels so long as the resulting division yields the maximum number of lots or parcels of at least 50 acres;
 3. Notwithstanding paragraphs 2, 3 and of this subsection, any lot or parcel may be divided into smaller lots or parcels or made subject to rights-of-way for the following purposes:
 - a. To provide public facilities and services;
 - b. To separate a portion of a lot or parcel in order to protect a natural resource, to provide a public amenity, or to implement a remediation plan for a site identified by the Oregon Department of Environmental Quality pursuant to ORS 465.225;
 - c. To separate a portion of a lot or parcel containing a nonconforming use from the remainder of the lot or parcel in order to render the remainder more practical for a permitted use;
 - d. To reconfigure the pattern of lots and parcels pursuant to subsection G of this section; or
 - e. To allow the creation of a lot for financing purposes when the created lot is part of a master planned development.
- G. A city or county may allow reconfiguration of lots or parcels less than 50 acres in area if the reconfiguration would be more conducive to a permitted use and would result in no net increase in the total number of lots and parcels. Lots or parcels 50 acres or greater in area may also be reconfigured so long as the resulting area of any such lot or parcel would not be less than 50 acres.
- H. Notwithstanding subsections C and D of this section, a city or county may allow the lawful use of any building, structure or land at the time of enactment of an ordinance adopted pursuant to this section to continue and to expand to add up to 20 percent more floor area and 10 percent more land area. Notwithstanding subsection F of this section, a city or county may allow division of lots or parcels pursuant to a master plan approved by the city or county prior to December 31, 2003.

- J. By December 31, 2003, Metro shall, following consultation with cities and counties, adopt a map of Regionally Significant Industrial Areas with specific boundaries derived from the Generalized Map of Regionally Significant Industrial Areas adopted in Ordinance No. 02-969, taking into account the location of existing uses that would not conform to the limitations of non-industrial uses in subsections C, D and E of this section and the need of individual cities and counties to achieve a mix of types of employment uses. Each city and county with land use planning authority over the area shall use the map in the application of the provisions of this section until the city or county adopts plan designations and zoning district boundaries of the area as provided by subsection A of this section.

3.07.430 Protection of Industrial Areas

- A. In Industrial Areas mapped pursuant to Metro Code section 3.07.130 that are not Regionally Significant Industrial Areas, cities and counties shall limit new and expanded retail commercial uses to those appropriate in type and size to serve the needs of businesses, employees and residents of the Industrial Areas.
- B. In an Industrial Area, a city or county shall not approve:
1. A commercial retail use with more than 20,000 square feet of retail sales area in a single building or in multiple buildings that are part of the same development project; or
 2. Commercial retail uses that would occupy more than ten percent of the net developable portion of the area or any adjacent Industrial Area.
- C. Notwithstanding subsection B of this section, a city or county may allow the lawful use of any building, structure or land at the time of enactment of an ordinance adopted pursuant to this section to continue and to expand to add up to 20 percent more floorspace and 10 percent more land area.

3.07.440 Protection of Employment Areas

- A. Except as provided in subsections C, D and E, in Employment Areas mapped pursuant to Metro Code section 3.07.130, cities and counties shall limit new and expanded commercial retail uses to those appropriate in type and size to serve the needs of businesses, employees and residents of the Employment Areas.
- B. Except as provided in subsections C, D and E, a city or county shall not approve a commercial retail use in an Employment Area with more than 60,000 square feet of gross leasable area in a single building, or commercial retail uses with a total of more than 60,000 square feet of retail sales area on a single lot or parcel, or on contiguous lots or parcels, including those separated only by transportation right-of-way.
- C. A city or county whose zoning ordinance applies to an Employment Area and is listed on Table 3.07-4 may continue to authorize commercial retail uses with more than 60,000 square feet of gross leasable area in that zone if the ordinance authorized those uses on January 1, 2003.

- D. A city or county whose zoning ordinance applies to an Employment Area and is not listed on Table 3.07-4 may continue to authorize commercial retail uses with more than 60,000 square feet of gross leasable area in that zone if:
1. The ordinance authorized those uses on January 1, 2003;
 2. Transportation facilities adequate to serve the commercial retail uses will be in place at the time the uses begin operation; and
 3. The comprehensive plan provides for transportation facilities adequate to serve other uses planned for the Employment Area over the planning period.
- E. A city or county may authorize new commercial retail uses with more than 60,000 square feet of gross leasable area in Employment Areas if the uses:
1. Generate no more than a 25 percent increase in site-generated vehicle trips above permitted non-industrial uses; and
 2. Meet the Maximum Permitted Parking – Zone A requirements set forth in Table 3.07-2 of Title 2 of the Urban Growth Management Functional Plan.

Table 3.07-4
(Section 3.07.420(B))

Clackamas County unincorporated
Commercial
Commercial Industrial

Lake Oswego
General Commercial
Highway Commercial

Troutdale
General Commercial

Hillsboro
General Commercial

Sherwood
General Commercial

Tigard
General Commercial
Commercial Professional

Tualatin
Commercial General

Wilsonville
Planned Development Commercial

Exhibit F to Ordinance No. 02-969B

TITLE 4: INDUSTRIAL AND OTHER EMPLOYMENT AREAS

3.07.410 Intent

~~It is the intent of the Metro 2040 Growth Concept that Employment and Industrial Areas contain supportive retail development. Employment and Industrial areas would be expected to include some limited retail commercial uses primarily to serve the needs of people working or living in the immediate Employment or Industrial Areas; not larger market areas outside the Employment or Industrial Areas.~~

3.07.410 Purpose and Intent

The Regional Framework Plan calls for a strong economic climate. To improve the region's economic climate, the plan seeks to protect the supply of sites for employment by limiting incompatible uses within Industrial and Employment Areas. To protect the capacity and efficiency of the region's transportation system for movement of goods and services, and to promote the creation of jobs in centers, the plan encourages efficient patterns and mixes of uses within designated Centers and discourages certain kinds of commercial retail development outside Centers. It is the purpose of Title 4 to achieve these policies. Metro will consider amendments to this title in order to make the title consistent with new policies on economic development adopted as part of periodic review.

3.07.420 Comprehensive Plan and Implementing Ordinance Changes Required

- A. ~~Cities and counties are hereby required to amend their comprehensive plans and implementing regulations, if necessary, to prohibit retail uses larger than 60,000 square feet of gross leasable area per building or business in the Industrial Areas designated on the attached Employment and Industrial Areas Map[†].~~
- B. ~~This subsection applies to city and county comprehensive plan designations and zoning ordinances acknowledged by the effective date of this functional plan, which allow retail uses larger than 60,000 square feet of gross leasable area per building or business in Employment Areas designated on the attached Employment and Industrial Areas Map. These cities and counties may continue to allow the extent and location of retail uses allowed in Employment Areas on the effective date of this Functional Plan for the specific zones in acknowledged land use regulations listed in Table 3.07.4. For all other zones in Employment Areas, these cities and counties are hereby required to amend their comprehensive plans and implementing regulations, if necessary, to require a process resulting in a land use decision for any retail uses larger than 60,000 square feet of gross leasable area per building or business on those lands where such uses are currently allowed by any process. The standards for the land use decision to allow any such retail uses shall require (1) a demonstration in the record that transportation facilities adequate to serve the retail use, consistent with Metro's functional plans for transportation, will be in place at the time the retail use begins operation; and (2) a demonstration that transportation facilities adequate to meet the transportation need for the other planned~~

[†] ~~On file in the Metro Council office.~~

~~uses in the Employment Areas are included in the applicable comprehensive plan provisions. If the city and county comprehensive plan designations and zoning ordinances which allow retail uses larger than 60,000 square feet of gross leasable area per building or business in Employment Areas have not been acknowledged by the effective date of this functional plan, subsection 3.07.420(C) of this title shall apply.~~

- ~~C. City or county comprehensive plan designations and zoning ordinances acknowledged by the effective date of this functional plan which do not allow retail uses larger than 60,000 square feet of gross leasable area per building or business in Employment Areas designated on the attached Employment and Industrial Areas Map shall continue to prohibit them unless an exception is established under section 3.07.430 of this title pursuant to the compliance procedures of Title 8.~~

3.07.420 Protection of Regionally Significant Industrial Areas

- A. Regionally Significant Industrial Areas are those areas that offer the best opportunities for family-wage industrial jobs. Each city and county with land use planning authority over areas shown on the Generalized Map of Regionally Significant Industrial Areas adopted in Ordinance No. 02-969 shall derive specific plan designation and zoning district boundaries of the areas from the Map, taking into account the location of existing uses that would not conform to the limitations on non-industrial uses in subsection C, D and E of this section and the need of individual cities and counties to achieve a mix of types of employment uses.
- B. Each city and county with land use planning authority over an area designated by Metro on the 2040 Growth Concept Map, as amended by Ordinance No. 02-969, as a Regional Significant Industrial Area shall, as part of compliance with section 3.07.1120 of the Urban Growth Management Functional Plan, derive plan designation and zoning district boundaries of the areas from the Growth Concept Map.
- C. After determining boundaries of Regionally Significant Industrial Areas pursuant to subsections A and B, the city or county shall adopt implementing ordinances that limit development in the areas to industrial uses, uses accessory to industrial uses, offices for industrial research and development and large corporate headquarters in compliance with subsection E of this section, utilities, and those non-industrial uses necessary to serve the needs of businesses and employees of the areas. Ordinances shall not allow financial, insurance, real estate or other professional office uses unless they are accessory to an industrial or other permitted use.
- D. Notwithstanding subsection C, a city or county shall not approve:
1. A commercial retail use with more than 20,000 square feet of retail sales area in a single building or in multiple buildings that are part of the same development project; or
 2. Commercial retail uses that would occupy more than five percent of the net developable portion of all contiguous Regionally Significant Industrial Areas.

E. As provided in subsection C of this section, a city or county may approve an office for industrial research and development or a large corporate headquarters if:

1. The office is served by public or private transit; and
2. If the office is for a corporate headquarters, it will accommodate for the initial occupant at least 1,000 employees.

F. A city or county may allow division of lots or parcels into smaller lots or parcels as follows:

1. Lots or parcels less than 50 acres may be divided into any number of smaller lots or parcels;
2. Lots or parcels 50 acres or larger may be divided into smaller lots and parcels so long as the resulting division yields the maximum number of lots or parcels of at least 50 acres;
3. Notwithstanding paragraphs 2, 3 and of this subsection, any lot or parcel may be divided into smaller lots or parcels or made subject to rights-of-way for the following purposes:
 - a. To provide public facilities and services;
 - b. To separate a portion of a lot or parcel in order to protect a natural resource, to provide a public amenity, or to implement a remediation plan for a site identified by the Oregon Department of Environmental Quality pursuant to ORS 465.225;
 - c. To separate a portion of a lot or parcel containing a nonconforming use from the remainder of the lot or parcel in order to render the remainder more practical for a permitted use;
 - d. To reconfigure the pattern of lots and parcels pursuant to subsection G of this section; or
 - e. To allow the creation of a lot for financing purposes when the created lot is part of a master planned development.

G. A city or county may allow reconfiguration of lots or parcels less than 50 acres in area if the reconfiguration would be more conducive to a permitted use and would result in no net increase in the total number of lots and parcels. Lots or parcels 50 acres or greater in area may also be reconfigured so long as the resulting area of any such lot or parcel would not be less than 50 acres.

H. Notwithstanding subsections C and D of this section, a city or county may allow the lawful use of any building, structure or land at the time of enactment of an ordinance adopted pursuant to this section to continue and to expand to add up to 20 percent more floor area and 10 percent more land area. Notwithstanding subsection F of this section, a city or county may allow division of lots or parcels pursuant to a master plan approved by the city or county prior to December 31, 2003.

J. By December 31, 2003, Metro shall, following consultation with cities and counties, adopt a map of Regionally Significant Industrial Areas with specific boundaries derived from the Generalized Map of Regionally Significant Industrial Areas adopted in Ordinance No. 02-969, taking into account the location of existing uses that would not conform to the limitations of non-industrial uses in subsections C, D and E of this section and the need of individual cities and counties to achieve a mix of types of employment uses. Each city and county with land use planning authority over the area shall use the map in the application of the provisions of this section until the city or county adopts plan designations and zoning district boundaries of the area as provided by subsection A of this section.

3.07.430 Exceptions

~~Exceptions to this standard for Employment Areas may be included in local compliance plans for:~~

- ~~A. Low traffic generating, land consumptive commercial uses with low parking demand which have a community or region wide market; or~~
- ~~B. Specific Employment Areas which have substantially developed retail areas or which are proposed to be or have been locally designated, but not acknowledged by the effective date of this functional plan, as retail areas, may allow new or redeveloped retail uses where adequate transportation facilities capacity is demonstrated in local compliance plans as provided in Title 8.~~

3.07.430 Protection of Industrial Areas

- A. In Industrial Areas mapped pursuant to Metro Code section 3.07.130 that are not Regionally Significant Industrial Areas, cities and counties shall limit new and expanded retail commercial uses to those appropriate in type and size to serve the needs of businesses, employees and residents of the Industrial Areas.
- B. In an Industrial Area, a city or county shall not approve:
1. A commercial retail use with more than 20,000 square feet of retail sales area in a single building or in multiple buildings that are part of the same development project; or
 2. Commercial retail uses that would occupy more than ten percent of the net developable portion of the area or any adjacent Industrial Area.
- C. Notwithstanding subsection B of this section, a city or county may allow the lawful use of any building, structure or land at the time of enactment of an ordinance adopted pursuant to this section to continue and to expand to add up to 20 percent more floorspace and 10 percent more land area.

3.07.440 Protection of Employment Areas

- A. Except as provided in subsections C, D and E, in Employment Areas mapped pursuant to Metro Code section 3.07.130, cities and counties shall limit new and expanded

commercial retail uses to those appropriate in type and size to serve the needs of businesses, employees and residents of the Employment Areas.

- B. Except as provided in subsections C, D and E, a city or county shall not approve a commercial retail use in an Employment Area with more than 60,000 square feet of gross leasable area in a single building, or commercial retail uses with a total of more than 60,000 square feet of retail sales area on a single lot or parcel, or on contiguous lots or parcels, including those separated only by transportation right-of-way.
- C. A city or county whose zoning ordinance applies to an Employment Area and is listed on Table 3.07-4 may continue to authorize commercial retail uses with more than 60,000 square feet of gross leasable area in that zone if the ordinance authorized those uses on January 1, 2003.
- D. A city or county whose zoning ordinance applies to an Employment Area and is not listed on Table 3.07-4 may continue to authorize commercial retail uses with more than 60,000 square feet of gross leasable area in that zone if:
1. The ordinance authorized those uses on January 1, 2003;
 2. Transportation facilities adequate to serve the commercial retail uses will be in place at the time the uses begin operation; and
 3. The comprehensive plan provides for transportation facilities adequate to serve other uses planned for the Employment Area over the planning period.
- E. A city or county may authorize new commercial retail uses with more than 60,000 square feet of gross leasable area in Employment Areas if the uses:
1. Generate no more than a 25 percent increase in site-generated vehicle trips above permitted non-industrial uses; and
 2. Meet the Maximum Permitted Parking – Zone A requirements set forth in Table 3.07-2 of Title 2 of the Urban Growth Management Functional Plan.

Table 3.07-4
(Section 3.07.420(B))

Clackamas County unincorporated
Commercial
Commercial Industrial

Lake Oswego
General Commercial
Highway Commercial

Troutdale
General Commercial

Hillsboro
General Commercial

Sherwood
General Commercial

Tigard
General Commercial
Commercial Professional

Tualatin
Commercial General

Wilsonville
Planned Development Commercial

Exhibit G to Ordinance No. 02-969B

New Regional Framework Plan Policy on Centers

1.15 Centers

The success of the 2040 Growth Concept depends upon the maintenance and enhancement of the Central City, Regional and Town Centers, Station Communities and Main Streets as the principal centers of urban life in the region. Each Center has its own character and is at a different stage of development. Hence, each needs its own strategy for success.

Metro shall develop a regional strategy for enhancement of Centers, Station Communities and Main Streets in the region. The strategy shall recognize the critical connection between transportation and these design types, and integrate policy direction from the Regional Transportation Plan. The strategy shall place a high priority on investments in Centers by Metro and efforts by Metro to secure complementary investments by others. The strategy shall include measures to encourage the siting of government offices and appropriate facilities in Centers and Station Communities. Metro shall work with local governments, community leaders and state and federal agencies to develop an investment program that recognizes the stage of each Center's development, the readiness of each Center's leadership, and opportunities to combine resources to enhance results. To assist, Metro shall maintain a database of investment and incentive tools and opportunities that may be appropriate for individual Centers.

Metro shall assist local governments and shall seek assistance from the state in the development and implementation of strategies for each of the Centers on the 2040 Growth Concept Map. The strategy for each Center shall be tailored to the needs of the Center and shall include an appropriate mix of investments, incentives, removal of barriers and guidelines aimed to encourage the kinds of development that will add vitality to Centers and improve their functions as the hearts of their communities.

It is the policy of Metro to determine whether strategies for Centers are succeeding. Metro shall measure the success of Centers and report results to the region and the state. Metro shall work with its partners to revise strategies over time to improve their results.

Exhibit G to Ordinance No. 02-969B

New Regional Framework Plan Policy on Centers

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It is the policy of Metro to determine whether strategies for Centers are succeeding. Metro shall measure the success of Centers and report results to the region and the state. Metro shall work with its partners to revise strategies over time to improve their results.

Exhibit H to Ordinance 02-969B

New Metro Code to Implement Policy 1.15 of the Regional Framework Plan

TITLE 6: CENTRAL CITY, REGIONAL CENTERS, TOWN CENTERS AND STATION COMMUNITIES

3.07.610 Purpose and Intent

The success of the 2040 Growth Concept depends upon the maintenance and enhancement of the Central City, Regional and Town Centers and Station Communities as the principal centers of urban life in the region. Title 6 intends to enhance Centers by encouraging development in these Centers that will improve the critical roles they play in the region and by discouraging development outside Centers that will detract from those roles. As used in this title, the term "Centers" includes the Central City, Regional and Town Centers and Station Communities.

3.07.620 Local Strategy to Improve Centers

- A. Each city and county with a Center shown on the 2040 Growth Concept map shall, on a schedule established jointly with Metro but not later than December 31, 2007, develop a strategy to enhance Centers within its jurisdiction. The strategy shall include at least the following elements:
1. An analysis of physical and regulatory barriers to development and a program of actions to eliminate or reduce them.
 2. An accelerated review process for preferred types of development.
 3. An analysis of incentives to encourage development and a program to adopt incentives that are available and appropriate for each Center.
 4. A schedule for implementation of Title 4 of the Urban Growth Management Functional Plan.
 5. An analysis of the need to identify one or more Neighborhood Centers within or in close proximity to Inner and Outer Neighborhoods to serve as a convenient location of neighborhood commercial services, as authorized by Title 12, section 3.07.1230 of the Urban Growth Management Functional Plan.
 6. A work plan, including a schedule, to carry out the strategy.

3.07.630 Special Transportation Areas

Any city or county that has adopted a strategy for a Center pursuant to section 3.07.620 and measures to discourage commercial retail use along state highways outside Center and Neighborhood Centers shall be eligible for designation of a Center by the Oregon Transportation Commission as a Special Transportation Area under Policy 1B of the 1999 Oregon Highway Plan.

3.07.640 Government Offices

- A. Cities and counties shall encourage the siting of government offices in Centers by taking action pursuant to section 3.07.620 to eliminate or reduce unnecessary physical and regulatory barriers to development and expansion of such offices in Centers.
- B. Cities and counties shall discourage the siting of government offices outside Centers, Main Streets and Corridors by requiring a demonstration by the applicant government agency that sites within these designations cannot reasonably accommodate the proposed offices due to characteristics of the offices other than parking for employees.
- C. For purposes of this section, "government offices" means administrative offices and those offices open to and serving the general public, such as libraries, city halls and courts. The term "government offices" does not include other government facilities, such as fire stations, sewage treatment plants or equipment storage yards.

3.07.650 Reporting on Center Progress

In order to assist Metro to evaluate the effectiveness of Title 6 in aid of accomplishment of the 2040 Growth Concept, and to comply with state progress reporting requirements in ORS 197.301, by April 15 of each even-numbered year beginning 2004, each city and county shall report to Metro on a set of measures prescribed by the Council on a form developed for that purpose by Metro.

Exhibit H to Ordinance 02-969B

New Metro Code to Implement Policy 1.15 of the Regional Framework Plan

TITLE 6: REGIONAL ACCESSIBILITY

3.07.610 Intent

Implementation of the 2040 Growth Concept requires that the region identify key measures of transportation effectiveness which include all modes of transportation. Developing a full array of these measures will require additional analysis. Focusing development in the concentrated activity centers, including the central city, regional centers, town centers and station communities, requires the use of alternative modes of transportation in order to avoid unacceptable levels of congestion. The continued economic vitality of industrial areas and intermodal facilities is largely dependent on preserving or improving access to these areas and maintaining reasonable levels of freight mobility in the region. Therefore, regional congestion standards and other regional system performance measures shall be tailored to reinforce the specific development needs of the individual 2040 Growth Concept design types.

These regional standards are linked to a series of regional street design concepts that fully integrate transportation and land use needs for each of the 2040 land use design types in the Regional Framework Plan. The designs generally form a continuum; a network of throughways (freeway and highway designs) emphasize auto and freight mobility and connect major activity centers. Slower speed boulevard designs within concentrated activity centers balance the multi-modal travel demands for each mode of transportation within these areas. Street and road designs complete the continuum, with multi-modal designs that reflect the land uses they serve, but also serving as moderate speed vehicle connections between activity centers that complement the throughway system. It is intended that the entirety of these Title 6 standards will be supplemented by the 1998 Regional Transportation Plan (RTP).

(Ordinance No. 97-715B, Sec. 1. Amended by Ordinance No. 98-721A, Sec. 1.)

3.07.620 Regional Street Design Guidelines

Regional routes in each of the 2040 Design Types are designated as one of four major classifications on the Regional Street Design Map, attached[†]. The four classifications are: Throughways, Boulevards, Streets and Roads. All cities and counties within the Metro region shall consider the following regional street design elements when planning for improvements to these facilities, including those facilities built by ODOT, Tri Met or the Port of Portland. "Creating Livable Streets: Street Design for 2040" (1997) is a resource for cities, counties, ODOT, Tri Met and the Port of Portland to use when prioritizing street design elements within a constrained right-of-way.

A. ~~Throughways.~~ Throughways connect the region's major activity centers within the region, including the central city, regional centers, industrial areas and intermodal facilities to one another and to points outside the region. Throughways are traffic oriented with designs that emphasize motor vehicle mobility. Throughways are divided into Freeway and Highways designs.

1. ~~Freeway Design.~~ Freeways are designed to provide high speed travel for longer motor vehicle trips throughout the region. These designs usually include four to six vehicle lanes, with additional lanes in some situations. They are completely

[†] On file in the Metro Council office.

~~divided, with no left turn lanes. Street connections always occur at separated grades with access controlled by ramps. Cities and counties shall amend their comprehensive plan and implementing ordinances, if necessary, to require consideration of the following Freeway design elements when proceeding with improvements to the right of way on regional routes designated on the regional street design map:~~

- ~~a. High vehicle speeds;~~
- ~~b. Improved pedestrian crossings on overpasses;~~
- ~~c. Parallel facilities for bicycles;~~
- ~~d. Motor vehicle lane widths that accommodate freight movement and high-speed travel.~~

~~2. Highway Design. Highways are designed to provide high speed travel for longer motor vehicle trips throughout the region while accommodating limited public transportation, bicycle and pedestrian travel. Highways are usually divided with a median, but also have left turn lanes where at grade intersections exist. These designs usually include four to six vehicle lanes, with additional lanes in some situations. Cities and counties shall amend their comprehensive plan and implementing ordinances, if necessary, to require consideration of the following Highway design elements when proceeding with improvements to the right of way on regional routes designated on the regional street design map:~~

- ~~a. High vehicle speeds;~~
- ~~b. Few or no driveways;~~
- ~~c. Improved pedestrian crossings at overpasses and all intersections;~~
- ~~d. Accommodation of bicycle travel through the use of a striped bikeway;~~
- ~~e. Sidewalks where appropriate;~~
- ~~f. Motor vehicle lane widths that accommodate freight movement and high-speed travel.~~

~~B. Boulevard Designs. Boulevards serve major centers of urban activity, including the Central City, Regional Centers, Station Communities, Town Centers and some Main Streets. Boulevards are designed with special amenities to favor public transportation, bicycle and pedestrian travel and balance the many travel demands of these areas. Boulevards are divided into regional and community scale designs on the Regional Street Design Map. Regional and Community Boulevards combine motor vehicle traffic with public transportation, bicycle and pedestrian travel where dense development is oriented to the street. Regional Boulevard designs usually include four vehicle lanes, with additional lanes or one-way couplets in some situations. Community Boulevard designs may include up to four vehicle lanes and on street parking. Fewer vehicle lanes may be appropriate in Community Boulevard designs in some situations, particularly when necessary to provide on street parking. Cities and counties shall amend their comprehensive plan and implementing ordinances, if necessary, to require consideration of the following Regional~~

~~and Community Boulevard design elements when proceeding with improvements to the right-of-way on regional routes designated on the regional street design map:~~

- ~~1. Low to moderate vehicle speeds on Regional Boulevard and low vehicle speeds on Community Boulevards;~~
- ~~2. The use of medians and curb extensions to enhance pedestrian crossings where wide streets make crossing difficult;~~
- ~~3. Combined driveways;~~
- ~~4. On street parking where possible;~~
- ~~5. Wide sidewalks with pedestrian amenities such as benches, awnings and special lighting;~~
- ~~6. Landscape strips, street trees or other design features that create a pedestrian buffer between curb and sidewalk;~~
- ~~7. Improved pedestrian crossings at all intersections, and mid block crossings where intersection spacing exceeds 530 feet;~~
- ~~8. Striped bikeways or shared outside lane;~~
- ~~9. Motor vehicle lane widths that consider the above improvements.~~

~~C. Street Designs. Streets serve the region's transit corridors, neighborhoods and some main streets. Streets are designed with special amenities to balance motor vehicle traffic with public transportation, bicycle and pedestrian travel in the 2040 Design Types they serve. Streets are divided into regional and community scale designs on the Regional Street Design Map. Regional Streets are designed to carry motor vehicle traffic while also providing for public transportation, bicycle and pedestrian travel. Regional street designs usually include four vehicle lanes, with additional lanes in some situations. Community Street designs may include up to four vehicle lanes. Fewer vehicle lanes may be appropriate in Community Street designs in some situations, particularly when necessary to provide on street parking. Cities and counties shall amend their comprehensive plan and implementing ordinances, if necessary, to require consideration of the following Regional Street design elements when proceeding with improvements to the right of way on regional routes designated on the Regional Street Design Map:~~

- ~~1. Moderate vehicle speeds;~~
- ~~2. The use of medians and curb extensions to enhance pedestrian crossings where wide streets make crossing difficult or to manage motor vehicle access;~~
- ~~3. Combined driveways;~~
- ~~4. On street parking when appropriate;~~
- ~~5. Buffered sidewalks with pedestrian amenities such as special lighting and special crossing amenities tied to major transit stops;~~

6. ~~Landscape strips, street trees or other design features that create a pedestrian buffer between curb and sidewalk;~~
7. ~~Improved pedestrian crossings at signaled intersections on Regional Streets and improved pedestrian crossings at all intersections on Community Streets;~~
8. ~~Striped bikeways or shared outside lane;~~
9. ~~Motor vehicle lane widths that consider the above improvements.~~

D. ~~Urban Roads. Urban Roads serve the region's industrial areas, intermodal facilities and employment centers where buildings are less oriented to the street, and primarily emphasize motor vehicle mobility. Urban Roads are designed to carry significant motor vehicle traffic while providing for some public transportation, bicycle and pedestrian travel. These designs usually include four vehicle lanes, with additional lanes in some situations. Cities and counties shall amend their comprehensive plan and implementing ordinances, if necessary, to require consideration of the following Urban Road design elements when proceeding with improvements to the right-of-way on regional routes designated on the regional street design map:~~

1. ~~Moderate vehicle speeds;~~
2. ~~Few driveways;~~
3. ~~Sidewalks;~~
4. ~~Improved pedestrian crossings at major intersections;~~
5. ~~Striped bikeways;~~
6. ~~Center medians that manage access and control left turn movements;~~
7. ~~Motor vehicle lane widths that consider the above improvements.~~

(Ordinance No. 97-715B, Sec. 1. Amended by Ordinance No. 98-721A, Sec. 1.)

3.07.630 Design Standards for Street Connectivity

~~The design of local street systems, including "local" and "collector" functional classifications, is generally beyond the scope of the Regional Transportation Plan (RTP). However, the aggregate effect of local street design impacts the effectiveness of the regional system when local travel is restricted by a lack of connecting routes, and local trips are forced onto the regional network. Therefore, streets should be designed to keep through trips on arterial streets and provide local trips with alternative routes. The following design and performance options are intended to improve local circulation in a manner that protects the integrity of the regional system.~~

~~Cities and counties within the Metro region are hereby required to amend their comprehensive plans and implementing ordinances, if necessary, to comply with or exceed one of the following options in the development review process:~~

A. ~~Design Option.~~ Cities and counties shall ensure that their comprehensive plans, implementing ordinances and administrative codes require demonstration of compliance with the following, consistent with regional street design policies:

1. ~~For new residential and mixed use development, all contiguous areas of vacant and primarily undeveloped land of five acres or more shall be identified by cities and counties and the following will be prepared, consistent with regional street design policies:~~

~~A map that identifies possible local street connections to adjacent developing areas. The map shall include:~~

a. ~~Full street connections at intervals of no more than 530 feet, except where prevented by topography, barriers such as railroads or freeways, or environmental constraints such as major streams and rivers. Street connections at intervals of no more than 330 feet are recommended in areas planned for the highest density mixed use development.~~

b. ~~Accessways for pedestrians, bicycles or emergency vehicles on public easements or right of way where full street connections are not possible, with spacing between full street or accessway connections of no more than 330 feet, except where prevented by topography, barriers such as railroads or freeways, or environmental constraints such as major streams and rivers.~~

2. ~~New residential and mixed use developments shall include local street plans that:~~

a. ~~Encourage pedestrian and bicycle travel by providing short, direct public right of way routes to connect residential uses with nearby existing and planned commercial services, schools, parks and other neighborhood facilities; and~~

b. ~~Include no cul-de-sac streets longer than 200 feet, and no more than 25 dwelling units on a closed-end street system except where topography, barriers such as railroads or freeways, or environmental constraints such as major streams and rivers, prevent street extension; and~~

c. ~~Provide bike and pedestrian connections on public easements or right of way when full street connections are not possible, with spacing between connections of no more than 330 feet except where prevented by topography, barriers such as railroads or freeways, or environmental constraints such as major streams and rivers; and~~

d. ~~Consider opportunities to incrementally extend and connect local streets in primarily developed areas; and~~

e. ~~Serve a mix of land uses on contiguous local streets; and~~

f. ~~Support posted speed limits; and~~

g. ~~Consider narrow street design alternatives that feature total right of way of no more than 46 feet, including pavement widths of no more than 28 feet, curb face to curb face, sidewalk widths of at least 5 feet and landscaped pedestrian buffer strips that include street trees; and~~

h. ~~Limit the use of cul-de-sac designs and closed street systems to situations where topography, pre-existing development or environmental constraints prevent full street extensions.~~

3. ~~For redevelopment of existing land uses, cities and counties shall develop local approaches for dealing with connectivity.~~

B. ~~Performance Option. For residential and mixed use areas, cities and counties shall amend their comprehensive plans, implementing ordinances and administrative codes, if necessary, to require demonstration of compliance with performance criteria in the following manner. Cities and counties shall develop local street design standards in text or maps or both with street intersection spacing to occur at intervals of no more than 530 feet except where prevented by topography, barriers such as railroads or freeways, or environmental constraints such as major streams and rivers. Street connections at intervals of no more than 330 feet are recommended in areas planned for the highest density mixed use development. Local street designs for new developments shall satisfy the following additional criteria:~~

1. ~~Performance Criterion: minimize local traffic on the regional motor vehicle system, by demonstrating that local vehicle trips on a given regional facility do not exceed the 1995 arithmetic median of regional trips for facilities of the same motor vehicle system classification by more than 25 percent.~~

2. ~~Performance Criterion: everyday local travel needs are served by direct, connected local street systems where: (1) the shortest motor vehicle trip over public streets from a local origin to a collector or greater facility is no more than twice the straight-line distance; and (2) the shortest pedestrian trip on public right of way is no more than one and one-half the straight-line distance.~~

(Ordinance No. 97-715B, Sec. 1. Amended by Ordinance No. 98-721A, Sec. 1.)

3.07.640 Transportation Performance Standards

~~A process to identify transportation mode split targets, transportation needs and appropriate actions to address those targets and needs is included in this section. The intent is to provide guidance to cities, counties, ODOT, Tri Met and the Port of Portland when developing a transportation system plan, defining a project, or evaluating the potential transportation impacts of a land use action.~~

~~A transportation need is identified when a particular transportation standard or threshold has been exceeded. Standards which may be used in identifying transportation needs include: safety, statewide mobility as identified in the Oregon Transportation Plan, mode splits, motor vehicle congestion analysis, freight mobility or demonstration that lack of access is limiting development of a priority regional land use. Needs are generally identified either through a comprehensive plan amendment review or as result of a system planning analysis which evaluates forecast travel demand.~~

~~Subsequent to the identification of a need, an appropriate transportation strategy or solution is identified through a two-phased multi-modal planning and project development process. The first phase is multi-modal system level planning. The purpose of system level planning is to examine a number of transportation alternatives over a large geographic area such as a corridor or sub-area, or through a local or regional Transportation System Plan (TSP). The purpose of the multi-modal system level planning step is to (1) consider alternative modes, corridors, and strategies to address identified needs; and~~

(2) determine a recommended set of transportation projects, actions, or strategies and the appropriate modes and corridors to address identified needs in the system-level study area.

The second phase is project-level planning (also referred to as project development). The purpose of project-level planning is to develop project design details and select a project alignment, as necessary, after evaluating engineering and design details and environmental impacts.

The following sub-sections (A-D): (1) require that cities and counties establish regional mode split targets for all 2040 design types that will be used to guide transportation system improvements; (2) establish optional performance standards and deficiency thresholds intended to identify transportation needs through multi-modal system-level planning and (3) establish the process to identify appropriate recommended solutions to address those needs identified through multi-modal system-level planning and project-level planning.

A. Alternative Mode Analysis.

1. Person travel represents the largest share of trips for all modes of travel. Improvement in mode split will be used as the key regional measure for assessing transportation system improvements in the Central City, Regional Centers, Town Centers and Station Communities. For other 2040 Growth Concept design types, mode split will be used as an important factor in assessing transportation system improvements. Each jurisdiction shall establish an alternative mode split target (defined as non-Single Occupancy Vehicle person-trips as a percentage of all person-trips for all modes of transportation) for trips into, out of and within all 2040 Growth Concept land use design types within its boundaries one year after adoption of the 1998 Regional Transportation Plan. The alternative mode split target shall be no less than the regional targets for these 2040 Growth Concept land use design types to be established in the 1998 Regional Transportation Plan.
2. Cities and counties shall identify actions which will implement the mode split targets one year after adoption of the 1998 Regional Transportation Plan. These actions should include consideration of the maximum parking ratios adopted as part of Title 2, section 3.07.220; Regional Street Design considerations in this title; and transit's role in serving the area.

B. Motor Vehicle Congestion Analysis.

1. Motor Vehicle Level Of Service (LOS) is a measurement of congestion as a share of designed motor vehicle capacity of a road. Table 3.07-5, Motor Vehicle Level Of Service Deficiency Thresholds and Operating Standards, may be incorporated into local comprehensive plans and implementing ordinances to replace current methods of determining motor vehicle congestion on regional facilities, if a city or county determines that this change is needed to permit Title 1, Table 3.07-1 capacities for the 2040 design types and facilities.
2. Analysis. A transportation need is identified in a given location when analysis indicates that congestion has reached the level indicated in the "exceeds deficiency threshold" column of Table 3.07-5 and that this level of congestion will negatively impact accessibility, as determined through section 3.07.640(B)(4), below. The analysis should consider a mid-day hour appropriate for the study area and the appropriate two-hour peak-hour condition, either A.M. or P.M. or both to address the problem. Other non-peak

hours of the day, such as mid-day on Saturday, should also be considered to determine whether congestion is consistent with the acceptable or preferred operating standards identified in Table 3.07-5. The lead agency or jurisdictions will be responsible for determining the appropriate peak and non-peak analysis periods. The lead agency or jurisdictions will be responsible for determining the appropriate peak analysis period.

— An appropriate solution to the need is determined through multi-modal system-level planning considerations listed in section 3.07.640(C), below. For regional transportation planning purposes, the recommended solution should be consistent with the acceptable or preferred operating standards identified in Table 3.07-5. A city or county may choose a higher level of service operating standard where findings of consistency with section 3.07.640(C) have been developed.

3. — Regional Highways. Figure 3.07-1 identifies the Regional Highways specified in Table 3.07-5. Each corridor will be evaluated on a case-by-case basis through system-level refinement studies. The studies will identify the performance and operating expectations for each corridor based on their unique operating and geographic characteristics. Appropriate multi-modal solutions to needs identified through these studies will be forwarded for inclusion in the Regional Transportation Plan.

4. — Accessibility. If a deficiency threshold is exceeded on the regional transportation system as identified in Table 3.07-5, cities and counties shall evaluate the impact of the congestion on regional accessibility using the best available quantitative or qualitative methods. If a determination is made by Metro that exceeding the deficiency threshold negatively impacts regional accessibility, cities and counties shall follow the transportation systems analysis and transportation project analysis procedures identified in 3.07.640(C) and (D) below.

5. — Consistency. The identified function or the identified capacity of a road may be significantly affected by planning for 2040 Growth Concept design types. Cities and counties shall take actions described in section 3.07.640(C) and (D) below, including amendment of their transportation plans and implementing ordinances, if necessary, to preserve the identified function and identified capacity of the road, and to retain consistency between allowed land uses and planning for transportation facilities.

C. — Transportation Systems Analysis. This section applies to city and county comprehensive plan amendments or to any studies that would recommend or require an amendment to the Regional Transportation Plan to add significant single-occupancy vehicle (SOV) capacity to multi-modal arterials and/or highways.

Consistent with Federal Congestion Management System requirements (23 CFR Part 500) and TPR system planning requirements (660-12), the following actions shall be considered through the Regional Transportation Plan when recommendations are made to revise the Regional Transportation Plan and/or local transportation system plans to define the need, mode, corridor and function to address an identified transportation need consistent with Table 3.07-5, and recommendations are made to add significant SOV capacity:

1. — Regional transportation demand strategies;
2. — Regional transportation system management strategies, including intelligent transportation systems (ITS);

3. ~~High occupancy vehicle (HOV) strategies;~~
4. ~~Regional transit, bicycle and pedestrian system improvements to improve mode split;~~
5. ~~Unintended land use and transportation effects resulting from a proposed SOV project or projects;~~
6. ~~Effects of latent demand from other modes, routes or time of day from a proposed SOV project or projects;~~
7. ~~If upon a demonstration that the above considerations do not adequately and cost-effectively address the problem, a significant capacity improvement may be included in the regional transportation plan.~~

Consistent with Federal Congestion Management System requirements (23 CFR Part 500) and TPR system planning requirements (660-12), the following actions shall be considered when local transportation system plans (TSPs), multi-modal corridor and sub-area studies, mode specific plans or special studies (including land use actions) are developed:

1. ~~Transportation demand strategies that further refine or implement a regional strategy identified in the RTP;~~
2. ~~Transportation system management strategies, including intelligent Transportation Systems (ITS), that refine or implement a regional strategy identified in the RTP;~~
3. ~~Sub-area or local transit, bicycle and pedestrian system improvements to improve mode split;~~
4. ~~The effect of a comprehensive plan change on mode split targets and actions to ensure the overall mode split target for the local TSP is being achieved;~~
5. ~~Improvements to parallel arterials, collectors, or local streets, consistent with connectivity standards contained in section 3.07.620 of this title, as appropriate, to address the transportation need and to keep through trips on arterial streets and provide local trips with alternative routes;~~
6. ~~Traffic calming techniques or changes to the motor vehicle functional classification, to maintain appropriate motor vehicle functional classification;~~
7. ~~If upon a demonstration that the above considerations do not adequately and cost-effectively address the problem, a significant capacity improvement may be included in the comprehensive plan.~~

Upon a demonstration that the above considerations do not adequately and cost-effectively address the problem and where accessibility is significantly hindered, Metro and the affected city or county shall consider:

1. ~~Amendments to the boundaries of a 2040 Growth Concept design type;~~
2. ~~Amendments or exceptions to land use functional plan requirements; and/or~~

3. ~~Amendments to the 2040 Growth Concept.~~

~~Demonstration of compliance will be included in the required congestion management system compliance report submitted to Metro by cities and counties as part of system-level planning and through findings consistent with the TPR in the case of amendments to applicable plans.~~

~~D. Transportation Project Analysis. The TPR and Metro's Interim Congestion Management System (CMS) document require that measures to improve operational efficiency be addressed at the project level. Section 3.07.620 of this title requires that street design guidelines be considered as part of the project level planning process. Therefore, cities, counties, Tri-Met, ODOT, and the Port of Portland shall address the following operational and design considerations during transportation project analysis:~~

- ~~1. Transportation system management (e.g., access management, signal inter-ties, lane channelization, etc.) to address or preserve existing street capacity.~~
- ~~2. Guidelines contained in "Creating Livable Streets: Street Design Guidelines for 2040" (1997) and other similar resources to address regional street design policies.~~

~~The project need, mode, corridor, and function do not need to be addressed at the project level. This section 3.07.640(D) does not apply to locally funded projects on facilities not designated on the Regional Motor Vehicle System Map or the Regional Street Design Map. Demonstration of compliance will be included in the required Congestion Management System project level compliance report submitted to Metro as part of project level planning and development.~~

~~(Ordinance No. 97-715B, Sec. 1. Amended by Ordinance No. 98-721A, Sec. 1.)~~

Table 3.07-5
Motor Vehicle Level of Service Deficiency Thresholds and Operating Standards*
 (Section 3.07.640(B)(1))

	Preferred Operating Standard	Acceptable Operating Standard		Preferred Operating Standard	Acceptable Operating Standard
Central City, Regional Centers, Town Centers, Main Streets and Station Communities	C	E		1 st hour E 2 nd hour E	1 st hour F 2 nd hour E
Corridors, Industrial Areas and Intermodal Facilities, Employment Areas and Inner and Outer Neighborhoods	C	D		1 st hour E 2 nd hour D	1 st hour E 2 nd hour E
Regional Highway Corridors	identify and evaluate on a case-by-case basis** to balance regional and local mobility and accessibility objectives			identify and evaluate on a case-by-case basis** to balance regional and local mobility and accessibility objectives	

*Level of Service is determined by using either the latest edition of the Highway Capacity Manual (Transportation Research Board) or through volume to capacity ratio equivalencies as follows: LOS C = .8 or better; LOS D = .8 to .9; LOS E = .9 to 1.0; and LOS F = 1.0 to 1.1. A copy of the Level of Service Tables from the Highway Capacity Manual is attached as Table 3.07-6. Regional Highway Corridors are identified in the map attached as Figure 3.07-1.

** See section 3.07.640(B)(3).

(Ordinance No. 98-721A, Sec. 1.)

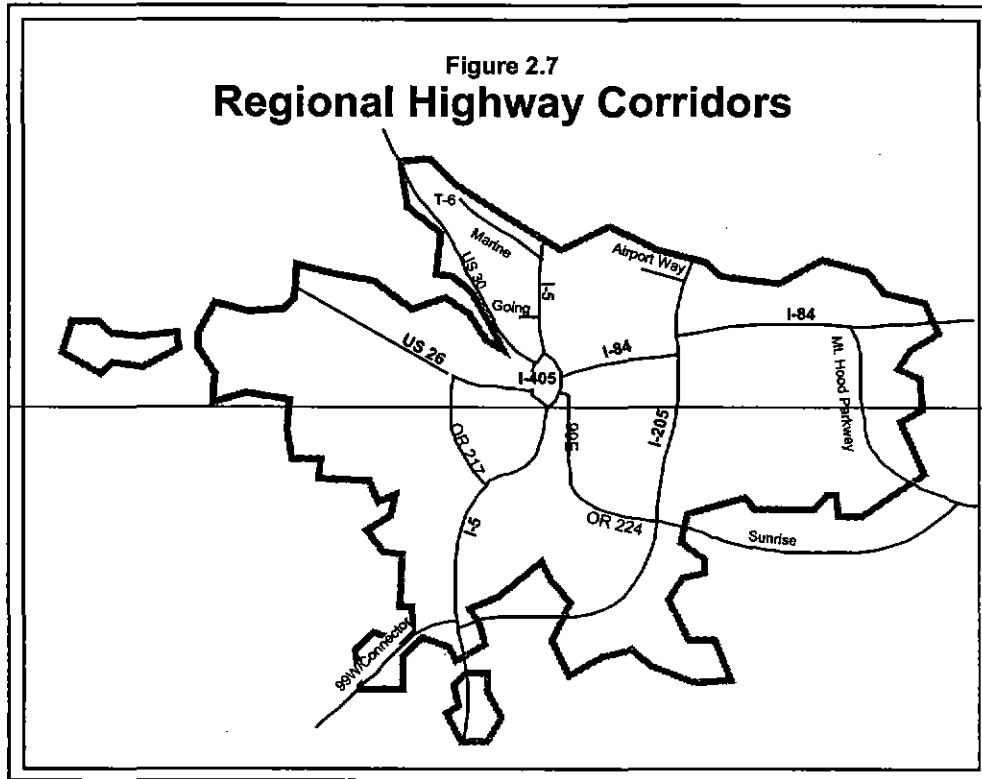
Table 3.07-6
Level-of-Service (LOS) Definitions for Freeways, Arterials and Signalized Intersections
 (Section 3.07.640(B)(1))

LOS	Freeways (average travel speed assuming 70 mph design speed)	Arterials (average travel speed assuming a typical free flow speed of 40 mph)	Signalized Intersections (stopped delay per vehicle)	Traffic Flow Characteristics
A	Greater than 60 mph Average spacing: 22 car lengths	Greater than 35 mph	Less than 5 seconds; most vehicles do not stop at all	Virtually free flow; completely unimpeded Volume/capacity ratio less than or equal to .60
B	57 to 60 mph Average spacing: 13 car lengths	28 to 35 mph	5.1 to 15 seconds; more vehicles stop than for LOS A	Stable flow with slight delays; reasonably unimpeded Volume/capacity ratio .61 to .70
C	54 to 57 mph Average spacing: 9 car lengths	22 to 28 mph	15.1 to 25 seconds; individual cycle failures may begin to appear	Stable flow with delays; less freedom to maneuver Volume/capacity ratio of .71 to .80
D	46 to 54 mph Average spacing: 6 car lengths	17 to 22 mph	25.1 to 40 seconds; individual cycle failures are noticeable	High density, but stable flow Volume/capacity ratio of .81 to .90
E	30 to 46 mph Average spacing: 4 car lengths	13 to 17 mph	40.1 to 60 seconds; individual cycle failures are frequent; poor progression	Operating conditions at or near capacity; unstable flow Volume/capacity ratio of .91 to 1.00
F	Less than 30 mph Average spacing: bumper to bumper	Less than 13 mph	Greater than 60 seconds; not acceptable for most drivers	Forced flow, breakdown conditions Volume/capacity ratio of greater than 1.00
>F	Demand exceeds roadway capacity, limiting volume that can be carried and forcing excess demand onto parallel routes and extending the peak period			Demand/capacity ratios of greater than 1.10

Source: 1985 Highway Capacity Manual (A through F descriptions); Metro (>F description)

(Ordinance No. 97-715B, Sec. 1. Amended by Ordinance No. 98-721A, Sec. 1.)

Figure 3.07-1
(Section 3.07.640(B)(3))



9-12-97

(Ordinance No. 98-721A, Sec. 1.)

TITLE 6: CENTRAL CITY, REGIONAL CENTERS, AND TOWN CENTERS AND STATION COMMUNITIES

3.07.610 Purpose and Intent

The success of the 2040 Growth Concept depends upon the maintenance and enhancement of the Central City, Regional and Town Centers and Station Communities as the principal centers of urban life in the region. Title 6 intends to enhance Centers by encouraging development in these Centers that will improve the critical roles Centers they play in the region and by discouraging development outside Centers that will detract from those roles. As used in this title, the term "Centers" includes the Central City, Regional and Town Centers and Station Communities.

3.07.620 Local Strategy to Improve Centers

- A. Each city and county with a Regional or Town Center shown on the 2040 Growth Concept map shall, on a schedule established jointly with Metro but not later than

December 31, 2007, develop a strategy to enhance Centers within its jurisdiction. The strategy shall include at least the following elements:

1. An analysis of physical and regulatory barriers to development and a program of actions to eliminate or reduce them.
2. An accelerated review process for preferred types of development.
3. An analysis of incentives to encourage development and a program to adopt incentives that are available and appropriate for each Center.
4. A schedule for implementation of Title 4 of the Urban Growth Management Functional Plan.
5. An analysis of the need to identify one or more Neighborhood Centers within or in close proximity to Inner and Outer Neighborhoods to serve as the central-a convenient location of neighborhood commercial services, as authorized by Title 12, section 3.07.1230 of the Urban Growth Management Functional Plan.
6. A work plan, including a schedule, to carry out the strategy.

3.07.630 Special Transportation Areas

Any city or county that has adopted a strategy for a Center pursuant to section 3.07.620 and measures to discourage commercial retail use along state highways outside Centers, Station Communities and Neighborhood Centers shall be eligible for designations of a Center by the Oregon Transportation Commission as a Special Transportation Area under Policy 1B of the 1999 Oregon Highway Plan.

3.07.640 Government Offices

- A. Cities and counties shall encourage the siting of government offices in Centers, Station Communities, Main Streets and Corridors by taking action pursuant to section 3.07.620 to eliminate or reduce unnecessary physical and regulatory barriers to development and expansion of such offices in Centers and Station Communities.
- B. Cities and counties shall discourage the siting of government offices outside Centers, Station Communities, Main Streets and Corridors by requiring a demonstration by the applicant government agency that sites within these designations cannot reasonably accommodate the proposed offices due to characteristics of the offices other than parking for employees.
- C. For purposes of this section, "government offices" means administrative offices and those offices open to and serving the general public, such as libraries, city halls and courts. The term "government offices" does not include other government facilities, such as fire stations, sewage treatment plants or equipment storage yards.

3.07.650 Reporting on Center Progress

In order to assist Metro to evaluate the effectiveness of Title 6 in aid of accomplishment of the 2040 Growth Concept, and to comply with state progress reporting requirements in ORS 197.301,

by April 15 of each even-numbered year beginning 2004, each city and county shall report to Metro on a set of measures prescribed by the Council on a form developed for that purpose by Metro.

Exhibit J to Ordinance No. 02-969B

New Regional Framework Plan Policy on the Urban Growth Boundary

1.9 Urban Growth Boundary

It is the policy of Metro to ensure that expansions of the UGB help achieve the objectives of the 2040 Growth Concept. When Metro expands the boundary, it shall determine whether the expansion will enhance the roles of Centers and, to the extent practicable, ensure that it does.

Exhibit J to Ordinance No. 02-969B

New Regional Framework Plan Policy on the Urban Growth Boundary

1.9 Urban Growth Boundary

It is the policy of Metro to ensure that expansions of the UGB help achieve the objectives of the 2040 Growth Concept. When Metro expands the boundary, it shall determine whether the expansion will enhance the roles of Centers and, to the extent practicable, ensure that it does.

Exhibit K to Ordinance No. 02-969B

CHAPTER 3.01: URBAN GROWTH BOUNDARY AND URBAN RESERVE PROCEDURES

3.01.005 Purpose

(a) This chapter is established to provide procedures to be used by Metro in making amendments to the Metro Urban Growth Boundary (UGB) adopted pursuant to ORS 268.390(3) and 197.005 through 197.430. The chapter is intended to interpret all criteria and standards for boundary amendments pertaining to Statewide Planning Goals 2 and 14, and the Regional Urban Growth Goals and Objectives. Unique circumstances associated with a proposed amendment may require consideration of statewide planning goals other than Goals 2 and 14. This chapter is also established to be used for the establishment and management of Urban Reserves, pursuant to OAR 660-21-000 to 660-21-100 and RUGGO Objective 22.

(b) The objectives of the UGB are to:

- (1) Provide sufficient urban land for accommodating the forecast 20-year urban land need, reevaluated at least every five years as set forth in sections 3.01.015-3.01.020;
- (2) Provide for an efficient urban growth form which reduces sprawl;
- (3) Provide a clear distinction between urban and rural lands;
- (4) Encourage appropriate infill and redevelopment in all parts of the urban region.

(c) The objectives of the Urban Reserves are to:

- (1) Identify sufficient land suitable for urbanization sufficient to accommodate the forecast needs for a 30 to 50 year interval, reevaluated at least every 15 years;
- (2) Limit the areas which are eligible to apply for inclusion to the Urban Growth Boundary consistent with ORS 197.298, and protect resource lands outside the urban reserve areas;
- (3) Protect lands designated as urban reserves for their eventual urbanization, and insure their efficient urbanization consistent with the 2040 Growth Concept, the RUGGOs and the Urban Growth Management Functional Plan;
- (4) Provide for coordination between cities, counties, school districts, and special districts for planning for the urban reserve areas;
- (5) Ensure a smooth transition to urban development by planning for general governance, public facilities, land uses, and planning for financing the capital needs of the urban development.

3.01.010 Definitions

- (a) "Council" has the same meaning as in chapter 1.01.
- (b) "Compatible," as used in this chapter, is not intended as an absolute term meaning no interference or adverse impacts of any type with adjacent uses. Any such interference or adverse impacts must be balanced with the other criteria and considerations cited.
- (c) "District" has the same meaning as in chapter 1.01.
- (d) "Goals" means the statewide planning goals adopted by the Oregon Land Conservation and Development Commission at OAR 660-15-000.
- (e) "Gross developable vacant land" means the total buildable land area within the UGB, as compiled by Metro for the purpose of determining the need for changes in the urban land supply. These are lands that can be shown to lack significant barriers to development. Gross developable vacant lands include, but are not limited to, all recorded lots on file with the county assessors equal to or larger than either the minimum lot size of the zone in which the lot is located or the minimum lot size which will be applied in an urban holding zone which:
 - (1) Are without any structures as corroborated through examination of the most recent aerial photography at the time of inventory; or
 - (2) Have no improvements according to the most recent assessor records.
- (f) "Gross redevelopable land" means the total area of redevelopable land and infill parcels within the UGB including:
 - (1) That portion of all partially developed recorded lots, where one-half acre or more of the land appears unimproved through examination of the most recent aerial photography at the time of inventory; and
 - (2) All recorded lots on file with the county assessors that are 20,000 square feet or larger where the value of the improvement(s) is significantly less than the value of the land, as established by the most recent assessor records at the time of inventory. Standard measures to account for the capability of infill and redevelopment properties will be developed by the district to provide a means to define what is significant when comparing structure value and land values; or, when a city or county has more detailed or current gross redevelopable land inventory data, for all or a part of their jurisdiction, it can request that the district substitute that data for inclusion in the gross developable land inventory.
- (g) "Gross developable land" means the total of gross developable vacant land and gross redevelopable land.
- (h) "Legislative amendment" means an amendment to the UGB initiated by the district, which is not directed at a particular site-specific situation or relatively small number of persons.

(i) "Natural area" means a landscape unit substantially without any human development that is substantially in a native and unaffected state and may be composed of plant and animal communities, water bodies, soil and rock and mitigated habitat. Natural areas must be identified in a city, county or special district open space inventory or plan.

(j) "Natural feature" means any landscape unit, such as a slope greater than 25 percent, a water body, a floodplain or a forest, that acts as a barrier or transition between human activities.

(k) "Net acre" for purposes of calculating the total land area within a proposal to amend the UGB means an area measured in acres which excludes:

- (1) Any developed road rights-of-way through or on the edge of the proposed UGB amendment; and
- (2) Environmentally constrained areas, including any open water areas, floodplains, natural resource areas protected in the comprehensive plans of cities and counties in the region, slopes in excess of 25 percent and wetlands requiring a federal fill and removal permit under Section 404 of the Clean Water Act. These excluded areas do not include lands for which the local zoning code provides a density bonus or other mechanism which allows the transfer of the allowable density or use to another area or to development elsewhere on the same site; and,
- (3) All publicly-owned land designated for park and open space uses.

(l) "Net developable land" means the total of net developable vacant land and net redevelopable land.

(m) "Net developable vacant land" means the number of acres that are available for all types of development after the total number of developable acres within the UGB is reduced by the amount of land for the provision of roads, schools, parks, private utilities, churches, social organizations, legally buildable single family lots, and other public facilities.

(n) "Net redevelopable land" means the amount of land remaining when gross redevelopable land is reduced by the estimated land needed for the provision of additional roads, schools, parks, private utilities and other public facilities. The district shall determine the appropriate factor to be used for each jurisdiction in consultation with the jurisdiction within which the specific redevelopable land is located.

(o) "Nonurban land" means land currently outside the UGB.

(p) "Party" means any individual, agency, or organization who participates orally or in writing in the creation of the record established at a public hearing.

(q) "Planning period" means the period covered by the most recent officially adopted district forecasts, which is approximately a 20-year period.

(r) "Property owner" means a person who owns the primary legal or equitable interest in the property.

(s) "Public facilities and services" means sanitary sewers, water service, fire protection, parks, open space, recreation, streets and roads and mass transit.

(t) "Regional forecast" means a 20-year forecast of employment and population by specific areas within the region, which has been adopted by the district.

(u) "Site" means the subject property for which an amendment or locational adjustment is being sought.

(v) "Specific land need" means a specific type of identified land needed which complies with Goal 14, Factors 1 and 2 that cannot be reasonably accommodated on urban reserve land.

(w) "UGB" means the Urban Growth Boundary for the district pursuant to ORS 268.390 and 197.005 through 197.430.

(x) "Urban land" means that land inside the UGB.

(y) "Urban reserve" means an area designated as an urban reserve pursuant to section 3.01.012 of this code and applicable statutes and administrative rules.

3.01.012 Urban Reserve Areas

(a) Purpose. The purpose of this section is to comply with ORS 197.298 by identifying lands designated urban reserve land by Metro as the first priority land for inclusion in the Metro Urban Growth Boundary.

(b) Designation of Urban Reserves.

- (1) The Council shall designate the amount of urban reserves estimated to accommodate the forecast need.
- (2) The areas designated as urban reserves shall be sufficient to accommodate expected urban development for a 30 to 50 year period, taking into account an estimate of all potential developable and redevelopable land within the current urban growth boundary.
- (3) The Council shall estimate the capacity of the urban reserves consistent with the procedures for estimating capacity of the urban area set forth in section 3.01.020.
- (4) The minimum residential density to be used in estimating the capacity of the areas designated as urban reserves shall be an average of at least 10 dwelling units per net developable acre or lower densities which conform to the 2040 Growth Concept design type designation for the urban reserve area.
- (5) The Council may designate a portion of the land required for urban reserves in order to phase designation of urban reserves.

- (6) Metro has designated as urban reserve areas those lands indicated on the 2040 Growth Concept map which was adopted as part of the Regional Urban Growth Goals and Objectives.

(c) Plans For Urban Reserve Areas. Subject to applicable law, cities and counties may prepare and adopt comprehensive plan amendments for urban reserve areas consistent with all provisions of the Urban Growth Management Functional Plan prior to the inclusion of an urban reserve area within the Urban Growth Boundary. Prior to the preparation and adoption of any such comprehensive plan amendments, at the request of a city or county, the Council shall establish the 2040 Growth Concept design types and the boundaries of the area to be planned, if it has not previously done so.

3.01.015 Legislative Amendment Procedures

(a) The process for determination of need and location of lands for amendment of the UGB is provided in section 3.01.020.

(b) Notice shall be provided as described in section 3.01.050.

(c) The Council shall initiate Legislative Amendments when it determines pursuant to Goal 14 and section 3.01.020 that there is a need to add land to the Urban Growth Boundary.

(d) Before adopting any legislative amendment, Metro shall consult with cities, counties and MPAC to determine which cities and counties, if any, are prepared to initiate comprehensive plan amendments for urban reserve areas, if they are included, within the Urban Growth Boundary.

(e) Where a city or county has adopted comprehensive plan amendments for an urban reserve area pursuant to section 3.01.012(c), the Metro Council shall rely upon the planned status of that urban reserve in considering applicable criteria.

(f) Legislative amendment decisions shall be based upon substantial evidence in the decision record which demonstrates how the amendment complies with applicable state and local law and statewide goals as interpreted by section 3.01.020.

(g) The following public hearings process shall be followed for legislative amendments:

- (1) The district council shall refer a proposed amendment to the appropriate council committee at the first council reading of the ordinance.
- (2) The committee shall take public testimony at as many public hearings as necessary. At the conclusion of public testimony, the committee shall deliberate and make recommendations to the council.
- (3) The council shall take public testimony at its second reading of the ordinance, discuss the proposed amendment, and approve the ordinance with or without revisions or conditions, or refer the proposed legislative amendment to the council committee for additional consideration.

- (4) Testimony before the council or the committee shall be directed to Goal 14 and Goal 2 considerations interpreted at section 3.01.020 of this chapter.
- (5) Prior to the council acting to approve a legislative amendment, including land outside the district, the council shall annex the territory to the district. The annexation decision shall be consistent with the requirements of section 3.09.120 of this code. If the annexation decision becomes the subject of a contested case pursuant to chapter 3.09 of this code, the Legislative amendment to the Urban Growth Boundary shall not be approved until the contested case is either withdrawn or the annexation is approved by the Boundary Appeals Commission, whichever occurs first.

3.01.020 Legislative Amendment Criteria

(a) The purpose of this section is to address ORS 197.298, Goals 2 and 14 of the statewide planning goals and RUGGO. This section details a process which is intended to interpret Goals 2 and 14 for specific application to the district UGB. Compliance with this section shall constitute compliance with ORS 197.298, statewide planning Goals 2 and 14 and the Regional Urban Growth Goals and Objectives.

(b) While all of the following Goal 14 factors must be addressed, the factors cannot be evaluated without reference to each other. Rigid separation of the factors ignores obvious overlaps between them. Demonstration of compliance with one factor or subfactor may not constitute a sufficient showing of compliance with the goal, to the exclusion of the other factors when making an overall determination of compliance or conflict with the goal. For legislative amendments, if need has been addressed, the district shall demonstrate that the priorities of ORS 197.298 have been followed and that the recommended site was better than alternative sites, balancing factors 3 through 7.

- (1) Factor 1: Demonstrated need to accommodate long-range urban population growth.
 - (A) The district shall develop 20-year Regional Forecasts of Population and Employment, which shall include a forecast of net developable land need, providing for coordination with cities, counties, special districts and other interested parties, and review and comment by the public. After deliberation upon all relevant facts the district shall adopt a forecast. This forecast shall be completed at least every five years or at the time of periodic review, whichever is sooner. Concurrent with the adoption of the district's 20-year Regional Forecast, the district shall complete an inventory of net developable land calculating the supply of buildable land within the urban growth boundary by applying the variables set forth in Chapter 1 of the Regional Framework Plan. The district shall provide the opportunity for review and comment by all cities and counties in the district, and by the public.

- (i) In calculating the supply of buildable lands in the urban growth boundary, the district shall estimate the effect, based on the best information available, of changes to zoned capacity that have been adopted and implemented by local governments to comply with the Region 2040 Growth Concept and all titles of the Urban Growth Management Functional Plan.
- (ii) The district shall estimate the number of gross vacant buildable acres within the urban growth boundary.
- (iii) The district shall estimate the number of net vacant buildable acres within the urban growth boundary from the gross vacant buildable acres. The number of acres estimated to be unavailable for housing development shall be subtracted to estimate the net acres, including, but not limited to:
 - (I) Lands in environmentally sensitive areas and lands with slopes equal to or exceeding 25 percent, provided those lands are zoned so as to be unavailable for housing development.
 - (II) Lands for streets, schools, parks, churches and social organizations.
 - (III) Vacant legally buildable lots zoned for single family residential use.
- (iv) The district shall estimate the number of net vacant buildable acres that are available for residential use based on current local government zoning designations. The district shall also estimate the number of dwelling units that these residentially zoned lands can accommodate under existing zoning designations.
- (v) The district shall reduce the estimated number of dwelling units that can be accommodated on vacant residential lands to account for the following:
 - (I) The number of dwelling units estimated to be lost when property owners do not develop to maximum residential densities, taking into account zoned minimum densities; and
 - (II) If Metro adopts additional measures to increase residential densities inside the existing urban growth boundary, the number of additional dwelling units estimated to be accommodated as the result of the new measures.

- (vi) The district shall increase the estimated number of dwelling units that may be accommodated on vacant residential lands due to changes in zoning or development patterns, including but not limited to, the following:
 - (I) Local adoption of mixed use zoning designations;
 - (II) Local adoption of increased residential densities to meet Region 2040 Growth Concept and Title 1 of the Urban Growth Management Functional Plan;
 - (III) The estimated number of dwelling units that may be accommodated as a result of redevelopment and infill development and accessory dwelling units;
 - (IV) The estimated number of dwelling units allowed on legally buildable lots in environmentally constrained areas.
 - (V) Development on vacant and legally buildable lots zoned for single family at a rate of one dwelling unit per lot.

- (B) The forecast and inventory, along with all other appropriate data shall be considered by the district in determining the need for net developable land. Appropriate data includes, but is not limited to, estimates of the actual density and the actual average mix of housing types of residential development that have occurred within the urban growth boundary since the last periodic review of the urban growth boundary or last five years, whichever is greater. The results of the inventory and forecast shall be compared, and if the net developable land equals or is larger than the need forecast, then the district council shall hold a public hearing, providing the opportunity for comment. The council may conclude that there is no need to move the UGB and set the date of the next five-year review or may direct staff to address any issues or facts which are raised at the public hearing.

- (C) If the inventory of net developable land is insufficient to accommodate the housing need identified in the 20-year Regional Forecast at the actual developed density that has occurred since the last periodic review of the urban growth boundary, the district shall
 - (i) Conduct a further analysis of the inventory of net developable land to determine whether the identified need can reasonable be met within the urban growth boundary including a consideration of whether any significant surplus of developable land in one or more land use categories could be suitable to address the unmet forecasted need;

- (ii) Estimate city and county progress toward meeting the target capacities for dwelling units and employment set forth in Title 1 of the Urban Growth Management Functional Plan (Metro Code, Table 3.07-1);
 - (iii) Consider amendments to the Urban Growth Management Functional Plan that would increase the number of dwelling units that can be accommodated on residential and mixed-use land within the urban growth boundary;
 - (iv) Adopt amendments to the Urban Growth Management Functional Plan that the Metro Council determines are appropriate;
 - (v) Estimate whether the increased number of dwelling units accommodated within the urban growth boundary due to amendments to the Urban Growth Management Functional Plan will provide a sufficient number of dwelling units to satisfy the forecasted need;
 - (vi) The Metro Council shall hold a public hearing prior to its determination of whether any estimated deficit of net developable land is sufficient to justify an analysis of locations for a legislative amendment of the UGB.
- (D) For consideration of a legislative UGB amendment, the district council shall review an analysis of land outside the present UGB to determine those areas best suited for expansion of the UGB to meet the identified need.
- (E) The district must find that the identified need cannot reasonably be met within the UGB, consistent with the following considerations:
- (i) That there is not a suitable site with an appropriate comprehensive plan designation.
 - (ii) All net developable land with the appropriate plan designation within the existing UGB shall be presumed to be available for urban use during the planning period.
 - (iii) Market availability and level of parcelization shall not render an alternative site unsuitable unless justified by findings consistent with the following criteria:
 - (I) Land shall be presumed to be available for use at some time during the planning period of the UGB unless legal impediments, such as deed restrictions, make it unavailable for the use in question.

(II) A parcel with some development on it shall be considered unavailable if the market value of the improvements is not significantly less than the value of the land, as established by the most recent assessor records at the time of inventory. Standard measures to account for the capability of infill and redevelopment will be developed by the district to provide a means to define what is significant when comparing structure value and land values. When a city or county has more detailed or current gross redevelopable land inventory data, for all or a part of their jurisdiction, it can request that the district substitute that data in the district gross developable land inventory.

(III) Properly designated land in more than one ownership shall be considered suitable and available unless the current pattern or level of parcelization makes land assembly during the planning period unfeasible for the use proposed.

(2) Factor 2: Need for housing, employment opportunities and livability may be addressed under either subsection (A) or (B) or both, as described below.

(A) For a proposed amendment to the UGB based upon housing or employment opportunities the district must demonstrate that a need based upon an economic analysis can only be met through a change in the location of the UGB. For housing, the proposed amendment must meet an unmet need according to statewide planning Goal 10 and its associated administrative rules. For employment opportunities, the proposed amendment must meet an unmet long-term need according to statewide planning Goal 9 and its associated administrative rules. The amendment must consider adopted comprehensive plan policies of jurisdictions adjacent to the site, when identified by a jurisdiction and must be consistent with the district's adopted policies on urban growth management, transportation, housing, solid waste, and water quality management.

(B) To assert a need for a UGB amendment based on livability, the district must:

(i) factually define the livability need, including its basis in adopted local, regional, state, or federal policy;

(ii) factually demonstrate how the livability need can best be remedied through a change in the location of the UGB;

- (iii) identify both positive and negative aspects of the proposed UGB amendment on both the livability need and on other aspects of livability; and
 - (iv) demonstrate that, on balance, the net result of addressing the livability need by amending the UGB will be positive.
- (3) Factor 3: Orderly and economic provision of public facilities and services. An evaluation of this factor shall be based upon the following:
 - (A) For the purposes of this section, economic provision shall mean the lowest public cost provision of urban services. When comparing alternative sites with regard to factor 3, the best site shall be that site which has the lowest net increase in the total cost for provision of all urban services. In addition, the comparison may show how the proposal minimizes the cost burden to other areas outside the subject area proposed to be brought into the boundary.
 - (B) For the purposes of this section, orderly shall mean the extension of services from existing serviced areas to those areas which are immediately adjacent and which are consistent with the manner of service provision. For the provision of gravity sanitary sewers, this could mean a higher rating for an area within an already served drainage basin. For the provision of transit, this would mean a higher rating for an area which could be served by the extension of an existing route rather than an area which would require an entirely new route.
- (4) Factor 4: Maximum efficiency of land uses within and on the fringe of the existing urban area. An evaluation of this factor shall be based on at least the following:
 - (A) The subject area can be developed with features of an efficient urban growth form including residential and employment densities capable of supporting transit service; residential and employment development patterns capable of encouraging pedestrian, bicycle, and transit use; and the ability to provide for a mix of land uses to meet the needs of residents and employees. If it can be shown that the above factors of compact form can be accommodated more readily in one area than others, the area shall be more favorably considered.
 - (B) The proposed UGB amendment will facilitate achieving an efficient urban growth form on adjacent urban land, consistent with local comprehensive plan policies and regional functional plans, by assisting with achieving residential and employment densities capable of supporting transit service; supporting the evolution of residential and employment development patterns capable of encouraging pedestrian, bicycle, and transit use; and

improving the likelihood of realizing a mix of land uses to meet the needs of residents and employees.

- (5) Factor 5: Environmental, energy, economic and social consequences. An evaluation of this factor shall be based upon consideration of at least the following:
- (A) If the subject property contains any resources or hazards subject to special protection identified in the local comprehensive plan and implemented by appropriate land use regulations, findings shall address how urbanization is likely to occur in a manner consistent with these regulations.
 - (B) Complementary and adverse economic impacts shall be identified through review of a regional economic opportunity analysis, if one has been completed. If there is no regional economic opportunity analysis, one may be completed for the subject land.
 - (C) The long-term environmental, energy, economic, and social consequences resulting from the use at the proposed site. Adverse impacts shall not be significantly more adverse than would typically result from the needed lands being located in other areas requiring an amendment of the UGB.
- (6) Factor 6: Retention of agricultural land. This factor shall be addressed through the following:
- (A) Prior to the designation of urban reserves, the following hierarchy shall be used for identifying priority sites for urban expansion to meet a demonstrated need for urban land:
 - (i) Expansion on rural lands excepted from statewide planning Goals 3 and 4 in adopted and acknowledged county comprehensive plans. Small amounts of rural resource land adjacent to or surrounded by those "exception lands" may be included with them to improve the efficiency of the boundary amendment. The smallest amount of resource land necessary to achieve improved efficiency shall be included;
 - (ii) If there is not enough land as described in (i) above to meet demonstrated need, secondary or equivalent lands, as defined by the state, should be considered;
 - (iii) If there is not enough land as described in either (i) or (ii) above, to meet demonstrated need, secondary agricultural resource lands, as defined by the state should be considered;

- (iv) If there is not enough land as described in either (i), (ii) or (iii) above, to meet demonstrated need, primary forest resource lands, as defined by the state, should be considered;
 - (v) If there is not enough land as described in either (i), (ii), (iii) or (iv) above, to meet demonstrated need, primary agricultural lands, as defined by the state, may be considered.
- (B) After urban reserves are designated and adopted, consideration of factor 6 shall be considered satisfied if the proposed amendment is wholly within an area designated as an urban reserve.
- (C) After urban reserves are designated and adopted, a proposed amendment for land not wholly within an urban reserve must also demonstrate that the need cannot be satisfied within urban reserves.
- (7) Factor 7: Compatibility of proposed urban development with nearby agricultural activities.

The record shall include an analysis of the potential impact on nearby agricultural activities including the following:

- (i) A description of the number, location and types of agricultural activities occurring within one mile of the subject site;
 - (ii) An analysis of the potential impacts, if any, on nearby agricultural activities taking place on lands designated for agricultural use in the applicable adopted county or city comprehensive plan, and mitigation efforts, if any impacts are identified. Impacts to be considered shall include consideration of land and water resources which may be critical to agricultural activities, consideration of the impact on the farming practices of urbanization of the subject land, as well as the impact on the local agricultural economy.
- (c) The requirements of statewide planning Goal 2 will be met by addressing all of the requirements of section 3.01.020(b), above, and by factually demonstrating that:
- (1) The land need identified cannot be reasonably accommodated within the current UGB; and
 - (2) The proposed uses are compatible with other adjacent uses or will be so rendered through measures designed to reduce adverse impacts; and

(3) The long-term environmental, economic, social and energy consequences resulting from the use at the proposed site with measures designed to reduce adverse impacts are not significantly more adverse than would typically result from the same proposal being located in other areas than the proposed site and requiring an exception.

(d) The proposed location for the UGB shall result in a clear transition between urban and rural lands, using natural and built features, such as roads, drainage divides, floodplains, powerlines, major topographic features, and historic patterns of land use or settlement.

(e) The Council shall determine whether adding land to the UGB contributes to the purposes of Centers.

(f) Satisfaction of the requirements of section 3.01.020(a) and (b) does not mean that other statewide planning goals do not need to be considered. If the proposed amendment involves other statewide planning goals, they shall be addressed.

(g) Section 3.01.020(a), (b), (c), (d) and (e) shall be considered to be consistent with and in conformance with the Regional Framework Plan.

(h) Where efficiencies in the future development of an existing urban reserve are demonstrated, the Metro Council may amend the urban reserve in the same UGB amendment process to include additional adjacent nonresource lands up to 10 percent of the total acreage. Any urban reserve amendment shall demonstrate compliance with the Urban Reserve Rule (OAR 660-021-0030).

3.01.025 Major Amendment Procedures

(a) A city, a county, a special district or a property owner may file an application for a major amendment to the UGB on a form provided for that purpose. The Executive Officer will accept applications for major amendments between February 1 and March 15 of each calendar year except that calendar year in which the Metro Council is completing its five-year analysis of buildable land supply under ORS 197.299(1). After receipt of a complete application, the Executive Officer will set the matter for a public hearing and provide notice to the public in the manner set forth in sections 3.01.050 and 3.01.055.

(b) The Executive Officer will determine whether the application is complete and notify the applicant of its determination within seven working days after the filing of an application. If the application is not complete, the applicant shall revise it to be complete within 14 days of notice of incompleteness from the Executive Officer. The Executive Officer will dismiss an application and return application fees if it does not receive a complete application within 14 days of its notice.

(c) Upon a request by a Metro councilor and a finding of good cause, the Metro Council may, by a two-thirds vote of the full Council, waive the filing deadline for an application.

(d) Except for that calendar year in which the Metro Council is completing its five-year analysis of buildable land supply, the Executive Officer shall give notice of the March 15 deadline for acceptance of applications for major amendments not less than 120 calendar days before the deadline and again 90 calendar days before the deadline in a newspaper of general

circulation in the district and in writing to each city and county in the district. A copy of the notice shall be mailed not less than 90 calendar days before the deadline to anyone who has requested notification. The notice shall explain the consequences of failure to file before the deadline and shall specify the Metro representative from whom additional information may be obtained.

(e) The Executive Officer shall submit a report and recommendation on the application to the hearings officer not less than 21 calendar days before the hearing. The Executive Officer shall send a copy of the report and recommendation simultaneously to the applicant and others who have requested copies. Any subsequent report by the Executive Officer to be used at the hearing shall be available at least seven days prior to the hearing.

(f) An applicant shall provide a list of names and addresses of property owners for notification purposes, consistent with section 3.01.055, when submitting an application. The list shall be certified in one of the following ways:

- (1) By a title company as a true and accurate list of property owners as of a specified date; or
- (2) By a county assessor, or designate, pledging that the list is a true and accurate list of property owners as of a specified date; or
- (3) By the applicant affirming that the list is a true and accurate list as of a specified date.

(g) An applicant may request postponement of the hearing to consider the application within 90 days after filing of the application. The Executive Officer may postpone the hearing for no more than 90 days. If the Executive Officer receives no request for rescheduling within 90 days after the request for postponement, the application shall be considered withdrawn and the Executive Officer shall return the portion of the fee deposit not required for costs assessed pursuant to 3.01.045.

(h) Position of City or County:

- (1) Except as provided in paragraph (4) of this section, an application shall not be considered complete unless it includes a written statement by the governing body of each city or county with land use jurisdiction over the area included in the application that:
 - (A) Recommends approval of the application;
 - (B) Recommends denial of the application; or
 - (C) Makes no recommendation on the application.
- (2) Except as provided in paragraph (4) of this subsection, an application shall not be considered complete unless it includes a written statement by any special district that has an agreement with the governing body of any city or county with land use jurisdiction over the area included in the application to provide an urban service to the area that:

- (A) Recommends approval of the application;
 - (B) Recommends denial of the application; or
 - (C) Makes no recommendation on the application.
- (3) If a city, county or special district holds a public hearing to consider an application, it shall:
- (A) Provide notice of such hearing to the Executive Officer and any city or county whose municipal boundary or urban planning area boundary abuts the area; and
 - (B) Provide the Executive Officer with a list of the names and addresses of persons testifying at the hearing and copies of any exhibits or written testimony submitted for the hearing.
- (4) Upon request by an applicant, Executive Officer shall waive the requirements of subsections (1) and (2) of this section if the applicant shows that the local government has a policy not to comment on such applications or that a request for comment was filed with the local government or special district at least 120 calendar days before the request and the local government or special district has not yet adopted a position on the application. The governing body of a local government may delegate the decisions described in paragraphs (1) and (2) of this subsection to its staff.
- (i) Applications involving land outside district boundary:
- (1) An application to expand the UGB to include land outside the district shall not be accepted unless accompanied by a copy of a petition for annexation to the district.
 - (2) A city or county may approve a plan or zone change to implement the proposed amendment prior to a change in the district UGB if:
 - (A) The Executive Officer receives notice of the local action;
 - (B) The local action is contingent upon subsequent action by the Metro Council to amend its UGB; and
 - (C) The local action to amend the local plan or zoning map becomes effective only if the Metro Council amends the UGB consistent with the local action.
 - (3) If the Metro Council approves the application, the local government shall amend its plan or map within one year to be consistent with the amendment.

(j) The proposed amendment to the UGB shall include the entire right-of-way of an adjacent street to ensure that public facilities and services can be provided to the subject property by the appropriate local government or service district in a timely and efficient manner.

3.01.030 Criteria for Major Amendment

(a) The purpose of the major amendment process is to provide a mechanism to address needs for land that were not anticipated in the last five-year analysis of buildable land supply and cannot wait until the next five-year analysis. This section establishes criteria for major amendments to the UGB and sets forth how state law applies to these amendments. Metro intends compliance with the criteria of this section to constitute compliance with ORS 197.298, statewide planning Goals 2 and 14 and the Regional Urban Growth Goals and Objectives. Land may be added to the UGB under this section only for the following purposes: public facilities, public schools, natural areas, land trades and other nonhousing needs.

(b) The applicant shall demonstrate that the amendment will provide for an orderly and efficient transition from rural to urban use, considering the following factors:

- (1) Demonstrated need to accommodate long-range urban population growth. The Metro Council will consider, based upon evidence in the record, whether the need for the subject land was accommodated at the time of the last legislative analysis of the UGB required by ORS 197.299. If the need was not accommodated in that analysis, the Metro Council will consider whether the need must be met now, rather than at the time of the next legislative amendment, in order to ensure an orderly and efficient transition from rural to urban use.
- (2) Need for employment opportunities and livability. The Metro Council will consider, based upon evidence in the record, whether the need must be met at a particular location, or in a particular part of the region, in order to secure an employment or livability opportunity that cannot await the next legislative review of the UGB required by ORS 197.299(1), or to ensure the livability of that part of the region.
- (3) Orderly and economic provision of public facilities and services. The Metro Council will consider, based upon evidence in the record, whether adding the subject land to the UGB, as compared with other land that might be added, will result in a more logical extension of public facilities and services and reduce the overall cost of public facilities and services to land already within the UGB.
- (4) Maximum efficiency of land uses within and on the fringe of the existing urban area. The Metro Council will consider, based upon evidence in the record, whether, in comparison with other land that might be added to the UGB, addition of the subject land will better achieve the residential and employment targets and transportation objectives in the 2040 Growth Concept that apply to nearby land within the UGB.
- (5) Environmental, energy, economic and social consequences. The Metro Council will consider, based upon evidence in the record, whether the consequences of addition of the subject land would be, on the whole,

more positive than not including the land, and more positive than including other land.

- (6) Retention of agricultural and forest land. The Metro Council will consider, based upon evidence in the record, addition of land designated for agriculture or forestry pursuant to a statewide Goal 3 (Agricultural Land) or 4 (Forest Land) only under the following circumstances:
 - (A) There is no land designated as urban reserve land pursuant to OAR 660, Division 021, as exception land pursuant to ORS 197.732(1)(a) or (b), or as marginal land pursuant to ORS 197.247 (1991 Edition) available to accommodate the subject need; or
 - (B) There is no land designated urban reserve available to accommodate the subject need, the subject land is not high-value farmland as described in ORS 215.710, and the subject land is completely surrounded by exception land; or
 - (C) The application identifies a specific type of land need that cannot reasonably be accommodated on land described in (A) or (B) of this paragraph; or
 - (D) Future urban services could not reasonably be provided to land described in (A) or (B) of this paragraph.
 - (7) Compatibility of proposed urban development with nearby agricultural activities. The Metro Council will consider, based upon evidence in the record, whether urban development on the subject land would likely cause a change in farm practices, or an increase in the cost of farm practices, on farms in areas designated for agriculture or forestry pursuant to a statewide planning goal within one mile of the subject land, based upon an inventory and analysis of those practices. The Metro Council will also consider measures that might eliminate or alleviate the potential conflicts with farm practices.
- (c) The applicant shall demonstrate that:
- (1) There is no land within the existing UGB that can reasonably accommodate the subject need;
 - (2) The long-term environmental, economic, social and energy consequences of addition of the subject land would not be significantly more adverse than the consequence of adding other land; and
 - (3) The proposed uses of the subject land would be compatible, or through measures can be made compatible, with uses of adjacent land.
 - (4) The amendment will not result in the creation of an island of urban land outside the UGB or an island of rural land inside the UGB.

- (5) The amendment complies with applicable statewide planning goals.
- (6) If the amendment would add land for public school facilities, a conceptual school plan as described in section 3.07.1120(I) has been completed.

(d) If the Metro Council adds land to the UGB in order to facilitate a trade and the land is available for housing, the Metro Council shall designate the land to allow an average density of at least 10 units per net developable acre or such lower density that is consistent with the 2040 Growth Concept plan designation for the area.

(e) Compliance with the criteria in subsections (b) and (c) of this section shall constitute conformance with the Regional Urban Growth Goals and Objectives.

3.01.033 Minor Adjustment Procedures

(a) A city, a county, a special district or a property owner may file an application with Metro for a minor adjustment to the UGB on a form provided for that purpose by Metro. The application shall include a list of the names and addresses of owners of property within 100 feet of the land involved in the application. The application shall also include the positions on the application of appropriate local governments and special districts, in the manner required by section 3.01.025(h).

(b) Upon receipt of a complete application, the Executive Officer shall provide notice of the application to the persons specified in 3.01.050(d)(1) and 3.01.050(d)(3) through (6), to owners of property within 100 feet of the land involved in the application, to the Metro Council and to any person who requests notification of applications for minor adjustments.

(c) The Executive Officer shall determine whether the application is complete and shall notify the applicant of its determination within seven working days after the filing of an application. If the application is not complete, the applicant shall complete it within 14 days of the Executive Officer's notice. The Executive Officer will dismiss an application and return application fees if it does not receive a complete application within 14 days of its notice.

(d) The Executive Officer shall review the application for compliance with the criteria in section 3.01.035 and issue an order with its analysis and conclusion within 90 days of receipt of a complete application. The Executive Officer shall send a copy of its order to the applicant, the city or county with jurisdiction over the land that is the subject of the application and any person who requests a copy.

(e) The applicant or any person who commented on the application may appeal the Executive Officer's order to the Metro Council by filing an appeal on a form provided by the Executive Officer for that purpose within 14 days of receipt of the order. The Council shall consider the appeal at a public hearing held not more than 60 days following receipt of a timely appeal. Following the hearing, the Council shall uphold, deny or modify the Executive Officer's order on the minor adjustment. The Council shall issue an order with its analysis and conclusion and send a copy to the appellant, the city or county with jurisdiction over the land that is the subject of the application and any person who requests a copy.

3.01.035 Criteria for Minor Adjustments

(a) The purpose of this section is to provide a mechanism to make small changes to the UGB in order to make it function more efficiently and effectively. It is not the purpose of this section to add land to the UGB to satisfy a need for housing or employment. This section establishes criteria that embody state law and Regional Framework Plan policies applicable to boundary adjustments.

(b) Metro may adjust the UGB under this section only for the following reasons: (1) to site roads and lines for public facilities and services; (2) to trade land outside the UGB for land inside the UGB; or (3) to make the UGB coterminous with nearby property lines or natural or built features.

(c) To make a minor adjustment to site a public facility line or road, or to facilitate a trade, Metro shall find that:

- (1) the adjustment will result in the addition to the UGB of no more than two net acres for a public facility line or road and no more than 20 net acres in a trade;
- (2) adjustment of the UGB will make the provision of public facilities and services more efficient or less costly;
- (3) urbanization of the land added by the adjustment would have no more adverse environmental, energy, economic or social consequences than urbanization of land within the existing UGB;
- (4) urbanization of the land added by the adjustment would have no more adverse effect upon agriculture or forestry than urbanization of land within the existing UGB;
- (5) the adjustment will help achieve the 2040 Growth Concept;
- (6) the adjustment will not result in an island of urban land outside the UGB or an island of rural land inside the UGB; and
- (7) if the adjustment is to facilitate a trade, the adjustment would not add land to the UGB that is currently designated for agriculture or forestry pursuant to a statewide planning goal.

(d) To make a minor adjustment to make the UGB coterminous with property lines, natural or built features, Metro shall find that:

- (1) the adjustment will result in the addition of no more than two net acres to the UGB;
- (2) urbanization of the land added by the adjustment would have no more adverse environmental, energy, economic or social consequences than urbanization of land within the existing UGB;

- (3) urbanization of the land added by the adjustment would have no more adverse effect upon agriculture or forestry than urbanization of land within the existing UGB;
- (4) the adjustment will help achieve the 2040 Growth Concept;
- (5) the adjustment will not result in an island of urban land outside the UGB or an island of rural land inside the UGB.

(e) If the Metro Council adds land to the UGB in order to facilitate a trade and the land is available for housing, the Metro Council shall designate the land to allow an average density of at least 10 units per net developable acre or such lower density that is consistent with the 2040 Growth Concept designation for the area.

(f) The Executive Officer shall submit a report to the Council at the end of each calendar year with an analysis of all boundary adjustments made during the year pursuant to this section. The report shall demonstrate how the adjustments, when considered cumulatively, are consistent with and help achieve the 2040 Growth Concept.

3.01.040 Metro Conditions of Approval

(a) Land added to the UGB by legislative amendment pursuant to 3.01.015 or by major amendment pursuant to 3.01.025 shall be subject to the Urban Growth Boundary area comprehensive plan requirements of Title 11 of the Urban Growth Management Functional Plan (Metro Code section 3.07.1110 et seq.).

(b) Unless a comprehensive plan amendment has been previously approved for the land pursuant to 3.01.012(c), when it adopts a Legislative or major amendment adding land to the UGB, the Council shall take the following actions:

- (1) The Council shall consult with affected local governments and MPAC to determine whether local governments have agreed, pursuant to ORS 195.065 to 195.085 or otherwise, which local government shall adopt comprehensive plan amendments for the area consistent with requirements of the Urban Growth Management Functional Plan (Metro Code Chapter 3.07) and in particular, Title 11 thereof (Metro Code section 3.07.1110 et seq.). Where the affected local governments have agreed as to which local government or governments shall be responsible, the Council shall so designate. If there is no agreement, then the Council shall, consistent with ORS 195.065 to 195.085, establish a process to determine which local government or governments shall be responsible and at the conclusion of the process, so designate.
- (2) The Council shall establish the 2040 Growth Concept design type designations applicable to the land added to the Urban Growth Boundary, including the special land need, if any, that is the basis for the amendment.
- (3) The Council shall establish the boundaries of the area that shall be included in the conceptual level of planning required by Title 11 of the

Urban Growth Management Functional Plan (Metro Code section 3.07.1110 et seq.). The boundary of the planning area may include all or part of one or more designated urban reserves.

- (4) The Council shall also establish the time period for city or county compliance with the requirements of the Urban Growth Management Functional Plan (Metro Code Chapter 3.07) and in particular, Title 11 thereof (Metro Code section 3.07.1110 et seq.); however, the time period shall not be less than two (2) years from the time a local government is designated pursuant to section 3.01.040(b)(1) above.
- (5) The Council may adopt text interpretations of the requirements of Urban Growth Management Functional Plan (Metro Code Chapter 3.07) and in particular, Title 11 thereof (Metro Code section 3.07.1110 et seq.) that shall be applicable to the required City or County comprehensive plan amendments. These interpretations may address special land needs that are the basis for the amendment but otherwise such interpretations shall not impose specific locational development requirements. Text interpretations may include determinations that certain provisions of Title 11 are not applicable to specific areas because of the size or physical characteristics of land added to the Urban Growth Boundary.

(c) When it adopts a legislative or major amendment adding land to the UGB, the Council may establish conditions that it deems necessary to ensure that the addition of land complies with state planning laws and the Regional Framework Plan.

3.01.045 Fees

- (a) Each application submitted by a property owner or group of property owners pursuant to this chapter shall be accompanied by a filing fee in an amount to be established by resolution of the council. Such fees shall not exceed the actual costs of the district to process an application. The filing fee shall include administrative costs and hearings officer/public notice costs.
- (b) The fees for administrative costs shall be charged from the time an application is filed through mailing of the notice of adoption or denial to the Department of Land Conservation and Development and other interested persons.
- (c) An applicant also shall be charged for the costs of the district hearings officer as billed for that case and for the costs of public notice.
- (d) Before a hearing is scheduled, an applicant shall submit a fee deposit.
- (e) The unexpended portion of an applicant's deposit, if any, shall be returned to the applicant at the time of a final disposition of the application.
- (f) If hearings officer/public notice or administrative costs exceed the amount of the deposit, the applicant shall pay to Metro an amount equal to the costs in excess of the deposit, prior to final action by the Metro council.

(g) The Metro council may, by resolution, reduce, refund or waive the administrative fee, or portion thereof, if it finds that such fees would create an undue hardship for the applicant.

3.01.050 Hearing Notice Requirements

(a) 45-Day Notice. A proposal to amend the UGB by legislative amendment under 3.01.015 or by major amendment under 3.01.025 shall be submitted to the director of the Department of Land Conservation and Development at least 45 days before the first public hearing on the matter. The notice shall be accompanied by the appropriate forms provided by the department and shall contain a copy of a map showing the location of the proposed amendment. A copy of the same information shall be provided to the city and county, representatives of recognized neighborhoods, citizen planning organizations and/or other recognized citizen participation organizations adjacent to the location of the proposed amendment.

(b) Newspaper Ads. A 1/8 page advertisement in a newspaper of general circulation of the district for all legislative amendments and major amendments. For legislative amendments and major amendments the initial newspaper advertisements shall be published at least 45 days prior to the public hearing and shall include the same information listed in subsection (a).

(c) Notice of public hearing shall include:

- (1) The time, date and place of the hearing.
- (2) A description of the property reasonably calculated to give notice as to its actual location. A street address or other easily understood geographical reference can be utilized if available.
- (3) For major amendments,
 - (A) An explanation of the proposed action, including the nature of the application and the proposed boundary change.
 - (B) A list of the applicable criteria for approval of the petition at issue.
 - (C) A statement that the failure of an issue to be raised in a hearing, in person or by letter, or failure to provide sufficient specificity to afford the decision maker an opportunity to respond to the issue precludes an appeal based on the issue.
- (4) Notice that interested persons may submit written comments at the hearing and appear and be heard.
- (5) Notice that the hearing will be conducted pursuant to district rules and before the hearings officer unless that requirement is waived by the Metro council;
- (6) Include the name of the Metro staff to contact and telephone number for more information;

- (7) State that a copy of the staff report will be available for inspection at no cost at least seven calendar days prior to the final hearing, and that a copy will be made available at no cost or reasonable cost. Further that if additional documents or evidence is provided in support of the application any party shall be entitled to a continuance of the hearing; and
- (8) Include a general explanation of the requirements for submission of testimony and the procedure for conduct of hearings; and

(d) Not less than 20 calendar days before the hearing, notice shall be mailed to the following persons:

- (1) The applicant and owners of record of property on the most recent property tax roll where the property is located.
- (2) All property owners of record within 500 feet of the site. For purposes of this subsection, only those property owners of record within the specified distance from the subject property as determined from the maps and records in the county departments of taxation and assessment are entitled to notice by mail. Failure of a property owner to receive actual notice will not invalidate the action if there was a reasonable effort to notify owners of record.
- (3) Cities and counties in the district, or cities and counties whose jurisdictional boundaries either include or are adjacent to the subject property, and affected agencies who request regular notice.
- (4) The neighborhood association, community planning organization or other citizen group, if any, which has been recognized by the city or county with land use jurisdiction for the subject property.
- (5) Any neighborhood associations, community planning organizations, or other vehicles for citizen involvement in land use planning processes whose geographic areas of interest either include or are adjacent to the site and which are officially recognized as being entitled to participate in land use planning processes by the cities and counties whose jurisdictional boundaries either include or are adjacent to the site.
- (6) The regional representatives of the director of the Oregon Department of Land Conservation and Development and the Oregon Department of Transportation.
- (7) Any other person requesting notification of UGB changes.

(e) At the conclusion of the hearing, the hearings officer may continue the hearing to a time, place and date certain, without additional notice.

3.01.055 Public Hearing Rules before the Hearings Officer

(a) Notice of the hearings governed by this section shall be provided to the applicant and to owners of record of property on the most recent property tax assessment roll where such property is located:

- (1) Within 250 feet of the property which is the subject of the notice where the subject property is outside an urban growth boundary and not within a farm or forest zone; or
- (2) Within 500 feet of the property which is the subject of the notice where the subject property is within a farm or forest zone.
- (3) Notice shall also be provided to any neighborhood or community organization recognized by the governing body and whose boundaries include the site.
- (4) At the discretion of the applicant, the ~~Executive~~ Chief Operating Officer shall also provide notice to the Department of Land Conservation and Development.
- (5) The notice shall:
 - (A) Explain the nature of the application and the proposed use or uses which could be authorized;
 - (B) List the applicable criteria from the ordinance and the regional framework plan that apply to the application at issue;
 - (C) Set forth the street address or other easily understood geographical reference to the subject property;
 - (D) State the date, time and location of the hearing;
 - (E) State that failure of an issue to be raised in a hearing, in person or by letter, or failure to provide statements or evidence sufficient to afford the decision maker an opportunity to respond to the issue precludes appeal to the board based on that issue;
 - (F) Be mailed at least:
 - (i) Twenty days before the evidentiary hearing; or
 - (ii) If two or more evidentiary hearings are allowed, 10 days before the first evidentiary hearing;
 - (G) Include the name of a Metro representative to contact and the telephone number where additional information may be obtained;

- (I) State that a copy of the staff report will be available for inspection at no cost at least seven days prior to the hearing and will be provided at reasonable cost; and
 - (J) Include a general explanation of the requirements for submission of testimony and the procedure for conduct of hearings.
- (6) The failure of the property owner to receive notice as provided in this section shall not invalidate such proceedings if the Executive Officer can demonstrate by affidavit that such notice was given. The notice provisions of this section shall not restrict the giving of notice by other means, including posting, newspaper publication, radio and television.
- (b) All applications for a major amendment accepted under this chapter shall receive a contested case hearing according to the following rules:
- (1) Hearings officers shall be selected by the district pursuant to the provisions of section 2.05.025(a) of the Metro Code.
 - (2) Parties to the case shall be defined as being any individual, agency, or organization who participates orally or in writing in the creation of the record used by the hearings officer in making a decision. If an individual represents an organization orally and/or in writing, that individual must indicate the date of the organization meeting in which the position presented was adopted. The hearings officer may request that the representative explain the method used by the organization to adopt the position presented. Parties need not be represented by an attorney at any point in the process outlined in this subsection and elsewhere in this chapter.
 - (3) At the time of the commencement of a hearing, the hearings officer shall provide the following information to parties:
 - (A) A list and statement of the applicable substantive criteria and procedures for notice and conduct of local quasi-judicial land use hearings provided that failure to provide copies to all those present shall not constitute noncompliance with this subsection; and
 - (B) A statement that testimony and evidence must be directed toward the criteria or other specific criteria which the person believes apply to the decision; and
 - (C) A statement that the failure to raise an issue accompanied by statements or evidence sufficient to afford the decision-maker and the parties an opportunity to respond to the issue precludes appeal.
 - (4) (A) Prior to the conclusion of the initial evidentiary hearing, any participant may request an opportunity to present additional evidence, arguments or testimony regarding the application. The

hearing may be continued for a reasonable period as determined by the hearings officer. The hearings officer shall grant such request by continuing the public hearing pursuant to paragraph (B) of this subsection or leaving the record open for additional written evidence, arguments or testimony pursuant to paragraph (C) of this subsection.

- (B) If the hearings officer grants a continuance, the hearing shall be continued to a date, time and place certain at least seven days from the date of the initial evidentiary hearing. An opportunity shall be provided at the continued hearing for persons to present and rebut new evidence, arguments and testimony. If new written evidence is submitted at the continued hearing, any person may request, prior to the conclusion of the continued hearing, that the record be left open for at least seven days to submit additional written evidence, arguments or testimony for the purpose of responding to the new written evidence.
 - (C) If the hearings officer leaves the record open for additional written evidence or testimony, the record shall be left open for at least seven days. Any participant may file a written request with the hearings officer for an opportunity to respond to new evidence submitted during the period the record was left open. If such a request is filed, the hearings officer shall reopen the record pursuant to subsection (11) of this section.
 - (D) Unless waived by the applicant, the local government shall allow the applicant at least seven days after the record is closed to all other parties to submit final written arguments in support of the application. The applicant's final submittal shall be considered part of the record, but shall not include any new evidence.
- (5) Failure of the applicant to appear at the hearing without making arrangements for rescheduling the hearing shall constitute grounds for immediately denying the application.
- (6) The hearing shall be conducted in the following order:
- (A) Staff report.
 - (B) Statement and evidence by the applicant in support of a petition.
 - (C) Statement and evidence of affected persons, agencies, and/or organizations opposing or supporting the petition, and/or anyone else wishing to give testimony.
 - (D) Rebuttal testimony by the applicant.
- (7) The hearings officer shall have the right to question any participant in the hearing. Cross-examination by parties shall be by submission of written

questions to the hearings officer. The hearings officer shall give parties the opportunity to submit such questions prior to closing the hearing.

- (8) The hearings officer may set reasonable time limits for oral testimony and may exclude or limit cumulative, repetitive, or immaterial testimony.
- (9) A verbatim audio tape or video tape, written, or other mechanical record shall be made of all proceedings, and need not be transcribed unless necessary for review upon appeal.
- (10) The burden of presenting evidence in support of a fact or position in the contested case rests on the applicant. The proponent of a proposed UGB amendment shall have the burden of proving that the proposed amendment complies with all applicable standards.
- (11) The hearings officer may reopen a record to receive evidence not available or offered at the hearing. If the record is reopened, any person may raise new issues which relate to the new evidence before the record is closed.
- (12) An issue which may be the basis for an appeal to the Land Use Board of Appeals shall be raised not later than the close of the record at or following the final evidentiary hearing on the proposal before the Metro Council. Such issues shall be raised and accompanied by statements or evidence sufficient to afford the governing body, planning commission, hearings body or hearings officer, and the parties an adequate opportunity to respond to each issue.
- (13) All documents or evidence relied upon by the applicant shall be submitted to the Executive Officer and be made available to the public.
- (14) Applications may be consolidated by the hearings officer for hearings where appropriate. Following consultation with district staff and prospective applicants, the hearings officer shall issue rules for the consolidation of related cases and allocation of charges. These rules shall be designed to avoid duplicative or inconsistent findings, promote an informed decision-making process, protect the due process rights of all parties, and allocate the charges on the basis of cost incurred by each party.

(c) Within 30 calendar days following the close of the record, the hearings officer shall prepare and submit a proposed order and findings, together with the record compiled in the hearing and a list of parties to the case, to the executive officer. Within seven working days of receiving the materials from the hearings officer, the executive officer, or designate, shall furnish the proposed order and findings to all parties to the case. Accompanying the proposed order and findings shall be notification to parties which includes:

- (1) The procedure for filing an exception and filing deadlines for submitting an exception to the proposed order and findings of the hearings officer. Parties filing an exception with the district must furnish a copy of their exception to all parties to the case and the hearings officer.

- (2) A copy of the form to be used for filing an exception.
- (3) A description of the grounds upon which exceptions can be based.
- (4) A description of the procedure to be used to file a written request to submit evidence that was not offered at the hearing, consistent with Metro Code sections 2.05.035(c) and (d).
- (5) A list of all parties to the case.

(d) Once a hearings officer has submitted the proposed order and findings to the executive officer, the executive officer, or designate, shall become the custodian of the record compiled in the hearing, and shall make the record available at the district offices for review by parties.

3.01.060 Exceptions to Hearing Officer Decision

(a) Standing to file an exception and participate in subsequent hearings is limited to parties to the case.

(b) Parties shall have 20 calendar days from the date that the proposed order and findings are mailed to them to file an exception to the proposed order and findings of the hearings officer with the district on forms furnished by the district.

(c) The basis for an exception must relate directly to the interpretation made by the hearings officer of the ways in which the application satisfies the standards for approving an application for a UGB amendment. Exceptions must rely on the evidence in the record for the case. Only issues raised at the evidentiary hearing will be addressed because failure to raise an issue constitutes a waiver to the raising of such issues at any subsequent administrative or legal appeal deliberations.

3.01.065 Council Action On Quasi-Judicial Amendments

(a) The council may act to approve, remand or deny an application in whole or in part. When the council renders a decision that reverses or modifies the proposed order of the hearings officer, then, in its order, it shall set forth its findings and state its reasons for taking the action.

(b) Parties to the case and the hearings officer shall be notified by mail at least 10 calendar days prior to council consideration of the case. Such notice shall include a brief summary of the proposed action, location of the hearings officer report, and the time, date, and location for council consideration.

(c) Final council action following the opportunity for parties to comment orally to council on the proposed order shall be as provided in Code section 2.05.045. Parties shall be notified of their right to review before the Land Use Board of Appeals pursuant to 1979 Oregon Laws, chapter 772.

(d) Comments before the council by parties must refer specifically to any arguments presented in exceptions filed according to the requirements of this chapter, and cannot introduce

new evidence or arguments before the council. If no party to the case has filed an exception, then the council shall decide whether to entertain public comment at the time that it takes final action on an application.

(e) Within 20 days from the day that the proposed order and findings of the hearings officer are mailed to them, parties may file a motion to reopen the record to receive admissible evidence not available at the hearing. The motion shall show proof of service on all parties. The council shall rule on such motions with or without oral argument at the time of its consideration of the case. An order approving such a motion to reopen the record shall remand the case to the hearings officer for evidentiary hearing. When the council or the hearings officer reopens a record to admit new evidence, arguments or testimony, any person may raise new issues which relate to the new evidence, testimony or criteria for decision-making which apply to the matter at issue.

(f) When the council acts to approve an application in whole or in part by requiring annexation to a city and/or service district(s) and Tri-Met and whenever an application includes land outside the district:

- (1) Such action shall be by resolution expressing intent to amend the UGB if and when the affected property is annexed to the district within six months of the date of adoption of the Resolution.
- (2) The council shall take final action, as provided for in paragraphs (c) and (d) of this section, within 30 calendar days of notice that all required annexations to a city, service district(s) and the district have been approved.

(g) When the council is considering an ordinance to approve an application, it shall take all public comment at its first reading of the ordinance, discuss the case, and then either pass the ordinance to second reading or remand the proposed order and findings of the hearings officer to the executive officer or the hearings officer for new or amended findings. If new or amended findings are prepared, parties to the case shall be provided a copy of the new order and findings by mail no less than seven calendar days prior to the date upon which the council will consider the new order and findings, and parties will be given the opportunity to provide the council with oral or written testimony regarding the new order and findings.

3.01.070 Final Action Notice Requirements

(a) The district shall give each county and city in the district notice of each amendment of the UGB. Mailing the notice required by Ballot Measure 56 (Nov. 1998) [ORS Chapter 268] or ORS 197.615 shall satisfy this subsection.

(b) For the local government designated as having the responsibility for land use planning for the area(s) added to the UGB, the district shall provide an additional notice stating the time period for completing comprehensive plan amendments for the area.

3.01.080 Chapter Regulation Review

The procedures in this chapter shall be reviewed by the district every five years, and can be modified by the council at any time to correct any deficiencies which may arise. This chapter shall be submitted upon adoption to the Land Conservation and Development Commission for

acknowledgment pursuant to ORS 197.251, as an implementing measure to the district UGB. Amendments to this chapter shall be submitted to the Department of Land Conservation and Development pursuant to the requirements of OAR 660 Divisions 18 and 19 as appropriate.

3.01.085 Severability

Should a section, or portion of any section of this chapter, be held to be invalid or unconstitutional by a court of competent jurisdiction, the remainder of this chapter shall continue in full force and effect.

Exhibit K to Ordinance No. 02-969B

CHAPTER 3.01: URBAN GROWTH BOUNDARY AND URBAN RESERVE PROCEDURES

3.01.005 Purpose

(a) This chapter is established to provide procedures to be used by Metro in making amendments to the Metro Urban Growth Boundary (UGB) adopted pursuant to ORS 268.390(3) and 197.005 through 197.430. The chapter is intended to interpret all criteria and standards for boundary amendments pertaining to Statewide Planning Goals 2 and 14, and the Regional Urban Growth Goals and Objectives. Unique circumstances associated with a proposed amendment may require consideration of statewide planning goals other than Goals 2 and 14. This chapter is also established to be used for the establishment and management of Urban Reserves, pursuant to OAR 660-21-000 to 660-21-100 and RUGGO Objective 22.

(b) The objectives of the UGB are to:

- (1) Provide sufficient urban land for accommodating the forecast 20-year urban land need, reevaluated at least every five years as set forth in sections 3.01.015-3.01.020;
- (2) Provide for an efficient urban growth form which reduces sprawl;
- (3) Provide a clear distinction between urban and rural lands;
- (4) Encourage appropriate infill and redevelopment in all parts of the urban region.

(c) The objectives of the Urban Reserves are to:

- (1) Identify sufficient land suitable for urbanization sufficient to accommodate the forecast needs for a 30 to 50 year interval, reevaluated at least every 15 years;
- (2) Limit the areas which are eligible to apply for inclusion to the Urban Growth Boundary consistent with ORS 197.298, and protect resource lands outside the urban reserve areas;
- (3) Protect lands designated as urban reserves for their eventual urbanization, and insure their efficient urbanization consistent with the 2040 Growth Concept, the RUGGOs and the Urban Growth Management Functional Plan;
- (4) Provide for coordination between cities, counties, school districts, and special districts for planning for the urban reserve areas;
- (5) Ensure a smooth transition to urban development by planning for general governance, public facilities, land uses, and planning for financing the capital needs of the urban development.

3.01.010 Definitions

- (a) "Council" has the same meaning as in chapter 1.01.
- (b) "Compatible," as used in this chapter, is not intended as an absolute term meaning no interference or adverse impacts of any type with adjacent uses. Any such interference or adverse impacts must be balanced with the other criteria and considerations cited.
- (c) "District" has the same meaning as in chapter 1.01.
- (d) "Goals" means the statewide planning goals adopted by the Oregon Land Conservation and Development Commission at OAR 660-15-000.
- (e) "Gross developable vacant land" means the total buildable land area within the UGB, as compiled by Metro for the purpose of determining the need for changes in the urban land supply. These are lands that can be shown to lack significant barriers to development. Gross developable vacant lands include, but are not limited to, all recorded lots on file with the county assessors equal to or larger than either the minimum lot size of the zone in which the lot is located or the minimum lot size which will be applied in an urban holding zone which:
 - (1) Are without any structures as corroborated through examination of the most recent aerial photography at the time of inventory; or
 - (2) Have no improvements according to the most recent assessor records.
- (f) "Gross redevelopable land" means the total area of redevelopable land and infill parcels within the UGB including:
 - (1) That portion of all partially developed recorded lots, where one-half acre or more of the land appears unimproved through examination of the most recent aerial photography at the time of inventory; and
 - (2) All recorded lots on file with the county assessors that are 20,000 square feet or larger where the value of the improvement(s) is significantly less than the value of the land, as established by the most recent assessor records at the time of inventory. Standard measures to account for the capability of infill and redevelopment properties will be developed by the district to provide a means to define what is significant when comparing structure value and land values; or, when a city or county has more detailed or current gross redevelopable land inventory data, for all or a part of their jurisdiction, it can request that the district substitute that data for inclusion in the gross developable land inventory.
- (g) "Gross developable land" means the total of gross developable vacant land and gross redevelopable land.
- (h) "Legislative amendment" means an amendment to the UGB initiated by the district, which is not directed at a particular site-specific situation or relatively small number of persons.

(i) "Natural area" means a landscape unit substantially without any human development that is substantially in a native and unaffected state and may be composed of plant and animal communities, water bodies, soil and rock and mitigated habitat. Natural areas must be identified in a city, county or special district open space inventory or plan.

(j) "Natural feature" means any landscape unit, such as a slope greater than 25 percent, a water body, a floodplain or a forest, that acts as a barrier or transition between human activities.

(k) "Net acre" for purposes of calculating the total land area within a proposal to amend the UGB means an area measured in acres which excludes:

- (1) Any developed road rights-of-way through or on the edge of the proposed UGB amendment; and
- (2) Environmentally constrained areas, including any open water areas, floodplains, natural resource areas protected in the comprehensive plans of cities and counties in the region, slopes in excess of 25 percent and wetlands requiring a federal fill and removal permit under Section 404 of the Clean Water Act. These excluded areas do not include lands for which the local zoning code provides a density bonus or other mechanism which allows the transfer of the allowable density or use to another area or to development elsewhere on the same site; and,
- (3) All publicly-owned land designated for park and open space uses.

(l) "Net developable land" means the total of net developable vacant land and net redevelopable land.

(m) "Net developable vacant land" means the number of acres that are available for all types of development after the total number of developable acres within the UGB is reduced by the amount of land for the provision of roads, schools, parks, private utilities, churches, social organizations, legally buildable single family lots, and other public facilities.

(n) "Net redevelopable land" means the amount of land remaining when gross redevelopable land is reduced by the estimated land needed for the provision of additional roads, schools, parks, private utilities and other public facilities. The district shall determine the appropriate factor to be used for each jurisdiction in consultation with the jurisdiction within which the specific redevelopable land is located.

(o) "Nonurban land" means land currently outside the UGB.

(p) "Party" means any individual, agency, or organization who participates orally or in writing in the creation of the record established at a public hearing.

(q) "Planning period" means the period covered by the most recent officially adopted district forecasts, which is approximately a 20-year period.

(r) "Property owner" means a person who owns the primary legal or equitable interest in the property.

(s) "Public facilities and services" means sanitary sewers, water service, fire protection, parks, open space, recreation, streets and roads and mass transit.

(t) "Regional forecast" means a 20-year forecast of employment and population by specific areas within the region, which has been adopted by the district.

(u) "Site" means the subject property for which an amendment or locational adjustment is being sought.

(v) "Specific land need" means a specific type of identified land needed which complies with Goal 14, Factors 1 and 2 that cannot be reasonably accommodated on urban reserve land.

(w) "UGB" means the Urban Growth Boundary for the district pursuant to ORS 268.390 and 197.005 through 197.430.

(x) "Urban land" means that land inside the UGB.

(y) "Urban reserve" means an area designated as an urban reserve pursuant to section 3.01.012 of this code and applicable statutes and administrative rules.

3.01.012 Urban Reserve Areas

(a) Purpose. The purpose of this section is to comply with ORS 197.298 by identifying lands designated urban reserve land by Metro as the first priority land for inclusion in the Metro Urban Growth Boundary.

(b) Designation of Urban Reserves.

- (1) The Council shall designate the amount of urban reserves estimated to accommodate the forecast need.
- (2) The areas designated as urban reserves shall be sufficient to accommodate expected urban development for a 30 to 50 year period, taking into account an estimate of all potential developable and redevelopable land within the current urban growth boundary.
- (3) The Council shall estimate the capacity of the urban reserves consistent with the procedures for estimating capacity of the urban area set forth in section 3.01.020.
- (4) The minimum residential density to be used in estimating the capacity of the areas designated as urban reserves shall be an average of at least 10 dwelling units per net developable acre or lower densities which conform to the 2040 Growth Concept design type designation for the urban reserve area.
- (5) The Council may designate a portion of the land required for urban reserves in order to phase designation of urban reserves.

- (6) Metro has designated as urban reserve areas those lands indicated on the 2040 Growth Concept map which was adopted as part of the Regional Urban Growth Goals and Objectives.

(c) Plans For Urban Reserve Areas. Subject to applicable law, cities and counties may prepare and adopt comprehensive plan amendments for urban reserve areas consistent with all provisions of the Urban Growth Management Functional Plan prior to the inclusion of an urban reserve area within the Urban Growth Boundary. Prior to the preparation and adoption of any such comprehensive plan amendments, at the request of a city or county, the Council shall establish the 2040 Growth Concept design types and the boundaries of the area to be planned, if it has not previously done so.

3.01.015 Legislative Amendment Procedures

(a) The process for determination of need and location of lands for amendment of the UGB is provided in section 3.01.020.

(b) Notice shall be provided as described in section 3.01.050.

(c) The Council shall initiate Legislative Amendments when it determines pursuant to Goal 14 and section 3.01.020 that there is a need to add land to the Urban Growth Boundary.

(d) Before adopting any legislative amendment, Metro shall consult with cities, counties and MPAC to determine which cities and counties, if any, are prepared to initiate comprehensive plan amendments for urban reserve areas, if they are included, within the Urban Growth Boundary.

(e) Where a city or county has adopted comprehensive plan amendments for an urban reserve area pursuant to section 3.01.012(c), the Metro Council shall rely upon the planned status of that urban reserve in considering applicable criteria.

(f) Legislative amendment decisions shall be based upon substantial evidence in the decision record which demonstrates how the amendment complies with applicable state and local law and statewide goals as interpreted by section 3.01.020.

(g) The following public hearings process shall be followed for legislative amendments:

- (1) The district council shall refer a proposed amendment to the appropriate council committee at the first council reading of the ordinance.
- (2) The committee shall take public testimony at as many public hearings as necessary. At the conclusion of public testimony, the committee shall deliberate and make recommendations to the council.
- (3) The council shall take public testimony at its second reading of the ordinance, discuss the proposed amendment, and approve the ordinance with or without revisions or conditions, or refer the proposed legislative amendment to the council committee for additional consideration.

- (4) Testimony before the council or the committee shall be directed to Goal 14 and Goal 2 considerations interpreted at section 3.01.020 of this chapter.
- (5) Prior to the council acting to approve a legislative amendment, including land outside the district, the council shall annex the territory to the district. The annexation decision shall be consistent with the requirements of section 3.09.120 of this code. If the annexation decision becomes the subject of a contested case pursuant to chapter 3.09 of this code, the Legislative amendment to the Urban Growth Boundary shall not be approved until the contested case is either withdrawn or the annexation is approved by the Boundary Appeals Commission, whichever occurs first.

3.01.020 Legislative Amendment Criteria

(a) The purpose of this section is to address ORS 197.298, Goals 2 and 14 of the statewide planning goals and RUGGO. This section details a process which is intended to interpret Goals 2 and 14 for specific application to the district UGB. Compliance with this section shall constitute compliance with ORS 197.298, statewide planning Goals 2 and 14 and the Regional Urban Growth Goals and Objectives.

(b) While all of the following Goal 14 factors must be addressed, the factors cannot be evaluated without reference to each other. Rigid separation of the factors ignores obvious overlaps between them. Demonstration of compliance with one factor or subfactor may not constitute a sufficient showing of compliance with the goal, to the exclusion of the other factors when making an overall determination of compliance or conflict with the goal. For legislative amendments, if need has been addressed, the district shall demonstrate that the priorities of ORS 197.298 have been followed and that the recommended site was better than alternative sites, balancing factors 3 through 7.

- (1) Factor 1: Demonstrated need to accommodate long-range urban population growth.
 - (A) The district shall develop 20-year Regional Forecasts of Population and Employment, which shall include a forecast of net developable land need, providing for coordination with cities, counties, special districts and other interested parties, and review and comment by the public. After deliberation upon all relevant facts the district shall adopt a forecast. This forecast shall be completed at least every five years or at the time of periodic review, whichever is sooner. Concurrent with the adoption of the district's 20-year Regional Forecast, the district shall complete an inventory of net developable land calculating the supply of buildable land within the urban growth boundary by applying the variables set forth in Chapter 1 of the Regional Framework Plan. The district shall provide the opportunity for review and comment by all cities and counties in the district, and by the public.

- (i) In calculating the supply of buildable lands in the urban growth boundary, the district shall estimate the effect, based on the best information available, of changes to zoned capacity that have been adopted and implemented by local governments to comply with the Region 2040 Growth Concept and all titles of the Urban Growth Management Functional Plan.
- (ii) The district shall estimate the number of gross vacant buildable acres within the urban growth boundary.
- (iii) The district shall estimate the number of net vacant buildable acres within the urban growth boundary from the gross vacant buildable acres. The number of acres estimated to be unavailable for housing development shall be subtracted to estimate the net acres, including, but not limited to:
 - (I) Lands in environmentally sensitive areas and lands with slopes equal to or exceeding 25 percent, provided those lands are zoned so as to be unavailable for housing development.
 - (II) Lands for streets, schools, parks, churches and social organizations.
 - (III) Vacant legally buildable lots zoned for single family residential use.
- (iv) The district shall estimate the number of net vacant buildable acres that are available for residential use based on current local government zoning designations. The district shall also estimate the number of dwelling units that these residentially zoned lands can accommodate under existing zoning designations.
- (v) The district shall reduce the estimated number of dwelling units that can be accommodated on vacant residential lands to account for the following:
 - (I) The number of dwelling units estimated to be lost when property owners do not develop to maximum residential densities, taking into account zoned minimum densities; and
 - (II) If Metro adopts additional measures to increase residential densities inside the existing urban growth boundary, the number of additional dwelling units estimated to be accommodated as the result of the new measures.

- (vi) The district shall increase the estimated number of dwelling units that may be accommodated on vacant residential lands due to changes in zoning or development patterns, including but not limited to, the following:
 - (I) Local adoption of mixed use zoning designations;
 - (II) Local adoption of increased residential densities to meet Region 2040 Growth Concept and Title 1 of the Urban Growth Management Functional Plan;
 - (III) The estimated number of dwelling units that may be accommodated as a result of redevelopment and infill development and accessory dwelling units;
 - (IV) The estimated number of dwelling units allowed on legally buildable lots in environmentally constrained areas.
 - (V) Development on vacant and legally buildable lots zoned for single family at a rate of one dwelling unit per lot.
- (B) The forecast and inventory, along with all other appropriate data shall be considered by the district in determining the need for net developable land. Appropriate data includes, but is not limited to, estimates of the actual density and the actual average mix of housing types of residential development that have occurred within the urban growth boundary since the last periodic review of the urban growth boundary or last five years, whichever is greater. The results of the inventory and forecast shall be compared, and if the net developable land equals or is larger than the need forecast, then the district council shall hold a public hearing, providing the opportunity for comment. The council may conclude that there is no need to move the UGB and set the date of the next five-year review or may direct staff to address any issues or facts which are raised at the public hearing.
- (C) If the inventory of net developable land is insufficient to accommodate the housing need identified in the 20-year Regional Forecast at the actual developed density that has occurred since the last periodic review of the urban growth boundary, the district shall
 - (i) Conduct a further analysis of the inventory of net developable land to determine whether the identified need can reasonable be met within the urban growth boundary including a consideration of whether any significant surplus of developable land in one or more land use categories could be suitable to address the unmet forecasted need;

- (ii) Estimate city and county progress toward meeting the target capacities for dwelling units and employment set forth in Title 1 of the Urban Growth Management Functional Plan (Metro Code, Table 3.07-1);
 - (iii) Consider amendments to the Urban Growth Management Functional Plan that would increase the number of dwelling units that can be accommodated on residential and mixed-use land within the urban growth boundary;
 - (iv) Adopt amendments to the Urban Growth Management Functional Plan that the Metro Council determines are appropriate;
 - (v) Estimate whether the increased number of dwelling units accommodated within the urban growth boundary due to amendments to the Urban Growth Management Functional Plan will provide a sufficient number of dwelling units to satisfy the forecasted need;
 - (vi) The Metro Council shall hold a public hearing prior to its determination of whether any estimated deficit of net developable land is sufficient to justify an analysis of locations for a legislative amendment of the UGB.
- (D) For consideration of a legislative UGB amendment, the district council shall review an analysis of land outside the present UGB to determine those areas best suited for expansion of the UGB to meet the identified need.
- (E) The district must find that the identified need cannot reasonably be met within the UGB, consistent with the following considerations:
- (i) That there is not a suitable site with an appropriate comprehensive plan designation.
 - (ii) All net developable land with the appropriate plan designation within the existing UGB shall be presumed to be available for urban use during the planning period.
 - (iii) Market availability and level of parcelization shall not render an alternative site unsuitable unless justified by findings consistent with the following criteria:
 - (I) Land shall be presumed to be available for use at some time during the planning period of the UGB unless legal impediments, such as deed restrictions, make it unavailable for the use in question.

(II) A parcel with some development on it shall be considered unavailable if the market value of the improvements is not significantly less than the value of the land, as established by the most recent assessor records at the time of inventory. Standard measures to account for the capability of infill and redevelopment will be developed by the district to provide a means to define what is significant when comparing structure value and land values. When a city or county has more detailed or current gross redevelopable land inventory data, for all or a part of their jurisdiction, it can request that the district substitute that data in the district gross developable land inventory.

(III) Properly designated land in more than one ownership shall be considered suitable and available unless the current pattern or level of parcelization makes land assembly during the planning period unfeasible for the use proposed.

(2) Factor 2: Need for housing, employment opportunities and livability may be addressed under either subsection (A) or (B) or both, as described below.

(A) For a proposed amendment to the UGB based upon housing or employment opportunities the district must demonstrate that a need based upon an economic analysis can only be met through a change in the location of the UGB. For housing, the proposed amendment must meet an unmet need according to statewide planning Goal 10 and its associated administrative rules. For employment opportunities, the proposed amendment must meet an unmet long-term need according to statewide planning Goal 9 and its associated administrative rules. The amendment must consider adopted comprehensive plan policies of jurisdictions adjacent to the site, when identified by a jurisdiction and must be consistent with the district's adopted policies on urban growth management, transportation, housing, solid waste, and water quality management.

(B) To assert a need for a UGB amendment based on livability, the district must:

(i) factually define the livability need, including its basis in adopted local, regional, state, or federal policy;

(ii) factually demonstrate how the livability need can best be remedied through a change in the location of the UGB;

- (iii) identify both positive and negative aspects of the proposed UGB amendment on both the livability need and on other aspects of livability; and
 - (iv) demonstrate that, on balance, the net result of addressing the livability need by amending the UGB will be positive.
- (3) Factor 3: Orderly and economic provision of public facilities and services. An evaluation of this factor shall be based upon the following:
 - (A) For the purposes of this section, economic provision shall mean the lowest public cost provision of urban services. When comparing alternative sites with regard to factor 3, the best site shall be that site which has the lowest net increase in the total cost for provision of all urban services. In addition, the comparison may show how the proposal minimizes the cost burden to other areas outside the subject area proposed to be brought into the boundary.
 - (B) For the purposes of this section, orderly shall mean the extension of services from existing serviced areas to those areas which are immediately adjacent and which are consistent with the manner of service provision. For the provision of gravity sanitary sewers, this could mean a higher rating for an area within an already served drainage basin. For the provision of transit, this would mean a higher rating for an area which could be served by the extension of an existing route rather than an area which would require an entirely new route.
- (4) Factor 4: Maximum efficiency of land uses within and on the fringe of the existing urban area. An evaluation of this factor shall be based on at least the following:
 - (A) The subject area can be developed with features of an efficient urban growth form including residential and employment densities capable of supporting transit service; residential and employment development patterns capable of encouraging pedestrian, bicycle, and transit use; and the ability to provide for a mix of land uses to meet the needs of residents and employees. If it can be shown that the above factors of compact form can be accommodated more readily in one area than others, the area shall be more favorably considered.
 - (B) The proposed UGB amendment will facilitate achieving an efficient urban growth form on adjacent urban land, consistent with local comprehensive plan policies and regional functional plans, by assisting with achieving residential and employment densities capable of supporting transit service; supporting the evolution of residential and employment development patterns capable of encouraging pedestrian, bicycle, and transit use; and

improving the likelihood of realizing a mix of land uses to meet the needs of residents and employees.

- (5) Factor 5: Environmental, energy, economic and social consequences. An evaluation of this factor shall be based upon consideration of at least the following:
- (A) If the subject property contains any resources or hazards subject to special protection identified in the local comprehensive plan and implemented by appropriate land use regulations, findings shall address how urbanization is likely to occur in a manner consistent with these regulations.
 - (B) Complementary and adverse economic impacts shall be identified through review of a regional economic opportunity analysis, if one has been completed. If there is no regional economic opportunity analysis, one may be completed for the subject land.
 - (C) The long-term environmental, energy, economic, and social consequences resulting from the use at the proposed site. Adverse impacts shall not be significantly more adverse than would typically result from the needed lands being located in other areas requiring an amendment of the UGB.
- (6) Factor 6: Retention of agricultural land. This factor shall be addressed through the following:
- (A) Prior to the designation of urban reserves, the following hierarchy shall be used for identifying priority sites for urban expansion to meet a demonstrated need for urban land:
 - (i) Expansion on rural lands excepted from statewide planning Goals 3 and 4 in adopted and acknowledged county comprehensive plans. Small amounts of rural resource land adjacent to or surrounded by those "exception lands" may be included with them to improve the efficiency of the boundary amendment. The smallest amount of resource land necessary to achieve improved efficiency shall be included;
 - (ii) If there is not enough land as described in (i) above to meet demonstrated need, secondary or equivalent lands, as defined by the state, should be considered;
 - (iii) If there is not enough land as described in either (i) or (ii) above, to meet demonstrated need, secondary agricultural resource lands, as defined by the state should be considered;

- (iv) If there is not enough land as described in either (i), (ii) or (iii) above, to meet demonstrated need, primary forest resource lands, as defined by the state, should be considered;
 - (v) If there is not enough land as described in either (i), (ii), (iii) or (iv) above, to meet demonstrated need, primary agricultural lands, as defined by the state, may be considered.
- (B) After urban reserves are designated and adopted, consideration of factor 6 shall be considered satisfied if the proposed amendment is wholly within an area designated as an urban reserve.
- (C) After urban reserves are designated and adopted, a proposed amendment for land not wholly within an urban reserve must also demonstrate that the need cannot be satisfied within urban reserves.
- (7) Factor 7: Compatibility of proposed urban development with nearby agricultural activities.

The record shall include an analysis of the potential impact on nearby agricultural activities including the following:

- (i) A description of the number, location and types of agricultural activities occurring within one mile of the subject site;
 - (ii) An analysis of the potential impacts, if any, on nearby agricultural activities taking place on lands designated for agricultural use in the applicable adopted county or city comprehensive plan, and mitigation efforts, if any impacts are identified. Impacts to be considered shall include consideration of land and water resources which may be critical to agricultural activities, consideration of the impact on the farming practices of urbanization of the subject land, as well as the impact on the local agricultural economy.
- (c) The requirements of statewide planning Goal 2 will be met by addressing all of the requirements of section 3.01.020(b), above, and by factually demonstrating that:
- (1) The land need identified cannot be reasonably accommodated within the current UGB; and
 - (2) The proposed uses are compatible with other adjacent uses or will be so rendered through measures designed to reduce adverse impacts; and

(3) The long-term environmental, economic, social and energy consequences resulting from the use at the proposed site with measures designed to reduce adverse impacts are not significantly more adverse than would typically result from the same proposal being located in other areas than the proposed site and requiring an exception.

(d) The proposed location for the UGB shall result in a clear transition between urban and rural lands, using natural and built features, such as roads, drainage divides, floodplains, powerlines, major topographic features, and historic patterns of land use or settlement.

(e) The Council shall determine whether adding land to the UGB contributes to the purposes of Centers.

(ef) Satisfaction of the requirements of section 3.01.020(a) and (b) does not mean that other statewide planning goals do not need to be considered. If the proposed amendment involves other statewide planning goals, they shall be addressed.

(fg) Section 3.01.020(a), (b), (c), ~~and (d)~~ and (e) shall be considered to be consistent with and in conformance with the Regional Urban Growth Goals and Objectives Framework Plan.

(gh) Where efficiencies in the future development of an existing urban reserve are demonstrated, the Metro Council may amend the urban reserve in the same UGB amendment process to include additional adjacent nonresource lands up to 10 percent of the total acreage. Any urban reserve amendment shall demonstrate compliance with the Urban Reserve Rule (OAR 660-021-0030).

3.01.025 Major Amendment Procedures

(a) A city, a county, a special district or a property owner may file an application for a major amendment to the UGB on a form provided for that purpose. The Executive Officer will accept applications for major amendments between February 1 and March 15 of each calendar year except that calendar year in which the Metro Council is completing its five-year analysis of buildable land supply under ORS 197.299(1). After receipt of a complete application, the Executive Officer will set the matter for a public hearing and provide notice to the public in the manner set forth in sections 3.01.050 and 3.01.055.

(b) The Executive Officer will determine whether the application is complete and notify the applicant of its determination within seven working days after the filing of an application. If the application is not complete, the applicant shall revise it to be complete within 14 days of notice of incompleteness from the Executive Officer. The Executive Officer will dismiss an application and return application fees if it does not receive a complete application within 14 days of its notice.

(c) Upon a request by a Metro councilor and a finding of good cause, the Metro Council may, by a two-thirds vote of the full Council, waive the filing deadline for an application.

(d) Except for that calendar year in which the Metro Council is completing its five-year analysis of buildable land supply, the Executive Officer shall give notice of the March 15 deadline for acceptance of applications for major amendments not less than 120 calendar days

before the deadline and again 90 calendar days before the deadline in a newspaper of general circulation in the district and in writing to each city and county in the district. A copy of the notice shall be mailed not less than 90 calendar days before the deadline to anyone who has requested notification. The notice shall explain the consequences of failure to file before the deadline and shall specify the Metro representative from whom additional information may be obtained.

(e) The Executive Officer shall submit a report and recommendation on the application to the hearings officer not less than 21 calendar days before the hearing. The Executive Officer shall send a copy of the report and recommendation simultaneously to the applicant and others who have requested copies. Any subsequent report by the Executive Officer to be used at the hearing shall be available at least seven days prior to the hearing.

(f) An applicant shall provide a list of names and addresses of property owners for notification purposes, consistent with section 3.01.055, when submitting an application. The list shall be certified in one of the following ways:

- (1) By a title company as a true and accurate list of property owners as of a specified date; or
- (2) By a county assessor, or designate, pledging that the list is a true and accurate list of property owners as of a specified date; or
- (3) By the applicant affirming that the list is a true and accurate list as of a specified date.

(g) An applicant may request postponement of the hearing to consider the application within 90 days after filing of the application. The Executive Officer may postpone the hearing for no more than 90 days. If the Executive Officer receives no request for rescheduling within 90 days after the request for postponement, the application shall be considered withdrawn and the Executive Officer shall return the portion of the fee deposit not required for costs assessed pursuant to 3.01.045.

(h) Position of City or County:

- (1) Except as provided in paragraph (4) of this section, an application shall not be considered complete unless it includes a written statement by the governing body of each city or county with land use jurisdiction over the area included in the application that:
 - (A) Recommends approval of the application;
 - (B) Recommends denial of the application; or
 - (C) Makes no recommendation on the application.
- (2) Except as provided in paragraph (4) of this subsection, an application shall not be considered complete unless it includes a written statement by any special district that has an agreement with the governing body of any city or county with land use jurisdiction over the area included in the application to provide an urban service to the area that:

- (A) Recommends approval of the application;
 - (B) Recommends denial of the application; or
 - (C) Makes no recommendation on the application.
- (3) If a city, county or special district holds a public hearing to consider an application, it shall:
- (A) Provide notice of such hearing to the Executive Officer and any city or county whose municipal boundary or urban planning area boundary abuts the area; and
 - (B) Provide the Executive Officer with a list of the names and addresses of persons testifying at the hearing and copies of any exhibits or written testimony submitted for the hearing.
- (4) Upon request by an applicant, Executive Officer shall waive the requirements of subsections (1) and (2) of this section if the applicant shows that the local government has a policy not to comment on such applications or that a request for comment was filed with the local government or special district at least 120 calendar days before the request and the local government or special district has not yet adopted a position on the application. The governing body of a local government may delegate the decisions described in paragraphs (1) and (2) of this subsection to its staff.
- (i) Applications involving land outside district boundary:
- (1) An application to expand the UGB to include land outside the district shall not be accepted unless accompanied by a copy of a petition for annexation to the district.
 - (2) A city or county may approve a plan or zone change to implement the proposed amendment prior to a change in the district UGB if:
 - (A) The Executive Officer receives notice of the local action;
 - (B) The local action is contingent upon subsequent action by the Metro Council to amend its UGB; and
 - (C) The local action to amend the local plan or zoning map becomes effective only if the Metro Council amends the UGB consistent with the local action.
 - (3) If the Metro Council approves the application, the local government shall amend its plan or map within one year to be consistent with the amendment.

(j) The proposed amendment to the UGB shall include the entire right-of-way of an adjacent street to ensure that public facilities and services can be provided to the subject property by the appropriate local government or service district in a timely and efficient manner.

3.01.030. Criteria for Major Amendment

(a) The purpose of the major amendment process is to provide a mechanism to address needs for land that were not anticipated in the last five-year analysis of buildable land supply and cannot wait until the next five-year analysis. This section establishes criteria for major amendments to the UGB and sets forth how state law applies to these amendments. Metro intends compliance with the criteria of this section to constitute compliance with ORS 197.298, statewide planning Goals 2 and 14 and the Regional Urban Growth Goals and Objectives. Land may be added to the UGB under this section only for the following purposes: public facilities, public schools, natural areas, land trades and other nonhousing needs.

(b) The applicant shall demonstrate that the amendment will provide for an orderly and efficient transition from rural to urban use, considering the following factors:

- (1) Demonstrated need to accommodate long-range urban population growth. The Metro Council will consider, based upon evidence in the record, whether the need for the subject land was accommodated at the time of the last legislative analysis of the UGB required by ORS 197.299. If the need was not accommodated in that analysis, the Metro Council will consider whether the need must be met now, rather than at the time of the next legislative amendment, in order to ensure an orderly and efficient transition from rural to urban use.
- (2) Need for employment opportunities and livability. The Metro Council will consider, based upon evidence in the record, whether the need must be met at a particular location, or in a particular part of the region, in order to secure an employment or livability opportunity that cannot await the next legislative review of the UGB required by ORS 197.299(1), or to ensure the livability of that part of the region.
- (3) Orderly and economic provision of public facilities and services. The Metro Council will consider, based upon evidence in the record, whether adding the subject land to the UGB, as compared with other land that might be added, will result in a more logical extension of public facilities and services and reduce the overall cost of public facilities and services to land already within the UGB.
- (4) Maximum efficiency of land uses within and on the fringe of the existing urban area. The Metro Council will consider, based upon evidence in the record, whether, in comparison with other land that might be added to the UGB, addition of the subject land will better achieve the residential and employment targets and transportation objectives in the 2040 Growth Concept that apply to nearby land within the UGB.
- (5) Environmental, energy, economic and social consequences. The Metro Council will consider, based upon evidence in the record, whether the consequences of addition of the subject land would be, on the whole,

more positive than not including the land, and more positive than including other land.

- (6) Retention of agricultural and forest land. The Metro Council will consider, based upon evidence in the record, addition of land designated for agriculture or forestry pursuant to a statewide Goal 3 (Agricultural Land) or 4 (Forest Land) only under the following circumstances:
 - (A) There is no land designated as urban reserve land pursuant to OAR 660, Division 021, as exception land pursuant to ORS 197.732(1)(a) or (b), or as marginal land pursuant to ORS 197.247 (1991 Edition) available to accommodate the subject need; or
 - (B) There is no land designated urban reserve available to accommodate the subject need, the subject land is not high-value farmland as described in ORS 215.710, and the subject land is completely surrounded by exception land; or
 - (C) The application identifies a specific type of land need that cannot reasonably be accommodated on land described in (A) or (B) of this paragraph; or
 - (D) Future urban services could not reasonably be provided to land described in (A) or (B) of this paragraph.
 - (7) Compatibility of proposed urban development with nearby agricultural activities. The Metro Council will consider, based upon evidence in the record, whether urban development on the subject land would likely cause a change in farm practices, or an increase in the cost of farm practices, on farms in areas designated for agriculture or forestry pursuant to a statewide planning goal within one mile of the subject land, based upon an inventory and analysis of those practices. The Metro Council will also consider measures that might eliminate or alleviate the potential conflicts with farm practices.
- (c) The applicant shall demonstrate that:
- (1) There is no land within the existing UGB that can reasonably accommodate the subject need;
 - (2) The long-term environmental, economic, social and energy consequences of addition of the subject land would not be significantly more adverse than the consequence of adding other land; and
 - (3) The proposed uses of the subject land would be compatible, or through measures can be made compatible, with uses of adjacent land.
 - (4) The amendment will not result in the creation of an island of urban land outside the UGB or an island of rural land inside the UGB.

(5) The amendment complies with applicable statewide planning goals.

(6) If the amendment would add land for public school facilities, a conceptual school plan as described in section 3.07.1120(I) has been completed.

(d) If the Metro Council adds land to the UGB in order to facilitate a trade and the land is available for housing, the Metro Council shall designate the land to allow an average density of at least 10 units per net developable acre or such lower density that is consistent with the 2040 Growth Concept plan designation for the area.

(e) Compliance with the criteria in subsections (b) and (c) of this section shall constitute conformance with the Regional Urban Growth Goals and Objectives.

3.01.033 Minor Adjustment Procedures

(a) A city, a county, a special district or a property owner may file an application with Metro for a minor adjustment to the UGB on a form provided for that purpose by Metro. The application shall include a list of the names and addresses of owners of property within 100 feet of the land involved in the application. The application shall also include the positions on the application of appropriate local governments and special districts, in the manner required by section 3.01.025(h).

(b) Upon receipt of a complete application, the Executive Officer shall provide notice of the application to the persons specified in 3.01.050(d)(1) and 3.01.050(d)(3) through (6), to owners of property within 100 feet of the land involved in the application, to the Metro Council and to any person who requests notification of applications for minor adjustments.

(c) The Executive Officer shall determine whether the application is complete and shall notify the applicant of its determination within seven working days after the filing of an application. If the application is not complete, the applicant shall complete it within 14 days of the Executive Officer's notice. The Executive Officer will dismiss an application and return application fees if it does not receive a complete application within 14 days of its notice.

(d) The Executive Officer shall review the application for compliance with the criteria in section 3.01.035 and issue an order with its analysis and conclusion within 90 days of receipt of a complete application. The Executive Officer shall send a copy of its order to the applicant, the city or county with jurisdiction over the land that is the subject of the application and any person who requests a copy.

(e) The applicant or any person who commented on the application may appeal the Executive Officer's order to the Metro Council by filing an appeal on a form provided by the Executive Officer for that purpose within 14 days of receipt of the order. The Council shall consider the appeal at a public hearing held not more than 60 days following receipt of a timely appeal. Following the hearing, the Council shall uphold, deny or modify the Executive Officer's order on the minor adjustment. The Council shall issue an order with its analysis and conclusion and send a copy to the appellant, the city or county with jurisdiction over the land that is the subject of the application and any person who requests a copy.

3.01.035 Criteria for Minor Adjustments

(a) The purpose of this section is to provide a mechanism to make small changes to the UGB in order to make it function more efficiently and effectively. It is not the purpose of this section to add land to the UGB to satisfy a need for housing or employment. This section establishes criteria that embody state law and Regional Framework Plan policies applicable to boundary adjustments.

(b) Metro may adjust the UGB under this section only for the following reasons: (1) to site roads and lines for public facilities and services; (2) to trade land outside the UGB for land inside the UGB; or (3) to make the UGB coterminous with nearby property lines or natural or built features.

(c) To make a minor adjustment to site a public facility line or road, or to facilitate a trade, Metro shall find that:

- (1) the adjustment will result in the addition to the UGB of no more than two net acres for a public facility line or road and no more than 20 net acres in a trade;
- (2) adjustment of the UGB will make the provision of public facilities and services more efficient or less costly;
- (3) urbanization of the land added by the adjustment would have no more adverse environmental, energy, economic or social consequences than urbanization of land within the existing UGB;
- (4) urbanization of the land added by the adjustment would have no more adverse effect upon agriculture or forestry than urbanization of land within the existing UGB;
- (5) the adjustment will help achieve the 2040 Growth Concept;
- (6) the adjustment will not result in an island of urban land outside the UGB or an island of rural land inside the UGB; and
- (7) if the adjustment is to facilitate a trade, the adjustment would not add land to the UGB that is currently designated for agriculture or forestry pursuant to a statewide planning goal.

(d) To make a minor adjustment to make the UGB coterminous with property lines, natural or built features, Metro shall find that:

- (1) the adjustment will result in the addition of no more than two net acres to the UGB;
- (2) urbanization of the land added by the adjustment would have no more adverse environmental, energy, economic or social consequences than urbanization of land within the existing UGB;

- (3) urbanization of the land added by the adjustment would have no more adverse effect upon agriculture or forestry than urbanization of land within the existing UGB;
- (4) the adjustment will help achieve the 2040 Growth Concept;
- (5) the adjustment will not result in an island of urban land outside the UGB or an island of rural land inside the UGB.

(e) If the Metro Council adds land to the UGB in order to facilitate a trade and the land is available for housing, the Metro Council shall designate the land to allow an average density of at least 10 units per net developable acre or such lower density that is consistent with the 2040 Growth Concept designation for the area.

(f) The Executive Officer shall submit a report to the Council at the end of each calendar year with an analysis of all boundary adjustments made during the year pursuant to this section. The report shall demonstrate how the adjustments, when considered cumulatively, are consistent with and help achieve the 2040 Growth Concept.

3.01.040 Metro Conditions of Approval

(a) Land added to the UGB by legislative amendment pursuant to 3.01.015 or by major amendment pursuant to 3.01.025 shall be subject to the Urban Growth Boundary area comprehensive plan requirements of Title 11 of the Urban Growth Management Functional Plan (Metro Code section 3.07.1110 et seq.).

(b) Unless a comprehensive plan amendment has been previously approved for the land pursuant to 3.01.012(c), when it adopts a Legislative or major amendment adding land to the UGB, the Council shall take the following actions:

- (1) The Council shall consult with affected local governments and MPAC to determine whether local governments have agreed, pursuant to ORS 195.065 to 195.085 or otherwise, which local government shall adopt comprehensive plan amendments for the area consistent with requirements of the Urban Growth Management Functional Plan (Metro Code Chapter 3.07) and in particular, Title 11 thereof (Metro Code section 3.07.1110 et seq.). Where the affected local governments have agreed as to which local government or governments shall be responsible, the Council shall so designate. If there is no agreement, then the Council shall, consistent with ORS 195.065 to 195.085, establish a process to determine which local government or governments shall be responsible and at the conclusion of the process, so designate.
- (2) The Council shall establish the 2040 Growth Concept design type designations applicable to the land added to the Urban Growth Boundary, including the special land need, if any, that is the basis for the amendment.
- (3) The Council shall establish the boundaries of the area that shall be included in the conceptual level of planning required by Title 11 of the

Urban Growth Management Functional Plan (Metro Code section 3.07.1110 et seq.). The boundary of the planning area may include all or part of one or more designated urban reserves.

- (4) The Council shall also establish the time period for city or county compliance with the requirements of the Urban Growth Management Functional Plan (Metro Code Chapter 3.07) and in particular, Title 11 thereof (Metro Code section 3.07.1110 et seq.); however, the time period shall not be less than two (2) years from the time a local government is designated pursuant to section 3.01.040(b)(1) above.
- (5) The Council may adopt text interpretations of the requirements of Urban Growth Management Functional Plan (Metro Code Chapter 3.07) and in particular, Title 11 thereof (Metro Code section 3.07.1110 et seq.) that shall be applicable to the required City or County comprehensive plan amendments. These interpretations may address special land needs that are the basis for the amendment but otherwise such interpretations shall not impose specific locational development requirements. Text interpretations may include determinations that certain provisions of Title 11 are not applicable to specific areas because of the size or physical characteristics of land added to the Urban Growth Boundary.

(c) When it adopts a legislative or major amendment adding land to the UGB, the Council may establish conditions that it deems necessary to ensure that the addition of land complies with state planning laws and the Regional Framework Plan.

3.01.045 Fees

- (a) Each application submitted by a property owner or group of property owners pursuant to this chapter shall be accompanied by a filing fee in an amount to be established by resolution of the council. Such fees shall not exceed the actual costs of the district to process an application. The filing fee shall include administrative costs and hearings officer/public notice costs.
- (b) The fees for administrative costs shall be charged from the time an application is filed through mailing of the notice of adoption or denial to the Department of Land Conservation and Development and other interested persons.
- (c) An applicant also shall be charged for the costs of the district hearings officer as billed for that case and for the costs of public notice.
- (d) Before a hearing is scheduled, an applicant shall submit a fee deposit.
- (e) The unexpended portion of an applicant's deposit, if any, shall be returned to the applicant at the time of a final disposition of the application.
- (f) If hearings officer/public notice or administrative costs exceed the amount of the deposit, the applicant shall pay to Metro an amount equal to the costs in excess of the deposit, prior to final action by the Metro council.

(g) The Metro council may, by resolution, reduce, refund or waive the administrative fee, or portion thereof, if it finds that such fees would create an undue hardship for the applicant.

3.01.050 Hearing Notice Requirements

(a) 45-Day Notice. A proposal to amend the UGB by legislative amendment under 3.01.015 or by major amendment under 3.01.025 shall be submitted to the director of the Department of Land Conservation and Development at least 45 days before the first public hearing on the matter. The notice shall be accompanied by the appropriate forms provided by the department and shall contain a copy of a map showing the location of the proposed amendment. A copy of the same information shall be provided to the city and county, representatives of recognized neighborhoods, citizen planning organizations and/or other recognized citizen participation organizations adjacent to the location of the proposed amendment.

(b) Newspaper Ads. A 1/8 page advertisement in a newspaper of general circulation of the district for all legislative amendments and major amendments. For legislative amendments and major amendments the initial newspaper advertisements shall be published at least 45 days prior to the public hearing and shall include the same information listed in subsection (a).

(c) Notice of public hearing shall include:

- (1) The time, date and place of the hearing.
- (2) A description of the property reasonably calculated to give notice as to its actual location. A street address or other easily understood geographical reference can be utilized if available.
- (3) For major amendments,
 - (A) An explanation of the proposed action, including the nature of the application and the proposed boundary change.
 - (B) A list of the applicable criteria for approval of the petition at issue.
 - (C) A statement that the failure of an issue to be raised in a hearing, in person or by letter, or failure to provide sufficient specificity to afford the decision maker an opportunity to respond to the issue precludes an appeal based on the issue.
- (4) Notice that interested persons may submit written comments at the hearing and appear and be heard.
- (5) Notice that the hearing will be conducted pursuant to district rules and before the hearings officer unless that requirement is waived by the Metro council;
- (6) Include the name of the Metro staff to contact and telephone number for more information;

- (7) State that a copy of the staff report will be available for inspection at no cost at least seven calendar days prior to the final hearing, and that a copy will be made available at no cost or reasonable cost. Further that if additional documents or evidence is provided in support of the application any party shall be entitled to a continuance of the hearing; and
 - (8) Include a general explanation of the requirements for submission of testimony and the procedure for conduct of hearings; and
- (d) Not less than 20 calendar days before the hearing, notice shall be mailed to the following persons:
- (1) The applicant and owners of record of property on the most recent property tax roll where the property is located.
 - (2) All property owners of record within 500 feet of the site. For purposes of this subsection, only those property owners of record within the specified distance from the subject property as determined from the maps and records in the county departments of taxation and assessment are entitled to notice by mail. Failure of a property owner to receive actual notice will not invalidate the action if there was a reasonable effort to notify owners of record.
 - (3) Cities and counties in the district, or cities and counties whose jurisdictional boundaries either include or are adjacent to the subject property, and affected agencies who request regular notice.
 - (4) The neighborhood association, community planning organization or other citizen group, if any, which has been recognized by the city or county with land use jurisdiction for the subject property.
 - (5) Any neighborhood associations, community planning organizations, or other vehicles for citizen involvement in land use planning processes whose geographic areas of interest either include or are adjacent to the site and which are officially recognized as being entitled to participate in land use planning processes by the cities and counties whose jurisdictional boundaries either include or are adjacent to the site.
 - (6) The regional representatives of the director of the Oregon Department of Land Conservation and Development and the Oregon Department of Transportation.
 - (7) Any other person requesting notification of UGB changes.
- (e) At the conclusion of the hearing, the hearings officer may continue the hearing to a time, place and date certain, without additional notice.

3.01.055 Public Hearing Rules before the Hearings Officer

(a) Notice of the hearings governed by this section shall be provided to the applicant and to owners of record of property on the most recent property tax assessment roll where such property is located:

- (1) Within 250 feet of the property which is the subject of the notice where the subject property is outside an urban growth boundary and not within a farm or forest zone; or
- (2) Within 500 feet of the property which is the subject of the notice where the subject property is within a farm or forest zone.
- (3) Notice shall also be provided to any neighborhood or community organization recognized by the governing body and whose boundaries include the site.
- (4) At the discretion of the applicant, the ~~Executive~~ Chief Operating Officer shall also provide notice to the Department of Land Conservation and Development.
- (5) The notice shall:
 - (A) Explain the nature of the application and the proposed use or uses which could be authorized;
 - (B) List the applicable criteria from the ordinance and the regional framework plan that apply to the application at issue;
 - (C) Set forth the street address or other easily understood geographical reference to the subject property;
 - (D) State the date, time and location of the hearing;
 - (E) State that failure of an issue to be raised in a hearing, in person or by letter, or failure to provide statements or evidence sufficient to afford the decision maker an opportunity to respond to the issue precludes appeal to the board based on that issue;
 - (F) Be mailed at least:
 - (i) Twenty days before the evidentiary hearing; or
 - (ii) If two or more evidentiary hearings are allowed, 10 days before the first evidentiary hearing;
 - (G) Include the name of a Metro representative to contact and the telephone number where additional information may be obtained;

- (H) State that a copy of the application, all documents and evidence submitted by or on behalf of the applicant and applicable criteria are available for inspection at no cost and will be provided at reasonable cost;
 - (I) State that a copy of the staff report will be available for inspection at no cost at least seven days prior to the hearing and will be provided at reasonable cost; and
 - (J) Include a general explanation of the requirements for submission of testimony and the procedure for conduct of hearings.
- (6) The failure of the property owner to receive notice as provided in this section shall not invalidate such proceedings if the Executive Officer can demonstrate by affidavit that such notice was given. The notice provisions of this section shall not restrict the giving of notice by other means, including posting, newspaper publication, radio and television.
- (b) All applications for a major amendment accepted under this chapter shall receive a contested case hearing according to the following rules:
- (1) Hearings officers shall be selected by the district pursuant to the provisions of section 2.05.025(a) of the Metro Code.
 - (2) Parties to the case shall be defined as being any individual, agency, or organization who participates orally or in writing in the creation of the record used by the hearings officer in making a decision. If an individual represents an organization orally and/or in writing, that individual must indicate the date of the organization meeting in which the position presented was adopted. The hearings officer may request that the representative explain the method used by the organization to adopt the position presented. Parties need not be represented by an attorney at any point in the process outlined in this subsection and elsewhere in this chapter.
 - (3) At the time of the commencement of a hearing, the hearings officer shall provide the following information to parties:
 - (A) A list and statement of the applicable substantive criteria and procedures for notice and conduct of local quasi-judicial land use hearings provided that failure to provide copies to all those present shall not constitute noncompliance with this subsection; and
 - (B) A statement that testimony and evidence must be directed toward the criteria or other specific criteria which the person believes apply to the decision; and
 - (C) A statement that the failure to raise an issue accompanied by statements or evidence sufficient to afford the decision-maker

and the parties an opportunity to respond to the issue precludes appeal.

- (4) (A) Prior to the conclusion of the initial evidentiary hearing, any participant may request an opportunity to present additional evidence, arguments or testimony regarding the application. The hearing may be continued for a reasonable period as determined by the hearings officer. The hearings officer shall grant such request by continuing the public hearing pursuant to paragraph (B) of this subsection or leaving the record open for additional written evidence, arguments or testimony pursuant to paragraph (C) of this subsection.
 - (B) If the hearings officer grants a continuance, the hearing shall be continued to a date, time and place certain at least seven days from the date of the initial evidentiary hearing. An opportunity shall be provided at the continued hearing for persons to present and rebut new evidence, arguments and testimony. If new written evidence is submitted at the continued hearing, any person may request, prior to the conclusion of the continued hearing, that the record be left open for at least seven days to submit additional written evidence, arguments or testimony for the purpose of responding to the new written evidence.
 - (C) If the hearings officer leaves the record open for additional written evidence or testimony, the record shall be left open for at least seven days. Any participant may file a written request with the hearings officer for an opportunity to respond to new evidence submitted during the period the record was left open. If such a request is filed, the hearings officer shall reopen the record pursuant to subsection (11) of this section.
 - (D) Unless waived by the applicant, the local government shall allow the applicant at least seven days after the record is closed to all other parties to submit final written arguments in support of the application. The applicant's final submittal shall be considered part of the record, but shall not include any new evidence.
- (5) Failure of the applicant to appear at the hearing without making arrangements for rescheduling the hearing shall constitute grounds for immediately denying the application.
 - (6) The hearing shall be conducted in the following order:
 - (A) Staff report.
 - (B) Statement and evidence by the applicant in support of a petition.
 - (C) Statement and evidence of affected persons, agencies, and/or organizations opposing or supporting the petition, and/or anyone else wishing to give testimony.

- (D) Rebuttal testimony by the applicant.
- (7) The hearings officer shall have the right to question any participant in the hearing. Cross-examination by parties shall be by submission of written questions to the hearings officer. The hearings officer shall give parties the opportunity to submit such questions prior to closing the hearing.
 - (8) The hearings officer may set reasonable time limits for oral testimony and may exclude or limit cumulative, repetitive, or immaterial testimony.
 - (9) A verbatim audio tape or video tape, written, or other mechanical record shall be made of all proceedings, and need not be transcribed unless necessary for review upon appeal.
 - (10) The burden of presenting evidence in support of a fact or position in the contested case rests on the applicant. The proponent of a proposed UGB amendment shall have the burden of proving that the proposed amendment complies with all applicable standards.
 - (11) The hearings officer may reopen a record to receive evidence not available or offered at the hearing. If the record is reopened, any person may raise new issues which relate to the new evidence before the record is closed.
 - (12) An issue which may be the basis for an appeal to the Land Use Board of Appeals shall be raised not later than the close of the record at or following the final evidentiary hearing on the proposal before the Metro Council. Such issues shall be raised and accompanied by statements or evidence sufficient to afford the governing body, planning commission, hearings body or hearings officer, and the parties an adequate opportunity to respond to each issue.
 - (13) All documents or evidence relied upon by the applicant shall be submitted to the Executive Officer and be made available to the public.
 - (14) Applications may be consolidated by the hearings officer for hearings where appropriate. Following consultation with district staff and prospective applicants, the hearings officer shall issue rules for the consolidation of related cases and allocation of charges. These rules shall be designed to avoid duplicative or inconsistent findings, promote an informed decision-making process, protect the due process rights of all parties, and allocate the charges on the basis of cost incurred by each party.

(c) Within 30 calendar days following the close of the record, the hearings officer shall prepare and submit a proposed order and findings, together with the record compiled in the hearing and a list of parties to the case, to the executive officer. Within seven working days of receiving the materials from the hearings officer, the executive officer, or designate, shall furnish the proposed order and findings to all parties to the case. Accompanying the proposed order and findings shall be notification to parties which includes:

- (1) The procedure for filing an exception and filing deadlines for submitting an exception to the proposed order and findings of the hearings officer. Parties filing an exception with the district must furnish a copy of their exception to all parties to the case and the hearings officer.
- (2) A copy of the form to be used for filing an exception.
- (3) A description of the grounds upon which exceptions can be based.
- (4) A description of the procedure to be used to file a written request to submit evidence that was not offered at the hearing, consistent with Metro Code sections 2.05.035(c) and (d).
- (5) A list of all parties to the case.

(d) Once a hearings officer has submitted the proposed order and findings to the executive officer, the executive officer, or designate, shall become the custodian of the record compiled in the hearing, and shall make the record available at the district offices for review by parties.

3.01.060 Exceptions to Hearing Officer Decision

(a) Standing to file an exception and participate in subsequent hearings is limited to parties to the case.

(b) Parties shall have 20 calendar days from the date that the proposed order and findings are mailed to them to file an exception to the proposed order and findings of the hearings officer with the district on forms furnished by the district.

(c) The basis for an exception must relate directly to the interpretation made by the hearings officer of the ways in which the application satisfies the standards for approving an application for a UGB amendment. Exceptions must rely on the evidence in the record for the case. Only issues raised at the evidentiary hearing will be addressed because failure to raise an issue constitutes a waiver to the raising of such issues at any subsequent administrative or legal appeal deliberations.

3.01.065 Council Action On Quasi-Judicial Amendments

(a) The council may act to approve, remand or deny an application in whole or in part. When the council renders a decision that reverses or modifies the proposed order of the hearings officer, then, in its order, it shall set forth its findings and state its reasons for taking the action.

(b) Parties to the case and the hearings officer shall be notified by mail at least 10 calendar days prior to council consideration of the case. Such notice shall include a brief summary of the proposed action, location of the hearings officer report, and the time, date, and location for council consideration.

(c) Final council action following the opportunity for parties to comment orally to council on the proposed order shall be as provided in Code section 2.05.045. Parties shall be

notified of their right to review before the Land Use Board of Appeals pursuant to 1979 Oregon Laws, chapter 772.

(d) Comments before the council by parties must refer specifically to any arguments presented in exceptions filed according to the requirements of this chapter, and cannot introduce new evidence or arguments before the council. If no party to the case has filed an exception, then the council shall decide whether to entertain public comment at the time that it takes final action on an application.

(e) Within 20 days from the day that the proposed order and findings of the hearings officer are mailed to them, parties may file a motion to reopen the record to receive admissible evidence not available at the hearing. The motion shall show proof of service on all parties. The council shall rule on such motions with or without oral argument at the time of its consideration of the case. An order approving such a motion to reopen the record shall remand the case to the hearings officer for evidentiary hearing. When the council or the hearings officer reopens a record to admit new evidence, arguments or testimony, any person may raise new issues which relate to the new evidence, testimony or criteria for decision-making which apply to the matter at issue.

(f) When the council acts to approve an application in whole or in part by requiring annexation to a city and/or service district(s) and Tri-Met and whenever an application includes land outside the district:

- (1) Such action shall be by resolution expressing intent to amend the UGB if and when the affected property is annexed to the district within six months of the date of adoption of the Resolution.
- (2) The council shall take final action, as provided for in paragraphs (c) and (d) of this section, within 30 calendar days of notice that all required annexations to a city, service district(s) and the district have been approved.

(g) When the council is considering an ordinance to approve an application, it shall take all public comment at its first reading of the ordinance, discuss the case, and then either pass the ordinance to second reading or remand the proposed order and findings of the hearings officer to the executive officer or the hearings officer for new or amended findings. If new or amended findings are prepared, parties to the case shall be provided a copy of the new order and findings by mail no less than seven calendar days prior to the date upon which the council will consider the new order and findings, and parties will be given the opportunity to provide the council with oral or written testimony regarding the new order and findings.

3.01.070 Final Action Notice Requirements

(a) The district shall give each county and city in the district notice of each amendment of the UGB. Mailing the notice required by Ballot Measure 56 (Nov. 1998) [ORS Chapter 268] or ORS 197.615 shall satisfy this subsection.

(b) For the local government designated as having the responsibility for land use planning for the area(s) added to the UGB, the district shall provide an additional notice stating the time period for completing comprehensive plan amendments for the area.

3.01.080 Chapter Regulation Review

The procedures in this chapter shall be reviewed by the district every five years, and can be modified by the council at any time to correct any deficiencies which may arise. This chapter shall be submitted upon adoption to the Land Conservation and Development Commission for acknowledgment pursuant to ORS 197.251, as an implementing measure to the district UGB. Amendments to this chapter shall be submitted to the Department of Land Conservation and Development pursuant to the requirements of OAR 660 Divisions 18 and 19 as appropriate.

3.01.085 Severability

Should a section, or portion of any section of this chapter, be held to be invalid or unconstitutional by a court of competent jurisdiction, the remainder of this chapter shall continue in full force and effect.

Exhibit L to Ordinance No. 02-969B

TITLE 11: PLANNING FOR NEW URBAN AREAS

3.07.1105 Purpose and Intent

It is the purpose of Title 11 to require and guide planning for conversion from rural to urban use of areas brought into the UGB. It is the intent of Title 11 that development of areas brought into the UGB implement the Regional Framework Plan and 2040 Growth Concept.

3.07.1110 Interim Protection of Areas Brought into the Urban Growth Boundary

After inclusion of an area within the UGB and prior to the adoption by all local governments with jurisdiction over an area brought into the UGB of amendments to comprehensive plans and implementing land use regulations that comply with 3.07.1120, the local government shall not approve of:

- A. Any land use regulation or zoning map amendments specific to the territory allowing higher residential density than allowed by acknowledged provisions in effect prior to the adoption of the UGB amendment;
- B. Any land use regulation or zoning map amendments specific to the territory allowing commercial or industrial uses not allowed under acknowledged provisions in effect prior to the adoption of the UGB amendment;
- C. Any land division or partition that would result in the creation of any new parcel which would be less than 20 acres in total size;
- D. In an area identified by the Metro Council in the ordinance adding the area to the UGB as a Regionally Significant Industrial Area:
 - 1. A commercial use that is not accessory to industrial uses in the area; and
 - 2. A school, church or other institutional or community service use intended to serve people who do not work or reside in the area.

3.07.1120 Urban Growth Boundary Amendment Urban Reserve Plan Requirements

All territory added to the Urban Growth Boundary as either a major amendment or a legislative amendment pursuant to Metro Code chapter 3.01 shall be subject to adopted comprehensive plan provisions consistent with the requirements of all applicable titles of the Metro Urban Growth Management Functional Plan and in particular this Title 11. The comprehensive plan provisions shall be fully coordinated with all other applicable plans. The comprehensive plan provisions shall contain an urban growth plan diagram and policies that demonstrate compliance with the RUGGO, including the Metro Council adopted 2040 Growth Concept design types. Comprehensive plan amendments shall include:

- A. Provision for annexation to a city or any necessary service districts prior to urbanization of the territory or incorporation of a city or necessary service districts to provide all required urban services.

- B. Provision for average residential densities of at least 10 dwelling units per net developable residential acre or lower densities which conform to the 2040 Growth Concept Plan design type designation for the area.
- C. Demonstrable measures that will provide a diversity of housing stock that will fulfill needed housing requirements as defined by ORS 197.303. Measures may include, but are not limited to, implementation of recommendations in Title 7 of the Urban Growth Management Functional Plan.
- D. Demonstration of how residential developments will include, without public subsidy, housing affordable to households with incomes at or below area median incomes for home ownership and at or below 80 percent of area median incomes for rental as defined by U.S. Department of Housing and Urban Development for the adjacent urban jurisdiction. Public subsidies shall not be interpreted to mean the following: density bonuses, streamlined permitting processes, extensions to the time at which systems development charges (SDCs) and other fees are collected, and other exercises of the regulatory and zoning powers.
- E. Provision for sufficient commercial and industrial development for the needs of the area to be developed consistent with 2040 Growth Concept design types. Commercial and industrial designations in nearby areas inside the Urban Growth Boundary shall be considered in comprehensive plans to maintain design type consistency.
- F. A conceptual transportation plan consistent with the applicable provision of the Regional Transportation Plan, Title 6 of the Urban Growth Management Functional Plan, and that is also consistent with the protection of natural resources either identified in acknowledged comprehensive plan inventories or as required by Title 3 of the Urban Growth Management Functional Plan. The plan shall, consistent with OAR Chapter 660, Division 11, include preliminary cost estimates and funding strategies, including likely financing approaches.
- G. Identification, mapping and a funding strategy for protecting areas from development due to fish and wildlife habitat protection, water quality enhancement and mitigation, and natural hazards mitigation. A natural resource protection plan to protect fish and wildlife habitat, water quality enhancement areas and natural hazard areas shall be completed as part of the comprehensive plan and zoning for lands added to the Urban Growth Boundary prior to urban development. The plan shall include a preliminary cost estimate and funding strategy, including likely financing approaches, for options such as mitigation, site acquisition, restoration, enhancement, or easement dedication to ensure that all significant natural resources are protected.
- H. A conceptual public facilities and services plan for the provision of sanitary sewer, water, storm drainage, transportation, parks and police and fire protection. The plan shall, consistent with OAR Chapter 660, Division 11, include preliminary cost estimates and funding strategies, including likely financing approaches.
- I. A conceptual school plan that provides for the amount of land and improvements needed, if any, for school facilities on new or existing sites that will serve the territory added to the UGB. The estimate of need shall be coordinated with affected local governments and special districts.
- J. An urban growth diagram for the designated planning area showing, at least, the following, when applicable:

1. General locations of arterial, collector and essential local streets and connections and necessary public facilities such as sanitary sewer, storm sewer and water to demonstrate that the area can be served;
 2. Location of steep slopes and unbuildable lands including but not limited to wetlands, floodplains and riparian areas;
 3. General locations for mixed use areas, commercial and industrial lands;
 4. General locations for single and multi-family housing;
 5. General locations for public open space, plazas and neighborhood centers; and
 6. General locations or alternative locations for any needed school, park or fire hall sites.
- K. The plan amendments shall be coordinated among the city, county, school district and other service districts.

3.07.1130 Implementation of Urban Growth Boundary Amendment Urban Reserve Plan Requirements

- A. On or before 60 days prior to the adoption of any comprehensive plan amendment subject to this Title 11, the local government shall transmit to Metro the following:
1. A copy of the comprehensive plan amendment proposed for adoption;
 2. An evaluation of the comprehensive plan amendment for compliance with the Functional Plan and 2040 Growth Concept design types requirements and any additional conditions of approval of the urban growth boundary amendment. This evaluation shall include an explanation of how the plan implements the 2040 Growth Concept;
 3. Copies of all applicable comprehensive plan provisions and implementing ordinances as proposed to be amended.
- B. The Council may grant an extension of time for adoption of the required Comprehensive Plan Amendment if the local government has demonstrated substantial progress or good cause for failing to adopt the amendment on time. Requests for extensions of time may accompany the transmittal under subsection A of this section.

3.07.1140 Effective Date and Notification Requirements

The provisions of this Title 11 are effective immediately. Prior to making any amendment to any comprehensive plan or implementing ordinance for any territory that has been added to the Urban Growth Boundary after the effective date of this code amendment, a city or county shall comply with the notice requirements of section 3.07.830 and include in the required staff report an explanation of how the proposed amendment complies with the requirements of this Title 11 in addition to the other requirements of this functional plan.

Exhibit L to Ordinance No. 02-969B

TITLE 11: PLANNING FOR NEW URBAN AREAS

~~3.07.1105 Purpose and Intent~~

~~It is the purpose of this Title 11 to require that all territory added to the Urban Growth Boundary shall be included within a city or county's comprehensive plan prior to urbanization. The comprehensive plan amendment must be consistent with the Functional Plan. The intent of this title is that comprehensive plan amendments shall promote the integration of the new land added to the Urban Growth Boundary into existing communities or provide for the establishment of new communities.~~

3.07.1105 Purpose and Intent

It is the purpose of Title 11 to require and guide planning for conversion from rural to urban use of areas brought into the UGB. It is the intent of Title 11 that development of areas brought into the UGB implement the Regional Framework Plan and 2040 Growth Concept.

~~3.07.1110 Interim Protection of Areas Brought Inside Urban Growth Boundary~~

~~Prior to the adoption by all local governments having jurisdiction over any territory added to the Urban Growth Boundary of comprehensive plan amendments consistent with all requirements set forth in this title, a city or county shall not approve of:~~

- ~~A. Any land use regulation or zoning map amendments specific to the territory allowing higher residential density than allowed by acknowledged provisions in effect prior to the adoption of the Urban Growth Boundary amendment;~~
- ~~B. Any land use regulation or zoning map amendments specific to the territory allowing commercial or industrial uses not allowed under acknowledged provisions in effect prior to the adoption of the Urban Growth Boundary Amendment;~~
- ~~C. Any land division or partition that would result in the creation of any new parcel which would be less than 20 acres in total size.~~

3.07.1110 Interim Protection of Areas Brought into the Urban Growth Boundary

After inclusion of an area within the UGB and prior to the adoption by all local governments with jurisdiction over an area brought into the UGB of amendments to comprehensive plans and implementing land use regulations that comply with 3.07.1120, the local government shall not approve of:

- A. Any land use regulation or zoning map amendments specific to the territory allowing higher residential density than allowed by acknowledged provisions in effect prior to the adoption of the UGB amendment;
- B. Any land use regulation or zoning map amendments specific to the territory allowing commercial or industrial uses not allowed under acknowledged provisions in effect prior to the adoption of the UGB amendment;
- C. Any land division or partition that would result in the creation of any new parcel which would be less than 20 acres in total size;

D. In an area identified by the Metro Council in the ordinance adding the area to the UGB as a Regionally Significant Industrial Area:

1. A commercial use that is not accessory to industrial uses in the area; and
2. A school, church or other institutional or community service use intended to serve people who do not work or reside in the area.

3.07.1120 Urban Growth Boundary Amendment Urban Reserve Plan Requirements

All territory added to the Urban Growth Boundary as either a major amendment or a legislative amendment pursuant to Metro Code chapter 3.01 shall be subject to adopted comprehensive plan provisions consistent with the requirements of all applicable titles of the Metro Urban Growth Management Functional Plan and in particular this Title 11. The comprehensive plan provisions shall be fully coordinated with all other applicable plans. The comprehensive plan provisions shall contain an urban growth plan diagram and policies that demonstrate compliance with the RUGGO, including the Metro Council adopted 2040 Growth Concept design types. Comprehensive plan amendments shall include:

- A. Provision for annexation to a city or any necessary service districts prior to urbanization of the territory or incorporation of a city or necessary service districts to provide all required urban services.
- B. Provision for average residential densities of at least 10 dwelling units per net developable residential acre or lower densities which conform to the 2040 Growth Concept Plan design type designation for the area.
- C. Demonstrable measures that will provide a diversity of housing stock that will fulfill needed housing requirements as defined by ORS 197.303. Measures may include, but are not limited to, implementation of recommendations in Title 7 of the Urban Growth Management Functional Plan.
- D. Demonstration of how residential developments will include, without public subsidy, housing affordable to households with incomes at or below area median incomes for home ownership and at or below 80 percent of area median incomes for rental as defined by U.S. Department of Housing and Urban Development for the adjacent urban jurisdiction. Public subsidies shall not be interpreted to mean the following: density bonuses, streamlined permitting processes, extensions to the time at which systems development charges (SDCs) and other fees are collected, and other exercises of the regulatory and zoning powers.
- E. Provision for sufficient commercial and industrial development for the needs of the area to be developed consistent with 2040 Growth Concept design types. Commercial and industrial designations in nearby areas inside the Urban Growth Boundary shall be considered in comprehensive plans to maintain design type consistency.
- F. A conceptual transportation plan consistent with the applicable provision of the Regional Transportation Plan, Title 6 of the Urban Growth Management Functional Plan, and that is also consistent with the protection of natural resources either identified in acknowledged comprehensive plan inventories or as required by Title 3 of the Urban Growth Management

Functional Plan. The plan shall, consistent with OAR Chapter 660, Division 11, include preliminary cost estimates and funding strategies, including likely financing approaches.

- G. Identification, mapping and a funding strategy for protecting areas from development due to fish and wildlife habitat protection, water quality enhancement and mitigation, and natural hazards mitigation. A natural resource protection plan to protect fish and wildlife habitat, water quality enhancement areas and natural hazard areas shall be completed as part of the comprehensive plan and zoning for lands added to the Urban Growth Boundary prior to urban development. The plan shall include a preliminary cost estimate and funding strategy, including likely financing approaches, for options such as mitigation, site acquisition, restoration, enhancement, or easement dedication to ensure that all significant natural resources are protected.
- H. A conceptual public facilities and services plan for the provision of sanitary sewer, water, storm drainage, transportation, parks and police and fire protection. The plan shall, consistent with OAR Chapter 660, Division 11, include preliminary cost estimates and funding strategies, including likely financing approaches.
- I. A conceptual school plan that provides for the amount of land and improvements needed, if any, for school facilities on new or existing sites that will serve the territory added to the UGB. The estimate of need shall be coordinated with affected local governments and special districts.
- J. An urban growth diagram for the designated planning area showing, at least, the following, when applicable:
 - 1. General locations of arterial, collector and essential local streets and connections and necessary public facilities such as sanitary sewer, storm sewer and water to demonstrate that the area can be served;
 - 2. Location of steep slopes and unbuildable lands including but not limited to wetlands, floodplains and riparian areas;
 - 3. General locations for mixed use areas, commercial and industrial lands;
 - 4. General locations for single and multi-family housing;
 - 5. General locations for public open space, plazas and neighborhood centers; and
 - 6. General locations or alternative locations for any needed school, park or fire hall sites.
- K. The plan amendments shall be coordinated among the city, county, school district and other service districts.

3.07.1130 Implementation of Urban Growth Boundary Amendment Urban Reserve Plan Requirements

- A. On or before 60 days prior to the adoption of any comprehensive plan amendment subject to this Title 11, the local government shall transmit to Metro the following:
 - 1. A copy of the comprehensive plan amendment proposed for adoption;
 - 2. An evaluation of the comprehensive plan amendment for compliance with the Functional Plan and 2040 Growth Concept design types requirements and any additional conditions

of approval of the urban growth boundary amendment. This evaluation shall include an explanation of how the plan implements the 2040 Growth Concept;

3. Copies of all applicable comprehensive plan provisions and implementing ordinances as proposed to be amended.

B. The Council may grant an extension of time for adoption of the required Comprehensive Plan Amendment if the local government has demonstrated substantial progress or good cause for failing to adopt the amendment on time. Requests for extensions of time may accompany the transmittal under subsection A of this section.

3.07.1140 Effective Date and Notification Requirements

The provisions of this Title 11 are effective immediately. Prior to making any amendment to any comprehensive plan or implementing ordinance for any territory that has been added to the Urban Growth Boundary after the effective date of this code amendment, a city or county shall comply with the notice requirements of section 3.07.830 and include in the required staff report an explanation of how the proposed amendment complies with the requirements of this Title 11 in addition to the other requirements of this functional plan.

**Exhibit M to Ordinance No. 02-969B
Conditions on Addition of Land to UGB**

I. General Conditions Applicable to All Land Added to UGB

A. The city or county with land use planning responsibility for a study area included in the UGB shall complete the planning required by Metro Code Title 11, Urban Growth Management Functional Plan ("UGMFP"), section 3.07.1120 ("Title 11 planning") for the area. Unless otherwise stated in specific conditions below, the city or county shall complete Title 11 planning within two years. Specific conditions below identify the city or county responsible for each study area.

B. The city or county with land use planning responsibility for a study area included in the UGB, as specified below, shall apply the 2040 Growth Concept design types shown on Exhibit N of this ordinance to the planning required by Title 11 for the study area.

C. The city or county with land use planning responsibility for a study area included in the UGB shall apply interim protection standards in Metro Code Title 11, UGMFP, section 3.07.1110, to the study area.

D. In Title 11 planning, each city or county with land use planning responsibility for a study area included in the UGB shall recommend appropriate long-range boundaries for consideration by the Council in future expansion of the UGB or designation of urban reserves pursuant to 660 Oregon Administrative Rules Division 21.

E. Each city or county with land use planning responsibility for a study area included in the UGB shall adopt provisions in its comprehensive plan and zoning regulations – such as setbacks, buffers and designated lanes for movement of slow-moving farm machinery - to ensure compatibility between urban uses in an included study area and agricultural practices on adjacent land outside the UGB zoned for farm or forest use.

F. Each city or county with land use planning responsibility for a study area included in the UGB shall apply Title 4 of the UGMFP to those portions of the study area designated Regionally Significant Industrial Area ("RSIA"), Industrial Area or Employment Area on the 2040 Growth Concept Map (Exhibit N). If the Council places a specific condition on a RSIA below, the city or county shall apply the more restrictive condition.

G. In the application of statewide planning Goal 5 (Natural Resources, Scenic and Historic Areas, and Open Spaces) to Title 11 planning, each city and county with land use planning responsibility for a study area included in the UGB shall comply with those provisions of Title 3 of the UGMFP acknowledged by the Land Conservation and Development Commission ("LCDC") to comply with Goal 5. If LCDC has not acknowledged those provisions of Title 3 intended to comply with Goal 5 by the deadline for completion of Title 11 planning, the city or county shall consider any inventory of regionally significant Goal 5 resources adopted by resolution of the Metro Council in the city or county's application of Goal 5 to its Title 11 planning.

H. Each city and county with land use planning responsibility for a study area included in the UGB shall provide, in the conceptual transportation plan required by Title 11, subsection 3.07.1120F, for bicycle and pedestrian access to and within school sites from surrounding area designated to allow residential use.

II. Specific Conditions for Particular Areas

A. Study Areas 6 (partial), 10 (partial), 11, 12, 13, 14, 15, 16, 17, 18 and 19 (partial)

1. Clackamas and Multnomah Counties and Metro shall complete Title 11 planning for the portions of these study areas in the Gresham and Damascus areas as shown on Exhibit N within four years following the effective date of this ordinance. The counties shall invite the participation of the cities of Gresham and Happy Valley and all special districts currently providing or likely to provide an urban service to territory in the area. If a portion of the area incorporates or annexes to the City of Happy Valley or the City of Gresham prior to adoption by Clackamas and Multnomah Counties of the comprehensive plan provisions and land use regulations required by Title 11, the Metro Council shall coordinate Title 11 planning activities among the counties and the new city pursuant to ORS 195.025.
2. In the planning required by Title 11, subsections A and F of section 3.07.1120, Clackamas and Multnomah Counties shall provide for annexation to the TriMet district of those portions of the study areas whose planned capacity for jobs or housing is sufficient to support transit.
3. In the planning required by Title 11, Clackamas County shall ensure, through phasing or staging urbanization of the study areas and the timing of extension of urban services to the areas, that the Town Center of Damascus, as shown on the 2040 Growth Concept Map (Exhibit N) or comprehensive plan maps amended pursuant to Title 1 of the UGMFP, section 3.07.130, becomes the commercial services center of Study Areas 10 and 11 and appropriate portions of Study Areas 12, 13, 14, 17 and 19. Appropriate portions of these study areas shall be considered intended for governance by a new City of Damascus. The Damascus Town Center shall include the majority of these areas' commercial retail services and commercial office space. Title 11 planning for these areas shall ensure that the timing of urbanization of the remainder of these areas contributes to the success of the town center.
4. In the planning required by Title 11, Clackamas and Multnomah Counties shall provide for separation between the Damascus Town Center and other town centers and neighborhoods centers designated in Title 11 planning or other measures in order to preserve the emerging and intended identities of the centers using, to the extent practicable, the natural features of the landscape features in the study areas.
5. If, prior to completion by Clackamas County of Title 11 planning for the Damascus Area, the county and Metro have determined through amendment to the 2000 Regional Transportation Plan to build the proposed Sunrise Corridor, the county shall provide for the preservation of the proposed rights-of-way for the highway as part of the conceptual transportation plan required by subsection G of section 3.07.1120 of Title 11.
6. Neither Multnomah County nor, upon annexation of the area to the City of Gresham, the city shall allow the division of a lot or parcel in an area designated RSIA to create a smaller lot or parcel except as part of the lot/parcel reconfiguration plan required in Condition 7.

7. Multnomah County or, upon annexation of the area to the City of Gresham, the city, as part of Title 11 planning, shall, in conjunction with property owners and affected local governments, develop a lot/parcel reconfiguration plan for land designated RSIA that results in the largest practicable number of parcels 50 acres or larger.

B. Study Areas 24 (partial), 25 (partial), 26 (partial) and 32 (partial)

Clackamas County or, upon annexation of the area to the City of Oregon City, the city shall complete Title 11 planning for the portions of Study Areas 24, 25, 26 and 32 shown on Exhibit N within four years following the effective date of Ordinance No. 02-969B.

C. Study Area 37

Clackamas County or, upon annexation of the area to the City of West Linn, the city shall complete Title 11 planning for Study Area 37 shown on Exhibit N.

D. Study Area 45

1. Clackamas County or, upon annexation of the area to the City of Wilsonville, the city shall complete Title 11 planning for Study Area 45 as shown on Exhibit N.
2. Clackamas County or, upon annexation of the area to the City of Wilsonville, the city shall adopt provisions in its comprehensive plan and zoning regulations to limit development on the three parcels in Study Area 45 owned by the West Linn-Wilsonville School District site to public school facilities and other development necessary and accessory to public school use, and public park facilities and uses identified in the conceptual school plan required by Title 11, subsection 3.07.1120I.

E. Study Areas 47 and 49 (partial)

1. Washington County or, upon annexation of the area to the City of Tualatin, the city shall complete Title 11 planning for the portions of Study Areas 47 and 49 shown on Exhibit N within four years following the effective date of Ordinance No. 02-969B.
2. Washington County or, upon annexation of the area to the City of Tualatin, the city, as part of the planning required for the site by section 3.07.1120E of the Metro Code, shall, in conjunction with property owners and affected local governments, develop a lot/parcel reconfiguration plan for the areas that results in the largest practicable parcel.
3. Neither the county nor the city shall allow new commercial retail uses on the portions of Study Areas 47 and 49 shown on Exhibit N.

F. Study Area 49 (partial)

Washington County or, upon annexation of the area to the City of Wilsonville, the city shall complete Title 11 planning for the portion of Study Area 49 shown on Exhibit N.

G. Study Areas 54 (partial) and 55 (partial)

1. Washington County or, upon annexation of the area to the City of Sherwood, the city shall complete Title 11 planning for the portions of Study Areas 54 and 55 shown on Exhibit N within four years following the effective date of Ordinance No. 02-969.
2. In the planning required by Title 11, subsection F of section 3.07.1120, the county or the city shall include measures to protect the possible corridor identified in the 2000 Regional Transportation Plan for the Tualatin-Sherwood Connector.

H. Study Area 59 (partial)

1. Washington County or, upon annexation of the area to the City of Sherwood, the city shall complete Title 11 planning for the portion of Study Area 59 shown on Exhibit N.
2. The county or the city shall adopt provisions in its comprehensive plan and zoning regulations to limit development in this portion of Study Area 59 to public school facilities and other development necessary and accessory to public school use.

I. Study Area 61 (partial)

Washington County or, upon annexation of the area to the City of Tualatin, the city shall complete Title 11 planning for the portions of Study Area 61 shown on Exhibit N.

J. Study Areas 62 (partial), 63 and 64

Washington County or, upon annexation of the area to the cities of Tigard, King City or Beaverton, the city shall complete Title 11 planning for the portions of Study Areas 62, 63 and 64 shown on Exhibit N.

K. Study Areas 67 and 69 (partial)

Washington County or, upon annexation of the area to the City of Beaverton or the City of Hillsboro, the city shall complete Title 11 planning for the portion of Study Areas 67 and 69 shown on Exhibit N.

L. Study Areas 71 and 0

Washington County or, upon annexation of the area to the City of Hillsboro, the city shall complete Title 11 planning for Study Areas 71 and 0 shown on Exhibit N.

M. Study Areas 77 (partial)

Washington County or, upon annexation of the area to the City of Cornelius, the city shall complete Title 11 planning for the portion of Study Area 77 shown on Exhibit N.

N. Study Area 93 (partial)

Multnomah County or, upon annexation of the area to the City of Portland, the city shall complete Title 11 planning for the portion of Study Area 93 shown on Exhibit N.

O. Study Areas 89 (partial) and 94

The City of Portland shall complete Title 11 planning for the portions of Study Areas 89 and 94 shown on Exhibit N within six years after the effective date of this ordinance. The expected number of dwelling units determined in the Title 11 planning process shall reflect the City of Portland's Residential Farm/Forest zone, including Environmental Overlay Zones.

Exhibit M to Ordinance No. 02-969B
Conditions on Addition of Land to UGB

I. General Conditions Applicable to All Land Added to UGB

A. The city or county with land use planning responsibility for a study area included in the UGB shall complete the planning required by Metro Code Title 11, Urban Growth Management Functional Plan (“UGMFP”), section 3.07.1120 (“Title 11 planning”) for the area. Unless otherwise stated in specific conditions below, the city or county shall complete Title 11 planning within two years. Specific conditions below identify the city or county responsible for each study area.

B. The city or county with land use planning responsibility for a study area included in the UGB, as specified below, shall apply the 2040 Growth Concept design types shown on Exhibit N of this ordinance to the planning required by Title 11 for the study area.

C. The city or county with land use planning responsibility for a study area included in the UGB shall apply interim protection standards in Metro Code Title 11, UGMFP, section 3.07.1110, to the study area.

D. In Title 11 planning, each city or county with land use planning responsibility for a study area included in the UGB shall recommend appropriate long-range boundaries for consideration by the Council in future expansion of the UGB or designation of urban reserves pursuant to 660 Oregon Administrative Rules Division 21.

E. Each city or county with land use planning responsibility for a study area included in the UGB shall adopt provisions in its comprehensive plan and zoning regulations – such as setbacks, buffers and designated lanes for movement of slow-moving farm machinery - to ensure compatibility between urban uses in an included study area and agricultural practices on adjacent land outside the UGB zoned for farm or forest use.

F. Each city or county with land use planning responsibility for a study area included in the UGB shall apply Title 4 of the UGMFP to those portions of the study area designated Regionally Significant Industrial Area (“RSIA”), Industrial Area or Employment Area on the 2040 Growth Concept Map (Exhibit N). If the Council places a specific condition on a RSIA below, the city or county shall apply the more restrictive condition.

G. In the application of statewide planning Goal 5 (Natural Resources, Scenic and Historic Areas, and Open Spaces) to Title 11 planning, each city and county with land use planning responsibility for a study area included in the UGB shall comply with those provisions of Title 3 of the UGMFP acknowledged by the Land Conservation and Development Commission (“LCDC”) to comply with Goal 5. If LCDC has not acknowledged those provisions of Title 3 intended to comply with Goal 5 by the deadline for completion of Title 11 planning, the city or county shall consider any inventory of regionally significant Goal 5 resources adopted by resolution of the Metro Council in the city or county’s application of Goal 5 to its Title 11 planning.

H. Each city and county with land use planning responsibility for a study area included in the UGB shall provide, in the conceptual transportation plan required by Title 11, subsection 3.07.1120F, for bicycle and pedestrian access to and within school sites from surrounding area designated to allow residential use.

II. Specific Conditions for Particular Areas

A. Study Areas 6 (partial), 10 (partial), 11, 12, 13, 14, 15, 16, 17, 18 and 19 (partial)

1. Clackamas and Multnomah Counties and Metro shall complete Title 11 planning for the portions of these study areas in the Gresham and Damascus areas as shown on Exhibit N within four years following the effective date of this ordinance. The counties shall invite the participation of the cities of Gresham and Happy Valley and all special districts currently providing or likely to provide an urban service to territory in the area. If a portion of the area incorporates or annexes to the City of Happy Valley or the City of Gresham prior to adoption by Clackamas and Multnomah Counties of the comprehensive plan provisions and land use regulations required by Title 11, the Metro Council shall coordinate Title 11 planning activities among the counties and the new city pursuant to ORS 195.025.
- ~~2. In the application of statewide planning Goal 5 (Natural Resources, Scenic and Historic Areas, and Open Spaces) to Title 11 planning, Clackamas and Multnomah Counties shall comply with those provisions of Title 3 of the UGMFP acknowledged by the Land Conservation and Development Commission ("LCDC") to comply with Goal 5. If LCDC has not acknowledged those provisions of Title 3 intended to comply with Goal 5 within four years following the effective date of this ordinance, Clackamas and Multnomah Counties shall consider any inventory of regionally significant Goal 5 resources adopted by resolution of the Metro Council in the county's Goal 5 process.~~
- ~~32.~~ In the planning required by Title 11, subsections A and F of section 3.07.1120, Clackamas and Multnomah Counties shall provide for annexation to the TriMet district of those portions of the study areas whose planned capacity for jobs or housing is sufficient to support transit.
- ~~43.~~ In the planning required by Title 11, Clackamas County shall ensure, through phasing or staging urbanization of the study areas and the timing of extension of urban services to the areas, that the Town Center of Damascus, as shown on the 2040 Growth Concept Map (Exhibit N) or comprehensive plan maps amended pursuant to Title 1 of the UGMFP, section 3.07.130, becomes the commercial services center of Study Areas 10 and 11 and appropriate portions of Study Areas 12, 13, 14, 17 and 19. Appropriate portions of these study areas shall be considered intended for governance by a new City of Damascus. The Damascus Town Center shall include the majority of these areas' commercial retail services and commercial office space. Title 11 planning for these areas shall ensure that the timing of urbanization of the remainder of these areas contributes to the success of the town center.
- ~~54.~~ In the planning required by Title 11, Clackamas and Multnomah Counties shall provide for separation between the Damascus Town Center and other town centers and neighborhoods centers designated in Title 11 planning or other measures in order to preserve the emerging and intended identities of the centers using, to the extent practicable, the natural features of the landscape features in the study areas.
- ~~65.~~ If, prior to completion by Clackamas County of Title 11 planning for the Damascus Area, the county and Metro have determined through amendment to the 2000 Regional Transportation Plan to build the proposed Sunrise Corridor, the county shall provide for the preservation of the proposed rights-of-way for the highway as part of the conceptual

~~transportation plan required by subsection G of section 3.07.1120 of Title 11. In the planning required by Title 11, subsection G of section 3.07.1120F, Clackamas County shall include measures to protect the possible corridors identified in the 2000 Regional Transportation Plan for the Sunrise Highway.~~

~~76.~~ Neither Multnomah County nor, upon annexation of the area to the City of Gresham, the city shall allow the division of a lot or parcel in an area designated RSIA to create a smaller lot or parcel except as part of the lot/parcel reconfiguration plan required in Condition ~~87~~.

~~87.~~ Multnomah County or, upon annexation of the area to the City of Gresham, the city, as part of Title 11 planning, shall, in conjunction with property owners and affected local governments, develop a lot/parcel reconfiguration plan for land designated RSIA that results in the largest practicable number of parcels 50 acres or larger.

B. Study Areas 24 (partial), 25 (partial), 26 (partial) and 32 (partial)

Clackamas County or, upon annexation of the area to the City of Oregon City, the city shall complete Title 11 planning for the portions of Study Areas 24, 25, 26 and 32 shown on Exhibit N within four years following the effective date of Ordinance No. 02-969B.

C. Study Area 37

Clackamas County or, upon annexation of the area to the City of West Linn, the city shall complete Title 11 planning for Study Area 37 shown on Exhibit N.

D. Study Area 45

1. Clackamas County or, upon annexation of the area to the City of Wilsonville, the city shall complete Title 11 planning for Study Area 45 as shown on Exhibit N.
2. Clackamas County or, upon annexation of the area to the City of Wilsonville, the city shall adopt provisions in its comprehensive plan and zoning regulations to limit development on the three parcels in Study Area 45 owned by the West Linn-Wilsonville School District site to public school facilities and other development necessary and accessory to public school use, and public park facilities and uses identified in the conceptual school plan required by Title 11, subsection 3.07.1120I.

E. Study Areas 47 and 49 (partial)

1. Washington County or, upon annexation of the area to the City of Tualatin, the city shall complete Title 11 planning for the portions of Study Areas 47 and 49 shown on Exhibit N within four years following the effective date of Ordinance No. 02-969B.
2. Washington County or, upon annexation of the area to the City of Tualatin, the city, as part of the planning required for the site by section 3.07.1120FE of the Metro Code, shall, in conjunction with property owners and affected local governments, develop a lot/parcel reconfiguration plan for the areas that results in the largest practicable parcel at least one parcel 50 acres or larger.

3. Neither the county nor the city shall allow new commercial retail uses on the portions of Study Areas 47 and 49 shown on Exhibit N.

F. Study Area 49 (partial)

Washington County or, upon annexation of the area to the City of Wilsonville, the city shall complete Title 11 planning for the portion of Study Area 49 shown on Exhibit N.

G. Study Areas 54 (partial) and 55 (partial)

1. Washington County or, upon annexation of the area to the City of Sherwood, the city shall complete Title 11 planning for the portions of Study Areas 54 and 55 shown on Exhibit N within four years following the effective date of Ordinance No. 02-969.
2. In the planning required by Title 11, subsection F of section 3.07.1120, the county or the city shall include measures to protect the possible corridor identified in the 2000 Regional Transportation Plan for the Tualatin-Sherwood Connector.

H. Study Area 59 (partial)

1. Washington County or, upon annexation of the area to the City of Sherwood, the city shall complete Title 11 planning for the portion of Study Area 59 shown on Exhibit N.
2. The county or the city shall adopt provisions in its comprehensive plan and zoning regulations to limit development in this portion of Study Area 59 to public school facilities and other development necessary and accessory to public school use.

I. Study Area 61 (partial)

Washington County or, upon annexation of the area to the City of Tualatin, the city shall complete Title 11 planning for the portions of Study Area 61 shown on Exhibit N.

J. Study Areas 62 (partial), 63 and 64

Washington County or, upon annexation of the area to the ~~City~~-cities of Tigard, King City or Beaverton, the city shall complete Title 11 planning for the portions of Study Areas 62, 63 and 64 shown on Exhibit N.

K. Study Areas 67 and 69 (partial)

Washington County or, upon annexation of the area to the City of Beaverton or the City of Hillsboro, the city shall complete Title 11 planning for the portion of Study Areas 67 and 69 shown on Exhibit N.

L. Study Areas 71 and 0

Washington County or, upon annexation of the area to the City of Hillsboro, the city shall complete Title 11 planning for Study Areas 71 and 0 shown on Exhibit N.

M. Study Areas ~~75 and 76~~ 77 (partial)

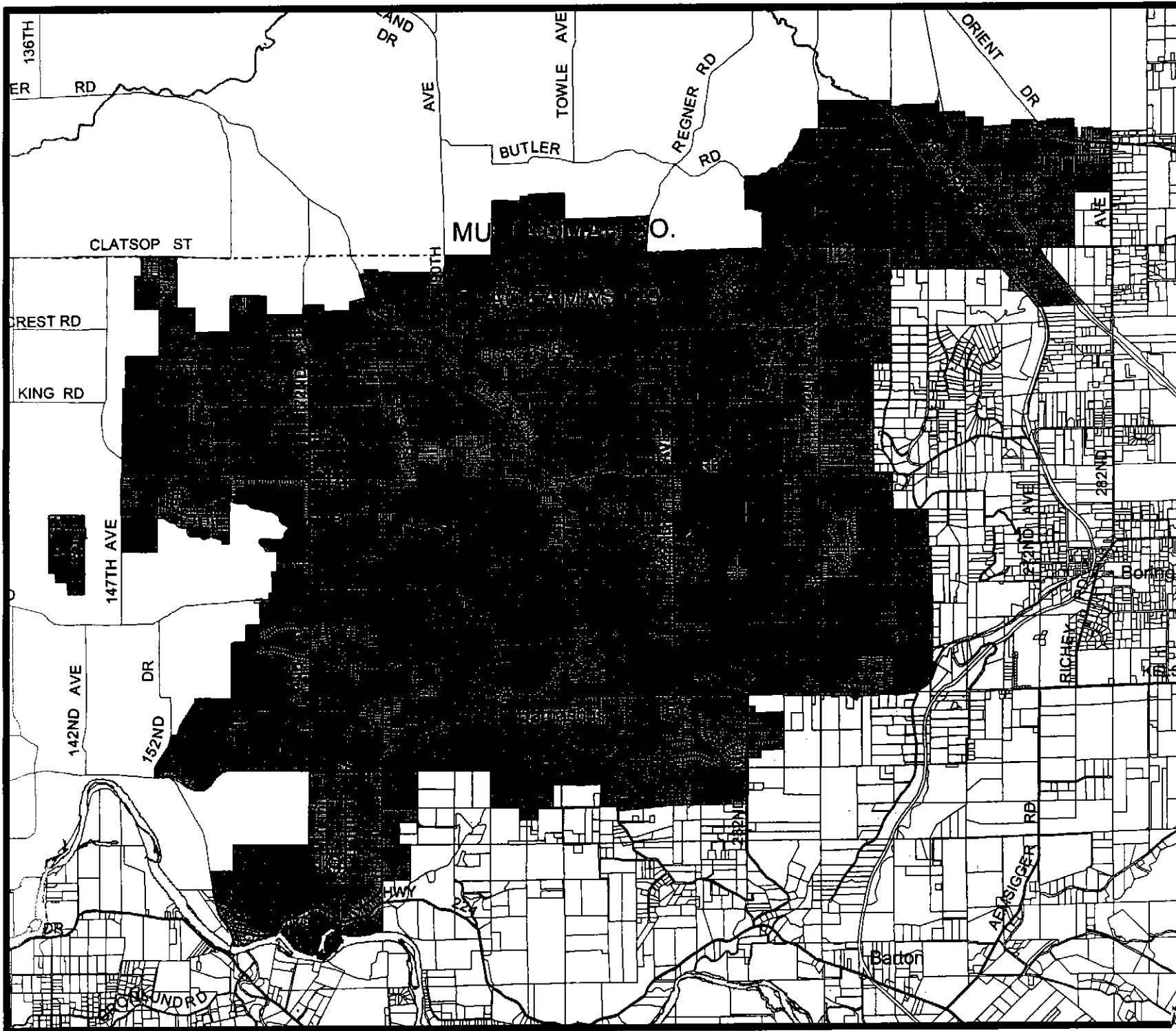
Washington County or, upon annexation of the area to the City of ~~Hillsboro~~ Cornelius, the city shall complete Title 11 planning for the portion of Study Areas ~~75 and 76~~ 77 shown on Exhibit N.

N. Study Area 93 (partial)

Multnomah County or, upon annexation of the area to the City of Portland, the city shall complete Title 11 planning for the portion of Study Areas 93 shown on Exhibit N.

O. Study Areas 89 (partial) and 94

The City of Portland shall complete Title 11 planning for the portions of Study Areas 89 and 94 shown on Exhibit N within six years after the effective date of this ordinance. The expected number of dwelling units determined in the Title 11 planning process shall reflect the City of Portland's Residential Farm/Forest zone, including Environmental Overlay Zones.



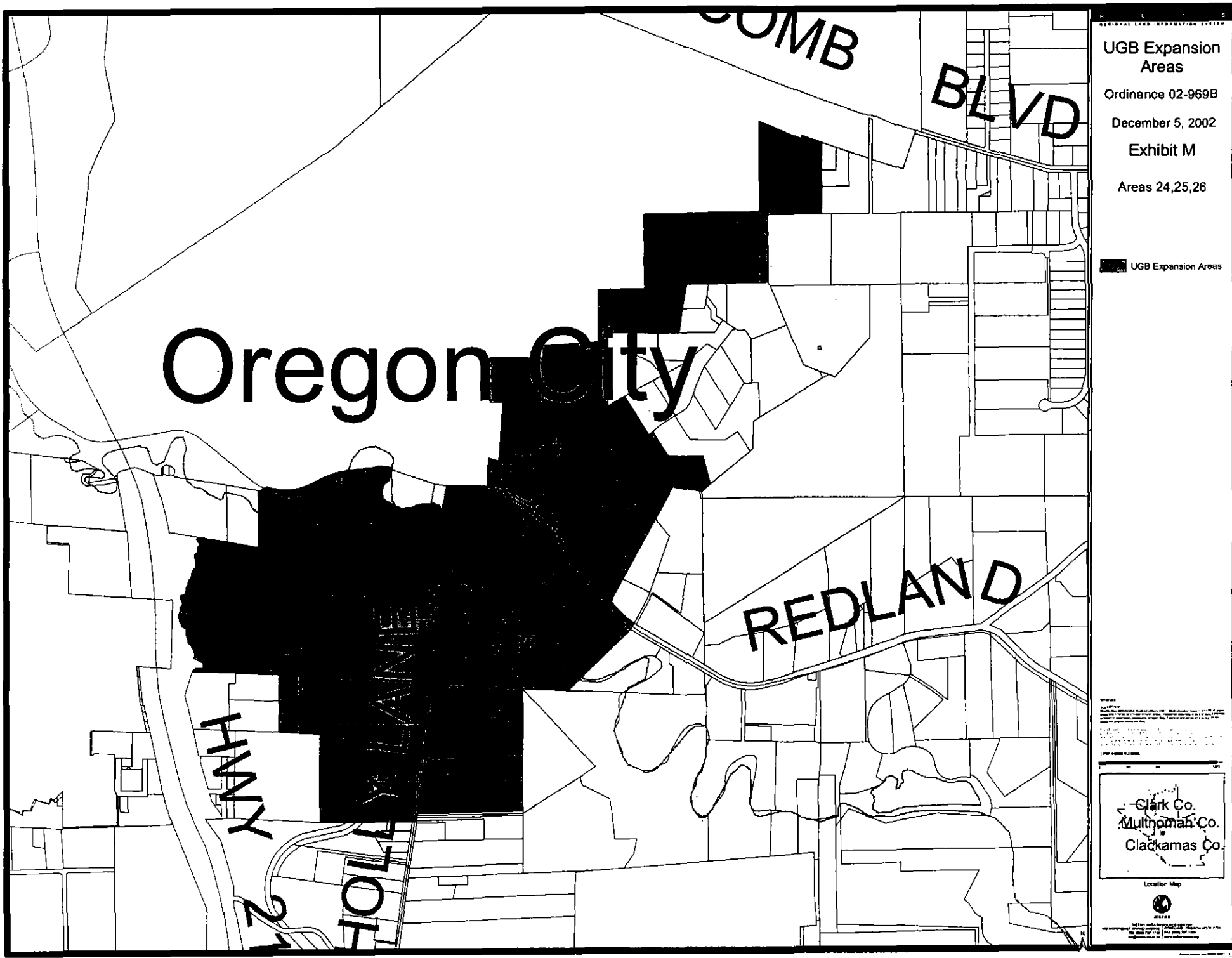
UGB Expansion Areas
 Ordinance 02-969B
 December 5, 2002
 Exhibit M
 Areas 6,10-19

 UGB Expansion Areas

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 Title: UGB Expansion Areas
 Project: 02-969B
 Drawing: Exhibit M
 Scale: 1" = 0.5 miles
 Date: 12/9/02
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 Title: UGB Expansion Areas
 Project: 02-969B
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 Scale: 1" = 0.5 miles

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 Multnomah Co.
 Clackamas Co.

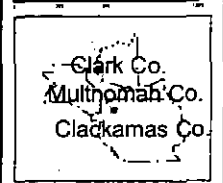


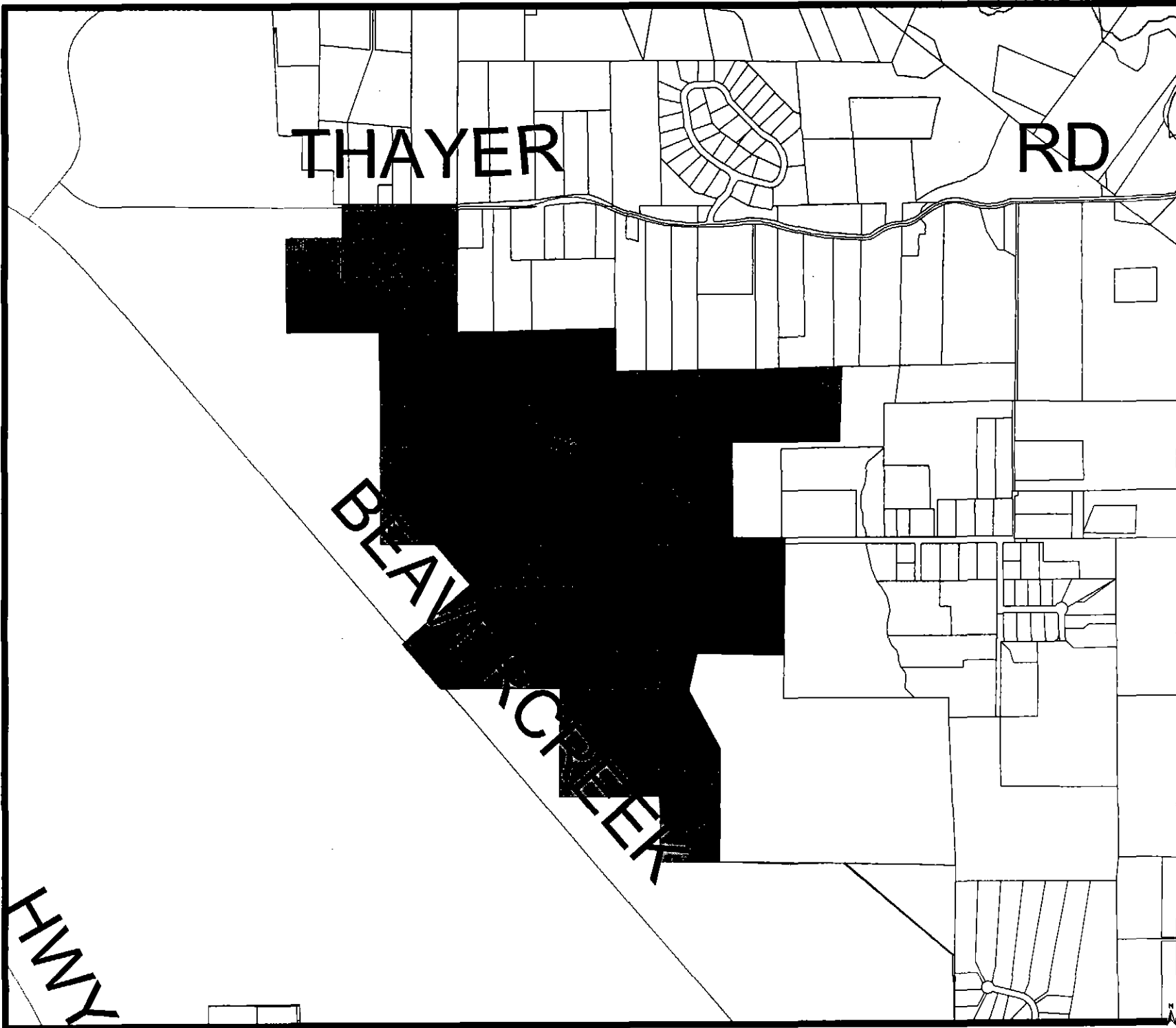


REGIONAL LAND INFORMATION SYSTEM
UGB Expansion Areas
Ordinance 02-969B
December 5, 2002
Exhibit M
Areas 24,25,26

 UGB Expansion Areas

Source:
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Multnomah County GIS Department
Clackamas County GIS Department
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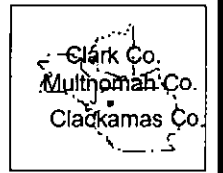




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Ordinance 02-969B
December 5, 2002
Exhibit M
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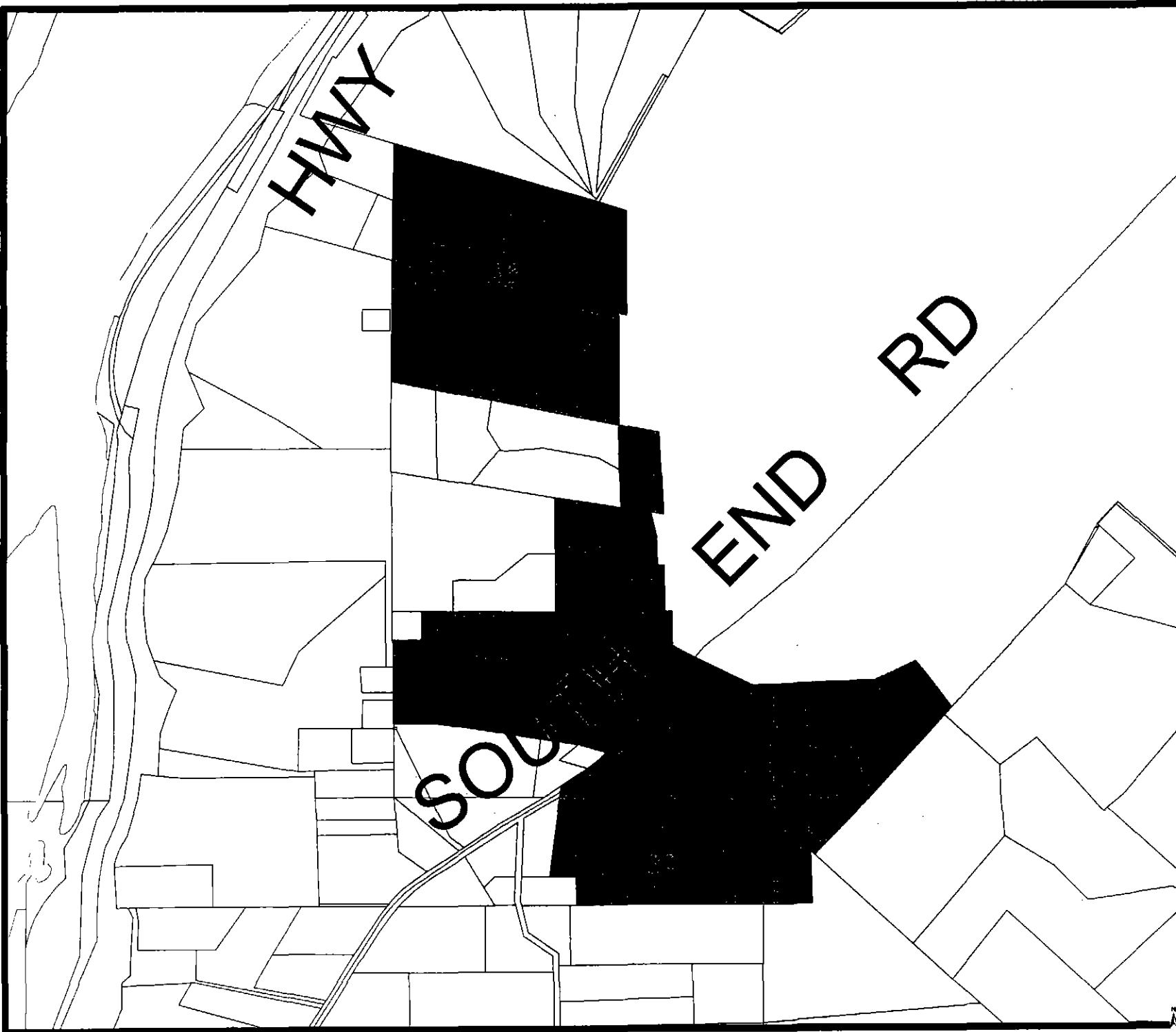
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DATE: 12/09/02
BY: JPH
PROJECT: UGB Expansion Areas
SHEET: 1 OF 1
SCALE: 1" = 100'



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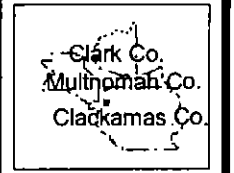
MEVA
OFFICE: 503.261.1234
FAX: 503.261.1235
WWW.MEVA.COM



UGB Expansion Areas
 Ordinance 02-969B
 December 5, 2002
 Exhibit M
 Area 32

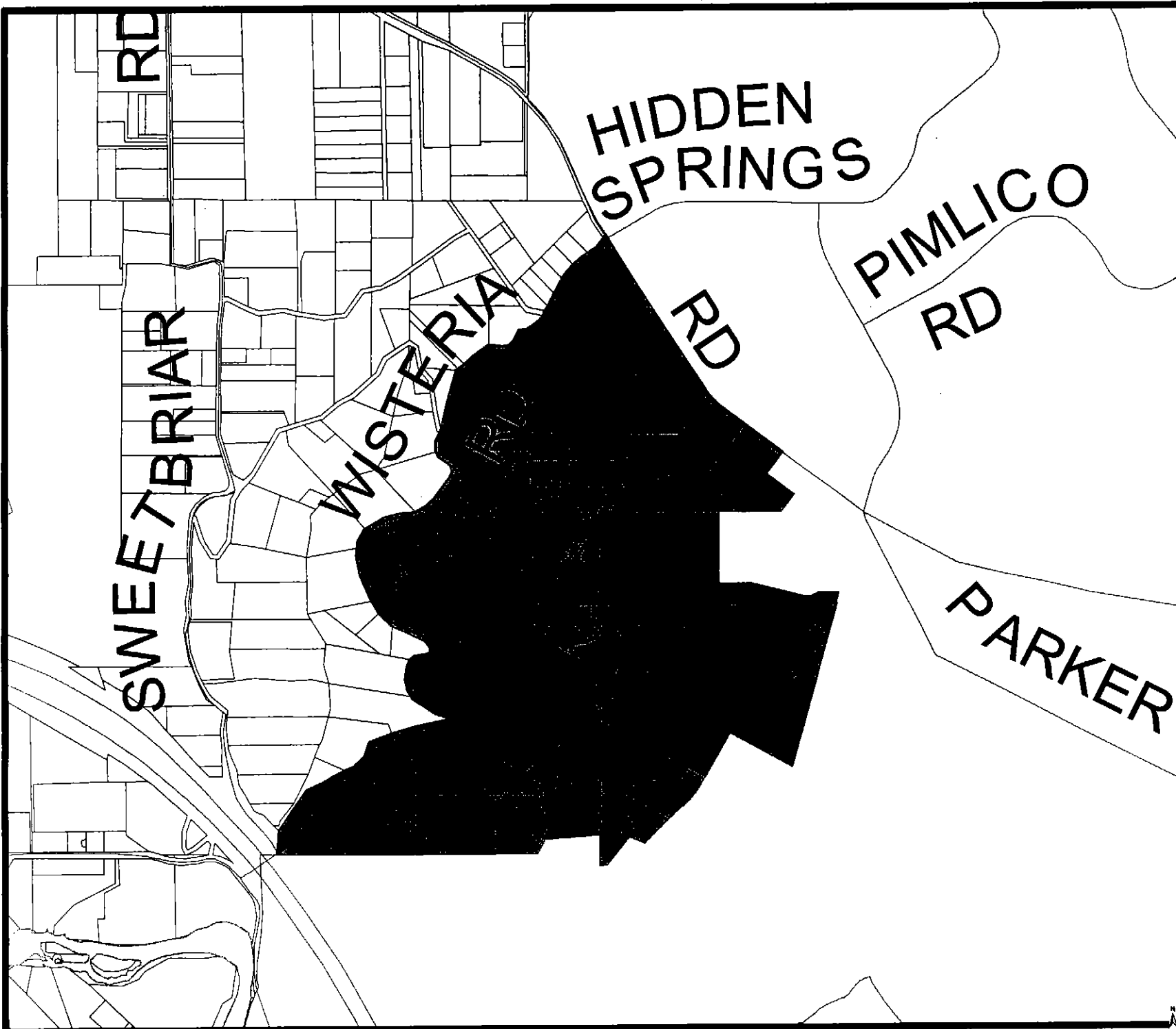
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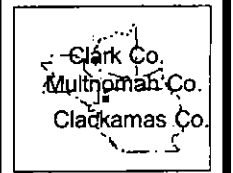
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 1000 NE Oregon Street, Suite 200, Portland, OR 97232
 TEL: 503.281.1500 FAX: 503.281.1501
 WWW: www.rlis.org



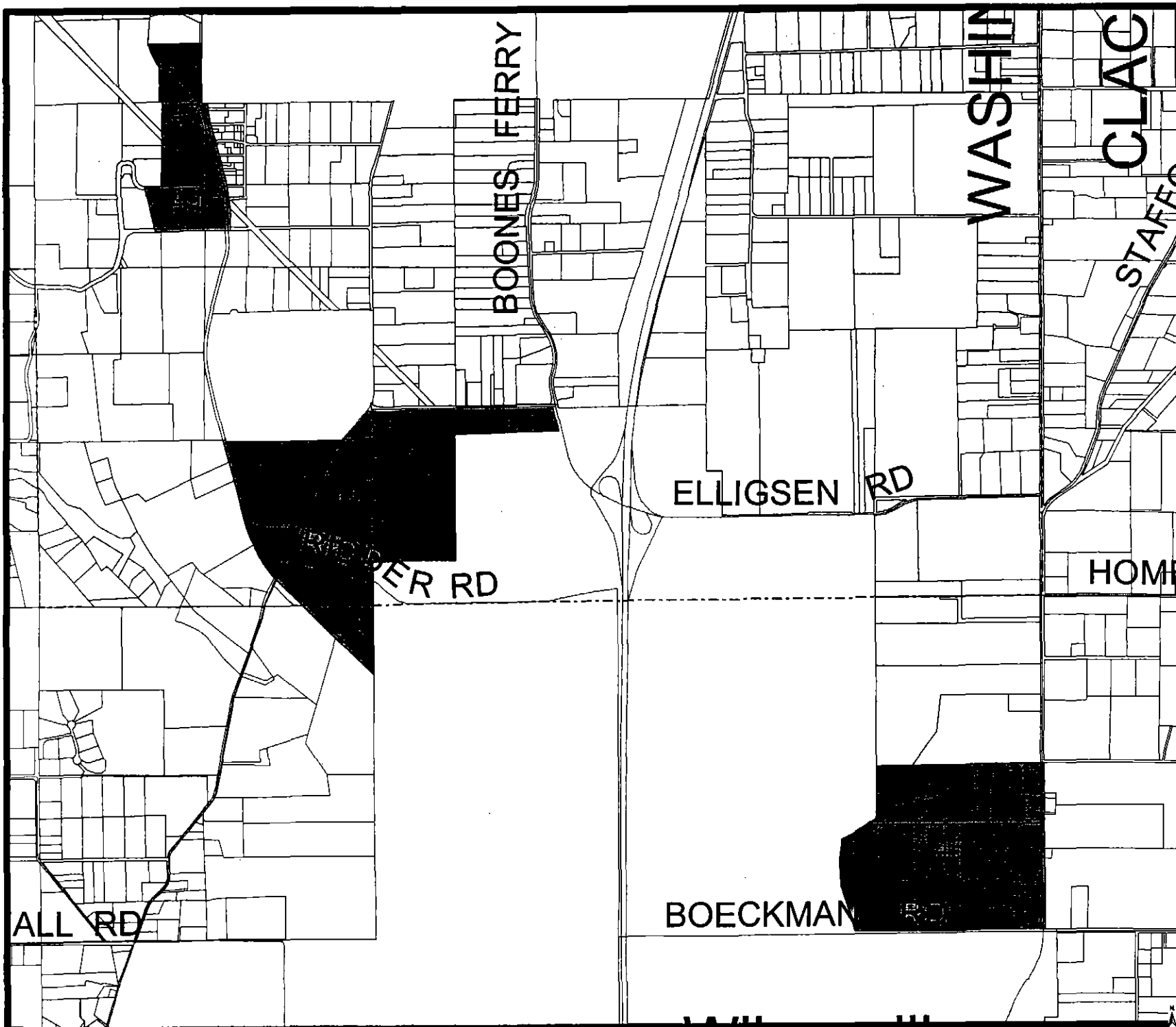
UGB Expansion Areas
Ordinance 02-969B
December 5, 2002
Exhibit M
Area 37

 UGB Expansion Areas

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CHECKED BY: J. HALL
APPROVED BY: J. HALL
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SHEET: 1 OF 1



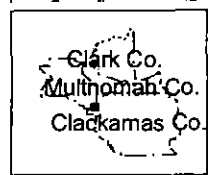
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CLACKAMAS COUNTY
REGISTRATION DIVISION
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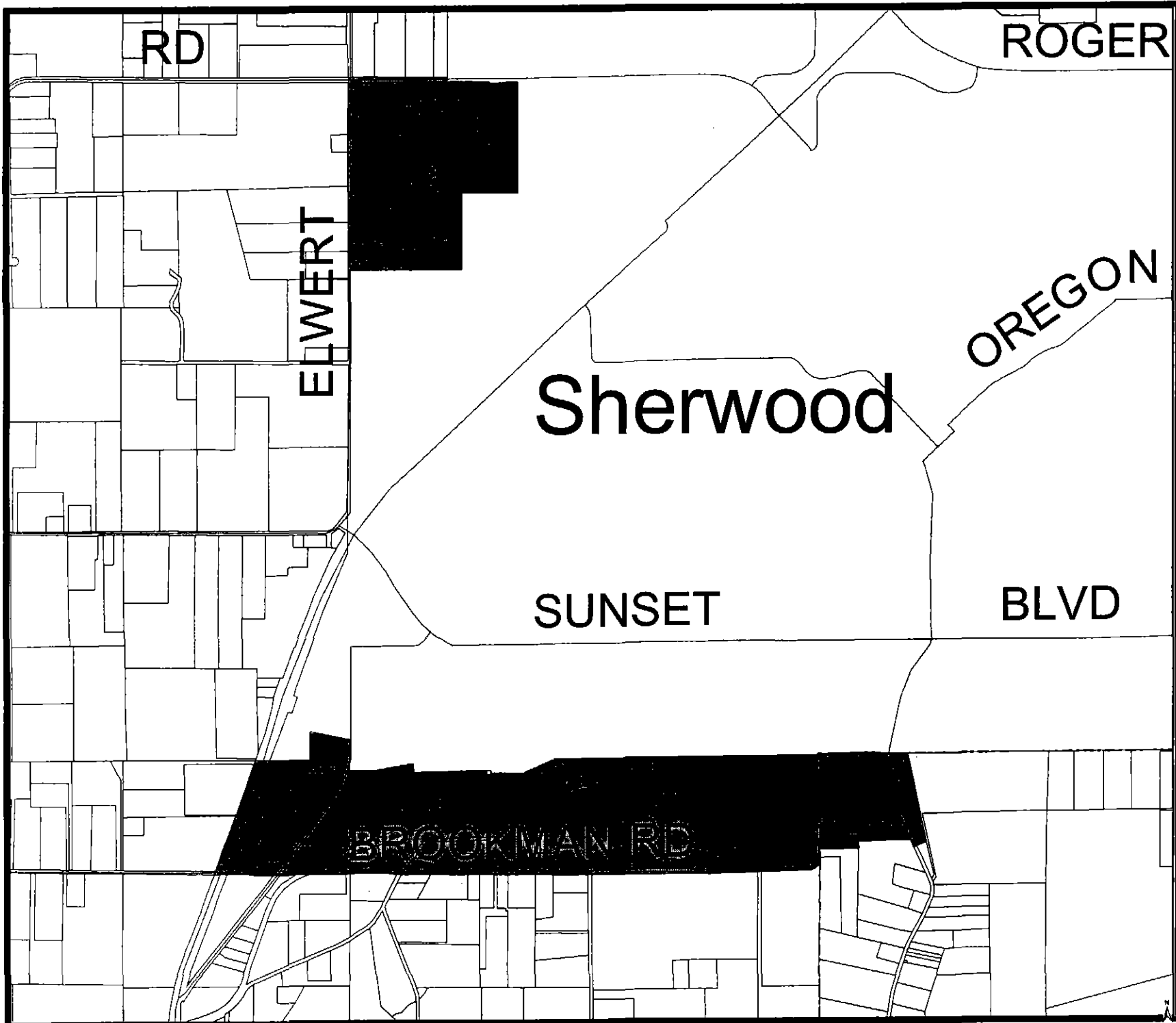


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 Ordinance 02-969B
 December 5, 2002
 Exhibit M
 Areas 45,47,49

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REGIONAL LAND INFORMATION SYSTEM


UGB Expansion Areas

Ordinance 02-969B

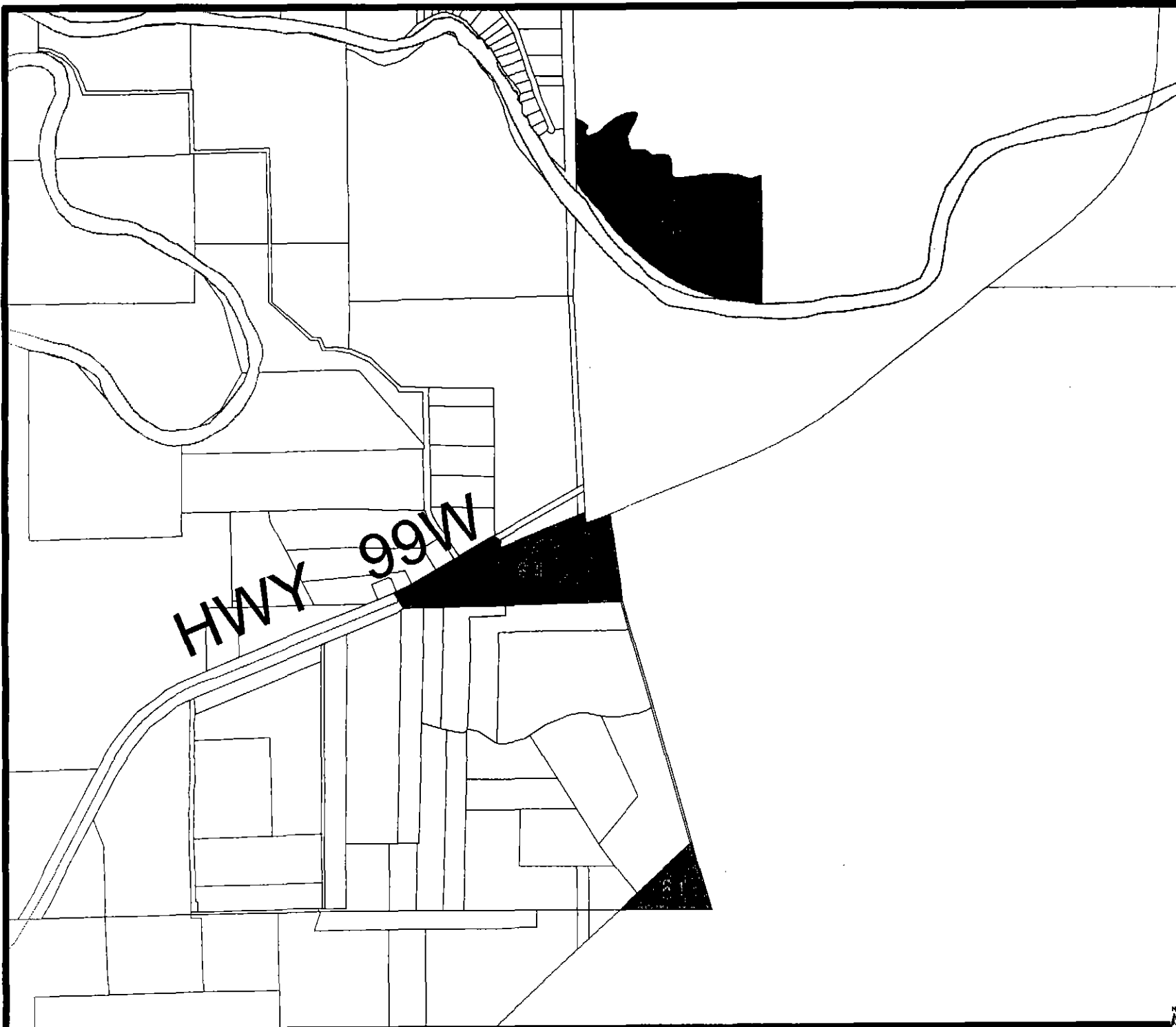
December 5, 2002

Exhibit M

Areas 55,59

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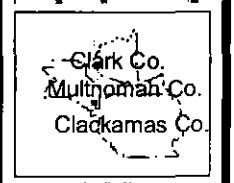
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REGIONAL LAND INFORMATION SYSTEM
UGB Expansion Areas
Ordinance 02-969B
December 5, 2002
Exhibit M
Areas 61,62

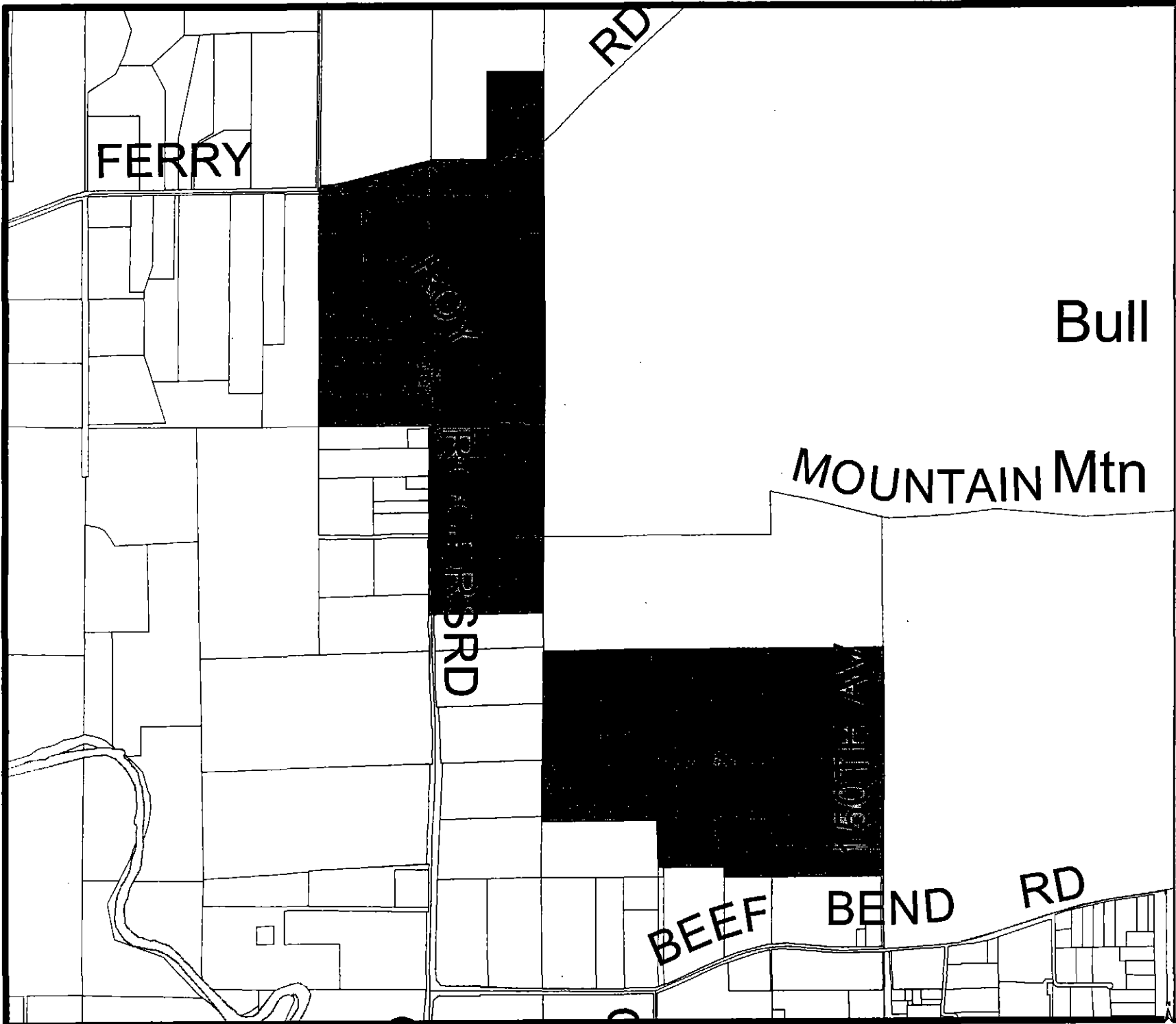
 UGB Expansion Areas

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Horizontal: +/- 1 foot
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12/05/02
Author:
J. Hall
Checked:
J. Hall
Approved:
J. Hall



Location Map

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12/05/02
Author:
J. Hall
Checked:
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J. Hall



R E L E A S E

UGB Expansion Areas
 Ordinance 02-969B
 December 5, 2002
 Exhibit M
 Areas 63,64

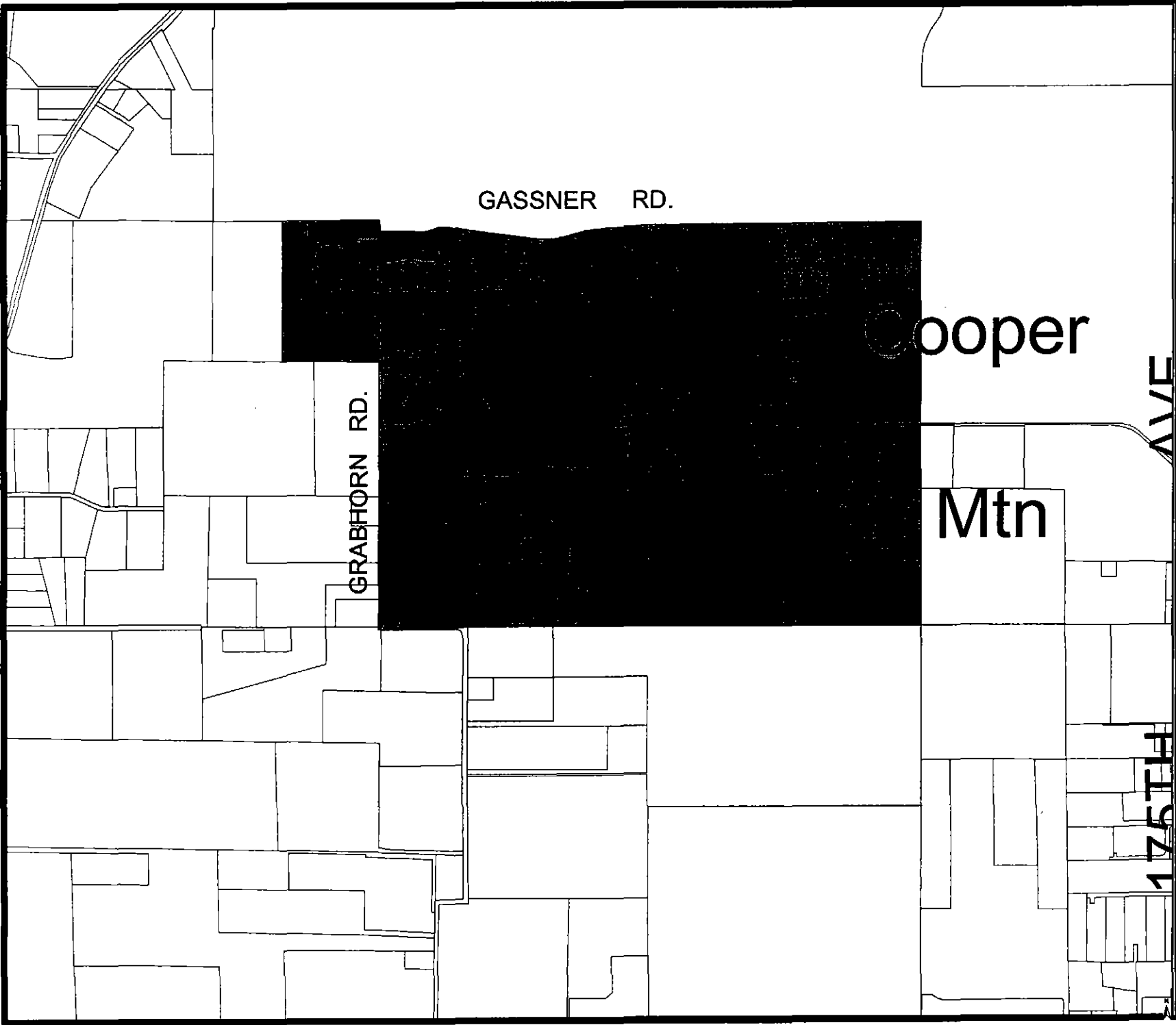
UGB Expansion Areas

Source:
 Clark Co. GIS
 Multnomah Co. GIS
 Clackamas Co. GIS
 1 inch equals 1.5 miles

Clark Co.
 Multnomah Co.
 Clackamas Co.

Location Map

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REGISTRATION INFORMATION SYSTEM

UGB Expansion Areas

Ordinance 02-969B

December 5, 2002

Exhibit M

Area 67

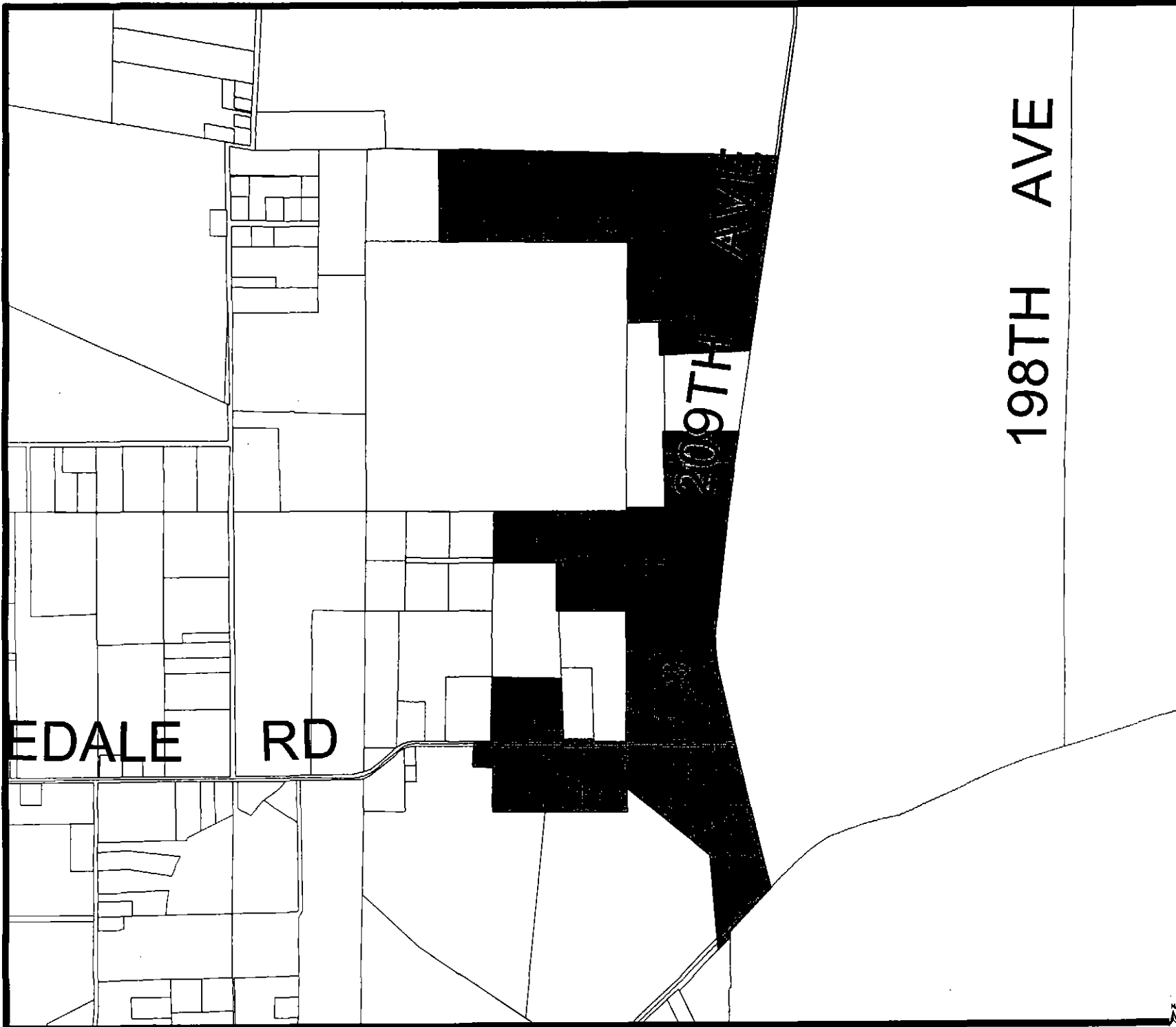
UGB Expansion Areas

Clark Co.
Multnomah Co.
Clackamas Co.

Location Map

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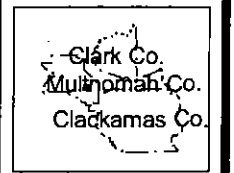
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REGIONAL LAND INFORMATION SYSTEM
UGB Expansion Areas
Ordinance 02-969B
December 5, 2002
Exhibit M
Area 69

UGB Expansion Areas

SCALE
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Location Map
CLACKAMAS COUNTY
2002

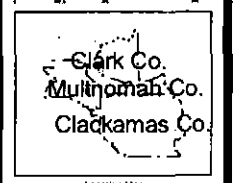
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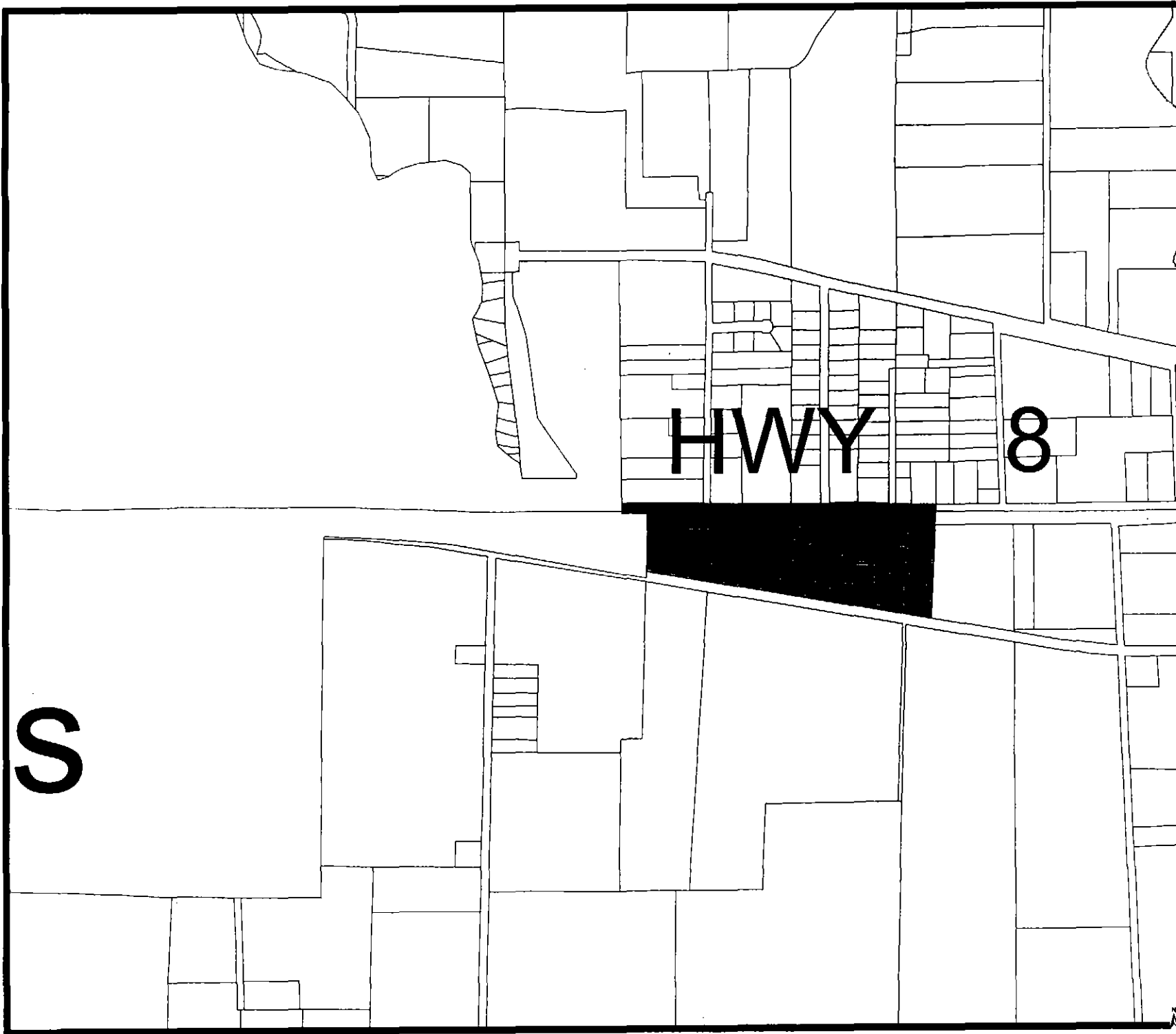
HWY

R L I S
REGIONAL LEAD INFORMATION SYSTEM
UGB Expansion Areas
Ordinance 02-969B
December 5, 2002
Exhibit M
Area 71

UGB Expansion Areas

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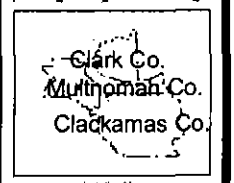


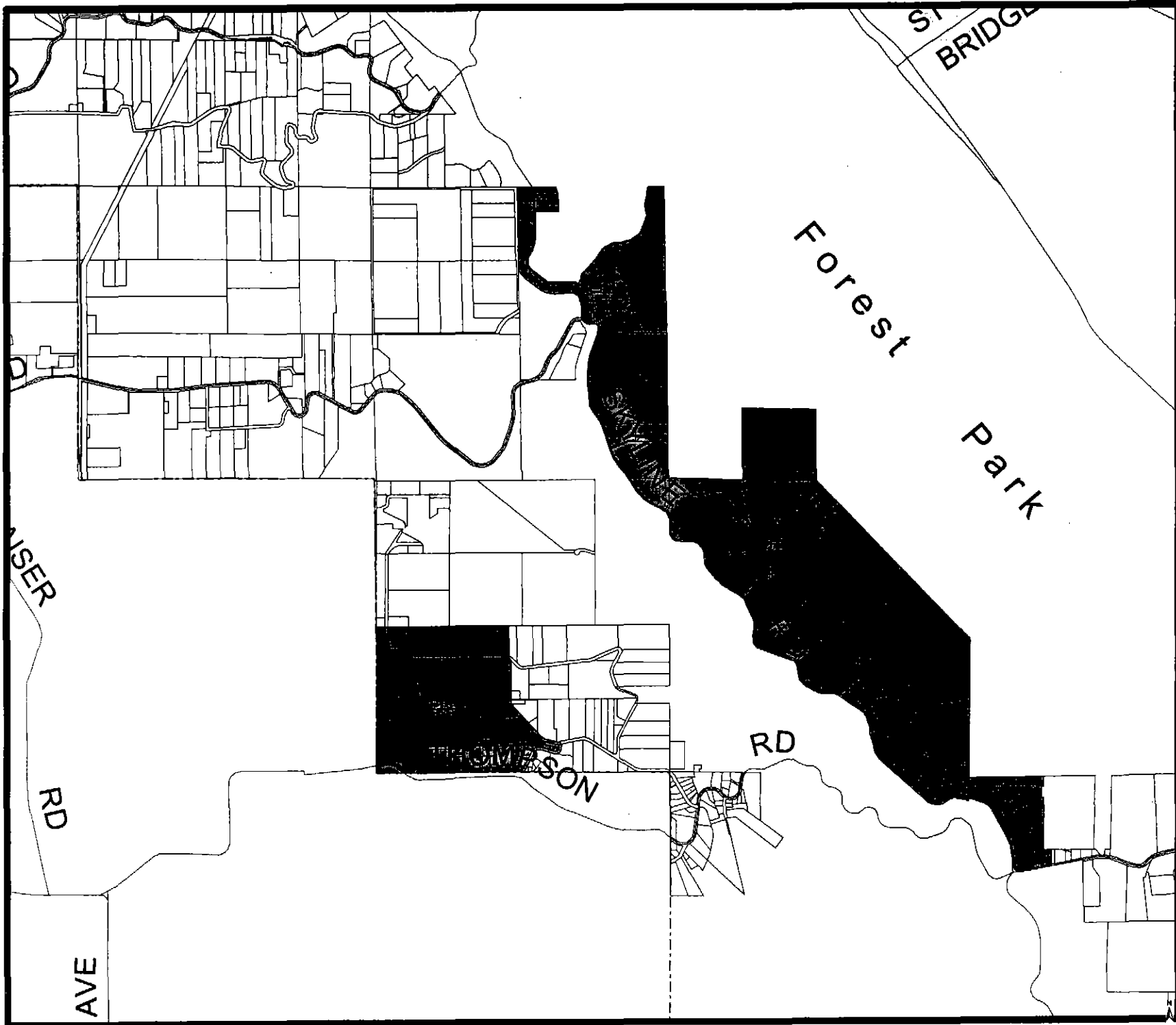


UGB Expansion Areas
Ordinance 02-969B
December 5, 2002
Exhibit M
Area 77

■ UGB Expansion Areas

NOT TO SCALE
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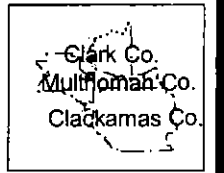




REGIONAL LAND INFORMATION SYSTEM
UGB Expansion Areas
 Ordinance 02-969B
 December 5, 2002
Exhibit M
 Areas 93,94

 UGB Expansion Areas

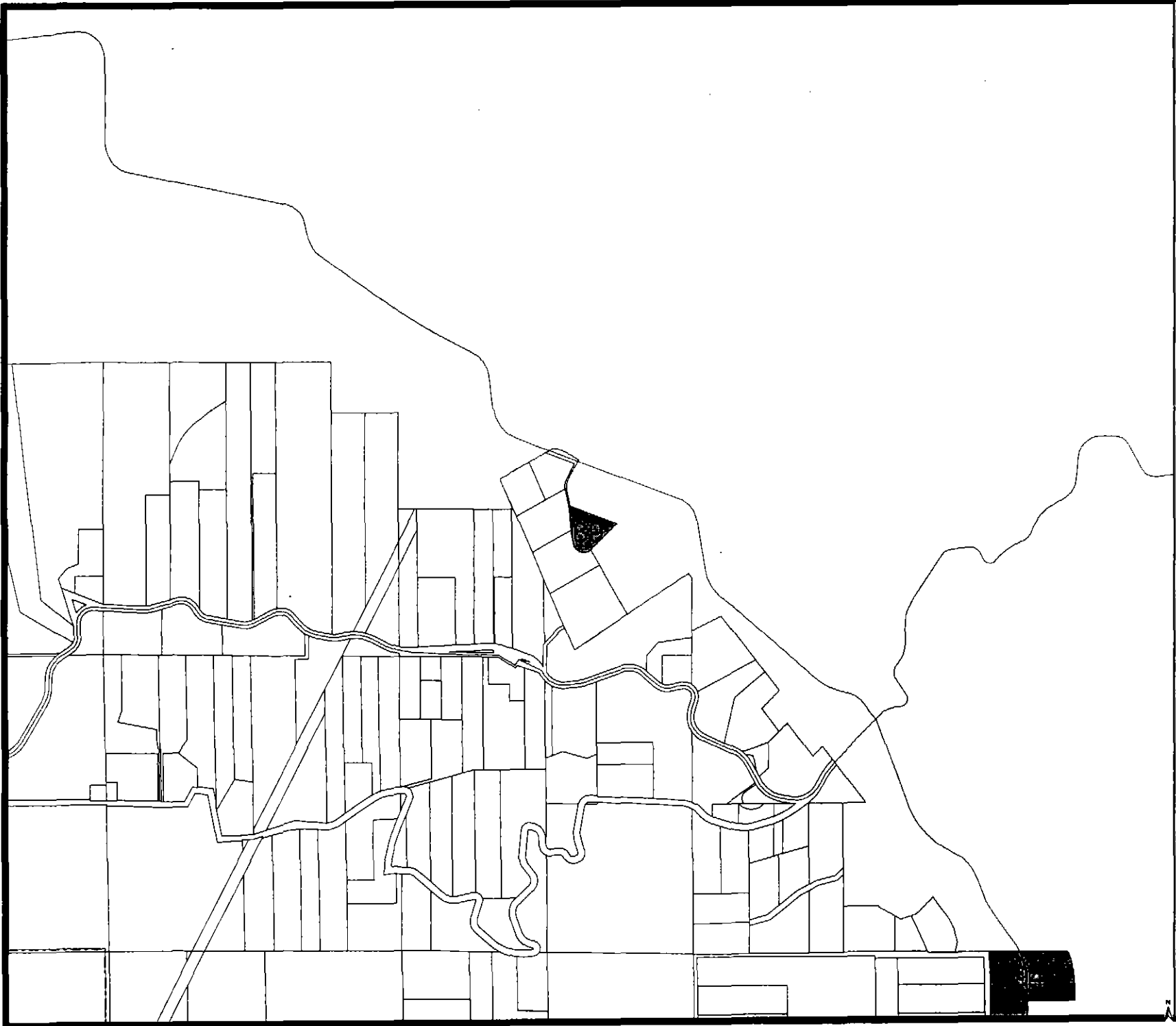
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Location Map



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 11/15/02



**UGB Expansion
Areas**

Ordinance 02-969B

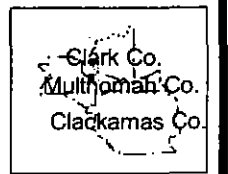
December 5, 2002

Exhibit M

Area 89

 UGB Expansion Areas

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Location Map



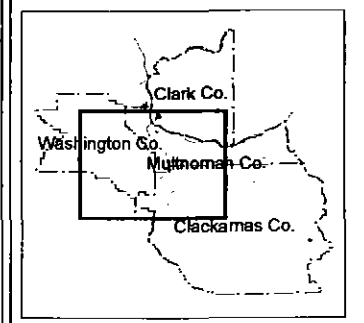
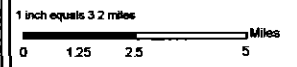
North

2040 Growth Concept Map

Ordinance No. 02-989B
Exhibit N

- Design Types**
- Industrial
 - Regionally Significant Industrial Areas (Proposed)
 - Employment
 - Inner Neighborhood
 - Outer Neighborhood
 - Town Center
 - Corridor
 - Current UGB

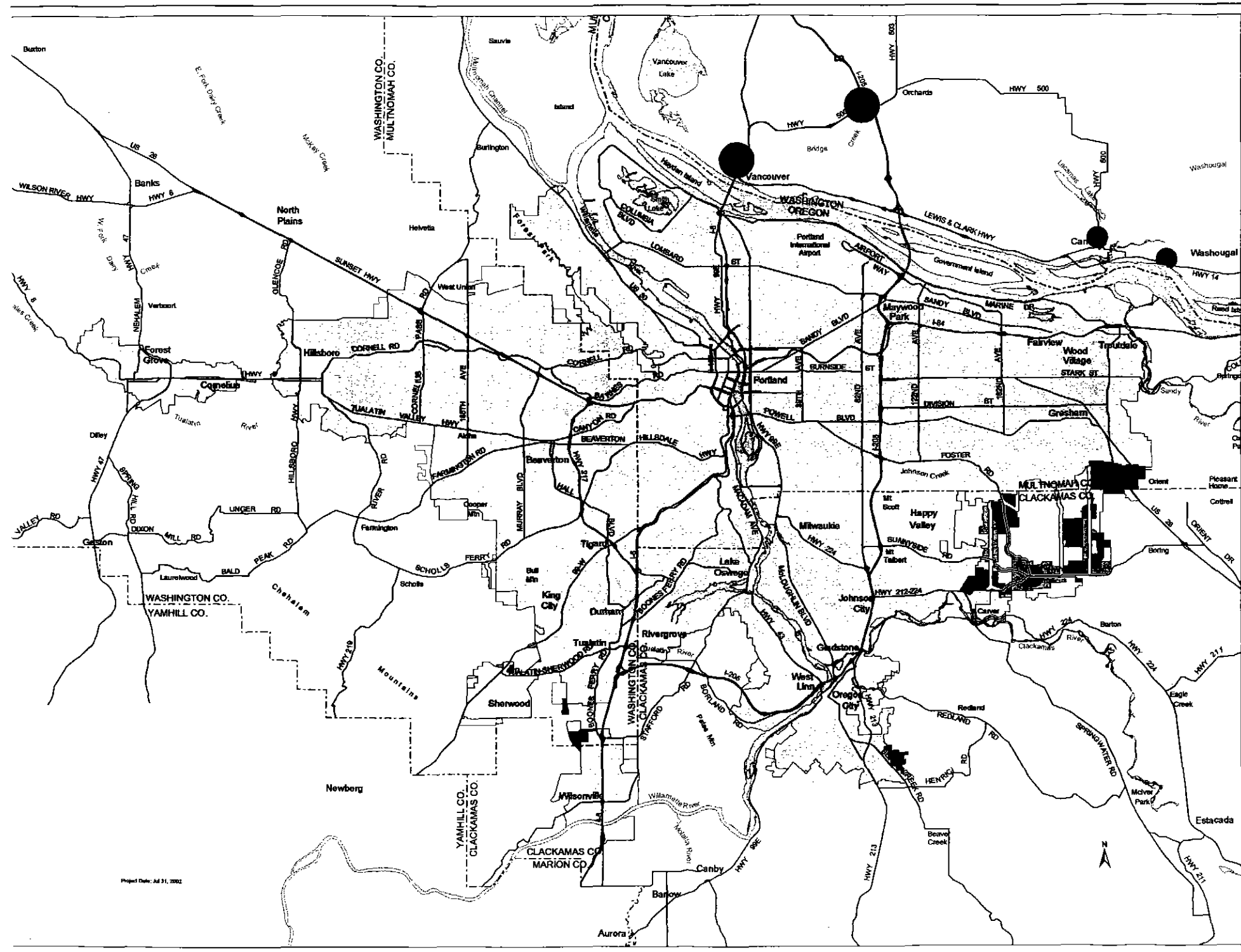
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Location Map



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Project Date: Jul 31, 2002

Appendix A, Item #1 to Ordinance No. 02-969

Performance Measures to Evaluate Efforts to Improve Land Use Efficiency

December, 2002

Background

This report addresses statutory (ORS 197.301 and 197.302) and Metro Code requirements (Sections 3.07.910 and 3.07.920) to develop and apply performance measures to evaluate the performance of actions to increase the capacity of the urban growth boundary (UGB). The report includes the performance measures themselves, and, where available, data and analysis for the measures.

ORS 197.301 states that a metropolitan service district shall compile, adopt and report to the Department of Land Conservation and Development on performance measures that include but are not limited to measures that analyze the following:

- a) The rate of conversion of vacant land to improved land;
- b) The density and price ranges of residential development, including both single family and multifamily residential units;
- c) The level of job creation within individual cities and the urban areas of a county inside the metropolitan service district;
- d) The number of residential units added to small sites assumed to be developed in the metropolitan service district's inventory of available lands but which can be further developed, and the conversion of existing spaces into more compact units with or without the demolition of existing buildings;
- e) The amount of environmentally sensitive land that is protected and the amount of environmentally sensitive land that is developed;
- f) The sales price of vacant land;
- g) Residential vacancy rates;
- h) Vacancy rates;
- i) Public access to open spaces; and
- j) Transportation measures including mobility, accessibility and air quality indicators. [1997 c.763 §3]

ORS 197.302 states that prior to submitting the performance measures report to the Department of Land Conservation and Development as stated in ORS 197.301 above, a metropolitan service district shall:

- 1) determine if actions taken under **ORS 197.296 (6)** have established the buildable land supply and housing densities necessary to accommodate estimated housing needs determined under ORS 197.296 (3). If the metropolitan service district determines that the actions undertaken will not accommodate estimated need, the district shall develop a corrective action plan, including a schedule for implementation. The district shall submit the plan to the department along with the report on performance measures required under ORS 197.301. Corrective action under this section may include amendment of the urban growth boundary, comprehensive plan, regional framework plan, functional plan or land use regulations as described in ORS 197.296;

- 2) Within two years of submitting a corrective action plan to the department, the metropolitan service district shall demonstrate by reference to the performance measures described in ORS 197.301 that implementation of the plan has resulted in the buildable land supply and housing density within the urban growth boundary necessary to accommodate the estimated housing needs for each housing type as determined under ORS 197.296 (3); and
- 3) The failure of the metropolitan service district to demonstrate the buildable land supply and housing density necessary to accommodate housing needs as required under this section and ORS 197.296 may be the basis for initiation of enforcement action pursuant to ORS 197.319 to 197.335. [1997 c.763 §4; 2001 c.908 §3]

ORS 197.296 essentially requires that at periodic review of its functional plan, Metro shall estimate the capacity of the remaining lands within the existing UGB and to compare this with a 20 year forecast of housing needs to determine whether to increase the capacity of the UGB. If the determination indicates that the UGB does not contain sufficient capacity to accommodate forecast housing needs, Metro can amend the UGB to include sufficient land to accommodate housing needs for 20 years, or Metro may consider new actions that increase capacity without expansion of the UGB. If Metro increase the capacity of the existing UGB as contemplated by ORS 197.296(6)(b), then Metro must establish one or more performance measure to measure the effectiveness of the action, and must report on its effectiveness to DLCD in a performance measures report every two years.

Metro's Periodic Review Work Program is currently using a variety of data and assumptions to estimate the remaining capacity within the current urban growth boundary to accommodate additional jobs and housing and compare it with the forecast need. The Metro Council is considering actions to increase the capacity of the UGB to accommodate forecast housing and employment.

As required in ORS 197.296(6)(b), Metro has established that the first four performance measures above (No. "a" through "d") are those needed by Metro to measure improvement in the efficiency of existing UGB.

Metro Performance Measures Work Program analyzed 80 performance indicators. Those indicators in the Metro Performance Measures Report addressing the first four performance measures above (No. "a" through "d") are listed below under the measures required by ORS 197.301. Complete analysis of these indicators is attached.

Measures Needed for Task 2 Actions by Metro to Improve Efficiency of Existing UGB

Measures that analyze:

- a) **The rate of conversion of vacant land to improved land as contemplated by ORS 197.301;**
 - i. Consumption of buildable land by residential sector in the Metro UGB (Performance Indicator 1.2a)
 - ii. Consumption of developed land in the UGB by non-industrial and industrial employment (Performance Indicator 1.2b)
 - iii. Amount of vacant land zoned industrial (Performance Indicator 8.1a)
 - iv. Change in consumption of land zoned industrial (Performance Indicator 8.1b)
 - v. Vacant buildable land served with public facilities or vacant industrial land classified as Tier A land (Performance Indicator 8.2)

- vi. Amount of vacant land zoned commercial (Performance Indicator 8.4a)
- vii. Change in consumption of land zoned commercial. (Performance Indicator 8.4b)
- viii. Amount of vacant land zoned mixed use (Performance Indicator 8.4d)
- ix. Change in consumption of land zoned mixed use (Performance Indicator 8.4e)

Measures that analyze:

- b) The density and price ranges of residential development, including both single family and multifamily residential units as contemplated by ORS 197.301;**
 - i. Number of dwelling units by the following type: a) Detached Single Family Units: Large lot, Small lot, Accessory, Manufactured; and b) Attached Multi-family Units: Duplex and Townhouses (attached SF*), Multi-family (Performance Measures 6.1b)
 - ii. Median rent of multi-family residential (Performance Measures 6.8)
 - iii. Median sales price of single family residential (Performance Measures 6.9)

Measures that analyze:

- c) The level of job creation within individual cities and the urban areas of a county inside the metropolitan service district as contemplated by ORS 197.301;**
 - i. Employment (types) in mixed use centers and Corridors (Performance Indicator 1.1c)
 - ii. Mixed Use Index: Progress of development of mixed use opportunities for employment and housing in the region in the Central City, Regional Centers and Town Centers (Performance Indicator 1.2e)

Measures that analyze:

- d) The number of residential units added to small sites assumed to be developed in the metropolitan service district's inventory of available lands but which can be further developed, and the conversion of existing spaces into more compact units with or without the demolition of existing buildings as contemplated by ORS 197.301;**
 - i. New housing units (single family residential and multi-family residential) permitted through redevelopment and infill – Refill Rate (Performance Indicator 1.2c)

Additional Measures Needed for Task 2 Actions to Improve Efficiency of Existing UGB¹

The following will be used as the framework to identify additional performance indicators needed to evaluate efforts to improve efficiency of existing UGB.

1. Measure the investment in transportation improvements in centers overall and as a percentage of overall transportation investments, before and after Task 2 decision.
2. Measure the number of Centers for which local governments have adopted strategies under new Title 6.
3. Measure the amount of land in Regionally Significant Industrial Areas or Industrial Areas currently zoned for industrial use that is rezoned to allow commercial, residential, institutional or other non-industrial use.

¹ Recommended to measure inputs upon which Metro bases its case for demonstrable likelihood that refill rate will climb from 26.3 to 28.5.

Attachment

Complete Analysis of Performance Measures to Evaluate Efforts to Improve Land Use Efficiency

Measures that analyze:

- a) **The rate of conversion of vacant land to improved land as contemplated by ORS 197.301;**
- i. Consumption of buildable land by residential sector in the Metro UGB (Performance Indicator 1.2a)
 - ii. Consumption of developed land in the UGB by non-industrial and industrial employment (Performance Indicator 1.2b)
 - iii. Amount of vacant land zoned industrial (Performance Indicator 8.1a)
 - iv. Change in consumption of land zoned industrial (Performance Indicator 8.1b)
 - v. Vacant buildable land served with public facilities or vacant industrial land classified as Tier A land (Performance Indicator 8.2)
 - vi. Amount of vacant land zoned commercial (Performance Indicator 8.4a)
 - vii. Change in consumption of land zoned commercial. (Performance Indicator 8.4b)
 - viii. Amount of vacant land zoned mixed use (Performance Indicator 8.4d)
 - ix. Change in consumption of land zoned mixed use (Performance Indicator 8.4e)

Performance Indicator 1.2a: Consumption of buildable land by residential sector in the Metro UGB.

Data years: 1999 and 2000. Source: Metro Data Resource Center and U.S. Census.

Finding:

- *From 1999 to 2000 there was an increase in the number of multi-family residential (MFR) units developed per net acre from 16.4 to 21.6 (32 percent increase), and number of single family residential (SFR) units developed per net acre from 5.9 to 6.2 (5 percent increase). As the data also show, during the same period, the amount of land consumed by the residential sector decreased from 1,468 acres in 1999 to 1,087 acres in 2000. The increases in units developed per acre represent progress in efficiency of residential land use and progress toward achieving the 2017 target capacity for housing.*

This indicator measures change in dwelling units per buildable acre. As was mentioned in the previous section entitled "Adopted Targets," specific and uniform accounting procedures are needed in order to track how land use standards adopted by local jurisdictions are achieving Functional Plan target capacities for housing and/or employment. Indicator 1.2a represents the next best method for assessing residential land use efficiency and calculates the number of residential units built per buildable acre.

Table 1.2a shows how vacant land available for development was used to accommodate single family residential and multi-family residential dwellings in 1999 and 2000. Due to data limitations, the trend in the number of units built per gross vacant buildable acre (GVBA) in the period from the adoption of the Functional Plan (1996) to 1999 is not available.

Table 1.2a – Consumption of Buildable Land by Residential Sector – Metro UGB

A Year	B GBVA		C Consumed Land (gross acres)			D Permits Issued (# of permits)			E Units/GVBA* (# of units)			F Units/ NVBA*		
	SFR	MFR	SFR	MFR	Total	SFR units	MFR units	Total	SFR	MFR	Total	SFR	MFR	Total
1999	15,682	2,562	1,183	285	1,468	4,920	3,263	8,183	4.2	11.4	5.6	5.9	16.4	8.0
2000	14,732	2,019	945	142	1,087	4,112	2,145	6,257	4.4	15.1	5.8	6.2	21.6	8.2

Source: Metro Data Resource Center
U.S. Census

*GVBA's (Gross Vacant Buildable Lands)

*Net Vacant Buildable Acres = GVBA - 30 percent

*30 percent includes:

- a) Vacant federal, state, county and city-owned lands
- b) Acres of platted single family lots (16,300 lots)
- c) Acres of streets
- d) Acres of schools
- e) Acres of parks
- f) Acres of places of worship and social organizations
- g) Easements for major public utilities, including gas lines

Column B displays the total number of GVBA by year upon which single family residential and multi-family residential units could be built. The decrease during the period account for single family residential and multi-family residential lands that were developed and single family residential and multi-family residential lands removed due to rezoning (approximately five acres zoned-out of single family residential and 401 acres zoned-out of multi-family residential). It should be pointed out that during the same period, some jurisdictions rezoned to add land to the single family residential and multi-family residential zones. These changes were included in the total.

Column C displays the number of acres (gross) of buildable land consumed each year in the construction of residential dwellings. Column D shows the number of multi-family residential and single family residential building permits that were issued during a two-year period for all jurisdictions inside the UGB. The proportion of multi-family residential to single family residential permits in 1999 and 2000 (which were 40 percent and 34 percent, respectively) represents an increase from the historic trend. Currently, multi-family residential accounts for 32 percent of all the residential units in the region.

Column E of the table displays the average number of housing units (single family residential and multi-family residential) that were built annually on a gross acre of land (Units/GVBA²). Available data for 1999 and 2000 shows an increase in the number of housing units developed per gross acre. Multi-family residential units built per gross acre increased from 11.4 to 15.1 (a 32 percent increase). Single family residential units built per gross acre increased from 4.2 to 4.4 (a 5 percent increase). It should be noted that multi-family homes are usually built after vacancy rates are low and are therefore more subject to volatile changes or cycles of building.

Column F of the table displays the average number of housing units that were built on a net acre of land (Units/Net Vacant Buildable Acre) after subtracting land (30 percent of gross acres) used for

² GVBA in the UGB excludes Title 3 land, but includes:

- a) Vacant federal, state, county and city-owned lands
- b) Acres of platted single family lots (16,300 lots)
- c) Acres of streets
- d) Acres of schools
- e) Acres of parks
- f) Acres of places of worship and social organizations
- g) Easements for major public utilities, including gas lines

infrastructure such as streets, schools, parks and churches. Multi-family residential units built per net acre increased from 16.4 to 21.6 (a 32 percent increase). Single family residential built per net acre increased from 5.9 to 6.2 (a 5 percent increase).

Overall, the increase in the development of single family residential units per buildable acre (4.2 to 4.4) and multi-family residential units per buildable acre (11.4 to 15.1) represents progress toward achieving the 2017 target capacity for housing in Table 3.07-1 of the Functional Plan. Although the increase in combined single family residential and multi-family residential developments built per gross and net acre is small, there was a substantial increase in multi-family residential units developed per acre. This may suggest that the region is making progress in achieving greater efficiency of residential land use in areas allowing higher density.

Data Limitations

Indicator 1.2a:

The following assumptions behind the data in Table 1.2a are helpful for the reader in choosing how to interpret the data:

- a) Metro monitors land consumption by existing zoned categories and not by what is actually built on the land
- b) Permit data is based on voluntary reporting by local jurisdictions that may not match with the U.S. Census data
- c) Permit data is for developments completed in the year reported. *Note: Building permits issued in a given year do not necessarily match with land consumed or developed in the same year and*
- d) The 30 percent of land that is deducted for infrastructure (or Net Vacant Buildable Acres) is a statistical estimate that may be slightly more or less from one area to another.

The above explanation of data limitations is not to suggest that the data is not useful as an indicator. The most important consideration is the overall trend in the data and the 30 percent assumption does not detract from this trend. As the data demonstrates, there is an upward trend in the number of housing units being built on vacant land. This upward trend is a sign that the region is making progress towards the goal of increasing the efficiency of land use.

Performance Indicator 1.2b: Consumption of developed land in the UGB by non-industrial and industrial employment

Data years: 1998 -2000. Source: Metro.

Finding:

- *During the 1998 to 2000 period, non-industrial or commercial employment in the UGB increased by 1.5 percent or 6,406 jobs (from 441,356 to 447,762) while land consumed in the areas zoned non-industrial increased by 12.7 percent or 1,707 acres (from 13,459 to 15,166 acres). Industrial employment increased by 8 percent or 25,193 jobs (from 310,738 to 335,931), while land consumed in the areas zoned industrial decreased by approximately 1 percent or 219 acres (from 24,742 to 24,523 acres). The decrease in land consumed during this period takes into account lands that were developed or removed and/or added due to rezoning.*
- *Non-industrial or commercial jobs accommodated per acre decreased from 32.8 in 1998 to 29.5 in 2000, while industrial jobs accommodated per acre increased from 12.6 in 1998 to 13.7 in 2000.*

1.2b Consumption of Buildable Land by Employment* Change by Sector (in UGB)

Year	Tri-County Employment Levels		UGB Employment Levels				UGB Developed Acres				UGB Jobs Per Developed Acre	
	Non Industrial	Industrial	Non Industrial	% Change	Industrial	% Change	Non Industrial	% Change	Industrial	% Change	Non Industrial	Industrial
1998	456,654	321,509	441,356	NA	310,738	NA	13,459	NA	24,742	NA	32.8	12.6
1999	469,288	303,010	453,567	2.8%	292,859	-5.8%	13,994	4.0%	24,925	0.7%	32.4	11.7
2000	463,282	347,574	447,762	-1.3%	335,931	14.7%	15,166	8.4%	24,523	-1.6%	29.5	13.7

*Employment is defined as Covered wage and salary jobs (excludes proprietors)

This indicator measures the consumption of developed land by industrial and non-industrial (commercial) employment in the UGB. The data in Table 1.2b shows that total employment in both the tri-county area and in the UGB increased during the 1998 to 2000 period with total industrial and non-industrial jobs in the UGB increasing by 4 percent (or 31,599). This increase was accompanied by a 3.9 percent (or 1,488 acres) increase in total developed industrial and commercial land in the UGB.

These figures show that approximately 45 industrial and non-industrial jobs were accommodated on each acre of developed land zoned commercial and industrial in 1998, while in 2000, 43 industrial and non-industrial jobs were accommodated on one acre of developed land zoned for industrial and commercial uses.

In 1998, total land consumed for non-industrial (commercial) uses accounted for 35 percent of all land zoned industrial and non-industrial, while land consumed for industrial uses accounted for 65 percent of all land zoned industrial and non-industrial. In 2000, total land consumed for non-industrial (commercial) uses accounted for 38 percent of all land zoned industrial and non-industrial, while land consumed for industrial uses accounted for 62 percent of all land zoned industrial and non-industrial.

Measuring jobs per developed acre is one method of assessing the efficiency of commercial and industrial land use, however, additional data points (beyond 1998-2000) would make this measure more reliable. Current employment data is not available at the local government level to determine if local governments are making progress towards the 2017 target capacity for employment in Table 3.07-1 of the Functional Plan.

Performance Indicator 8.1a: Amount of vacant land zoned industrial.

Performance Indicator 8.1b: Change in consumption of land zoned industrial.

Data years: 1999 and 2000. Source: Metro Data Resource Center.

Finding:

- In 1999, there were 9,924 acres of vacant, industrial land available inside the UGB. By the year 2000, vacant, industrial land inside the UGB had decreased by 312 acres to 9,612 acres (a 3 percent decrease). Change in the amount of vacant industrial land can result from development of land currently zoned industrial and/or from rezoning.

These indicators measure the amount of land zoned by local jurisdictions for industrial use and the rate of industrial land consumed. Data for these indicators was available for only two years, 1999 and 2000. A table showing the amount of industrial land by jurisdiction is included in the Appendix J.

Changes in the amount of vacant industrial land stated above can result from land zoned industrial being either consumed or rezoned. The decreases could have resulted from actual absorption, and/or rezoning. It is important to point out that rezoning could mean zoning changes that add more land to the existing stock or take away land from the existing stock.

Note:

Vacant land zoned industrial or commercial has no visible land use on aerial photography. Factors such as redevelopment potential, ownership, constraints, etc. are not considered when identifying vacant land.

Data Limitations

Much of the above analysis was taken from the December 1999 Regional Industrial Land Supply for the Portland-Vancouver Metropolitan Area prepared by OTAK. Tracking of industrial land consumed is very difficult. There is no mechanism in place for capturing information on industrial land that is sold or resold.

Performance Indicator 8.2: Vacant buildable land served with public facilities or vacant industrial land classified as Tier A.

Data year: 1999, 2000. Source: Regional Land Supply Study (1999); Metro Data Resource Center (2000)

Finding:

- *Within the tri-county area (Clackamas, Multnomah and Washington Counties) in 1999, a total of 5,203 acres of vacant buildable industrial land were available, while in 2000, this figure increased to 6,517 acres. Approximately 972 acres (19 percent) of the 1999 industrial land supply were classified as Tier A, or as land readily-developable and without major constraints. In 2000, land classified as Tier A increased to 2,093 (32 percent). Of this Tier A land, 518 acres are composed of parcels that are 1-5 acres in size.*

Historically, Metro has measured the total supply of industrial land, but has not quantified the available land in terms of suitability of the sites. However, the 1999 Regional Industrial Land Study prepared by OTAK employed a four-tier system (A, B, C and D) to categorize the industrial land supply in terms of suitability of the sites. The following is an explanation of the tier system:

- Tier A land is land without major development constraints.
- Tier B land is constrained by lack of public facilities, corporate ownership, soils, use constraints, brownfields or transportation access.
- Tier C is land with infill sites smaller than one acre and “commercial valued” based on current property tax assessment records.
- Tier D land is considered to be land suited for redevelopment.

Indicator 8.2 measures the total acres of Tier A industrial land in the region and Indicator 8.3 measures the supply of Tier D industrial land. Tier A land is considered to be most available for use within a short time frame (less than five years) as a result of the availability of public infrastructure such as roads, streets, water, sewer, etc. Tier D land is considered to be land suited for redevelopment.

The data in Table 8.2a that follows, shows that in the six-county Portland PMSA, approximately 2,387 acres (26 percent) of the net buildable supply are classified as Tier A. 972 of these Tier A acres (19 percent) are located in the tri-county area. The remaining acres (74 percent) of the supply are classified as Tier B, Tier C and Tier D are constrained by factors identified above.

Table 8.2b shows that in 2000, approximately 49 percent (3,212 acres) of the vacant buildable industrial land supply within the UGB is classified as Tier B, while 32 percent (2,093 acres) is classified as Tier A. The remaining 19 percent (590 acres and 623 acres) are classified as Tier C and Tier D.

Table 8.2a: Buildable Industrial Land Supply by Tier - Portland PMSA, 1999

County	Tier A	Tier B	Tier C	Tier D	Total	Percent
Clackamas	47	651	-	166	865	9%
Multnomah	442	1,960	87	83	2,572	28%
Washington	483	1,205	26	53	1,766	19%
Tri-County Subtotal	972	3,816	113	302	5,203	56%
Columbia	70	590	-	223	883	10%
Yamhill	-	238	-	5	243	3%
Oregon Counties Subtotal	1,042	4,644	113	530	6,329	69%
Clark County Total	1,345	1,163	71	290	2,869	31%
Total	2,387	5,807	184	820	9,198	100%

Source: Regional Industrial Land Supply, 1999

Note: Measurements of industrial land are taken for the six-county Portland PMSA.

**Table 8.2b: Amount of Vacant Buildable Industrial Land within the UGB, 2000
Net Acres (includes partially developed acres)**

Tier*	Under 1 acre lot	1 to 5	5 to 10	10 to 25	25 to 50	50 to 100	100 plus acre lot	Total	% Total
A	53	518	431	484	348	171	89	2,093	32%
B	67	789	678	760	769	149	-	3,212	49%
C	281	264	45	-	-	-	-	590	9%
D	31	236	156	99	47	53	-	623	10%
Total	432	1,807	1,309	1,343	1,164	373	89	6,517	100%

Source: Metro Data Resources Center, 2000

The study projected that the current supply of Tier A land would be depleted within seven to nine years and much sooner for some counties in the study. Land banking, industrial rezoning, and commercial/mixed use development are expected to exert pressure on the availability of this category of industrial land in coming years, especially as the current supply diminishes.

The forecasted 20-year net buildable land demand in the six-county Portland PMSA is 6,310 acres. This figure is significantly greater than the Tier A industrial vacant land inventory of 2,387 acres.

Note:

Buildable land: The process of identifying buildable land begins with vacant land, then removes Title 3 land, government and church-owned land, platted lots, and buffers of major utilities. The Industrial buildable land supply is then scrutinized by the local development community and local jurisdictional planners who may request that additional parcels be removed from the inventory because they are land banked, are steeply sloped, or are otherwise unsuitable for industrial development.

Performance Indicator 8.4a: Amount of vacant land zoned commercial.

Performance Indicator 8.4b: Change in consumption of land zoned commercial.

Data years: 1999 and 2000. Source: Metro Data Resource Center.

Findings:

- In 1999, there were 2,180 acres of vacant commercial land inside the UGB. By the year 2000, vacant commercial land inside the UGB decreased by 251 acres (a 12 percent decrease). Change in the amount of commercial land can result from consumption of land currently zoned industrial and/or from rezoning.

Indicators 8.4a and 8.4b measure the amount of land zoned by local jurisdictions for commercial use and the rate of commercial land consumption. Data for these indicators was available for only two years, 1999 and 2000. A table showing the amount of commercial land consumed by jurisdiction is included in the Appendix.

As stated earlier in Indicators 8.1a and 8.1b, change in the amount of vacant commercial land shown in the above table can result from consumption of land currently zoned commercial and/or from rezoning. It is important to point out that rezoning could mean zoning changes that add more land to the existing stock or take away land from the existing stock.

Note:

Vacant land zoned industrial or commercial has no visible land use on aerial photography. Factors such as redevelopment potential, ownership, constraints, etc. are not considered when identifying vacant land.

Data Limitations

Tracking of commercial land consumed is very difficult. There is no mechanism in place for capturing information on land that is sold or resold, hence the data used for this report is based on snapshot sale information and zoning and rezoning information.

Performance Indicator 8.4d: Amount of vacant land zoned mixed use.

Performance Indicator 8.4e: Change in consumption of land zoned mixed use.

Data years: 1998 and 2000. Source: Metro Data Resource Center.

Finding:

- *The data shows that in 1998, a total of 5,024 acres of vacant mixed use land were available within the UGB. This number increased by approximately 232 acres (5 percent) to 5,256 acres in 2000.*
- *The regional supply of vacant mixed use land increased by approximately 232 acres from 1998 to 2000. The supply of vacant mixed use land increased in eleven individual jurisdictions from 1998 to 2000, adding 709.3 acres to the regional supply. Twelve jurisdictions experienced a decrease in this same period and accounted for approximately 478 acres being removed from the regional supply. Four jurisdictions had zero acres of vacant mixed use land in both years for which data is available. One jurisdiction went from zero acres to 84 acres in this period.*

These two indicators measure the amount of vacant land that falls within areas zoned for mixed use. Mixed use zones are those which allow both residential and commercial uses. This information is presented for each jurisdiction, and for the entire region in Table 8.4d/e which appears in Appendix L.

Most local governments in the region have taken steps to provide a supply of mixed use land in one form or another. Some governments have created new, "mixed use" areas and zones while other jurisdictions have rezoned existing commercial or residential areas to allow a mix of uses. The data that was used to calculate these figures attempts to capture the diverse approach that local governments are taking to providing mixed use zones. This data was gathered by generalizing into categories all local zoning that meet the definition of mixed use. **Note: This methodology may not capture high density residential zones that also allow commercial uses or areas where commercial and residential zones are so close together that the area essentially allows a mix of uses.**

The data shows that in 1998, a total of 5,024 acres of vacant mixed use land was available within the UGB. Six jurisdictions had between 1 and 50 acres of mixed use land. Five jurisdictions had between 50 and 100 acres of vacant mixed use land. Ten jurisdictions had between 100 and 999 acres of

vacant mixed use land and one jurisdiction had more than 1,000 acres. In 1998, five jurisdictions had no acres of vacant mixed use land.

By the year 2000, the amount of vacant mixed use land in the UGB had increased to 5,256 acres. Seven jurisdictions had between 1 and 50 acres of mixed use land. Six jurisdictions had between 50 and 100 acres of vacant mixed use land. Nine jurisdictions had between 100 and 999 acres of vacant mixed use land and one jurisdiction had more than 1,000 acres (a different jurisdiction than in 1998). Four jurisdictions had no acres of vacant mixed use land.

It is important to note that four of the 27 jurisdictions in the Metro region do not host a 2040 mixed use area. This explains why at least four jurisdictions have no acres of mixed use land. Also, a number of the remaining 23 local governments are still working on rezoning their 2040 mixed use areas.

In subsequent years, this indicator may prove more useful as a method for calculating each jurisdiction's mixed use areas becomes more refined. Additionally, future evaluations of the regional supply of mixed use land will allow local governments to finish work on rezoning mixed use center areas and the supply will better reflect the implementation of the 2040 Growth Concept.

Measures that analyze:

b) The density and price ranges of residential development, including both single family and multifamily residential units as contemplated by ORS 197.301;

- i. Number of dwelling units by the following type: a) Detached Single Family Units: Large lot, Small lot, Accessory, Manufactured; and b) Attached Multi-family Units: Duplex and Townhouses (attached SF*), Multi-family (Performance Measures 6.1b)
- ii. Median rent of multi-family residential (Performance Measures 6.8)
- iii. Median sales price of single family residential (Performance Measures 6.9)

Performance Indicator 6.1b: Number of new dwelling units by the following type.

- Detached Single Family Units
 - Various lot sizes (<5,000 sq. ft.; 5,000-7,500 sq. ft.; 7,500-10,000 sq. ft. and >10,000 sq. ft.)
 - Accessory
 - Manufactured
- Attached Multi-family Units
 - Duplex and Townhouses (attached SF classified as MFR(2-4))
 - Other Multi-family

Data years: 1996 through 2000. Source: Metro Data Resource Center.

Finding:

- 40 percent of all single family residential units built in the Metro UGB (per tax lot) between 1996 and 2000 were on lots between 5,000 and 7,500 square feet in size. The remaining units were built on lots under 5,000 square feet (26 percent), between 7,500 and 10,000 square feet (20 percent), and over 10,000 square feet (14 percent).
- Between 1996 and 1999, the average number of apartment complex units permitted each year was 3,751, and in the year 2000, permits were issued for 1,384 apartment complex units.

This indicator measures the diversity of housing in the Metro UGB. Table 6.1b(1) illustrates the number of newly built single family residential units by lot size within the Metro UGB from 1996 to 2000, as recorded by the county tax assessors. A total of 33,416 units of new single family units were built during the five-year period. About 26 percent of the units built in that period were on lots under 5,000 square feet, however, most of the units built (40 percent) were on lots between 5,000 and 7,500 square feet in size. Approximately 20 percent of the units built in this period were on lots between 7,501 and 10,000 square feet in size, while 14 percent of the units were built on lots over 10,000 square feet.

From 1996 to 2000, the only lot size category showing an increasing trend in units built is the under 5,000 square feet category. Lot sizes over 10,000 square feet showed a decreasing trend during this period.

Table 6.1b (1): New Single Family Residential Units Based on Tax Assessor Data of Built Units in the Metro UGB

Year	Tax Lot Size				Total Units Built
	Under 5,000 sq. ft.	5,000 to 7,500 sq. ft.	7,501 to 10,000 sq. ft.	Over 10,000 sq. ft.	
1996	1,071	3,153	1,610	1,336	7,170
1997	1,648	3,731	1,748	1,283	8,410
1998	1,403	1,952	959	733	5,047
1999	2,103	2,284	1,275	775	6,437
2000	2,490	2,137	1,021	704	6,352
Total by Type	8,715	13,257	6,613	4,831	33,416

Source: Data Resource Center (RLIS tax lot data); Note: ***Data for 2000 is for a partial year

Table 6.1b(2) below illustrates two types of non-traditional single family units (accessory dwelling units and manufactured homes) and four groups of multi-family residential units (apartment complex, duplexes/row houses/condos, mixed use and group quarters) permitted from 1996-2000 within the Metro UGB. A total of 12,638 apartment units were permitted during the five-year period. A moderate amount of manufactured homes were built with few accessory dwelling units and duplexes/rowhouses and condominiums being added to the stock.

Table 6.1b (2): New Multi Family and Non-Traditional Single Family Residential Units Based on Permits* in the Metro UGB

Year	Non-Traditional Single Family Units Permitted*		Multi-Family Units Permitted*				Total Units Permitted
	Accessory Dwelling Units***	Manufactured Homes	Apartment Complex Units	Duplexes/ Row Houses/ Town Houses/ Condos	Mixed Use Units	Group Quarters	
1997	9	196	3,885	253	324	15	4,682
1998	12	249	4,243	340	50	247	5,141
1999	18	119	3,126	430	--	--	3,683
2000	4	29	1,384	261	--	--	1,678
Total by Type	33	593	12,638	1,284	374	262	15,184

Source: Data Resource Center (RLIS building permit database)

Notes: * Building permit data is based only on geo-coded permits.

*** Many local jurisdictions do not have a procedure for distinguishing ADU permits from other single family.

Data Limitations

- Submission of permit data to Metro is voluntary and a uniform methodology does not exist for collecting and tracking this data. For example, some local governments do not distinguish permits for accessory dwelling units from permits for single family dwelling units. About one-third of local governments provide permit data in electronic format, while some send hard copies and some do not send reports.

Performance Indicator 6.8: Median rent of multi-family residential.

Performance Indicator 6.9 Median sales price of single family residential.

Data years: 1990 through 200. Source: McGregor Millette Report, 1998 and 2001.

Findings:

- Average rents increased by approximately 36 percent between 1990 and 2000 in the Portland metropolitan area.
- The median selling price of single family dwellings doubled between 1990-2000, an increase of approximately 108 percent in the Portland metropolitan area.

Indicators 6.8 and 6.9 measure the region's progress or lack of progress in the production of affordable rental housing and single family homes to meet housing demand in the region.

Table 6.8: Average Rent and Selling Price in the Portland Metropolitan Area

Average Rent of Multi-Family Residential			Median Selling Price of Single Family Dwellings		
Year	Average Rent	Cumulative % Change	Median Selling Price	Cumulative Change -%	Median Family Income
1990	\$489	0.0%	\$79,700	0.0%	\$37,100
1991	\$520	6.3%	\$91,750	15.1%	\$39,000
1992	\$523	7.0%	\$97,000	21.7%	\$39,400
1993	\$539	10.2%	\$107,000	34.3%	\$40,700
1994	\$563	15.1%	\$117,000	46.8%	\$42,300
1995	\$591	20.9%	\$128,000	60.6%	\$42,700
1996	\$617	26.2%	\$139,900	75.5%	\$44,400
1997	\$635	29.9%	\$150,000	88.2%	\$46,300
1998	\$653	33.5%	\$156,900	96.9%	\$49,600
1999	\$654	33.7%	\$160,000	100.7%	\$52,400
2000	\$667	36.4%	\$166,000	108.3%	\$53,700
10-year Change	\$195	36.4%	\$77,200	108.3%	\$16,600

Source: The McGregor Millette Report Fall/Winter 1998, Spring/Summer 2001

Table 6.8 above depicts the rate of change of median selling price of single family dwellings and average rent of multi-family residential. The rate of change is based on 1990 base year.

Both single family dwelling sale price and multi-family residential rent have undergone a steady increase since 1990. The median selling price of single family residences in the Portland MSA has increased by an astounding 108 percent. Stated differently, single family homes have doubled in price over the period 1990-1998. Income actually rose more rapidly than did multi family rents from 1990-2001. Average rents increased by approximately 36 percent. See Indicator 6.6b for the impact of the increases in multi-family residential rents and single family dwellings sale prices on housing affordability in the region.

Measures that analyze the following:

- c) The level of job creation within individual cities and the urban areas of a county inside the metropolitan service district as contemplated by ORS 197.301;

- i. Employment (types) in mixed use centers and Corridors (Performance Indicator 1.1c)
- ii. Mixed Use Index: Progress of development of mixed use opportunities for employment and housing in the region in the Central City, Regional Centers and Town Centers (Performance Indicator 1.2e)

Performance Indicator 1.1c: Employment (types) in mixed use centers and corridors.

Data year: 2000. Source: Metro Data Resource Center.

Finding:

- *The 2000 baseline data shows that the service industry is the most predominant employment sector in the mixed use centers (178,770 or 42 percent of total), followed by retail (102,759 – 24 percent), finance insurance and real estate (52,243 – 12 percent), manufacturing (30,278 – 7 percent), transportation and utilities (25,771 – 6 percent), and others. All of the service jobs in the mixed use centers represents about 56 percent of all service jobs in the UGB. About 18 percent of all the service jobs inside the UGB are located in the Central City, while 12 percent are located in Station Communities, 11 percent in Main Streets, 8 percent in Regional Centers, and 6 percent in the Town Centers.*

This indicator measures the distribution (amount and type of jobs) by industrial categories in the mixed use centers and corridors. The 2040 Growth Concept relies on mixed use centers to concentrate transportation and other infrastructure, and to provide greater opportunities for housing and employment. Mixed use centers are therefore expected to allow for a diverse and vibrant concentration of businesses that might not exist in areas that are zoned traditionally for commercial use only. The type and number of jobs locating in the 2040 centers is important to assessing whether employment opportunities are encouraged by local government land use actions.

The Central City attracts 37 percent of the finance insurance and real estate jobs (28,807) and 13 percent of the retail jobs (21,920) within the UGB, as data in Table 1.1c shows. Regional Centers and Town Centers also attract significant portions of the retail jobs (21,456 or 13 percent and 12,583 or 7 percent, respectively). Town Centers attract 11 percent of the agriculture, fishing and forestry jobs in the UGB. Station Communities attract much of manufacturing (14,724 or 12 percent) and retail jobs (11,995 or 7 percent) in the UGB. Main Streets attract a significant share of the retail jobs within the UGB (34,806 or 20 percent).

Corridors attract mostly service jobs (41,886 or 13 percent in the UGB), retail jobs (34,580 or 20 percent in the UGB) and school jobs (13,565 or 33 percent in the UGB).

The following table (Table 1.1c) illustrates this data in detail.

Table 1.1c: Types of Employment (People Employed) in Mixed Use Areas and Corridors – 2000

	SIC	Central City		Regional Centers		Town Centers		Station Communities		Main Streets		Total Mixed Use Centers			Corridors		Total by Industry	Total UGB	
			% of UGB Total		% of UGB Total		% of UGB Total		% of UGB Total		% of UGB Total		% of Mixed Use Total	% of UGB Total		% of UGB Total		% of UGB Total	
1	AFF	177	2%	129	2%	774	11%	205	3%	527	7%	1,811	0.4%	25%	1,783	24%	3,594	49%	7,301
2	Construction	4,986	10%	874	2%	2,001	4%	2,905	6%	3,135	7%	13,902	3.2%	29%	7,240	15%	21,143	44%	47,537
3	FIRE	28,807	37%	6,173	8%	3,931	5%	6,908	9%	6,424	8%	52,243	12.1%	67%	6,848	9%	59,092	76%	78,123
4	Manufacturing	7,171	6%	2,998	3%	2,825	2%	14,723	12%	2,560	2%	30,278	7.0%	25%	8,772	7%	39,050	33%	119,072
5	Retail	21,920	13%	21,456	13%	12,583	7%	11,994	7%	34,806	20%	102,759	23.9%	60%	34,580	20%	137,339	80%	170,743
6	School	277	1%	596	1%	1,096	3%	1,645	4%	812	2%	4,426	1.0%	11%	13,565	33%	17,991	43%	41,453
7	Services	58,557	18%	25,615	8%	20,373	6%	38,412	12%	35,814	11%	178,770	41.5%	56%	41,886	13%	220,656	70%	317,276
8	TPU	14,815	27%	1,903	3%	1,303	2%	6,384	12%	1,366	2%	25,771	6.0%	47%	3,121	6%	28,892	52%	55,172
9	Wholesale	8,013	12%	3,334	5%	2,187	3%	4,869	7%	2,207	3%	20,610	4.8%	30%	5,079	7%	25,690	38%	67,762
	Total	144,723	16%	63,079	7%	47,073	5%	88,045	10%	87,651	10%	430,571	100%	48%	122,875	14%	553,446	61%	904,440

Source: Metro DRC

Note: Data is for Metro UGB only.

*AFF = Agriculture, Fishing and Forestry

*FIRE = Finance, Insurance and Real Estate

*TPU = Transportation and Public Utilities

Data Limitation

Employment data for Main Streets and Corridors should be used with caution because of potential errors resulting from geo-coding of addresses of jobs outside the 2040 design boundary adopted by the jurisdictions.

Performance Indicator 1.2e: Mixed Use Index: Progress of development of mixed use opportunities for employment and housing in the region in the Central City, Regional Centers, and Town Centers.

Data years: 1996 and 2000. Source: Metro Data Resource Center.

Finding:

- *The transportation analysis zones within the boundaries of the Central City (downtown Portland) scored the highest on the mixed use index in both 1996 and 2000. Several TAZ areas in the highest mixed use categories of the Central City became slightly less mixed in 2000 than in 1996, perhaps due to large redevelopment projects.*
- *The Regional Centers scored second to the Central City on the mixed use Index in 1996 and 2000. Regional Centers became slightly more mixed from 1996 to 2000.*
- *Town Centers scored third on the mixed use index for 1996 and 2000 and became more mixed in 2000 than in 1996 in some, but not all categories.*

Metro's Data Resource Center and Travel Forecasting Division created the mixed use index to help land use and transportation planners better understand the extent of job opportunities and accessibility options offered by the mixed use areas to households in the region. Intersections are a key variable of the mixed use index because a concentration of intersections is generally associated with a variety of land uses, circulatory efficiency, pedestrian accessibility and /safe streetscapes. By examining the concentration and relationship between jobs, households and intersections over time, it is possible to measure the progress that the 2040 mixed use design types are making in supporting a greater mix of uses.

The analysis of the mixed use index presented in this report is based on cataloging the mixed use values assigned to Traffic Analysis Zones (TAZs or Zones) that intersect the actual boundaries of 2040 mixed use design types areas for which data was available. Due to data limitations, the Central City, Regional Centers and Town Centers are the only design type areas measured.

The range of the index values begins at zero and represents the lowest value assigned to areas that offer a limited range of land uses and transportation connectivity. A score of 15,000 is the highest value and is associated with areas that offer the greatest variety of land uses, circulatory efficiency, and a wide range of transportation options. Table 1.2 e (1) shows the ranges of the mixed use index values.

Table 1.2e (1): Mixed Use Index Values

<u>Index Scores represent intensity, connectivity and mix of uses graduated from low to high.</u>	
0 – 1,000	<u>LOWEST:</u> Areas receiving this score are generally located on the fringes of the UGB or outside of the UGB. These areas offer a limited range of land uses and transportation connectivity and options and support low density patterns of development.
1,001 – 2,500	
2,501 – 5,000	
5,001 – 7,500	
7,501 – 15,000	<u>HIGHEST:</u> These areas have a variety of land uses, circulatory efficiency or variety of transportation options, pedestrian friendly and better streetscape and buildings oriented to the street. The areas receiving this score are also located in densely-developed urban areas where a wide range of services and housing are available.

The boundaries of the Central City (downtown Portland) intersect with 43 TAZs. As data in Table 1.2e (2) shows, in both 1996 and 2000 the TAZs within the Central City accounts for the highest score on

the mix use index (between 5000 to 15,000). This implies that the greatest concentration of a mix of uses in the region are occurring in this area. In 1996, about 53 percent of the TAZs in the Central City were in the highest two categories of the mixed use index (5,001-7,500 and 7,501-15,000). In 2000, roughly 49 percent of the TAZ zones in the Central City were in these highest two categories of the mixed use index. These areas offer a wide range of services and housing and are intensely served with the widest variety of transportation options. The data shows that one of the Central City TAZs in each of these highest two categories of the mixed use index (5,001-7,500 and 7,501-15,000) moved into lower categories of the mix use index. These changes may reflect a temporary reduction in mix use while redevelopment occurs in the Central City, however, additional years of data will be needed to reveal if the decreases in the number of TAZs in the highest two categories of the mix use index reflect a trend.

Table 1.2e (2): Change in Mixed Use Index Scores: 1996 and 2000

Mixed Use Area	# of TAZs	TAZs scoring 0-1000		% change	TAZs scoring 1001-2500		% change	TAZs scoring 2501-5000		% change	TAZs scoring 5001-7500		% change	TAZs scoring 7501-15000		% change
		1996	2000		1996	2000		1996	2000		1996	2000		1996	2000	
Central City	43	0	0	N/A	1	1	0%	19	21	11%	14	13	-7%	9	8	-11%
Regional Centers	74	4	3	-25%	28	29	4%	39	40	3%	2	2	0%	0	0	N/A
Town Centers	130	11	8	-27%	88	89	1%	27	30	11%	4	3	-25%	0	0	N/A
Total	247	15	11	-27%	117	119	2%	85	91	7%	20	18	-10%	9	8	-11%

Source: Metro DRC

The boundaries of Regional Centers intersect with a total of 74 TAZs throughout the region. The mixed use index data shows that in 1996, most (53 percent) of the TAZs in the Regional Centers were located within the middle category of the mix use index (2,500 –5,000). About 38 percent of the TAZs were in the next lowest (1,001-2,500) category of the mixed use index. In 2000, one more TAZ moved into these two lower categories.

The boundaries of the Town Centers intersect with a total of 130 TAZs throughout the region. In 1996, 76 percent of the TAZs intersecting with the boundaries of Town Centers were in the two lowest categories of the mixed use index (0-1,000 and 1,001-2,500), while in 2000 the percent of TAZs in these categories decreased by two TAZs (1 percent). The decrease in the number of TAZs in these lower categories during this period was due to some of the TAZs becoming more mixed and moving up to the next middle category of mix use index (2,501-5,000 and 5,001-7,500). Four TAZs moved into the middle category of the mix use index (2,501-5,000 and 5,001-7,500) from 1999 to 2000.

Methodology

As stated earlier, the mixed use index was created to help measure the progress that the 2040 mixed use design types are making in supporting a mix of uses. The index specifically measures the concentration of local intersections in a given area and how households interact with employment opportunities in these mixed use centers. The result is an index which blends these three factors or variables (normalized households, employment and local intersections) into a single index that describes the degree of mix use opportunities, including accessibility.

This process is conducted within a half-mile radius of the centroid of each TAZ inside the Metro UGB. The geometric mean of the three variables for a given TAZ is calculated and the TAZs with the greatest concentration of these three variables receives a higher score or ranking. For example, a TAZ with a

medium level of employment and a high number of households and high number of intersections would receive a higher mixed value than a TAZ with a high number of employment, low number of households and few intersections.

The formula and examples:

$$MUI_j = \frac{HH_j \times E_j \times \left(\frac{\sum HH_j}{\sum E_j} \right)}{HH_j + E_j \times \left(\frac{\sum HH_j}{\sum E_j} \right)} + I_j \times \frac{\left(\frac{\sum HH_j}{\sum I_j} \right)}{\left(\sum I_j \right)} \quad \text{where } j = 1 \dots 969 \text{ TAZs}$$

- Note: MUI_j is the mixed use index for a TAZ
- HH is the normalized households within a TAZ
- E is the normalized employment within a TAZ
- I_j is the number of intersection within a TAZ

Data Limitations

- It is very important to note that a relatively small portion of a TAZ that scores high on the mixed use index will influence the score that the entire TAZ receives. For this reason, the geographic area that certain TAZs represent is not an indication that this entire area supports a mix of uses.
- The five-year period for which data was collected may prove to be too short for an effective measure of conversion or loss of mixed use areas. Many of the areas located in 2040 mixed use centers are being rezoned and redeveloped and do not currently support substantial levels of employment and local street connectivity.



1996 Mixed Use Index Map






(Household & Job Density w/ Street Intersections)

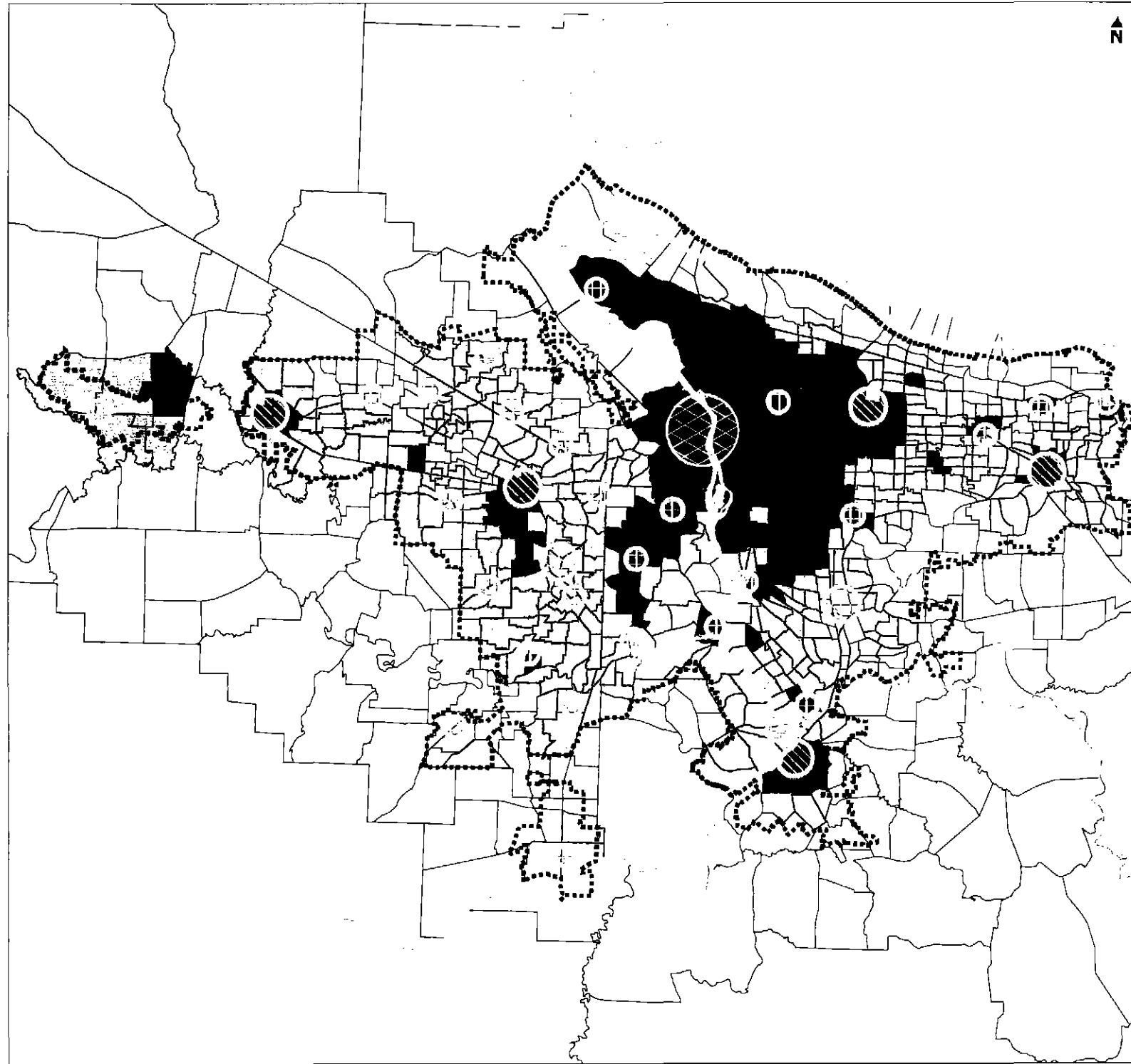
Centers

-  Central City
-  Regional Centers
-  Town Centers
-  Urban Growth Boundary

Mixed Use Index

(larger values indicate greater degree of mixed use)

-  0 - 1000
-  1001 - 2500
-  2501 - 5000
-  5001 - 7500
-  7501 - 15000



The information on this map was derived from digital databases on Metro's GIS. Care was taken in the creation of this map. Metro cannot accept any responsibility for errors, omissions, or positional accuracy. There are no warranties, expressed or implied, including the accuracy of measurements or fitness for a particular purpose, accompanying this product. However, notification of any errors will be appreciated.



1" = 4.9 miles



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2000 Mixed Use Index Map






(Household & Job Density
w/ Street Intersections)

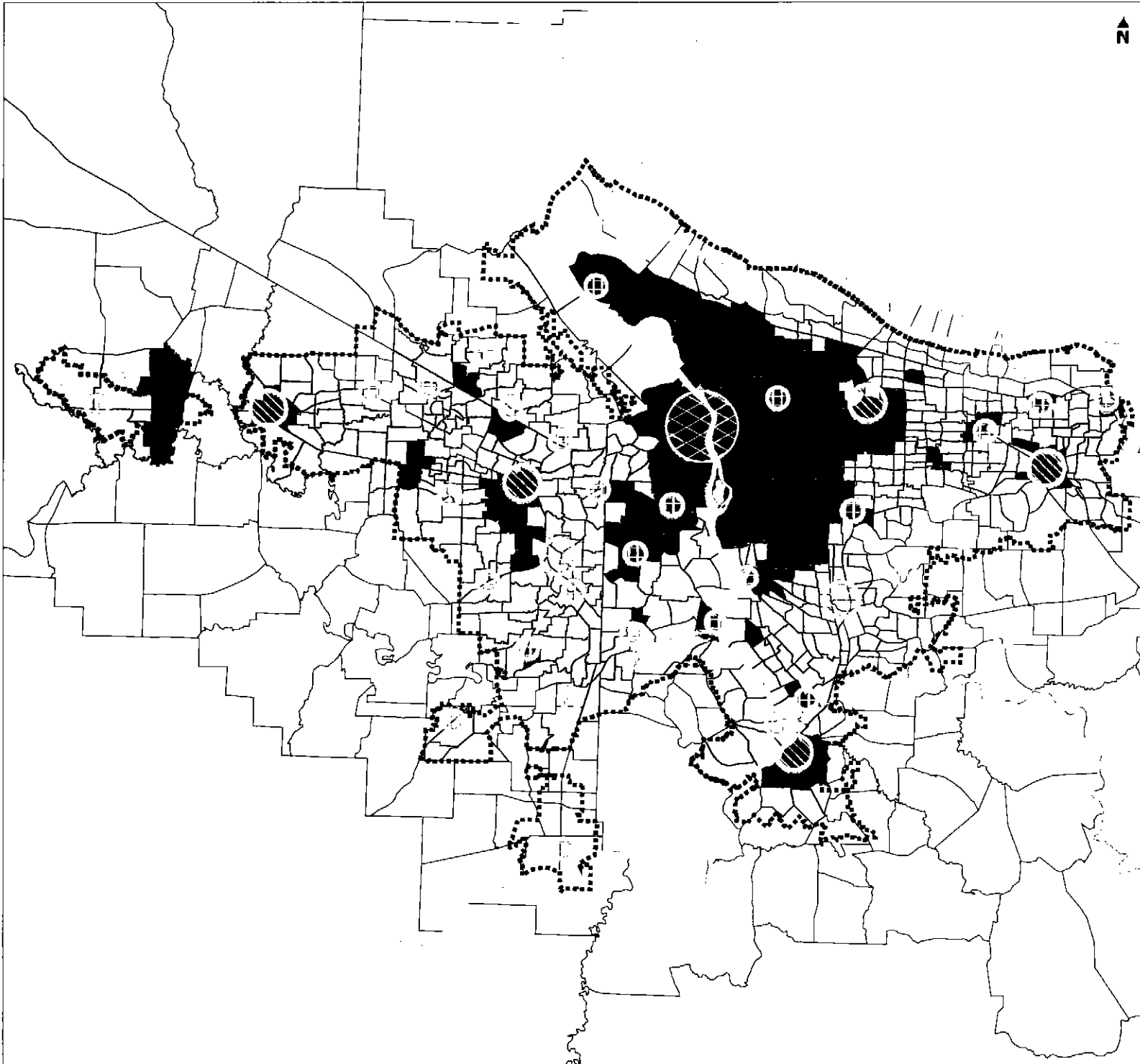
Centers

- Central City
- Regional Centers
- Town Centers

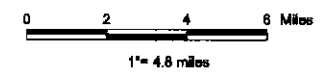
 Urban Growth Boundary

Mixed Use Index
(larger values indicate greater degree of mixed use)

	0 - 1000
	1001 - 2500
	2501 - 5000
	5001 - 7500
	7501 - 15000



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Measures that analyze:

- d) **The number of residential units added to small sites assumed to be developed in the metropolitan service district's inventory of available lands but which can be further developed, and the conversion of existing spaces into more compact units with or without the demolition of existing buildings as contemplated by ORS 197.301;**
 - i. New housing units (single family residential and multi-family residential) permitted through redevelopment and infill – Refill Rate (Performance Indicator 1.2c)

Performance Indicator 1.2c: New housing units (single family residential and multi-family residential) permitted through redevelopment and infill – Refill Rate.

Data years: 1995-1996 and 1997-1998. Source: Metro Data Resource Center Refill Study (1999).

Finding:

- *In the period for which data is available, refill (or redevelopment and infill) activity in the region accounted for about 26 percent of all residential development in the region.*

This indicator is a key measure of how well policies and the economy are working to promote efficient re-use of existing developed land and the conservation of raw, undeveloped land. The methodology for estimating the refill rate involves selecting a representative sample of single family and multi-family building units. These units are then compared with building permits and Metro's Regional Land Information System (RLIS) data to determine whether the structures were placed on vacant or previously developed tax lots. If the unit was constructed on a developed parcel without removing the existing improvement, the permit is considered infill development. If the unit was constructed on a parcel where the existing improvement was removed, the permit is considered redevelopment.

Table 1.2c shows the residential refill rate for 1995-1996 and 1997-1998. Refill estimates for recent years are not available at this time. Refill activities in the region were estimated to be 25.4 percent during 1996 and 26.3 percent during 1998. The 1998 refill rate includes 16.3 percent of infill development and 10 percent redevelopment.

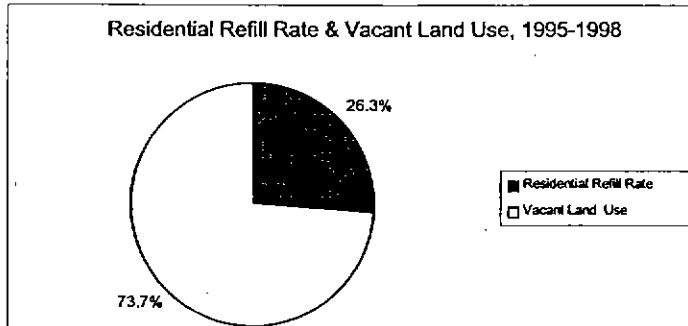
Table 1.2c – Residential Redevelopment and Infill (Refill) Rate within the UGB

Year	Residential Refill Rate
1995-96	25.4%
1997-98	26.3%
1998-00	N/A

Source: Refill Study, Metro DRC

As pointed out earlier, the 1997 Metro Urban Growth Report assumed that the growth that could occur through infill and redevelopment could be 28.5 percent on average for the 20-year planning period. Substantial infill stock, or substantial increases in the redevelopment rate are crucial for any increases in the refill rate to be realized. In the absence of efforts to encourage refill development, the scarcity of infill sites in the coming years is expected to cause the refill rate to decrease. A comparison of 1995-98 refill activities (26 percent) and non-refill activities (74 percent) in the region is shown in Figure 1.2c.

Figure 1.2c



Source: Metro DRC

Data Limitations

Refill data is reported in two fiscal year periods (1995-96 and 1997-98). These are one-year rates.

Corrective Action

As indicated above, the 1997 Urban Growth Report assumed a refill rate of 28.5 percent. Metro's estimate of the capacity of the UGB in the report was based, in part, on this refill rate. The most recently reported refill rate in the year 1997-98, was 26.3, below the assumed rate. In this circumstance, ORS 197.302(1) requires Metro to take corrective action in order to ensure that the assumed refill rate will be achieved. The Metro Council has taken corrective actions that will increase infill and redevelopment. These actions, described more fully in the 2002-2022 Urban Growth Report-Residential, include:

- New policies in the Regional Framework Plan to encourage refill in Centers;
- A requirement that each local government with a Regional or Town Center develop a strategy to encourage housing and employment in each center;
- New standards to limit commercial development outside centers;
- A Centers Work Program within Metro to provide grants and technical assistance for local development of centers strategies;
- Revised criteria for distribution of transportation improvement funds to give priority to improvements in centers.

For reasons described in the 2002-2022 Urban Growth Report-Residential, these actions are expected to bring the refill rate to the 28.5 percent level assumed in the UGR.

Metro Report

Appendix A
Item 2
Ordinance 02-969 B

2000-2030 **Regional Forecast**

March 2002
Revised September 2002
Updated December 2002



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PEOPLE PLACES
OPEN SPACES

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Metro serves 1.3 million people who live in Clackamas, Multnomah and Washington counties and the 24 cities in the Portland metropolitan area. The regional government provides transportation and land-use planning services and oversees regional garbage disposal and recycling and waste reduction programs.

Metro manages regional parks and greenspaces and owns the Oregon Zoo. It also oversees operation of the Oregon Convention Center, the Portland Center for the Performing Arts and the Portland Metropolitan Exposition (Expo) Center, all managed by the Metropolitan Exposition Recreation Commission.

For more information about Metro or to schedule a speaker for a community group, call (503) 797-1510 (public affairs) or (503) 797-1540 (council).

Your Metro representatives

Executive Officer – Mike Burton; Auditor – Alexis Dow, CPA; Metro Council – Presiding Officer Carl Hosticka, District 3; Deputy Presiding Officer Susan McLain, District 4; Rod Park, District 1; Bill Atherton, District 2; Rex Burkholder, District 5; Rod Monroe, District 6; David Bragdon, District 7.

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DRI-WEFA, The U.S. Economy, The 25-Year Focus, Winter Issue 2002

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(Note: DRI-WEFA produces a fourth scenario known as the “cyclical projection”. This scenario is not used in the production of the Metro Regional Forecast)

Appendix C: Forecast Review Committees

Appendix D: Model Documentation Summary

Paper delivered at the Pacific Northwest Regional Economic Conference, 1998

Executive Summary

2000-2030 Regional Forecast

The National View: Winter 2002

- It's official – the U.S. is in a recession since March 2001, according to the private economic think tank: National Bureau of Economic Research.
- There's little worry of inflation. Interest rates are low; but so are consumer confidence and business activity. The National Association of Purchasing Manager's Index (NAPM) still points to contraction. Low confidence and downbeat industrial output spell negative GDP growth for the U.S for the first part of 2002.
- After a year, the recession may be coming to an end. . .
 1. Consumer confidence is on the rise – but still under pre-recession levels
 2. NAPM index is on the rise too – the level is presently near 50 – indicative of positive growth just around the corner
 3. Surplus capacity utilization and industrial production are showing early signs of acceleration
 4. Very favorable interest rates for stimulating additional domestic investments which could lead to a recovery in computers and software production
 5. Timely tax cuts prior to 9/11 and huge federal spending are stimulating GDP

Favorable Economic Factors

- Early & deep interest rate cuts
- Unusually well timed Federal spending initiatives and tax cuts
- Low fuel prices
- Decline in U.S. imports
- Steady housing demand
- Strong consumer auto purchases

Unfavorable Economic Factors

- Vulnerable capital goods cycle – weak domestic investment outlook
- Global recession
- Weak U.S. exports
- Weak state & local budgets
- Poor business profits
- Inventories overstocked

The Regional Perspective.

- The region is in its worst condition in over a decade.
- The average number of unemployed rose to near 60,000 with peak unemployment reaching 75,000 in November and December 2001.
- The manufacturing sector is in full retreat – that's not good news for a region that has proportionally more industrial jobs than other areas of the country.
- Regional mainstays high tech, transportation equipment, machinery, metals, and food processors, are hurting. Quarterly job figures in manufacturing are off 6 percent from over a year ago on a seasonalized annual basis.
- A weak Pacific Rim has also hurt regional exports. Japan is in its 3rd recession in a decade.
- Despite weak economic fundamentals, population and migration are still holding up well. Population rose 1.5 percent last year, which is below historical norms, but that figure is still high compared with growth in the early half of the 1980's.

When can we expect the Portland region to rebound?

- The good news is: Probably by mid-summer. But at the start the rebound will be slow...so the region probably won't feel like its out of the recession until the first quarter of 2003.
- The U.S. should be well on its way to a recovery, so the region can count on a boost from higher U.S. business activity. High-tech will be on its way up, and that should help fuel regional growth.
- A mild recovery overseas – especially in Japan – will aid in bolstering exports and the regional economy, too.

Executive Summary – *continued*

2000-2030 Regional Forecast

Regional Long-term Forecast Outlook: 2000 to 2030

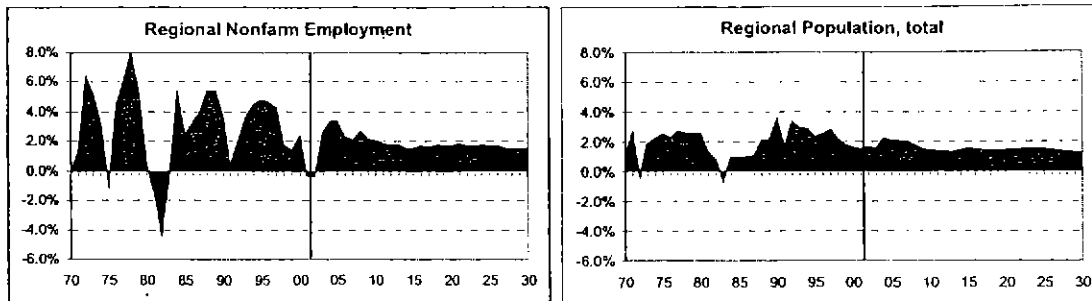
- Regional forecast presumes policy neutral position. Policies in effect today will be in force in the future. Regulation of the land supply assumed to not restrict underlying market growth trends.
- Population growth in last half of 1990's grew more rapidly than expected. Nearly 40,000 more residents by 2000 than previous 1995-2020 Regional Forecast¹.
- 20 year population expected to rise 1.6% A.P.R. as compared to 2.0 percent annual average since 1970.
- Population in 2022 expected to hit 2.65 million residents living in the region. 5 county region expected to reach 3 million mark by 2030.

	Population change in decade	Avg. Growth in decade
1850-60	16,046	9.2%
1860-70	13,811	6.4%
1870-80	25,123	6.3%
1880-90	69,510	8.5%
1890-00	39,891	2.8%
1900-10	157,733	7.0%
1910-20	71,192	2.0%
1920-30	83,767	1.9%
1930-40	50,538	1.0%
1940-50	210,702	3.4%
1950-60	116,332	1.5%
1960-70	194,697	2.1%
1970-80	248,584	2.1%
1980-90	179,969	1.3%
1990-00	396,554	2.4%
2000-10	359,451	1.8%
2010-20	337,200	1.4%
2020-30	384,200	1.4%

- Population table (left) shows growth tapering off during the forecast to 1.4 % per year between 2010 to 2030.
- Migration represents one-half of future population growth.
- Despite more people in this forecast, the number of households or the housing unit need forecast is actually 30,000 lower than the previous regional forecast.
- Household size was revised upwards by Census. Future household sizes expected to hold up higher than in previous forecast assumption.
- Population growth helps fuel population-dependent industries reach 4 and 4.5 percent growth rates in mid-1990's.
- Employment growth in near term expected to rebound and as a result so too will population (see charts below).
- Long-run employment prospects are expected to be favorable for the region. Job growth expected to exceed U.S. growth rates.
- Manufacturing jobs are expected to grow at an average of 0.8 percent a year – fueled primarily by high tech

developments. Nonmanufacturing jobs expected to average 2.0 percent a year. Total is 1.9 percent average annual growth as compared to 3.0 percent during the last 30 years.

Annual Growth Rate Charts



¹ Source: Metro Data Resource Center, 2015 Regional Forecast, January 1996

Executive Summary – *continued*

2000-2030 Regional Forecast for Various Geographies

Exhibit 1

5-County Regional Forecast Tables

(Multnomah, Clackamas, Washington, Yamhill and Clark counties)

	Total Employment (thousands)			Wage & Salary Jobs (thousands)			Self-Employed (thousands)		
	High	Mid	Low	High	Mid	Low	High	Mid	Low
2000	1,210.2	1,210.2	1,210.2	958.0	958.0	958.0	252.2	252.2	252.2
2005	1,344.3	1,314.2	1,290.0	1,068.5	1,043.5	1,023.9	275.9	270.7	266.1
2010	1,518.3	1,477.2	1,431.0	1,202.4	1,168.7	1,138.0	315.9	308.5	293.0
2015	1,677.3	1,625.2	1,525.7	1,321.6	1,273.1	1,209.3	355.7	352.0	316.5
2020	1,873.4	1,788.9	1,609.1	1,459.8	1,387.7	1,267.8	413.6	401.2	341.3
2025	2,115.9	1,972.7	1,709.4	1,627.7	1,515.5	1,335.8	488.2	457.2	373.6
2030	2,399.9	2,151.6	1,814.2	1,823.8	1,641.5	1,406.0	576.1	510.1	408.2

	Population, total (thousands)			Household, total (thousands)			Personal Income (million \$ 1996)		
	High	Mid	Low	High	Mid	Low	High	Mid	Low
2000	1,874.5	1,874.5	1,874.5	725.4	725.4	725.4	53,088	53,088	53,088
2005	2,087.8	2,049.2	1,991.4	811.1	799.6	785.9	59,154	57,131	56,400
2010	2,299.6	2,233.9	2,079.6	894.1	876.7	840.1	65,982	64,429	65,650
2015	2,453.6	2,394.1	2,120.3	956.3	946.9	876.7	76,568	72,874	72,250
2020	2,701.4	2,571.1	2,177.2	1,049.8	1,021.6	915.1	90,101	84,819	76,714
2025	3,026.2	2,768.2	2,275.2	1,171.6	1,104.2	966.4	105,294	98,272	80,641
2030	3,391.5	2,955.3	2,385.8	1,308.7	1,178.8	1,022.6	123,614	110,939	82,264

	Per Capita Income (\$ 1996)			Portland CPI (1982-84=100)			Median Home Price (nominal \$)		
	High	Mid	Low	High	Mid	Low	High	Mid	Low
2000	28,320	28,320	28,320	178.0	178.0	178.0	166,000	166,000	166,000
2005	28,300	27,900	28,300	211.0	208.2	205.9	199,200	195,200	186,900
2010	28,700	28,800	31,600	246.8	243.6	223.6	274,700	256,100	222,700
2015	31,200	30,400	34,100	284.9	277.7	253.9	328,800	308,300	242,800
2020	33,400	33,000	35,200	335.9	314.4	298.3	403,500	365,000	252,500
2025	34,800	35,500	35,400	400.1	356.8	355.1	520,700	434,800	273,200
2030	36,400	37,500	34,500	481.4	406.0	425.5	682,300	510,600	301,200

Table Notes:

- Total employment includes wage & salary jobs, proprietors and other self-employed individuals.
- Personal income includes wages and salary, other labor income, transfer payments, dividends, interest and rent, farm and nonfarm proprietors income, and residents adjustment less social insurance contributions.
- Portland CPI is the Bureau of Labor Statistics all items urban consumer price index for the Portland-Vancouver metropolitan area
- Median Home Price derived from RMLS median sales price statistics

Executive Summary – continued
2000-2030 Regional Forecast
for Various Geographies

Exhibit 2

4-County Forecast Table

(Multnomah, Clackamas, Washington, and Clark counties)

	Total Employment	Total Population	Total Household
2000	1,172,900	1,789,460	696,669
2005	1,273,400	1,956,300	759,600
2010	1,433,100	2,134,300	832,800
2015	1,577,300	2,287,000	899,600
2020	1,736,900	2,455,700	970,500
2025	1,916,000	2,643,700	1,049,000
2030	2,089,800	2,821,000	1,118,900

Table Notes:

- Total employment includes wage and salary plus proprietors. Excludes military employment.

Exhibit 3

Metro UGB Forecast Table

(data tables include Multnomah, Clackamas, Washington, and Clark county)

	Total Employment 1/	Total Population 2/	Total Household 3/
2000	953,134	1,305,574	520,395
2005	1,028,500	1,419,000	563,200
2010	1,148,300	1,540,000	613,000
2015	1,256,500	1,643,800	658,400
2020	1,376,200	1,758,500	706,700
2025	1,510,500	1,886,300	760,000
2030	1,640,900	2,006,900	807,600

Table Notes (source: Metro Urban Growth Report, August 2002):

A capture rate represents a Metro policy determination to accommodate with the Metro UGB a fraction of expected regional growth. There are two pertinent capture rates assumed in the UGR: 1) households (housing units) and 2) employment (jobs). The numerator represents the number of households or jobs in the Metro UGB. The denominator represents a four-county total. The ratio is the capture rate for the future.

1. Assumes a 75 percent job capture rate
2. Assumes a 68 percent population capture rate
3. Assumes a 68 percent household capture rate

Exhibit 4

Metro UGB Employment, Population and Household Demand Table

	Total Employment	Total Population	Total Household
2000	953,134	1,305,574	520,395
2022 1/2	1,428,134	1,821,300	732,600
Change	475,000	515,700	212,200

Table Notes: "Change" values have been rounded

- Figures in Exhibit 4 are interpolated from the forecast data shown in Exhibit 3.
- The total employment figures include self-employed and also do not yet subtract out the effects of redevelopment and infill. (An adjusted change without self-employed totals 355,000 jobs.)

2000-2030 Regional Forecast

Introduction

Purpose.

In order to maintain a sound and vibrant regional economy, planning for future land needs is essential. State law mandates that Urban Growth Boundaries (UGB) in Oregon are periodically updated, and the inventory of buildable residential land inside UGB's are replenished up to a 20 year supply at the time of periodic review. And as a matter of general practice, Metro also maintains an inventory of up to 20 years of industrial and commercial land at its periodic review of the Metro UGB. The basis for future land need and demand is derived from a regional forecast of employment and household change.

The regional forecast is, in part, the supporting evidence for Metro's UGB decision which is due to be finalized in December 2002. This demand, represented by the current regional forecast, provides the technical information for a baseline estimate of a 20 year need for both residential and employment land². Metro is now in the process of completing its studies and analyses for its 2002-2022 periodic review UGB decision³.

The Metro regional forecast presents the technical underpinnings for estimates of future employment and future residential land need. National economic assumptions drive a regional forecast that is derived from a regional economic model of the Portland-Vancouver region. Overall regional control totals for aggregate demand for employment land are derived from sector-by-sector employment forecasts. Commercial and industrial land demand (need) are derived from sector level employment forecasts and by projections of employment density and floor-to-area-ratios (FAR) for each sector⁴.

Future residential land demand (need) is determined from housing unit forecasts created from the Metro regional forecast. Future regional population is estimated using an age-cohort model, with the final result a forecast of population by age. U.S. Census "middle-series" age-specific birth and age-specific mortality rates are the initial basis for projecting natural population growth. These age-specific rates are benchmarked to regional vital statistics data to create composite regional age-specific birth and death rates used in estimating natural increases in regional population⁵. The migration component is

² Additional high and low growth scenarios for the region will accompany this baseline forecast to cover a range of uncertainty in the forecast.

³ Additional information is needed from other tasks under periodic review to make a final determination of UGB land need, e.g., alternatives analysis, Metroscope data on capture rates and refill rates, policy inputs with respect to matters of urban form, regional transportation plan assumptions.

⁴ FAR projections and employment density assumptions are derived by Metro's other economic model – Metroscope. In fact, Metroscope is a comprehensive land use allocation model that interacts with Metro's regional transportation model as well as the regional economic model.

⁵ Regional birth and death rates fluctuate a tad from year-to-year. We chose as initial rates a set of composite rates that minimized the difference between actual and model fitted births and deaths between 1990 and 2000. We adjusted the national fertility and mortality assumptions to correspond to regional

estimated net of in- and outflows and is linked to the employment forecast. The completed population forecast is then converted to an estimate of the number of households and dwelling units. A vacancy rate of 5 percent is assumed for converting the number of households to dwelling units.

The Context of this Forecast and Past Regional Forecasts.

The last officially adopted regional forecast and growth allocation was completed in 1995 and the results published in a two volume set: *The 2015 Regional Forecast*, and *The 2015 Regional Forecast and Urban Development Patterns*, January 1996 and February 1996, respectively. This Economic Report updates the first of these documents.

A regional forecast was prepared in December 2000 and presented to the Metro Council. That forecast was never officially adopted and remains as an “unpublished report”.⁶

This Report summarizes our recent review of the Portland-Vancouver metropolitan area as of February 2002. This review includes development of a new regional economic forecast consistent with a winter 2002, long-term U.S macroeconomic outlook. The U.S. outlook is prepared by DRI-WEFA. The Regional Forecast is the sole responsibility of Metro and not WEFA.

The regional forecast is developed by Metro Staff using an econometric model of the five county regional area (Multnomah, Clackamas, Washington, Yamhill in Oregon and Clark county Washington). The forecast results are reviewed by a panel of regional economic observers and peer reviewers. Comments from professional reviewers are factored into consideration in the final draft of the Regional Forecast.

Policy and Economic Assumptions.

No economic forecast can be prepared free of policy assumptions. Implicitly we maintain an assumption of status quo for regional and state policies. In terms of economic assumptions, the DRI-WEFA U.S. forecast sets the overall tone of anticipated macroeconomic conditions for the next 20 year period. The Metro regional forecast implicitly adopts these assumptions for the Metro region for its next 20 year growth cycle⁷.

Before estimating future employment and population increases, a set of overarching conditions are presumed to be pre-set assumptions for the region and the U.S. These assumptions are often overlooked, but are fundamental to the forecast. For example, the

differences in these rates. These differences were not large, but we felt it was reasonable to make the adjustments in order to better replicate regional trends.

⁶ Metro Data Resource Center, Economic Report to the Metro Council – 2000-2025, December 2000

⁷ Although business cycles are not dead and there have been at least 10 downturns in the Metro region, the current regional forecast plays out the present recession and attempts to forecast regional growth at its long-run expected growth rate. In the near term, population and economic growth in the region is slow or negative. Subsequently, as the U.S. economy emerges from the current 2001-2 recession, the region is expected to do so as well, but with a one-quarter lag. The recovery will initially show about a year or two of above average growth rates as the region climbs out of recession, but after this initial growth peak, the regional forecast gradually tapers off to the region's long-run average growth path. This growth path is determined by the national forecast obtained from DRI-WEFA as well as demographic trends.

regional forecast assumes that Americans are free to go where they please without undue restrictions (this has implications on migration trends and business start ups), that Americans are protected by the U.S. Constitution and the rule of law (this implies that people and businesses can reasonably expect certain behavior from others and can plan for the future on this basis), that America's fundamental economic system continues to be based on a system of free enterprise (this presupposes a sense of economic stability and conditions as opposed to a socialist regime that has a different set of economic implications), that Americans have the right to the pursuit of happiness. These fundamentals we hold to be true in the regional forecast as well as the U.S. forecast. Additional macroeconomic assumptions with respect to fiscal policy, monetary policy, and so forth are also explicitly folded into the national forecast. And, in the course of assuming the national forecast, these national assumptions become implicit policies for the region too.

At the regional level we assume a policy-neutral set of conditions over the course of the next 20 years. In other words, the policies that are in force today are presumed to be similar in the future. In terms of regional planning for the UGB, this means that future regional land use policies are assumed to be more of the same. In other words, future policies will have similar impact to that which exists today.

The region in the past, and arguably in the present, has enjoyed land demand and supply conditions that pretty much do not suffer from peculiar economic distortions. Additionally, the forecast presumes that the market for all goods and services in the region is no more constrained than that of the rest of the nation. What this translates into for the regional forecast is that regardless of future policies, the regional markets (whether for labor, land or goods and services) in the Metro region are able to determine market equilibriums, and the condition of these markets are competitive with other cities on the west coast. In short, the regional forecast presumes future policies will do no harm to observable economic trends⁸. The State's periodic review process and Metro code are intended to provide periodic replenishment of the available land inventory by balancing the desire for economic vitality with land and environmental conservation.

The economic trends for the region are based in part on past economic relationships, clusters, inter-industry linkages and the outlook for the nation. Our attempts to peer into a mist-shrouded future are based on these assumptions. The economic relationships between the U.S. economy, world economy and regional economy are intertwined and implicitly included in the regional forecast by virtue of the economic equations formulated in the regional economic model. Economic clusters that exist in the region are also considered. Inter-industry linkages, that is the relationships among different sectors of the region, are folded into the calculations of the regional forecast by inter-industry demand variables (behaves as an input-output parameter among industry sectors).

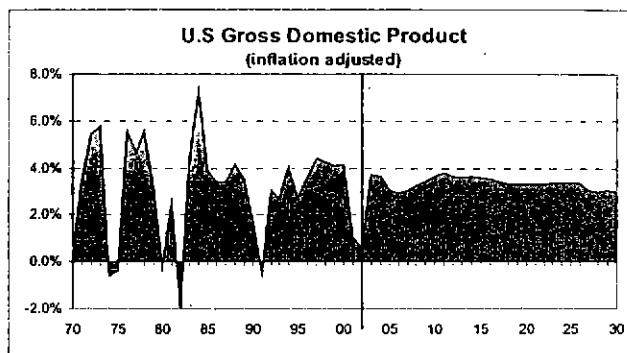
The future forecast for the region is based on an outlook of global and national conditions that are expected to materialize over the next 20 years, as well as economic relationships

⁸ Policies today may encourage economic trends such as economic development. Other policies today may tend to redirect or dampen economic growth, but are in place to mitigate externalities that an open and competitive market may not have the mechanisms to properly control, such as environmental externalities.

that have formed over the past decades. The set of U.S. and worldwide assumptions derive from the DRI-WEFA U.S. forecast. To highlight, the regional outlook includes these most recent updates:

- U.S. Census 2000 population data (updated from 1991-99 Portland State University intercensal estimates)
- New immigration trend information for the 1990's
- Updated demographic assumptions of future households, migration, birth and death rates
- Revised employment data from the state employment departments
- New and revised U.S. Bureau of Economic Analysis income and wage data
- 9/11 economic impacts
- Macroeconomic recession assumptions from DRI-WEFA
- Global macroeconomic and industry detailed growth assumptions from DRI-WEFA

The DRI-WEFA national forecast is a trended forecast. This means that after the current recession is played out for the U.S., an expected growth rate is assumed by DRI-WEFA that presumably models an average growth path which bisects the peaks and valleys associated with recessions and a business cycle. The chart (right) of real U.S. GDP from DRI-WEFA exemplifies the trended approach of the national and regional forecast.



Alternate Regional Forecasts.

Three regional population and job growth scenarios are packaged together in this regional outlook report. This report includes a baseline (mid-growth scenario), high (optimistic scenario) and low (pessimistic scenario) growth projections. A baseline growth forecast is prepared first. This baseline regional forecast represents a middle growth scenario and is representative of the region's most likely economic and population trends. The baseline regional forecast is characterized by playing out the current business cycle and with regional growth tapering off in later years. Future growth beyond this point assumes a trend projection based on "averaging out" peak growth periods with future downturns in order to model the region's fundamental economic growth path.

The baseline assumes that the economy suffers no major mishaps between now and the end of the forecast horizon in 2030. The baseline scenario is based on economic and demographic characteristics that represents neither an extremely high or low set of assumptions. This trended scenario assumes the absence of major economic disruptions. Such disruptions include large oil price shocks, unanticipated policy swings, or excessively rapid changes in supply or demand.

Separate high and low regional growth scenarios are prepared for the region. These alternative growth forecasts are constructed based on respective high and low growth national forecasts taken from DRI-WEFA's national model of U.S. growth. Additionally, more optimistic or pessimistic regional demographic parameters are assumed in coordination with the corresponding alternate growth scenario. For example, the high growth regional scenario assumes greater migration rates than the baseline or low growth scenario. The high and low growth regional forecasts produced in conjunction with the baseline provides an alternate range of growth projections that the region could achieve given the range of assumptions. The alternative forecasts bracket growth and offers a different timeline for when a certain level of growth could be achieved given each set of assumptions.

Both the optimistic and pessimistic growth scenarios have been constructed in a way that assumes economic and demographic factors on the extreme ends of the spectrum. In the case of the optimistic scenario, demographic factors were adjusted to reflect faster population growth parameters than the baseline assumption set. Economic factors were assumed to change more rapidly than in the baseline trend projection. Output is projected to climb much faster and economic variables exhibit more rapid growth.

Conversely, the pessimistic scenario switches the demographic factors to a slower setting. For example, birth rates are lower, life expectancy is lower, and net migration is much less than the baseline. Economic variables were reset to weaker settings. Productivity and output are assumed to increase at a slower rate than either the baseline and the optimistic scenario.

In terms of the economic growth path that eventually might materialize, we characterize the range between the high and low scenarios as approximately accounting for 90 percent of all possible outcomes. Therefore, there is only a 10 percent chance of growth exceeding or underperforming beyond the growth bands of the respective optimistic and pessimistic scenarios.

Forecast Methodology Summary.

The Metro Regional Forecast is prepared using a state-of-the-art econometric model with over 100 endogenous equations and 200 exogenous and identity/accounting equations and variables. Stochastic behavioral equations describe each significant industry category in the manufacturing and nonmanufacturing sectors. Income equations for every major income category are modeled. Wage equations for aggregate groupings of industries project future wage rates. Inter-industry linkages between different parts of the regional economy are expressed with feedbacks and interactions that represent the mix of regional economic relationships and growth patterns. The equations for employment, income, wages and population are compiled together to describe the growth rate anticipated for the Portland-Vancouver area economy.

Specifically, inter-industry demand variables (IDV) are employed in each employment equation to reflect the implicit input-output associations which exist among each regional industry. Industries with significant traded demand, typically sectors in manufacturing

and some traded-sector nonmanufacturing classifications (e.g., transportation & warehousing and creative services) include additional industry demand drivers, for example, variables that proxy specified industry-level national demand. Non-traded industries, typically classified in nonmanufacturing sectors, include demand variables triggered by growth in population and income related variables. Productivity assumptions and projected wage rate increases are employed in each industry employment equation to reflect the labor force and price variations that co-determine employment demand from the factor input side. Employment equations represent the heart of the Metro Regional Economic Model and describe in the greatest possible detail the structure of the regional economy.

Population change is estimated by five-year age groups. A cohort-component method of projecting future population changes in the region is employed. Population statistics are projected for individual five-year age cohorts. The Metro Regional Economic Model includes estimates of fertility and the number of births. Mortality rates are also assumed and the number of deaths in each age cohort is estimated in each forecast year. The difference between births and deaths from these projections represents the expected natural increase in the regional population. Adding in a forecast of migration (net of inflows and outflows of residents) by age cohort, we are able to arrive at an estimate of population in future years. A net-migration forecast is prepared using a stochastic equation which models the relationship identified between migration and relative economic growth comparisons. Essentially, migration levels increase when economic growth in the region increase on a relative basis significantly faster than the economies of California, Washington and the U.S. population growth in the region is tied directly into the Regional Forecast by the amount of migration and the ability of the region to draw in migrants based on the strength of regional economic growth.

Future growth assumptions also include economic growth projections for the U.S. and the global economy. National variables include components of gross domestic product (consumption and investment trends), fiscal and monetary variables, exchange rates, inflation, productivity, housing variables, and labor force data. These future year growth expectations provide the backdrop for Metro's Regional Economic Forecast.

Report Organization.

The regional forecast begins in year 2002 through 2030. Year 2001 data through the 3rd quarter represents the last actual data point with the 4th quarter still a preliminary estimate. The geographic coverage of the Regional Forecast is a five-county Portland-Vancouver metropolitan area that includes Multnomah, Clackamas, Washington and Yamhill counties in Oregon plus Clark county, Washington. For purposes of comparison and additional geographic coverage, less detailed "satellite models" also forecast individually the employment, income, and population for Columbia, Yamhill, and the Salem MSA (Marion and Polk counties). These other county projections are separate from the detailed Portland-Vancouver MSA (five counties). Subtracting the Yamhill county forecast from the five-county Regional Forecast, an officially adopted Regional Forecast with just the four-county area is employed for Urban Growth reporting purposes.

The U.S. economic forecast and most other assumptions in this report are based on data released through the month of October 2001. Regional and national statistics which are usually tabulated on a monthly or quarterly frequency have been seasonally adjusted using the Census X-11 method. U.S. historical data are also through the 3rd quarter.

Regional income data which comes annually from the U.S. Bureau of Economic Analysis (BEA) reflect historical data through 1999. Monthly current employment statistics (CES) from the State of Oregon include data through October 2001. Annual population statistics are updated to 2001 based on Census 2000 enumerations and county population estimates derived from Portland State University, Center for Population Research and Census (CPRC) and Washington State Office of Financial Management (OFM). Other historical data series (e.g., self employment, wages and components of personal income) used in this report are at least through 1999.

Detailed statistical information describing the baseline regional forecast is tabulated in the Appendix of this report. The main text of this report provides a summary description of the assumptions, results and conclusions contained in the baseline regional forecast.

Details of the high and low growth regional forecast scenarios are also included in the Appendix which compares the three alternative forecast scenarios for selected economic variables.

DRI-WEFA's detailed explanation of its U.S. long-term economic outlook is also found in the Appendix of this report. A brief description of the DRI-WEFA U.S. forecast is incorporated into the main text of the report. Additional forecast tables are included in the appendix which offer more detailed information about the U.S. macroeconomic trend and the optimistic and pessimistic national scenarios. Excerpts of the DRI-WEFA 25-year focus of the U.S. economy is included.

Additional forecast years beyond 2030 were prepared as part of this regional forecast, but the reliability of these projections is significantly diminished from the prior year projections. The later forecast years, beyond 2030, were developed as a convenience for extreme long-range facility planning efforts and to address questions about potential future growth patterns in 2040 and 2060.

Economic Report to the Metro Council

2000-2030

**Portland-Vancouver Metropolitan Area
Economic & Demographic Projections**

- Employment
- Population & Households
- Income & Wages

The Regional Forecast information contained herein is based on U.S. macroeconomic assumption obtained from DRI-WEFA from its winter 2002 U.S. Economy economic outlook. The U.S. economic outlook includes DRI-WEFA's estimate of the effects from September 11th on U.S. growth. The DRI-WEFA U.S. outlook is provided to Metro as is. The Regional Forecast is then developed based on the assumptions in the WEFA U.S. Outlook and Metro's econometric model (MARIO – Metro Area Region Integrated-Industry Outlook model). MARIO translates the national assumptions through a modeled economic structure of the Portland-Vancouver OR-WA metropolitan area to produce the 2000-2030 Regional Forecast. The Regional Forecast is then reviewed by an independent panel of regional forecasters, demographers, city planners and economic observers. The Metro Data Resource Center bears responsibility for the content of the Regional Forecast. All information is based on data sources believed to be accurate and reliable; however, users are cautioned that economic conditions may change and unforeseen circumstances may materially impact the accuracy of the Regional Forecast in future years.

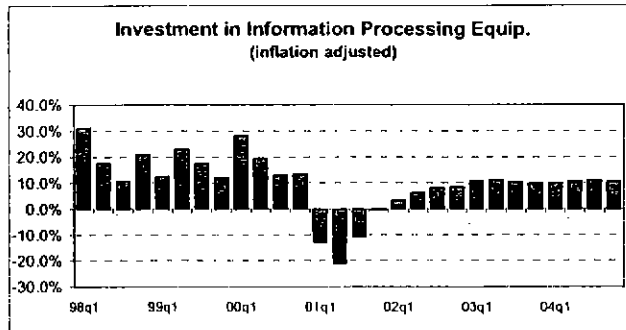
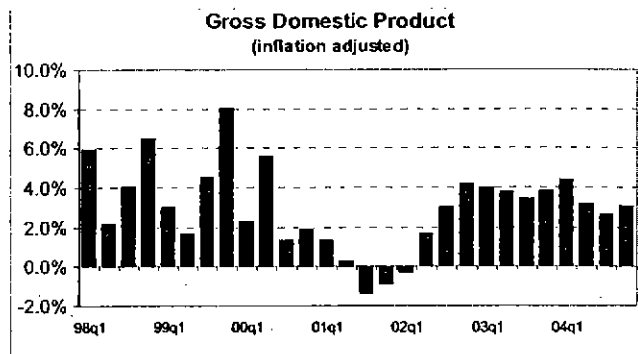


METRO

2000-2030 Regional Forecast

U.S. Economy in Review.

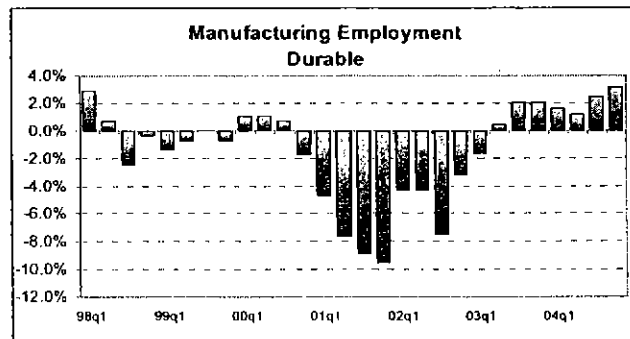
It's official! – the National Bureau of Economic Research (NBER) last November determined that the U.S. economy peaked in business activity in March 2001. With that announcement⁹, the current U.S. recession began and the longest uninterrupted expansion since World War II ended – exactly 10 years after it had begun (March 1991).



Inflation-adjusted GDP estimates finally confirm the NBER's declaration. In the fourth quarter of 2001, real GDP in the U.S. fell 1.3 percent. Signs of a slowdown were appearing long before. Producers began cutting production in 2000Q4. Investments in domestic plant and equipment began declining in 2001Q1. Employment

cuts soon followed as one after another economic driver stalled. Weak consumer confidence and fears of more unemployment caused consumers to retrench as consumption fell to 1.0 percent growth in the fourth quarter.

Every recession in the U.S. starts out differently and this one has been no different. The primary reason for the decline in U.S. output can be traced to the steep deceleration in manufacturing and investment spending.



- Steep draw-downs in retail and industrial inventories combined with cutbacks in industrial production
- Severe fall-offs in capital investments
- Struggling economies in Japan, Canada and Mexico hit U.S. shores just as the nation's own domestic

industries began to decline

⁹ The Business-Cycle Peak of March 2001, Business Cycle Dating Committee, NBER, Nov. 26, 2001. The NBER bases its recession determination on industrial production, employment, real income, and wholesale-retail trade activity when as a group these indicators show "significant decline".

Now a worldwide recession and Japan in its third recession in 10 years have severely hampered U.S. exports. A relatively strong U.S. dollar has not helped U.S. exports, which have fallen more steeply than imports.

The impact of this recession has been uneven across different geographic regions of the country and industry sectors. The Pacific Northwest has been hit the hardest by this recession. Employment in nonmanufacturing sectors has held steady with only narrow declines in many industries. Oregon's unemployment rate (7.3%) is the worst in the U.S.

U.S. unemployment in total has risen only modestly since the recession – to 5.8 percent from 4.0 percent a year ago. The manufacturing sector has endured the brunt of the current recession. On an annualized basis, U.S. manufacturing jobs fell 6.3 percent in the last quarter. High-technology manufacturing employment is down almost 10 percent. Transportation equipment is off nearly 6 percent. For the most part, durable producers are hurting much more than nondurable manufacturers.

Unlike previous recessions, many other national variables remain in good standing. Interest rates have been falling as the Federal Reserve (FED) and Chairman Alan Greenspan had attempted to stave off the recession with earlier cuts in interest rates. Since mid-2000, there have been 11 consecutive interest rate cuts. More recently, the FED has signaled a change in its interest rate bias to a neutral position – neither expecting to cut nor raise rates in the immediate future.

Along with a favorable interest rate climate, inflation has remained in check for much of the latter decade thanks to a balanced budget and an acceleration in productivity. Low real energy prices have also aided in taming inflation.

Favorable Economic Factors	Unfavorable Economic Factors
<ul style="list-style-type: none">■ Early & deep interest rate cuts■ Unusually well-timed Federal spending initiatives and tax cuts■ Low fuel prices■ Decline in U.S. imports■ Steady housing demand■ Strong consumer auto purchases	<ul style="list-style-type: none">■ Vulnerable capital goods cycle■ Global recession■ Steep drop in U.S. exports■ Weak state & local budgets■ Poor business profits■ Inventory draw downs

Housing demand and consumer purchases of automobiles – now a strength – could easily become a negative factor. Higher housing prices could easily tilt U.S. housing production down. And auto purchases could be at risk if consumers decide to not buy as many cars as rebate incentives evaporate.

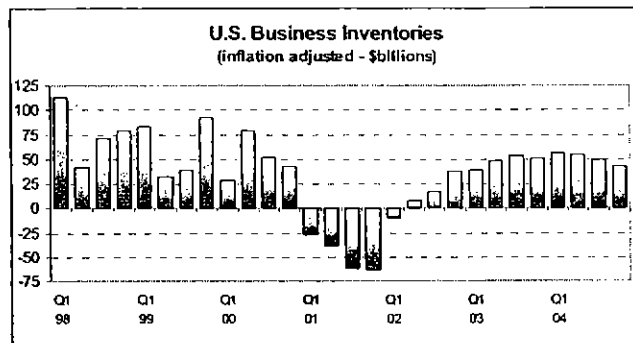
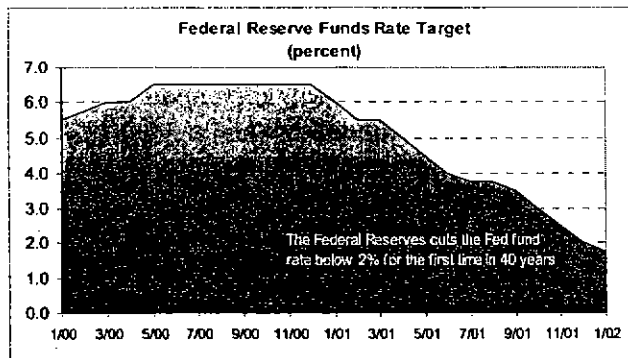
On the other hand, businesses will soon have to restock store shelves and bolster their inventories as economic spirits begin to lift. Inventory growth would accelerate GDP.

National Forecast Overview.

The main question for most everyone has been “when can we expect the U.S. economy to rebound?”. Estimates by most economic observers believe a turn-around could begin as soon as the start of summer, while others think it might not happen until early autumn. Most recessions have, on average, a peak to trough timeline of between 12 and 15 months. If indeed the U.S. economy fell into recession in March 2001, the U.S. should begin climbing out of its doldrums in the next few months –which would place the recovery in about June 2002.

Monetary conditions are in place for a recovery, but there are concerns that the rebound could be weaker than normal and slower to develop. However, over the long-run, U.S. economic growth is expected to be robust – more in line with growth during the 1990’s than the low growth, low productivity, high interest, and inflationary 1970’s and 80’s. A couple of factors will tend to undercut a sharp recovery in the near term.

- Housing starts and sales have remained at relatively high levels, so expectations are mild for a strong run-up in additional housing starts. Low interest rates help, but the FED is unlikely to cut any deeper anytime soon.
- U.S. domestic auto sales have remained relatively strong throughout the downturn. Price rebates have stimulated strong demand despite the recession. A sharp rise in auto purchases in late-2001 may restrain auto sales growth in the near future, just as a recovery is beginning.



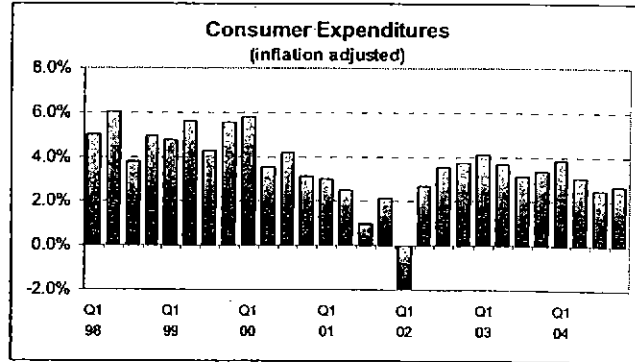
As a consequence, these two large sectors of the economy are not expected to offer much bounce to an early recovery. The U.S. will have to look to other sectors of the economy for leadership during the recovery.

And so...once again, consumers will have to step it up in order to boost U.S. GDP. Nascent signs are emerging to suggest the consumers are ready and willing, but there are worries that high consumer debt levels may hamper a stronger recovery.

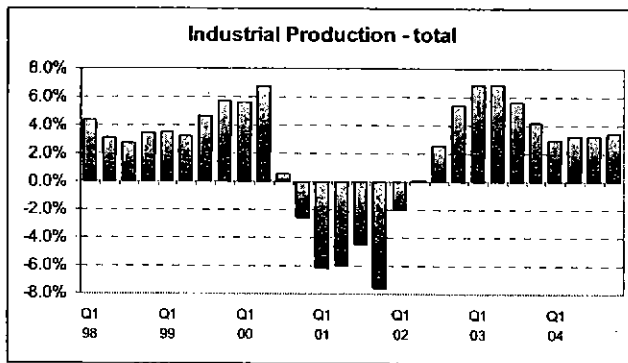
Consumers will have to lead, before conditions ripen enough for producers to gain the confidence to gear up production.

A couple of other factors favor a recovery in the near future. The first was the “economic stimulus” in the fall of 2001.

Though this “tax rebate” was not initially billed as an economic stimulus, the refunds came at a very serendipitous time in the business cycle. For all intents and purposes, its timing and size has acted as a positive stimulus.



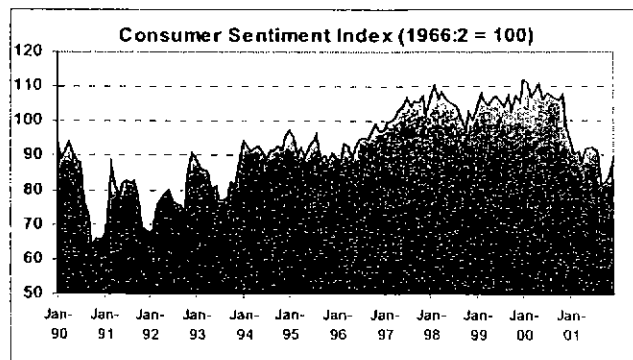
Second, in hindsight it is clear producers and retailers saw a recession in the making in late 2000. Inventory accumulation began slowing in 2000, and by 2001 everyone was slashing inventories. As we begin 2002, manufacturers and retailers alike will have to rebuild their depleted inventories, which should add an additional bump of about ½ percent to domestic GDP growth. Stronger consumer demand in the second quarter will provide all the signal needed to boost inventories.

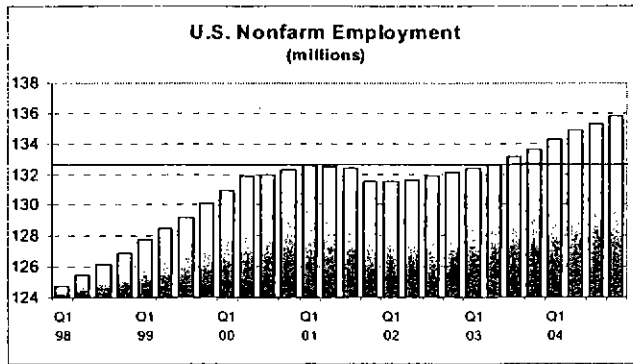


The U.S. macroeconomic forecast predicts consumer spending will bounce back in the second quarter of 2002 and accelerate to 4.1 percent by the 2003 Q1. Investments in fixed plant and equipment will lag behind consumption by another quarter before accelerating up to 11 percent by the end of 2003.

A one quarter lag in nonresidential fixed investments is further reflected in industrial production, where output will not ramp up until the third quarter of 2002. Industrial production peaks in 2003 before settling into a trend growth path between 2 and 3 percent growth per year.

Consumer confidence will be a key indicator of where the U.S. economy is in the business cycle. Consumer confidence hit bottom in September with the terrorist attacks on New York and Washington D.C. Since October the University of Michigan consumer sentiment index has been steadily rising, with a relatively large percentage jump in December 2001.



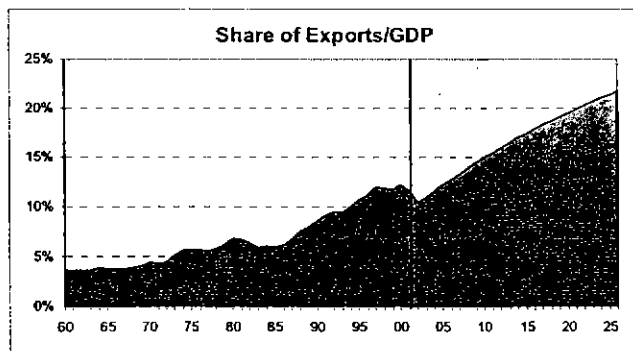
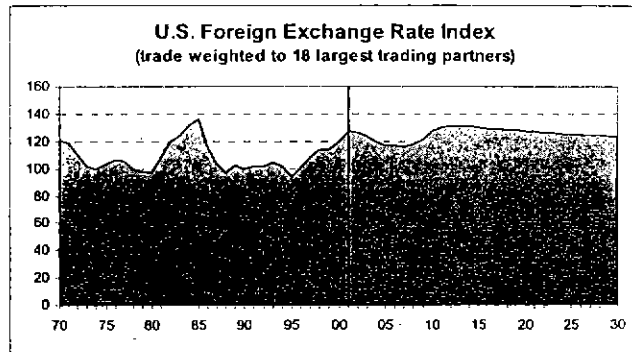


As this index continues to rise, and with expectations for employment gains just over the horizon, the U.S. recovery should begin to be felt as soon as summer arrives. However, it may still be a long wait – perhaps 2003 - before a complete thawing and the U.S. economy returns to warmer conditions. Economic conditions surely will begin to improve, but employment growth

won't likely return to anywhere near pre-recession levels until mid-2003.

Global Setting.

World trade is important to the U.S. economy. U.S exports currently contribute about 12 percent to the total Gross Domestic Product. Over the long-haul, the national forecast calls for exports to grow faster than other components of GDP. By 2030 the share of exports to U.S. GDP rises above 22 percent. International trade very much is expected to favor the U.S..



The U.S. carries a significant current account deficit, due to its own export deficit. However, due to the strength of the U.S. economy and the confidence this generates with respect to the rest of the world, the value of the U.S. dollar is expected remain relatively strong. This tends to dampen exports, but not by an inordinate amount, and exports are still

expected to grow. The rest of the world will continue to expand and to drive up demand for U.S. goods, especially services. In the long-run, a flat or somewhat declining exchange rate will tend to help U.S. manufacturers export their goods to the world.

DRI-WEFA World Economy Forecast.

This section reprinted from DRI-WEFA Global Forecast, February 2002.

DRI-WEFA World Market Overview

Recovery is in the air, at least in North America and Europe. Parts of Asia will follow along, but much of the region is struggling with the consequences of not following through on economic reforms. The region also has its share of political crises, many related to the war on terrorism. China, Russia, and most of the other former states of the Soviet Union continue unscathed from the high-tech collapse that pushed Europe and North America into recession. Japan and much of Latin America will continue to struggle with largely domestic political and economic problems.

Projected Growth Rates of Real GDP

	(Percent)			Average
	2001	2002	2003	2004-06
United States	1.1	1.0	4.0	3.0
Canada	1.4	1.1	3.9	3.3
Japan	-0.4	-1.1	1.8	2.1
W. European Big 4 (a)	1.6	1.3	3.2	2.5
Mexico	-0.3	1.8	4.6	5.6
S. American 7 (b)	0.6	-0.4	2.7	4.0
Middle-Income Asia (c)	5.4	5.5	6.5	6.8
World	1.4	1.4	3.7	3.4

- a. France, Germany, Italy, and the United Kingdom.
b. Argentina, Brazil, Chile, Columbia, Ecuador, Peru, and Venezuela.
c. China, India, Indonesia, Malaysia, Philippines, Thailand, Fiji, Maldives, Papua New Guinea, and Vanuatu.

Canada: Turning Around. The Canadian economy is probably now in the early stages of recovery from a mild recession. While recent indicators have been decidedly mixed, the first quarter of 2002, unlike the previous two quarters, is expected to show slight positive growth. Fiscal and monetary policies will be supplementary to the recovering U.S. economy as drivers of recovery in Canada. While the interest rate reductions of 2001 will provide stimulus over the next few quarters, the reductions have not been as significant in Canada as in the United States. It will probably be the third quarter before growth will be back up to potential, and 2005 before the output gap is eliminated. The Canadian economy is expected to grow 1.1% in 2002 and 3.9% in 2003.

Eurozone: Gaining Confidence. There are increasing signs that Eurozone economic activity is beginning to pick up gradually. Nevertheless, GDP may have contracted modestly in the fourth quarter of 2001, following minimal growth in the previous two quarters, as the negative economic repercussions of the September 11 terrorist attacks on the United States had an increased impact. Even before the attacks, the slowdowns in the U.S. economy, in particular, and elsewhere in the global economy had already had a substantial dampening effect on Eurozone activity. Following the terrorist attacks, the slowdowns in the manufacturing and service sectors intensified, while business and consumer confidence weakened further. Encouragingly, though, the latest data are generally showing modest improvement, and confidence is growing, showing that the downturn has bottomed out. Indeed, the service sector now appears to be expanding again. On the assumption that the U.S. economy starts to recover in early 2002, we believe Eurozone activity should pick up modestly as the first half of 2002 progresses. Growth should gain increasing momentum in the second half, supported by low inflation and interest rates, modest real wage increases, and some fiscal stimulus in several countries. Inventories have also been reduced significantly. Even so, Eurozone GDP growth will be limited to 1.3% in 2002, after an estimated 1.6% expansion in 2001. Growth is then projected to accelerate to 3.0% in 2003.

Mexico: Both Victim and Beneficiary of Spillover. The Mexican economy suffered a sharp deterioration in 2001, primarily the result of adverse external conditions. The U.S. recession buffeted Mexico's exporting sector, which had been the one of the country's most dynamic. Meanwhile, declining oil prices also hurt, as the government found itself unable to increase fiscal spending to stimulate the faltering economy. In addition to negative external factors, Congress approved only a partial fiscal reform that will not give the government the extra resources it needs. We do not expect any of the aforementioned factors to improve significantly in the first half of 2002, and some will remain negative through the entire year. Nevertheless, the recovery of the U.S. economy in the second half of 2002 will allow the Mexican economy—and especially its exporting sector—to rebound. As a result, GDP should expand 2.0% in 2002, a clear improvement from the 0.4% contraction in 2001.

DRI-WEFA Forecast Summary of the U.S. Economy.

This section reprinted from DRI-WEFA U.S. Executive Summary, January 2002.

	2001:2	2001:3	2001:4	2002:1	2002:2	2002:3	2000	2001	2002	2003	2004	2005
Composition of Real GDP (Annual percent change)												
Gross Domestic Product	0.3	-1.3	-0.9	-0.2	1.7	3.0	4.1	1.0	0.6	3.7	3.7	3.0
Final Sales	0.7	-0.5	-0.8	-2.2	1.0	2.8	4.3	2.0	0.0	3.4	3.7	3.1
Gross National Product	0.3	-1.3	-0.8	0.2	1.9	3.1	4.1	1.1	0.8	3.4	3.4	3.0
Total Consumption	2.5	1.0	2.2	-1.9	2.7	3.6	4.8	2.8	1.4	3.7	3.3	2.9
Durable Goods	7.0	0.9	19.4	-24.6	6.7	5.1	9.5	5.6	-1.0	7.6	5.0	2.9
Nondurable Goods	0.3	0.6	-1.8	0.8	2.0	4.2	4.7	1.5	1.1	3.6	3.4	2.9
Services	2.8	1.2	0.9	2.0	2.3	3.0	4.0	2.9	2.0	3.0	2.9	2.9
Nonres. Fixed Investment	-14.6	-8.5	-8.9	-4.2	-4.9	2.9	9.9	-2.8	-5.2	5.5	8.5	6.1
Equipment and Software	-15.4	-8.8	-6.1	-2.9	-3.8	6.5	11.1	-4.5	-3.7	8.3	10.5	7.7
Computers	-30.3	-26.8	3.1	4.6	9.6	8.4	39.1	-2.2	-1.0	16.3	19.1	20.0
Software	-3.7	4.3	2.3	6.9	10.7	9.7	12.1	2.8	6.3	10.6	10.6	10.7
Communications Equipment	-41.2	-25.8	-2.5	-2.4	-3.9	9.8	28.7	-18.4	-7.8	5.2	8.9	8.0
Light Vehicles	-2.6	-17.1	7.9	-6.9	-17.8	8.1	0.6	-7.7	-4.8	8.9	7.4	2.7
Other	-12.6	-4.1	-15.0	-7.4	-8.4	3.5	4.5	-3.8	-7.2	6.3	10.2	5.5
Private Nonres. Structures	-12.2	-7.5	-16.2	-7.9	-7.8	-6.4	6.2	2.2	-9.4	-2.3	2.6	1.2
Buildings and Other	-19.1	-0.8	-19.3	-6.1	-3.6	-5.2	5.1	-2.0	-8.5	-2.5	3.8	1.3
Residential Fixed Investment	5.9	2.4	-2.7	-7.8	-3.2	0.4	0.8	1.6	-2.3	0.5	0.7	1.8
Exports	-11.9	-18.8	-21.7	-8.4	-1.3	4.7	9.5	-5.3	-9.0	9.2	9.7	8.1
Imports	-8.4	-13.0	-6.0	-1.5	6.3	9.5	13.4	-2.6	-1.2	8.1	6.7	5.5
Federal Government	1.8	3.6	3.8	6.2	7.6	5.3	1.7	2.2	5.0	3.0	2.0	1.4
State and Local Governments	6.6	-1.3	2.5	2.4	2.6	3.0	3.2	3.6	2.2	1.7	1.7	1.7

Source: U.S. Economic Outlook, DRI-WEFA, January 2002

The approaching new year is a good time to look at what may go right in the economic arena during 2002. One sector worth looking at is high technology. Spending on high-tech equipment ran out of control in 2000, and we project only a slow recovery in 2002. The good news is that, even at its low, high-tech spending will still account for 47% of total spending on equipment and software and 4% of GDP. This direct spending—still much higher than in most other countries and higher than in the United States until the late-1990s boom—will continue to crank out productivity gains. A lot of recent (and future) innovations from Web access, e-commerce, and medical/biotech, for example, are free or priced below user value. That is bad news for innovator profits, and for "real" growth (which does not capture ideas), but the innovations generate a nice consumer surplus for users that in many cases also boosts productivity.

Cyclically, housing is much stronger now than during the average recession, and the inventory correction will be over sooner because it started sooner. We estimate that reversal of the inventory shrinkage will add 0.6 percentage point to GDP growth in 2002. Travel is already showing some early rebound, with dining out, sporting events, and flying all showing gains. As people make more reasonable risk calculations, consumer spending will rise further from today's depressed levels. Leisure industry employment could show an early turnaround, beating overall employment, which generally lags.

The federal government's boost to the economy is large and unusually well-timed. The large tax cuts voted before September 11 have now been enhanced by billions in new spending. The failure of Congress to enact a stimulus bill will do little to hold back the recovery. While the parties' contending bills would have provided some temporary income support to the unemployed, the added growth would be small, and unnecessary, in our baseline forecast.

The interest rate cuts began early, and rates are now down to extremely low levels. Inflation seems neither too hot nor too cold, meaning it is low enough for undistorted economic decisions and financial market confidence, but high enough to ease relative price adjustments.

Adding it all up, the U.S. economy is not out of the business cycle trough just yet, with the new year expected to bring a third consecutive quarterly decline in real GDP. By year-end 2002, though, real GDP should be forging ahead at a 4% annualized rate.

Long-range U.S. Macroeconomic Outlook.

Recessions make up only a small “blip” in economic trends. There have been 10 recessions since World War II. On average, U.S. recessions have lasted between 12 to 15 months, with the most severe lasting as long as 18 months. Even with recessions sprinkled over the last 55 years, real GDP rose an average of 3.5 percent a year. Despite fears of global terrorism and the tragic aftermath of 9/11, the current recession will have very little impact over the long-run. The U.S. economy is expected to bounce back, perhaps a little more tired and more cautious, but eventually it will have vigor and vitality to similar before the recession.

A recession, although hurtful to selected segments of the economy that bear the brunt of its force, is not always a bad thing. Recessions serve to root out weak firms and sagging industries. They weed out poor business practices and reveal ill-conceived business ventures. In the end, it leaves the economy stronger and better able to forge ahead, populated with healthier companies.

In peering into a hazy long range horizon necessary for regional planning, it is useful to view economic and population forecasting not in terms of ‘Did the forecast accurately predict all growth?’, but rather, to think instead about when we might achieve a certain level of growth, plus or minus 2 or 3 years. This turns forecasting on a different axis, and allows planning to proceed, without getting diverted by questions about the “right number”. Planning may be viewed as the accommodation of growth up to a certain range, with policies that speed into implementation sooner when growth is faster and growth management strategies deferred when the economy is growing more slowly.

The current U.S. recession is expected to bottom-out in the 2nd or 3rd quarter of 2002. U.S. Gross Domestic Product (GDP) is anticipated to accelerate through 2003-04, before moderating and tapering off to a more sustainable long run rate – absent of any additional business cycles. The DRI-WEFA national forecast calls for long-term inflation adjusted U.S. GDP to settle into an annual growth rate of between 3.0 and 3.5 percent.

The fundamental underpinnings for the long run growth path of the U.S. depend on the projected growth rate of the labor force and increases in productivity.

U.S. long-run growth fundamentals:

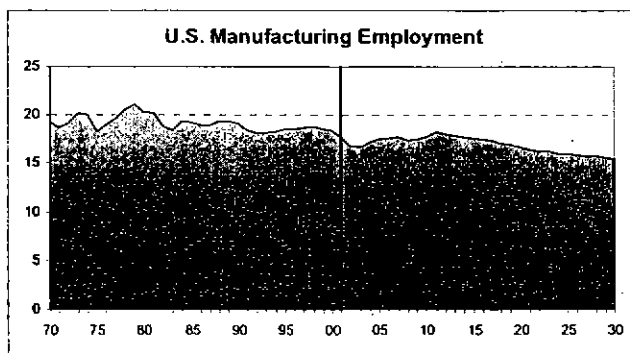
	Annual Average Growth Rates	
	History (1970-00)	25 Year Forecast
Gross Domestic Product	3.1 percent	3.2 percent
Productivity	1.0 percent	2.1 percent
Labor Force	1.7 percent	1.2 percent

Source: DRI-WEFA, Winter 2002 U.S. Economy outlook as derived by Metro Data Resource Center

The national forecast from DRI-WEFA calls for annual productivity rates to double, increasing to 2.1% from its historical rate of 1.0%. Productivity increases are assumed, as more and more U.S. and international firms continue to take advantage of automation and information processing resources. The current U.S. forecast view continues to incorporate significant amounts of “New Economy” growth into the long run macroeconomic forecast. Unlike the technology wave in prior decades, which replaced manual and less efficient means of producing goods and services, this second wave of information technology is creating innovation of a different sort. In the new economy paradigm, new technology assumes the form of new ideas and new products, which lift the overall wealth of the nation.

The significant increases in industrial plant and equipment growth forecasted for the investment in the computers and software category support this view. Over the long haul, the national outlook for high-technology investments is very robust – with an annualized growth rate of 6.8 percent per year. This is slower than the break-neck pace of high-technology investments of the 1990’s, which saw rates shoot up to 22 percent and average over 16 percent a year. This projected investment in high-technology and other innovation will help to bolster productivity in the long run. This allows the nation to create more goods and services at lower costs.

At the same time, employment in high-technology represents a bright spot in the manufacturing sector. Most other manufacturing industries are expected to slowly shed employment as more labor intensive production processes are shipped overseas. In addition, corporate outsourcing is expected to continue along its present path as more

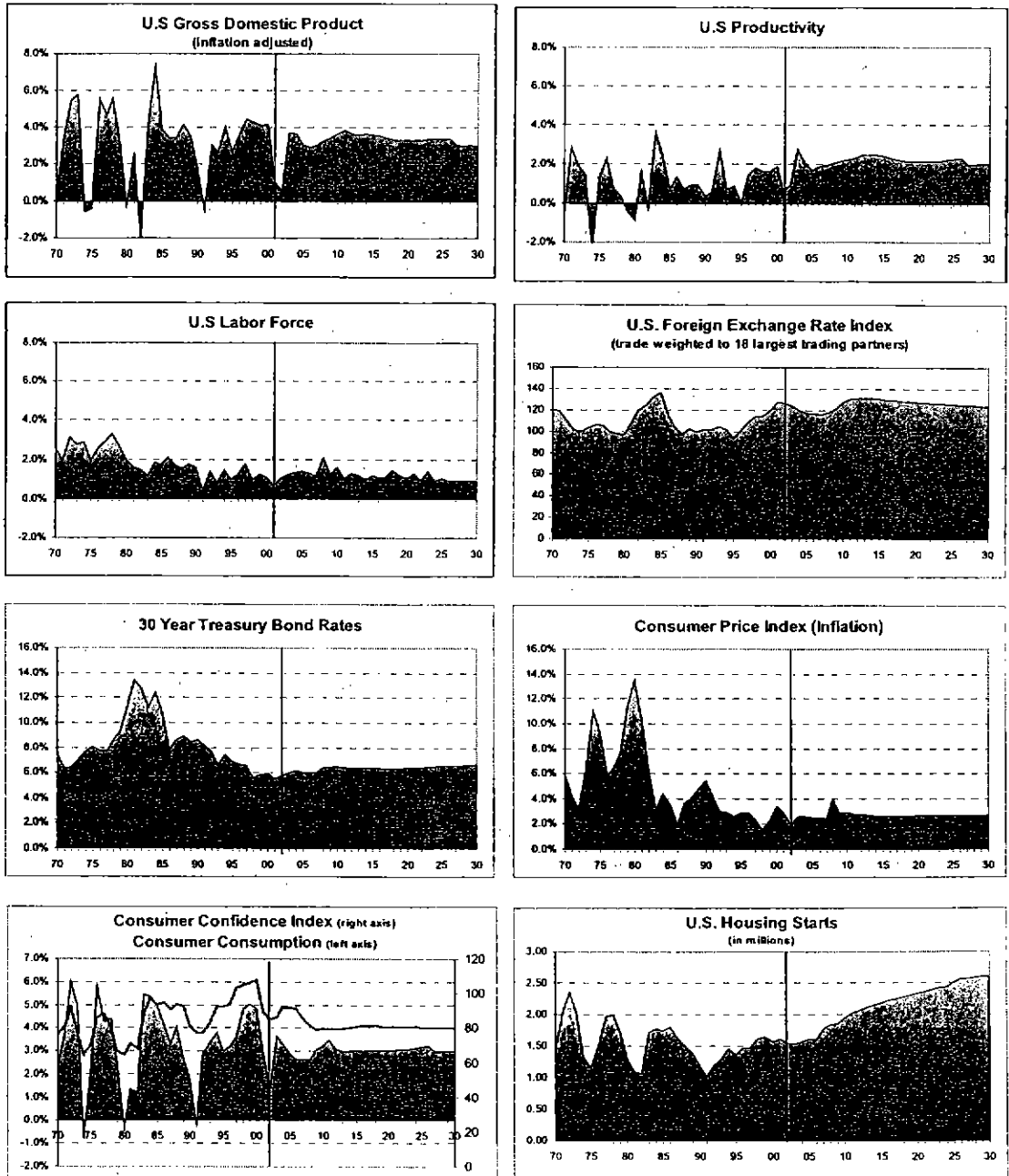


employment functions are re-classified into services. Higher productivity rates allow firms to do more with fewer people. With the exception of the current recession, employment growth in the technology sector continues to see expansion on the order of under 0.5 percent per year. For the whole of manufacturing, employment over the long-haul is expect to decline an average of -0.6 percent annually.

The next fundamental is the growth in the labor force. The U.S. labor force is not expected to grow as rapidly in the next 30 years as it has in the last. This slower rate of increase tends to dampen potential GDP growth. One factor which offsets the potential decline is immigration from abroad, which is expected to be higher than previously assumed. Retention of older workers in the workforce also serves to ameliorate the effect of the slowing of labor force growth.

An economy’s growth rate can fluctuate year-to-year with the rise and fall of the business cycle, but the long range trend of GDP growth is not likely to waver too far from its

expected trend. Changes in monetary or fiscal policy, an unforeseen global recession, changes in capacity utilization, investments and inventory fluctuations are likely to cause economic growth to change as some of these factors play out in the current economic malaise. But these variables are transitory and will tend to fade into the background in the long-run. Determinants of the long-run are primarily the labor force and its productivity.

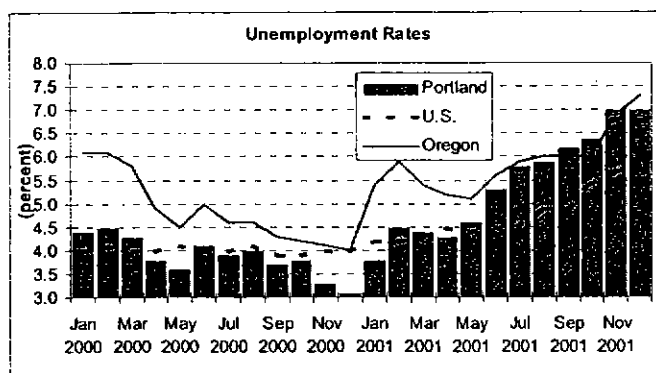


Portland-Vancouver Economic Forecast

(5 counties – Multnomah, Clackamas, Washington, Yamhill and Clark)

Recent Trends.

Economic conditions in the region during the past year have been much worse than the U.S. as a whole. In fact, Oregon brings up the rear in state unemployment rates with an unemployment rate of 7.5 percent¹⁰. And it's not just Oregon; the entire Northwest is suffering. In Washington State unemployment hit 7.1 percent. Things were so bad in November 2001 that for a brief while the Portland metro regional unemployment topped the State's unemployment rate.



Nonfarm employment growth slowed in 1998-99, before seeing a modest rebound in 2000. In 2001, the previous year's brief growth spurt turned negative. Employment news has not been this bad since 1991. Total nonfarm employment lost ground in 2001 as annual job figures for the region fell 0.34 percentage points (or a net loss

of 3,200 jobs). The average number of unemployed rose to near 60,000, with peak unemployment soaring to 75,000 unemployed workers in November and December 2001.

The last four years of economic expansion – dating back to 1991 – have been much more turbulent than the previous six. Regional nonfarm job growth slowed for consecutive years in 1998 and 1999, with growth reaching only 1.8 and 1.4 percent, respectively. The roots for this region's economic slowdown can be traced to the world-wide high-technology slump happening then. The region's higher proportion of manufacturing – especially its concentration of high technology – made the region more susceptible to the so-called "Asian Flu". And the region's proportionally greater exposure to the Pacific Rim caused growth in the late 1990's to decelerate.

In 2000 employment growth exhibited a mini-rebound across the board. Manufacturing jobs edged up 1.5 percent and nonmanufacturing rose 2.5 percent. As 2001 drew nearer, it seemed at first possible that the region would be able to skirt the latest recession, as it had in 1990-91, but events unraveled and the terrorist attacks on September 11th were the last straw for an economy that was on the brink of a downturn. Even by mid-2001, most economic pundits were still hopeful that a regional bounce could be possible by September. Those hopes were destroyed.

¹⁰ Seasonally adjusted. Source: Local Area Unemployment Statistics, Bureau of Labor Statistics, www.bls.gov/web/lauhsthl.htm

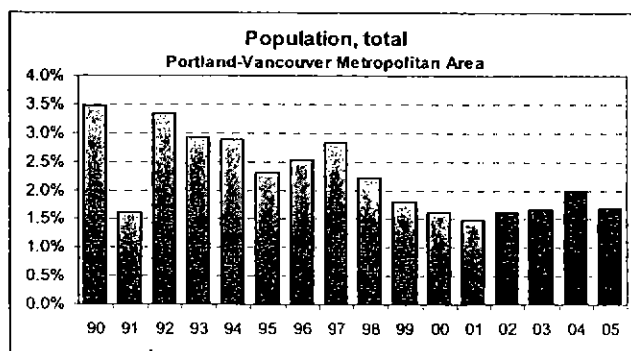
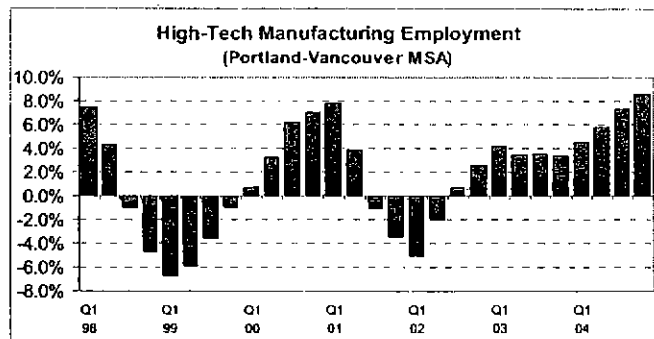
The greatest weaknesses in the region's current economic state lies in its manufacturing sector. Employment declines appeared across almost every major industry group. Overall manufacturing jobs fell by 2.3 percent in 2001 with the steepest declines in transportation equipment, machinery, metals, and food processing.

Regional Expectations.

The conditions that created the recession in the region may provide the possibility as well as the initial surge for a strong rebound in 2003 and 2004. However, until then, the regional economy will have to wait. We anticipate the recession to continue to exert its power over employment and regional growth through much of 2002. Prospects for a rapid rebound in 2002 are quite slim for the region, as a rebound for the nation is not expected until mid-2002. We anticipate a recovery for the region after the U.S., and growth rates to rebound more sharply as compared to the U.S.

This recession has been one that has been marked by a slumping high-technology industry. Negative returns triggered by the collapse in Internet companies and rapid decline in information processing and software investments started what will be a three year decline in the non-electrical machinery and "second-dip" in the region's electronics and instrument industry. High-technology, which had been a mainstay for the region's rapid rise during the mid-1990's, has become this region's Achilles heel. For this reason, the regional economy has dipped lower than that of the U.S., but we anticipate a stronger resurgence in the region's high-tech sector than for the nation as a whole.

Moreover, this region's greater dependence on manufacturing firms to supply employment opportunities has turned into a manufacturers recession, with retail and other service sector industries being dragged down by the producer sector's weaknesses. As the region recovers, what was once a source of



weakness will again become a source of strength for the region's future.

Despite current weakness in the economy, regionwide population estimates through this period have been surprisingly strong. Population growth had been slowing since 1998 with the regional economy winding down.

Forecast Summary for the Portland-Vancouver Region

	1999	2000	2001	2002	2003	2004	2005	Annual Avg 2006-22
(percentage growth rates)								
Population	1.8	1.6	1.5	1.6	1.7	2.0	1.7	1.5
Crude Birth Rate (per 1,000)	14.64	14.66	15.17	15.00	14.83	14.78	14.75	14.3
Crude Death Rate (per 1,000)	7.24	7.35	7.47	7.48	7.49	7.46	7.47	8.5
Labor Force Participation Rate (%)	69.0	69.1	69.1	68.9	68.6	68.4	68.4	69.7
Personal Income, nominal	5.6	7.5	3.5	2.0	6.4	6.3	6.5	5.5
Wage Disbursements	6.4	7.8	2.7	1.4	5.2	6.7	6.8	5.3
Social Insurance Contrib.	6.7	4.7	1.8	0.9	4.8	6.3	6.2	5.6
Other Labor Income	3.5	4.8	2.5	1.1	5.4	5.9	6.5	6.1
Transfer Payments	5.0	4.8	8.6	12.5	11.6	2.1	0.0	6.3
Proprietors' Income	7.4	4.1	2.0	2.2	8.1	4.4	4.8	6.5
Div., Interest & Rent	3.6	9.3	3.6	-1.6	5.5	8.1	5.1	5.3
Housing Price – Median avg.	2.6	3.8	2.3	0.6	3.2	4.7	5.8	4.0
CPI all items – Portland	3.3	3.1	2.7	3.2	3.6	3.3	3.2	2.7
Total Employment	1.7	2.5	0.6	-0.4	2.4	3.2	3.2	2.0
Proprietors	2.9	6.5	0.8	-0.4	1.7	2.5	2.4	2.6
Nonfarm – Wage & Salary, total	1.4	2.4	-0.3	-0.4	2.7	3.5	3.4	1.9
Manufacturing, total	-2.5	1.5	-2.3	-1.3	2.7	3.6	3.5	0.7
Food Processing	-6.3	-1.5	-4.9	-1.7	0.6	1.3	0.3	-1.2
Textile & Apparels	-10.9	-10.7	3.8	-0.7	6.2	5.0	1.5	-3.0
Lumber & Wood	-4.6	1.5	-2.2	0.8	-0.3	-1.8	0.4	-2.8
Paper	-2.9	9.6	-1.3	-0.6	0.1	1.4	0.8	-1.1
Printing	4.6	1.8	-0.3	3.4	2.9	2.3	2.0	0.6
Metals	-2.3	-1.0	-4.6	-2.7	3.1	2.8	2.3	-0.3
Machinery	-10.4	-4.5	-6.4	0.0	3.2	3.1	4.1	1.3
Electronic Equipment	-1.3	8.4	5.0	-1.3	3.5	6.4	5.9	1.3
Transport. Equipment	7.2	-3.4	-20.7	-5.4	3.6	3.0	3.5	0.8
Other Nondurables	-6.3	-0.6	-5.4	-3.8	1.2	2.7	4.1	2.3
Other Durables	2.2	1.1	3.2	-1.7	3.4	2.7	2.7	1.6
Nonmanufacturing	2.2	2.5	0.0	-0.2	2.6	3.3	3.4	2.1
Construction	-0.5	0.6	-1.4	0.4	4.0	3.2	3.6	1.6
Trans., Comm., Util.	2.2	2.2	-1.1	-0.5	1.2	2.7	2.9	1.5
Wholesale Trade	-2.1	-0.3	-2.5	-0.9	4.1	4.3	3.9	1.6
Retail Trade	3.0	2.0	0.0	-0.4	2.0	4.0	4.0	1.8
Fin., Ins., R.E.	-0.7	-2.6	0.1	-0.1	0.3	2.3	3.4	1.4
Health Services	1.5	-0.1	1.8	2.1	3.5	3.4	3.0	2.6
Other Services	3.6	5.2	0.7	-0.5	4.6	4.9	3.9	2.8
State & Local Gov.	5.4	5.2	1.1	-0.6	0.2	-0.1	1.9	1.5
Federal Gov. – Civilian	-1.7	5.5	-3.6	1.4	-0.5	-0.7	-0.2	0.9

With the recession upon the region, population still grew 1.6 percent in 2000 and 1.5 percent in 2001. The last time population growth came anywhere close to 1 percent was back in the mid-1980's – which was a particularly weak period for the region. Stimulus from relatively moderate population increases in the last two years has helped bolster regional employment in industries that are strongly dependent on population growth, such as retail, services and government. This relatively strong employment growth, compared

to our neighboring states, has in turn attracted more than 300,000 new residents since 1990¹¹.

Comparison of Population and Employment Demand Projections.

(5 counties – Multnomah, Clackamas, Washington, Yamhill and Clark)

	POPULATION				EMPLOYMENT		
	Old Forecast	New Forecast	Diff.		Old Forecast	New Forecast	Diff.
2000	1,837,600	1,874,450	36,850	2000	1,147,300	1,208,900	61,600
2005	1,993,300	2,049,200	55,900	2005	1,274,900	1,320,600	45,700
2010	2,152,800	2,233,900	81,100	2010	1,406,400	1,483,800	77,400
2015	2,315,400	2,394,600	79,200	2015	1,537,900	1,631,700	93,800
2020	2,475,000	2,571,100	96,100	2020	1,673,700	1,795,400	121,700
2025		2,768,200		2025		1,979,200	
2030		2,955,300		2030		2,158,100	

Employment figures includes proprietors or self employed workers.

	Manufacturing Emp.*				Non-manufacturing Emp.*		
	Old Forecast	New Forecast	Diff.		Old Forecast	New Forecast	Diff.
2000	138,900	145,500	6,600	2000	780,600	812,500	31,900
2005	145,300	154,700	9,400	2005	870,000	888,800	18,800
2010	149,700	165,900	16,200	2010	961,700	1,002,700	41,000
2015	153,600	168,900	15,300	2015	1,015,200	1,104,200	89,000
2020	157,300	172,800	15,500	2020	1,142,600	1,214,900	72,300
2025		177,200		2025		1,338,200	
2030		182,900		2030		1,458,500	

* Employment figures in these two table above include only wage and salary jobs.

	HOUSEHOLDS				PER CAPITA INCOME (\$1996)		
	Old Forecast	New Forecast	Diff.		Old Forecast	New Forecast	Diff.
2000	736,000	725,400	-10,600	2000	26,600	28,400	1,800
2005	812,100	799,600	-12,500	2005	28,100	27,900	-200
2010	891,500	876,700	-14,800	2010	29,300	28,800	-500
2015	972,000	946,900	-25,100	2015	30,500	30,400	-100
2020	1,052,000	1,021,600	-30,400	2020	31,800	33,000	1,200
2025		1,104,200		2025		35,500	
2030		1,177,800		2030		37,500	

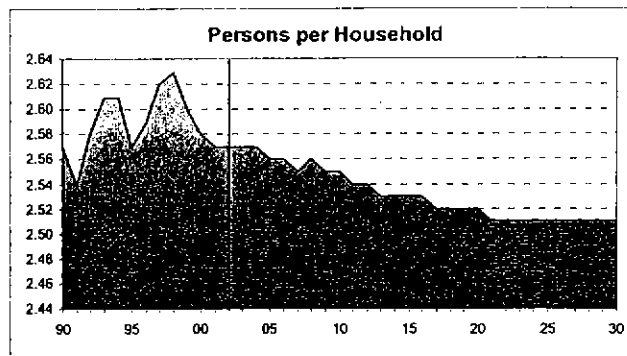
Source: 1995-2015 Regional Forecast (old forecast used in Sept. 1999 Urban Growth Report)
2000-2030 Regional Forecast (new forecast for Dec. 2002 Urban Growth Report)

Regional Population Trends.

The latest Census figures for population in the Portland region have been released, and now show almost 37,000 more residents in 2000 than originally estimated. Higher levels of in-migration account for this larger population total. Migrants tend to be younger and of working age, which in turn raises the employment totals. The demographic composition of the region's population is also not exactly as we had anticipated. The downward trend in household size (i.e., persons per household) seems to have stabilized during the decade of the 1990's, instead of falling as previously expected. The region's

¹¹ We estimate from population figures from the Census and Portland State University that the change in population for 1990 to 2000 was close to 450,000 persons, and migration accounted for about 300,000 of those residents, representing two-thirds of the region's population increase.

average household size in 1990 was 2.57 people. Today, it is estimated to be near that same level. However, the new forecast returns to the longer run secular trend of declining household sizes, but assumes a less precipitous drop-off. As a consequence, the number of new households formed in the future as a result of regionwide population growth is actually less than previously predicted. Household sizes by 2020 are expected to stabilize at around 2.5 persons per household, as compared to 2.4 persons per household in the previous regional forecast.



Population growth from decade to decade has fluctuated up and down with major migrations of Americans, coming west over the Oregon Trail in the mid-1800's and moving to the north and west soon after World War II. More recently, in the 1990's people moved to the Portland area in search of a better place to live or a greater number of job opportunities. This was especially true for high-tech workers.

	Population at end of period	Avg. Growth in decade
1850-60	16,046	9.2%
1860-70	29,857	6.4%
1870-80	54,980	6.3%
1880-90	124,490	8.5%
1890-00	164,381	2.8%
1900-10	322,114	7.0%
1910-20	393,306	2.0%
1920-30	477,073	1.9%
1930-40	527,611	1.0%
1940-50	738,313	3.4%
1950-60	854,645	1.5%
1960-70	1,049,342	2.1%
1970-80	1,297,926	2.1%
1980-90	1,477,895	1.3%
1990-00	1,874,449	2.4%

Source: U.S. Census and PSU

During the 1990's, about two-thirds of new residents had never lived in the Portland area before. Net in-migration will still be a force driving population growth in the future, but a lesser one. Only about half of the region's population increase during the next 20 years will come from migration; the remainder will be from residents having children and grandchildren.

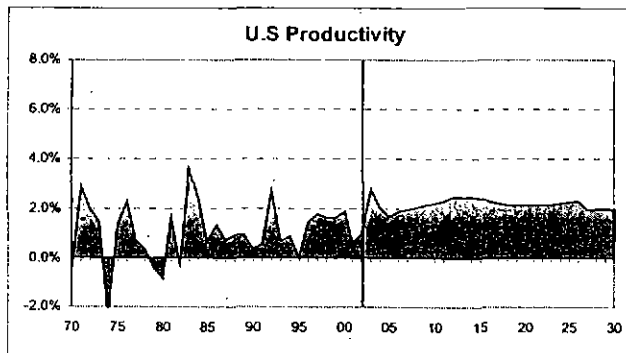
The shape of future population growth in the region will depend on the quality of life here in the region and the ability to generate good paying jobs for future workers. We anticipate population growth to shadow the future employment trends for the region. Regional population growth is expected to average about 1.6 percent per year through 2030, as compared to about 2 percent from

1970 to 2000. Population will increase more rapidly in the near term as current conditions favor an economic rebound, which will attract greater number of migrants. Over the long-haul, though, the average growth rate per year will start to taper off as regional economic growth moderates.

Industry Details and Long-term Forecast Outlook.

The Regional Economy. The regional economy is approaching a crossroad. The current land supply situation is becoming tighter as more buildable land inside the UGB is absorbed by businesses and housing, but as yet is not a limiting factor. This forecast assumes that current land market conditions and regional transportation accessibility do not interrupt growth trends that are evident today.

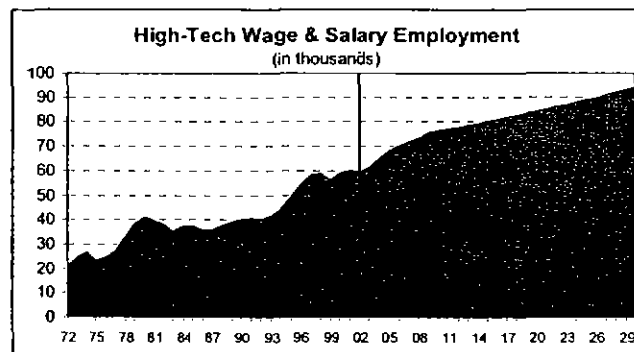
Total nonfarm employment for the region is expected to rise an average of 1.9 percent per year as compared to 1.1 percent in the U.S.. This is somewhat slower employment growth than in the previous 30 years, which saw 3 percent average growth in the region. To a great extent, slower labor force growth is the culprit behind slower job growth. As the labor force participation rate of women eventually reaches and exceeds male participation rates in the future, the rate of growth of the work force slows with the slowdown in labor force participation.



Productivity is projected to rise steadily over the next 30 years, but productivity is a "two-edged sword". On the one hand, productivity helps lift corporate profits, wages and salaries without causing additional inflation, but it also tends to cut into employment. On the other hand, when productivity can also bolster output and create new demand, this type

of innovation makes employees more productive and valuable and has the effect of bolstering employment growth.

In older manufacturing situations, productivity does indeed reduce the need for more employment. When new machinery and innovative processes simply replace human activity without a corresponding increase in the demand for additional goods or services, then the need for labor is reduced and employment growth in that industry stalls. In this region, traditional industries such as food processing, metals, and other resource extractive industries are projected to improve their productivity by replacing people with machinery. Output may stay the same or increase, but projected employment declines.



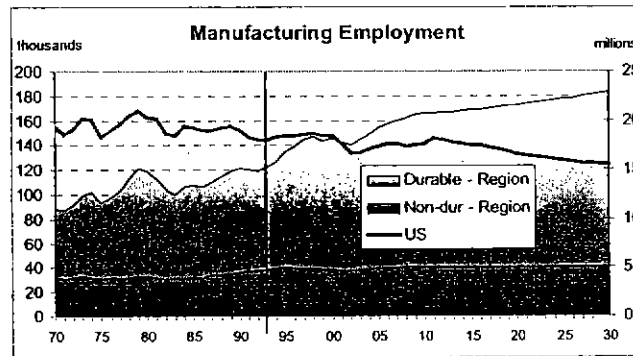
On the other hand, when productivity and innovation can boost output and create new demand, the need for workers – particularly skilled ones – will become increasingly significant in these industries. The “New Economy” presupposes that high-tech industries such as computers, information processing, software, telecommunications and biotechnology firms will lead employment growth. The regional firms are well situated to take advantage of computer, information processing and software developments. These regional industries are one of two classifications in manufacturing that will see employment actually increase from today’s levels.

The combined high-tech industries in the region employed approximately 60,000 workers in 2001. The ranks of the high-tech workforce in the region are expected to swell to 94,000 by 2030. This represents an addition of two high-tech companies the size of Intel today. Possibly, some of this growth will be from an agglomeration of smaller firms, but in order to facilitate this level of growth the region may perhaps attract another major high-tech player. However, the majority of industry growth will likely be attributed to the internal expansion and vitality of existing firms in the region.

The total number of regional jobs, including self-employed workers, is about 61,000 higher in 2000 in the new forecast than was previously forecasted. Job growth in high-tech electronics and semiconductors, construction, and the service sector showed the widest deviations. This is to be expected, given that the old forecast was completed before the wave of high-tech expansion and construction. Unanticipated service sector job growth can be attributed to faster-than-predicted population increases, and the economic downstream effect of more high-tech workers in the region. This new forecast incorporates these latest trends.

Nondurable Manufacturing.

Industries which are included in nondurable manufacturing are Food Processing (SIC 20), Textile and Apparel (SIC 22 & 23), Paper (SIC 26), Printing and Publishing (SIC 27). Except for printing and publishing, the major nondurable industries are expected to see falling employment levels during the next 25 years. A combination of anticipated productivity gains, overseas competition, limited supplies, and relocation of production capacity abroad spells an overall trend to declining jobs.



Our view on the printing and publishing industry assumes job growth to continue in this industry but at a slower pace than during the last 30 years. Employment growth is expected to achieve an average rate of 1.4 percent per year as compared to 3.4 percent in the decades before.

Durable Manufacturing. Industries classified in this category include Lumber & Wood Products (SIC 24), Metals (SIC 33 & 34), Machinery & Computer equipment (SIC 35), Electrical Machinery, Semiconductors and Instruments (SIC 36 & 38), and Transportation Equipment (SIC 37). The resource based industries (lumber and paper) are projected to experience steady decreases in employment as productivity and competition from other regional sources erode the region's competitiveness.

The business cycle for metals and transportation is not dead. Transportation equipment in the near term is expected to remain weak because of travel fears. However a delayed rebound is expected even after the travel industry recovers and the global recession retreats due to the weakness in the airline market. The region's metals industry, include primarily aluminum makers and scrap metal re-producers, is projected to remain flat in employment. Long-term, regional employment in this sector is projected to be about the same level of employment as today. However, the path into the future for both industrial sectors is likely to suffer through wide swings in employment with fluctuating global change.

Nonmanufacturing Employment Trends. The steady shift in focus of the workforce to nonmanufacturing is expected to continue. Job growth in the nonmanufacturing sector is projected to exceed 2 percent per year on average. The nonmanufacturing sector created over 800,000 jobs in 2000 as compared to 300,000 in 1970. This total is expected to reach 1.46 million by 2030.

The largest component continues to be the service sector, which employs almost 280,000 workers. A fast growing segment of the service sector includes business services, computer software development and health services. Health services alone comprises more than 22 percent of service sector jobs. With the average age of the U.S. population growing older, more resources are expected to be diverted towards health care. A generally older population will tend to have greater accumulated wealth and is more likely to purchase more services than today. Regional job growth in total services is projected to reach an average of 2.8 percent growth per year.

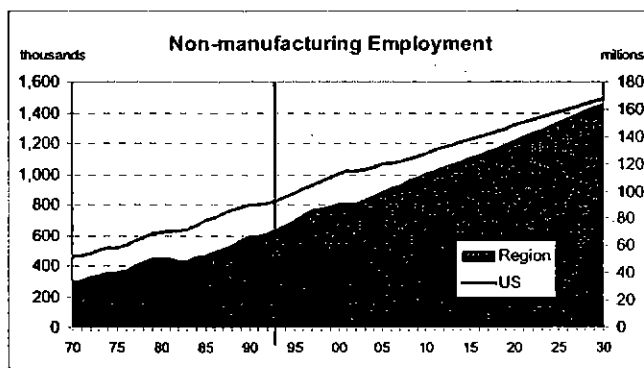
Business services, and temporary help services in particular, is likely to be a relatively fast growth segment as more and more firms out-source temporary help as well as ancillary business functions such as accounting, printing, and human resources.

Software development is expected to be another strong growth segment in services. With long-run investments in computer and business equipment steadily growing, software to manage and control these new devices will be aided by the advancement in technology.

The transportation services sector is expected to see relatively stronger growth than its companion communication and utility sector workforce. While the transportation sector continues to press its comparative advantage as a regional distribution hub in Portland, the communication and utility sector is expected to see limited expansion opportunities. Overall, the transportation, communication and utilities industry (TCU) is projected to growth at near the region's rate of population growth (1.5 percent APR).

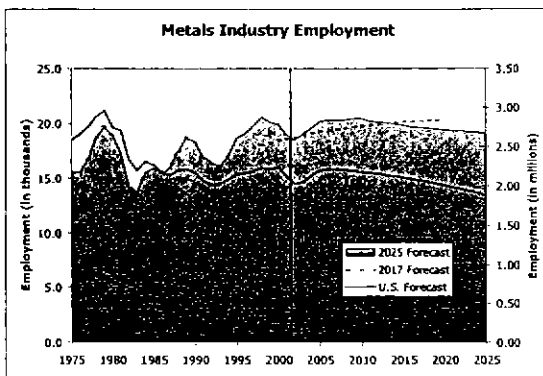
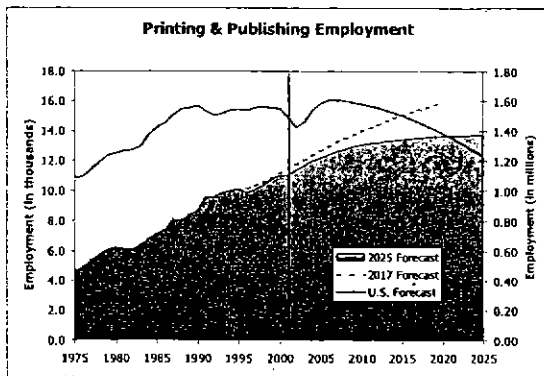
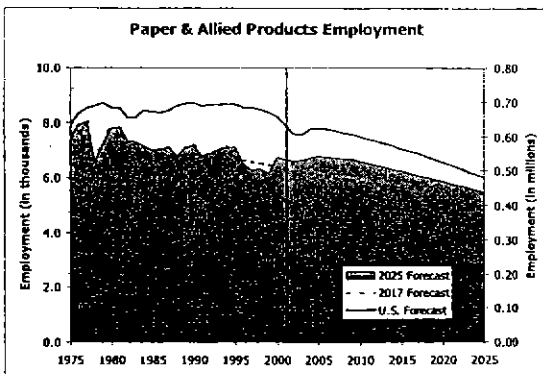
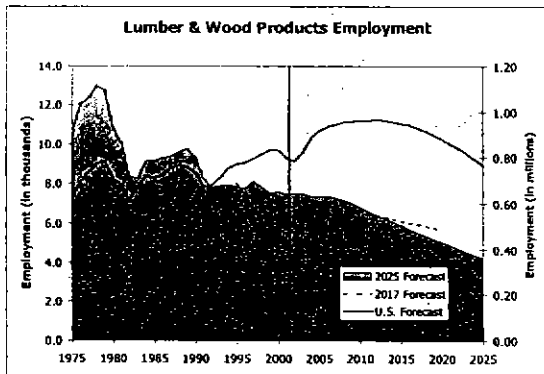
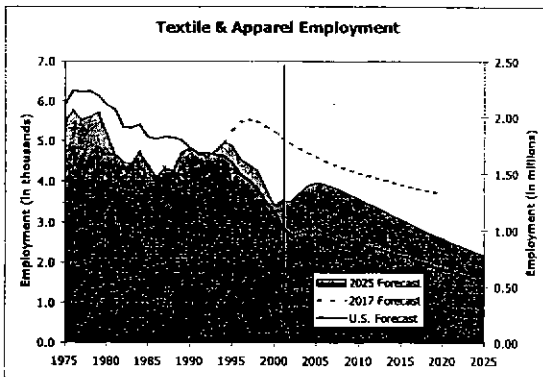
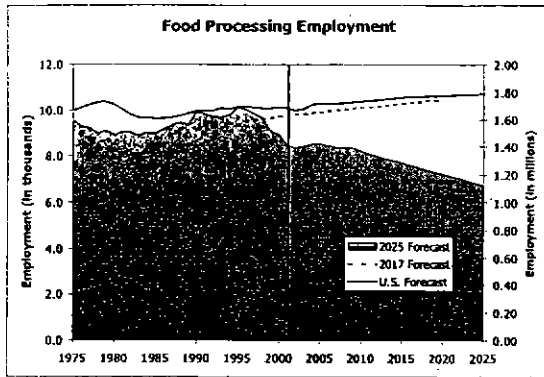
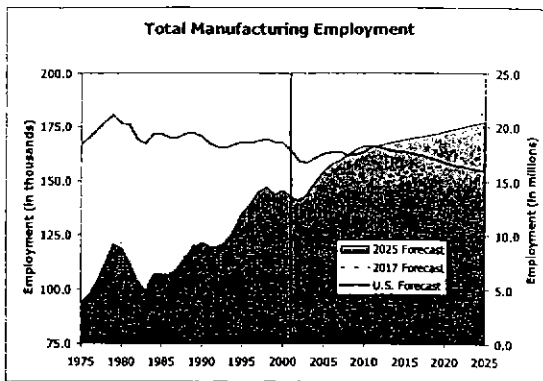
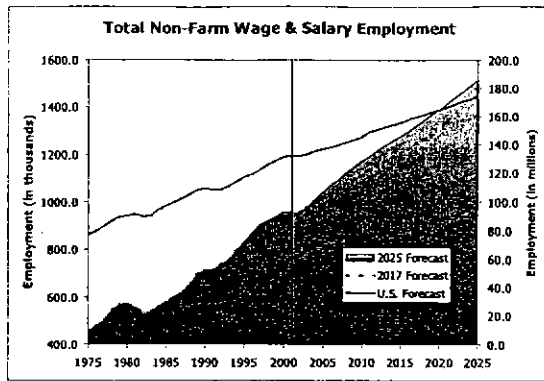
The retail and wholesale trade sectors in the region are expected to also increase at about the rate of population growth. Retail trade employment is forecasted to grow an average of 1.9 percent APR while wholesale trade is expected to grow a bit slower at 1.7% APR. The region's proximity to Asian markets and as distribution hub for the Northwest will play a key role in aiding wholesale trade employment to continue to add to job growth in the region.

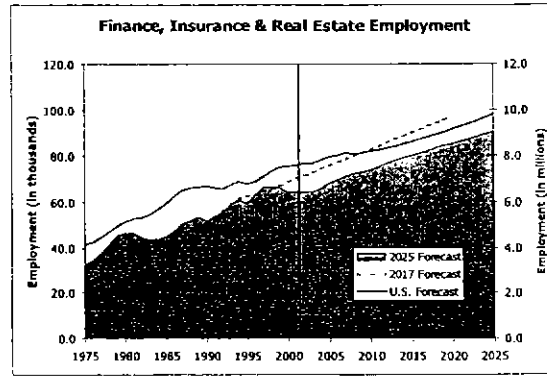
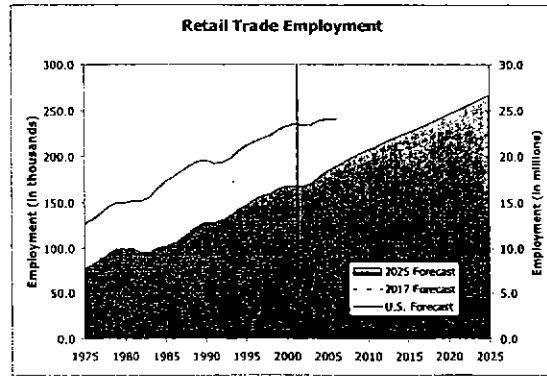
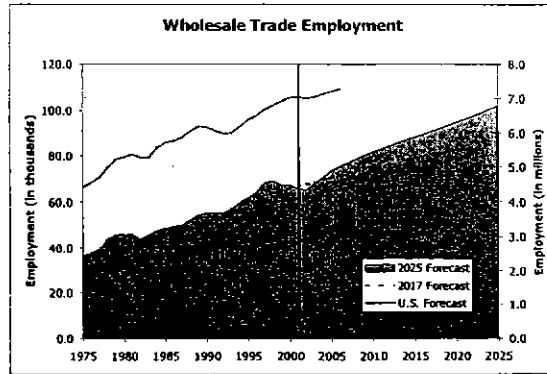
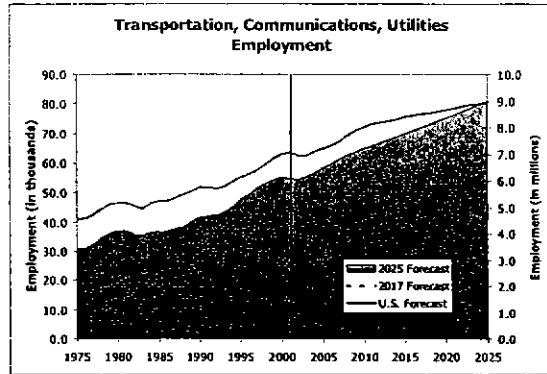
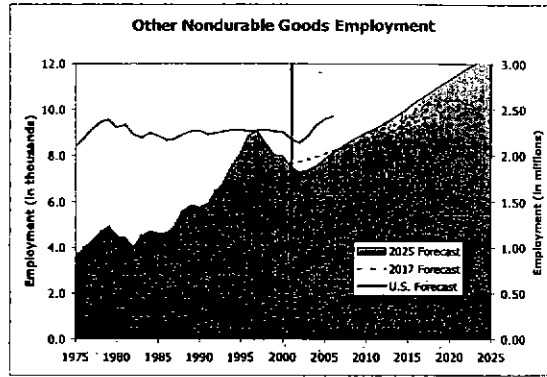
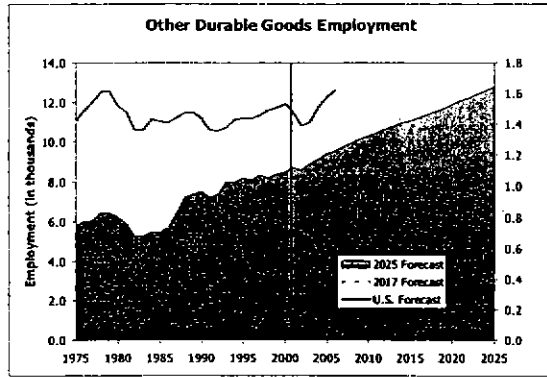
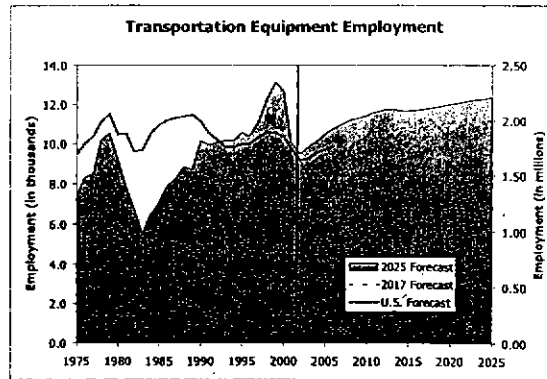
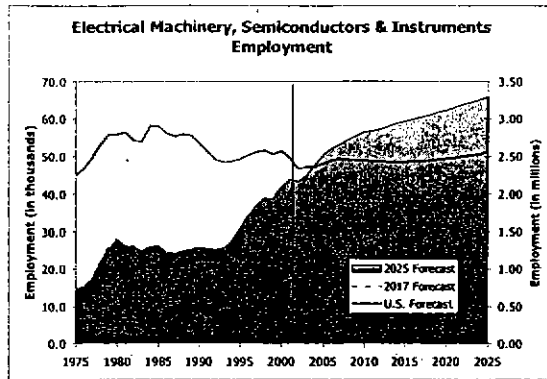
The region's finance sector has been weakened in the wake of mergers and acquisition in the banking community that has led to a significant number of corporate headquarter jobs relocating to other states. The prospects for well-paying corporate level finance positions have diminished and as a result the forecast reflects significantly slower job growth in the finance, insurance, and real estate sector. The cyclical weakness in the region has hampered job growth in the insurance and real estate sectors. These industry segments tend to ebb and flow with changes in population and income. Right now, these factors are down. Over the long haul, we expect these economic factors to rebound. In total, the average percent rate of growth is expected to run about 1.4 percent per year.

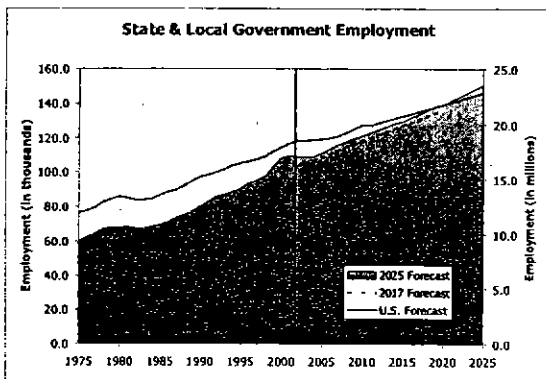
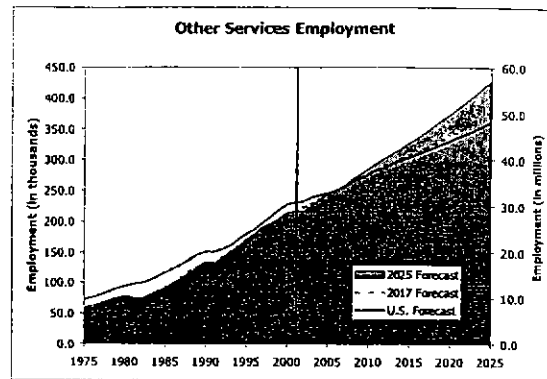
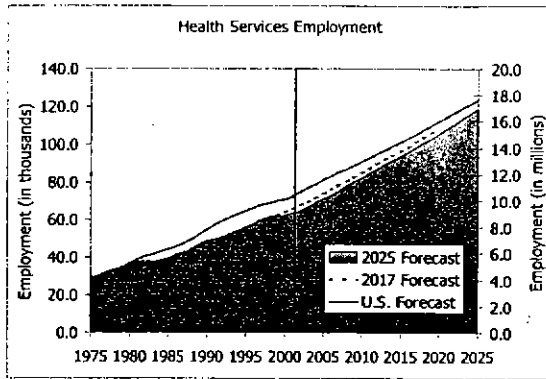


The construction sector has historically been an early indicator of business cycle turning points. In fact, construction employment has been very weak for several years leading up to the current recession. This is clearly another factor that has lead this region to having one of the highest unemployment rates of metropolitan areas in the nation. The regional forecast calls for construction jobs to rebound after the recovery and for growth to be moderate instead of a sharp rebound. The forecast anticipates the region's construction industry to experience job growth similar to the average in population – 1.6 percent.

Employment in state and local government is projected to increase by a small margin slower than population growth. The assumption is that tight state and local budgets will limit job growth in government.







Alternate Regional Growth Scenarios

Introduction.

Regional forecasts are constructed based on numerous assumptions. Prior sections of this economic report focused on the mid-growth or baseline regional growth forecast and its assumptions. The baseline forecast represents, in our opinion and those of peer review panels, the most likely and reasonable growth projection for the Portland region over the next 20+ years. Knowing that forecasts can change as world events unfold, we have prepared separate high and a low growth scenarios. For policy makers, these two scenarios delineate a range of possibilities in case economic and demographic conditions change drastically from the baseline assumptions.

We have prepared two alternative forecasts: a pessimistic scenario and an optimistic scenario. Each scenario begins with the regional baseline forecast and tilts all the economic drivers in one direction or another. The pessimistic scenario assumes economic and population will grow much more slowly. The pessimistic regional scenario incorporates DRI-WEFA's pessimistic U.S. growth projections in which all the key economic variables are "dialed" to a lower growth setting, and also assumes the Census Bureau's high mortality and low fertility assumptions. The optimistic regional scenario assumes DRI-WEFA's optimistic U.S. growth projections and the Census Bureau's low mortality and high fertility assumptions.

The high and low growth scenarios that have been developed for the region represent extreme bandwidths for regional growth. It is estimated that over the next 20+ years of the forecast that there is over a 90 percent probability that regional growth will fall within the range of these two scenarios. However, the baseline regional forecast remains as the best approximation of the region's most apparent growth trend.

The Regional Growth Alternatives.

Regional Overview. The low growth (pessimistic scenario) forecast for the region is characterized by substantially slower employment growth than its baseline counterpart. Total wage and salary employment growth comes in at an anemic 1.3 percent APR over the duration of the forecast. Manufacturing employment within the region stalls and in particular high technology jobs grow at very low levels (0.5 percent APR in pessimistic, 1 percent in the baseline, 1.5 percent in optimistic). Other regional industries suffer significant job losses as industrial production nationwide is assumed to contract in many resource and labor intensive industrial sectors. As a result of this national pessimism, the consumer sector takes a significant beating as consumption falls well below historic rates.

Not only is the economic sector battered by weaker regional economic performances, the population and labor trends for the pessimistic scenario assumes much slower increases too. The pessimistic scenario restricts labor force growth because of lower net migration into the region and lower birth rates and lower life expectancies. These factors combine to slow the future rate of population growth. In turn, the lower demographic factors force

employment growth in population serving industries to cut back employment growth too. Generally, in the traded sector industries, a dimmer outlook for national growth dampens regional economic activity relative to the base trend. Overall, the potential output for the region is significantly diminished as compared to the region's baseline forecast.

Other economic factors in the low growth regional scenario also grow more slowly – including the housing stock, housing values appreciate much less, and the ability of governments to generate revenue from taxes is lower (but demand for government services may be less in some areas but more in others, such as welfare and other low income aid.) because personal income in the region will also be substantially less.

In the case of the regional high growth (optimistic scenario) forecast, economic and demographic assumptions are “dialed up at a higher rate”. National economic conditions are all assumed to favor more rapid economic expansion worldwide. This U.S. forecast is characterized by higher GDP, lower inflation, lower interest rates, lower exchange rates, lower oil prices and at the same time employment and industry production rates are to grow more rapidly. Demographic conditions in the optimistic case is characterized by a greater migration rates that corresponds to greater overall population, labor force, and employment growth. The national outlook that drives the high scenario assumes annual U.S. population growth averages 1.3 percent per year (1.0 percent in the baseline trend, 0.5 percent for the pessimistic scenario).

Because the optimistic scenario assumes a higher growth trend for the U.S., the region shares in the greater bounty. Birth rates are higher, life expectancies are higher, and regional migration hits greater heights which in turn drives up regional population growth. The region's population growth averages 2 percent per year during the forecast (1.5 percent in the baseline trend, 0.8 percent for the pessimistic scenario). The higher population trend pushes the adult population higher which directly affects the regional labor force. More people in the labor force and better economic conditions lead to higher job growth in the region. Regionwide wage and salary employment growth averages 2.2 percent in the optimistic case (1.8 percent in the baseline trend, 1.3 percent for the pessimistic scenario).

Population Comparisons. Total population in the baseline scenario for the five county region¹² grows from 1,874,400 residents in 2000 (source: Census sf1) to 2,647,000 by year 2022. In comparison, the optimistic scenario grows to 2,822,300; whereas the pessimistic scenario reaches a level of 2,212,100 residents in the same period of time. The difference between scenarios as compared to the baseline is a matter of minus 4 years for the optimistic regional scenario and plus 10 years in the pessimistic regional scenario¹³.

The baseline population growth trend is characteristic of birth, death and migration trends consistent with emerging trends in the region and of national demographic expectations.

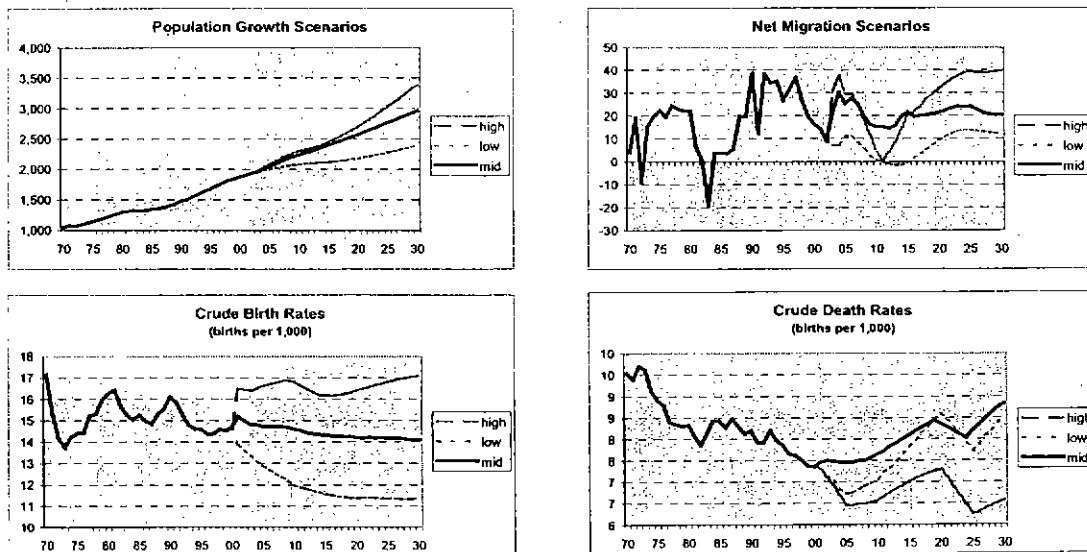
¹² Includes Multnomah, Clackamas, Washington, Yamhill and Clark counties

¹³ In other words, the optimistic scenario reaches the 2022 population mark in the baseline trend 4 years sooner and in the case of the pessimistic scenario, over 10 years later.

Regional population trends assumed in the optimistic case are characteristic of migration patterns experienced in the Portland region during a sustained period of very high in-migration levels. The variation in migration levels in the optimistic scenario mimic those experienced during the late-1980's and 1990's in the Portland region, but over the entire forecast, the average growth rate in the optimistic case is below the regional trend rate in the 1990's (history: 2.4 percent, forecast: 2.0 percent). In addition, we assume higher fertility and life expectancies for residents living in the region.

A population rate that mimics national growth rates is assumed in the pessimistic scenario. This scenario represents an extremely low population rate for the region and is highly uncharacteristic of past trends. At no point in history has the region ever experienced over 20 years of repressive population trends as exhibited in this pessimistic regional scenario. The only period in regional history that saw population growth slow to near 1 percent APR was the 10-year period that included the 1930 era Depression. Clearly, the region is unlikely to experience 20 years of depression-style population growth and so this scenario represents the lower bounds of this region's population trends.

Bandwidth Forecasts for Selected Regional Population Characteristics



In the pessimistic scenario, we wanted to characterize what could be a lower bound of population if we assumed very little regional in-migration, low natural increases in regional population and how these factors would impact regional employment growth. The population growth rate in the pessimistic scenario is similar to the growth rate that DRI-WEFA has forecasted for the U.S. in its baseline trend projection.

Similarly, the optimistic scenario for the region is as equally unlikely, but is illustrative of a higher bound of this region's population trend. It is improbable that this region would achieve 20 years in a row of population growth that copied what this region experienced

during the 1990's. It is also unlikely that another \$12 billion of high-tech investments would be repeating itself in next 20 years – especially so soon after the 1990's boom.

Economic Comparisons. In part, employment growth drives off of population because of the labor force characteristics derived from each growth alternative. Labor force conditions in the optimistic scenario call for growth to average 2.1 percent per year (1.6 percent in the base, 1 percent in pessimistic). Because at the national level, the adult population is expected to grow faster in the optimistic case, more working age adults are expected to migrate into the region seeking jobs. Also, faster internal population growth from natural increases will also add to the region's labor force. The expectation in the high growth scenario calls for regional employment to rise an average of 2.2 percent per year (1.8 percent in the baseline trend, 1.3 percent for the pessimistic scenario).

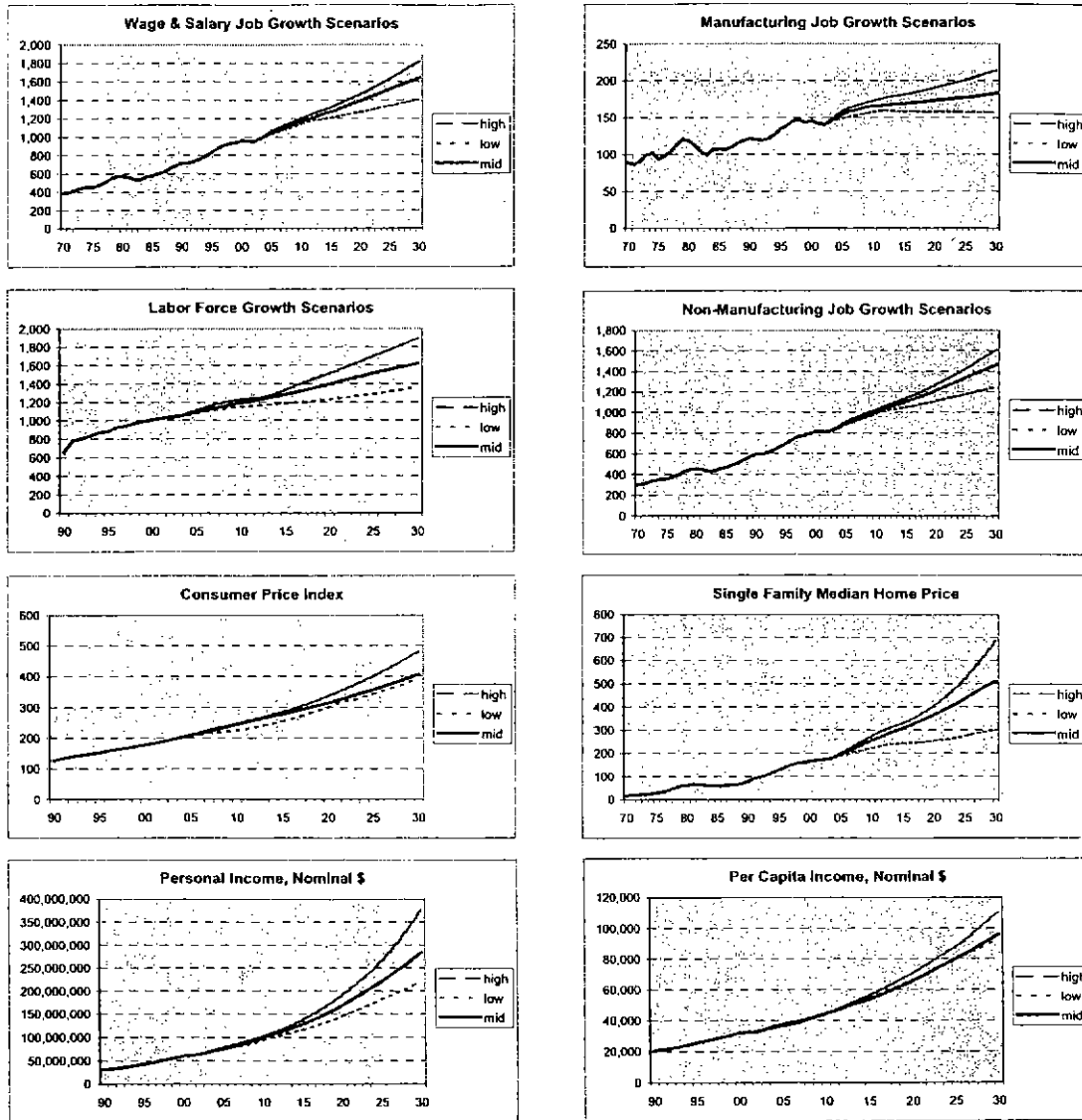
Wage and salary employment growth is expected to exceed the change in the labor force in part due to the expectation that labor force participation rates will continue to edge up modestly in all scenarios

In the optimistic case, regional income growth is expected to rise more sharply than the baseline trend scenario. However, because population growth rises fairly rapidly and the inflation rate in the high growth scenario is greater, the region forecast exhibits a quirky situation in which per capita income growth in real dollars is slower in the optimistic case than the base case. Otherwise, in current dollars, regional per capita income grows and is higher in the optimistic case.

In all cases, wage and salary disbursements still represent over half of all earned and unearned income. Interestingly, the amount of transfer payments coming to the region in the optimistic case is less than transfer payments received in the baseline forecast. This results from the region achieving greater economic prosperity in the high growth case as to offset income transfers to medicare/medicaid recipients, unemployment benefits, and social security, aid for dependent children and welfare payments.

Home prices appreciate more rapidly (average 4.8 percent per year in the optimistic, 3.8 percent in base case, 2.0 percent in pessimistic) in the optimistic case. Higher housing prices are indicative of an economy that exhibits hefty gains in population, employment and income as in the optimistic scenario. More population fuels the labor force which in turn leads to employment gains. Robust employment and relatively greater productivity in the future combine to boost the rate of income growth. More income and more people add up to more demand for housing. In the short run, production of housing falls behind the demand for housing, home prices appreciate in the short run because of deficits. However, over the long run the consistently higher demand shifts the demand curve higher resulting in higher home prices. The opposite occurs in the pessimistic scenario for the region. Thus, a lower revving regional economy generates less housing demand, and so home prices don't appreciate as readily.

Bandwidth Forecasts for Selected Regional Economic Characteristics



National Overview. Regional growth is directly affected by the national outlook. The regional baseline forecast is derived from DRI-WEFA's trend outlook for the U.S. The optimistic and pessimistic regional alternatives derive from DRI-WEFA's respective optimistic and pessimistic national scenarios.

A U.S. economic outlook that presents a much more robust forecast creates economic incentives and downstream benefits for regional industries and households. In the case of the DRI-WEFA optimistic U.S. forecast, higher GDP, productivity, employment, and other favorable economic conditions spur a faster pace of regional activity. Conversely, a U.S. forecast that is more constrained in its outlook for the U.S. will have an opposite effect on regional economic activity.

The following table highlights major sectors of the U.S. economy as well as demographic and economic factors which affect the pace of long-run economic activity for the region.

U.S. Economic and Demographic Summary Details.

(Average Annual Percent Change)

	History	30-Year Forecast		
	1970-00	Optimistic	Baseline	Pessimistic
Population and Labor Force				
Total Population	1.0%	1.3%	1.1%	0.5%
Labor Force	1.7	1.1	1.0	0.8
Total Wage & Salary Jobs	2.1	1.1	1.0	0.5
Manufacturing	-0.1	-0.3	-0.7	-0.9
Non-manufacturing	2.6	1.3	1.2	0.7
GDP Components (\$1996)				
Gross Domestic Product	3.1	3.6	3.1	2.6
Consumption	3.3	3.6	3.1	2.7
Investment, total	4.3	5.0	4.0	3.5
Technology (equipment & software)	14.6	6.6	6.1	5.7
Government, Federal	0.7	1.5	1.3	1.4
Government, State & Local	2.6	2.1	1.7	1.5
Personal Income (\$1996)	2.6	3.5	3.0	2.7
Output and Productivity				
Output	2.9	3.5	3.0	2.4
Productivity	0.8	2.6	2.4	1.9
Inflation and Prices				
CPI	5.2	2.5	3.1	3.9
GDP price deflator	4.4	2.3	2.8	3.6
Oil Price (\$/ barrel)	14.2	2.5	2.6	4.0
Global Conditions				
Global GDP	2.4	2.5	2.4	2.3
Exchange Rate	0.3	-0.3	-0.1	0.0

Source: DRI-WEFA, Winter U.S. forecast as compiled by Metro DRC

Early Risks to the Regional Forecast.

The regional forecast assumes that the U.S. economy is in a mild recession, but that the monetary and fiscal boosts succeed in turning it around in early 2002. The regional forecast also assumes that, by spring 2002, consumers have shaken off their fears of flying and large crowds. Finally, it assumes that there are no further direct terrorist attacks on the United States, and that military action ends with the defeat of the Taliban, the rout of al Qaeda, and stability in the middle east. Any or all of these assumptions could prove too rosy.

On the other hand, the regional forecast could be overly pessimistic. Businesses may have overreacted to the plunge in spending that followed the September 11 attacks. This scenario carries its own risks. If activity is about to turn around on its own, the huge amount of monetary and fiscal stimulus in the pipeline could prove excessive. Rather than grease the wheels of the recovery, it would set up the conditions for a return of inflation and speculative investment. Nonetheless, in our estimation there is more downside risk than upside growth potential at this juncture of the business cycle.

See Appendix Sections for further details :

- Appendix A: Table 14: “Alternate Forecasts for the Portland-Vancouver, OR-WA” for a summary table of key variables in the regional forecast.
- Appendix B: “A Range of Possibilities: The Optimistic and Pessimistic Projections” for DRI-WEFA’s description of the national alternatives.

**Appendix A:
Regional Economic Forecast Details**

Table 1

Total Population of Selected Metropolitan Areas, Counties, States, and U.S.

	Portland- Vanc. OR- WA	Pct. Chg.	Salem	Pct. Chg.	Yamhill	Pct. Chg.	Columbia	Pct. Chg.	Oregon	Pct. Chg.	California	Pct. Chg.	U.S. (in mil.)	Pct. Chg.
1970	1,049.3		186.7		40.2		28.8		2,091.0		20,039.0		205.1	
1971	1,075.8	2.5%	192.6	3.2%	41.5	3.1%	29.9	3.8%	2,151.0	2.9%	20,346.0	1.5%	207.7	1.3%
1972	1,072.5	-0.3%	194.3	0.9%	42.2	1.8%	30.1	0.7%	2,197.3	2.2%	20,585.0	1.2%	209.9	1.1%
1973	1,092.6	1.9%	200.1	3.0%	43.4	2.9%	30.2	0.4%	2,241.9	2.0%	20,869.0	1.4%	211.9	1.0%
1974	1,117.5	2.3%	205.0	2.4%	44.0	1.4%	31.2	3.2%	2,285.0	1.9%	21,174.0	1.5%	213.9	0.9%
1975	1,145.8	2.5%	207.5	1.2%	44.9	2.0%	31.8	2.1%	2,329.7	2.0%	21,538.0	1.7%	216.0	1.0%
1976	1,171.7	2.3%	214.7	3.5%	45.7	1.8%	32.4	1.9%	2,378.3	2.1%	21,936.0	1.8%	218.0	1.0%
1977	1,203.6	2.7%	219.7	2.3%	47.2	3.3%	33.3	2.8%	2,446.7	2.9%	22,352.0	1.9%	220.2	1.0%
1978	1,234.8	2.6%	231.6	5.4%	51.8	9.6%	33.9	1.8%	2,518.3	2.9%	22,836.0	2.2%	222.6	1.1%
1979	1,266.0	2.5%	237.0	2.3%	53.6	3.5%	34.9	2.9%	2,588.0	2.8%	23,257.0	1.8%	225.1	1.1%
1980	1,297.9	2.5%	249.9	5.4%	55.3	3.3%	35.7	2.1%	2,633.1	1.7%	23,782.0	2.3%	227.7	1.2%
1981	1,314.8	1.3%	256.4	2.6%	56.3	1.8%	36.2	1.4%	2,668.0	1.3%	24,278.0	2.1%	230.0	1.0%
1982	1,325.6	0.8%	252.4	-1.5%	56.6	0.5%	36.2	0.1%	2,664.9	-0.1%	24,805.0	2.2%	232.2	1.0%
1983	1,316.9	-0.7%	250.5	-0.8%	56.2	-0.7%	36.0	-0.6%	2,653.1	-0.4%	25,337.0	2.1%	234.3	0.9%
1984	1,329.6	1.0%	255.0	1.8%	57.0	1.4%	36.2	0.6%	2,666.6	0.5%	25,816.0	1.9%	236.4	0.9%
1985	1,342.3	1.0%	258.1	1.2%	57.6	1.1%	36.1	-0.3%	2,672.7	0.2%	26,403.0	2.3%	238.5	0.9%
1986	1,355.2	1.0%	254.8	-1.3%	57.1	-0.9%	36.1	0.0%	2,683.5	0.4%	27,052.0	2.5%	240.7	0.9%
1987	1,369.5	1.1%	260.3	2.2%	58.4	2.3%	36.1	0.0%	2,701.0	0.7%	27,717.0	2.5%	242.8	0.9%
1988	1,398.6	2.1%	266.3	2.3%	59.8	2.4%	36.8	1.9%	2,741.3	1.5%	28,393.0	2.4%	245.0	0.9%
1989	1,428.4	2.1%	271.8	2.1%	60.7	1.5%	37.3	1.4%	2,790.6	1.8%	29,142.0	2.6%	247.3	0.9%
1990	1,477.9	3.5%	278.0	2.3%	65.6	8.0%	37.6	0.7%	2,842.3	1.9%	29,811.4	2.3%	249.9	1.0%
1991	1,502.0	1.6%	287.9	3.6%	67.9	3.6%	37.8	0.6%	2,918.8	2.7%	30,414.1	2.0%	252.7	1.1%
1992	1,552.0	3.3%	294.5	2.3%	69.2	1.9%	38.8	2.6%	2,973.9	1.9%	30,875.9	1.5%	255.4	1.1%
1993	1,597.4	2.9%	301.0	2.2%	70.9	2.5%	38.8	0.0%	3,034.5	2.0%	31,147.2	0.9%	258.1	1.1%
1994	1,643.4	2.9%	307.2	2.1%	72.8	2.7%	39.4	1.5%	3,087.1	1.7%	31,317.2	0.5%	260.7	1.0%
1995	1,681.1	2.3%	313.4	2.0%	74.6	2.5%	39.7	0.8%	3,141.4	1.8%	31,493.5	0.6%	263.0	0.9%
1996	1,723.9	2.5%	319.1	1.8%	77.5	3.9%	40.1	1.0%	3,195.1	1.7%	31,780.8	0.9%	265.2	0.8%
1997	1,772.7	2.8%	324.4	1.7%	79.2	2.2%	41.5	3.5%	3,243.3	1.5%	32,217.7	1.4%	267.6	0.9%
1998	1,812.0	2.2%	331.6	2.2%	81.9	3.4%	42.3	1.9%	3,282.1	1.2%	32,682.8	1.4%	269.9	0.9%
1999	1,844.6	1.8%	335.4	1.1%	83.1	1.5%	42.7	0.8%	3,316.2	1.0%	33,145.1	1.4%	272.2	0.8%
2000	1,874.5	1.6%	347.2	3.5%	85.0	2.3%	43.6	2.1%	3,421.4	3.2%	33,871.6	2.2%	274.5	0.8%
2001	1,902.5	1.5%	352.6	1.5%	86.4	1.6%	43.5	-0.2%	3,465.8	1.3%	34,456.6	1.7%	276.8	0.8%
2002	1,934.3	1.7%	358.6	1.7%	88.2	2.0%	43.9	1.0%	3,504.5	1.1%	35,127.7	1.9%	279.1	0.8%
2003	1,963.7	1.5%	364.6	1.7%	89.9	1.9%	44.4	1.0%	3,533.7	0.8%	35,771.6	1.8%	281.3	0.8%
2004	2,007.7	2.2%	370.6	1.6%	91.4	1.7%	44.8	1.1%	3,583.0	1.4%	36,549.6	2.2%	283.6	0.8%
2005	2,049.2	2.1%	376.4	1.6%	92.9	1.6%	45.3	1.1%	3,629.6	1.3%	37,337.6	2.2%	285.9	0.8%
2006	2,091.0	2.0%	382.2	1.5%	94.3	1.5%	45.8	1.1%	3,674.9	1.2%	38,087.1	2.0%	288.2	0.8%
2007	2,132.8	2.0%	387.4	1.4%	95.6	1.3%	46.3	1.1%	3,720.5	1.2%	38,904.6	2.1%	290.5	0.8%
2008	2,170.1	1.8%	392.7	1.4%	96.8	1.3%	46.8	1.1%	3,762.3	1.1%	39,715.2	2.1%	292.9	0.8%
2009	2,203.0	1.5%	398.2	1.4%	98.2	1.4%	47.4	1.1%	3,798.8	1.0%	40,469.0	1.9%	295.3	0.8%
2010	2,233.9	1.4%	404.2	1.5%	99.6	1.4%	47.9	1.1%	3,832.8	0.9%	41,159.9	1.7%	297.7	0.8%
2011	2,264.5	1.4%	410.7	1.6%	101.0	1.5%	48.4	1.1%	3,866.8	0.9%	41,818.7	1.6%	300.1	0.8%
2012	2,294.6	1.3%	417.2	1.6%	102.6	1.5%	49.0	1.1%	3,900.8	0.9%	42,447.5	1.5%	302.6	0.8%
2013	2,324.7	1.3%	423.9	1.6%	104.1	1.5%	49.5	1.1%	3,935.0	0.9%	43,082.3	1.5%	305.1	0.8%
2014	2,357.9	1.4%	430.7	1.6%	105.6	1.5%	50.0	1.1%	3,972.6	1.0%	43,678.7	1.4%	307.6	0.8%
2015	2,394.1	1.5%	437.5	1.6%	107.2	1.5%	50.6	1.1%	4,013.5	1.0%	44,251.8	1.3%	310.2	0.8%
2016	2,429.5	1.5%	444.3	1.6%	108.8	1.5%	51.1	1.1%	4,053.4	1.0%	44,827.5	1.3%	312.7	0.8%
2017	2,464.2	1.4%	451.1	1.5%	110.4	1.5%	51.7	1.1%	4,092.7	1.0%	45,420.6	1.3%	315.2	0.8%
2018	2,499.5	1.4%	458.1	1.5%	112.1	1.5%	52.2	1.1%	4,132.5	1.0%	45,972.1	1.2%	317.7	0.8%
2019	2,534.9	1.4%	465.1	1.5%	113.7	1.5%	52.8	1.1%	4,172.4	1.0%	46,526.6	1.2%	320.2	0.8%
2020	2,571.1	1.4%	472.2	1.5%	115.4	1.5%	53.4	1.1%	4,213.2	1.0%	47,139.7	1.3%	322.7	0.8%
2021	2,608.4	1.5%	479.4	1.5%	117.2	1.5%	53.9	1.1%	4,255.0	1.0%	47,680.1	1.1%	325.2	0.8%
2022	2,647.0	1.5%	486.6	1.5%	119.0	1.5%	54.5	1.0%	4,298.2	1.0%	48,187.2	1.1%	327.7	0.8%
2023	2,687.0	1.5%	494.0	1.5%	120.8	1.5%	55.1	1.0%	4,342.6	1.0%	48,754.4	1.2%	330.2	0.7%
2024	2,727.6	1.5%	501.4	1.5%	122.6	1.5%	55.6	1.0%	4,387.7	1.0%	49,342.9	1.2%	332.6	0.7%
2025	2,768.2	1.5%	508.9	1.5%	124.5	1.5%	56.2	1.0%	4,432.6	1.0%	49,893.6	1.1%	335.0	0.7%

Table 2

Components of Population Change for Portland-Vancouver, OR-WA

	Population	Percent Change	Change	Births	Deaths	Natural Increase	Net Migration	Migration Share*
1970	1,049.3		12.1	18.0	10.0	8.0	4.1	34%
1971	1,075.8	2.5%	26.5	16.5	10.1	6.4	20.1	76%
1972	1,072.5	-0.3%	-3.3	15.2	10.4	4.8	-8.1	244%
1973	1,092.6	1.9%	20.1	15.0	10.5	4.4	15.7	78%
1974	1,117.5	2.3%	24.9	15.9	10.2	5.7	19.2	77%
1975	1,145.8	2.5%	28.3	16.5	10.2	6.3	22.0	78%
1976	1,171.7	2.3%	25.9	16.9	10.3	6.7	19.2	74%
1977	1,203.6	2.7%	31.9	18.3	10.1	8.1	23.8	74%
1978	1,234.8	2.6%	31.2	18.9	10.4	8.6	22.6	73%
1979	1,266.0	2.5%	31.2	20.2	10.5	9.7	21.5	69%
1980	1,297.9	2.5%	32.0	21.1	10.8	10.3	21.7	68%
1981	1,314.8	1.3%	16.8	21.6	10.7	11.0	5.9	35%
1982	1,325.6	0.8%	10.8	20.9	10.4	10.4	0.3	3%
1983	1,316.9	-0.7%	-8.7	20.1	10.7	9.4	-18.1	208%
1984	1,329.6	1.0%	12.7	20.0	11.2	8.8	3.9	31%
1985	1,342.3	1.0%	12.8	20.5	11.3	9.2	3.5	28%
1986	1,355.2	1.0%	12.9	20.3	11.2	9.1	3.8	29%
1987	1,369.5	1.1%	14.2	20.3	11.6	8.7	5.6	39%
1988	1,398.6	2.1%	29.1	21.4	11.6	9.8	19.3	66%
1989	1,428.4	2.1%	29.8	22.3	11.6	10.6	19.2	64%
1990	1,477.9	3.5%	49.5	23.8	12.1	11.7	37.8	76%
1991	1,502.0	1.6%	24.1	23.8	11.9	11.9	12.2	51%
1992	1,552.0	3.3%	50.0	23.7	12.3	11.4	38.5	77%
1993	1,597.4	2.9%	45.4	23.6	13.1	10.5	34.9	77%
1994	1,643.4	2.9%	46.0	24.0	13.1	11.0	35.0	76%
1995	1,681.1	2.3%	37.8	24.5	13.2	11.3	26.5	70%
1996	1,723.9	2.5%	42.8	24.8	13.2	11.6	31.2	73%
1997	1,772.7	2.8%	48.8	25.5	13.5	12.0	36.7	75%
1998	1,812.0	2.2%	39.3	26.4	13.6	12.7	26.6	68%
1999	1,844.6	1.8%	32.6	26.8	13.5	13.3	19.3	59%
2000	1,874.5	1.6%	29.9	27.5	13.8	13.7	16.2	54%
2001	1,902.5	1.5%	28.1	28.9	14.2	14.6	13.4	48%
2002	1,934.3	1.7%	31.8	29.0	14.5	14.6	17.3	54%
2003	1,963.7	1.5%	29.4	29.1	14.7	14.4	14.9	51%
2004	2,007.7	2.2%	44.0	29.7	15.0	14.7	29.3	67%
2005	2,049.2	2.1%	41.5	30.2	15.3	14.9	26.6	64%
2006	2,091.0	2.0%	41.8	30.8	15.7	15.2	26.6	64%
2007	2,132.8	2.0%	41.8	31.4	16.0	15.4	26.4	63%
2008	2,170.1	1.8%	37.4	31.9	16.3	15.6	21.8	58%
2009	2,203.0	1.5%	32.9	32.3	16.7	15.6	17.3	53%
2010	2,233.9	1.4%	30.9	32.6	17.1	15.5	15.4	50%
2011	2,264.5	1.4%	30.6	32.9	17.5	15.3	15.3	50%
2012	2,294.6	1.3%	30.2	33.2	18.0	15.2	15.0	50%
2013	2,324.7	1.3%	30.1	33.4	18.4	15.0	15.0	50%
2014	2,357.9	1.4%	33.2	33.8	18.9	14.9	18.3	55%
2015	2,394.1	1.5%	36.3	34.3	19.4	14.9	21.4	59%
2016	2,429.5	1.5%	35.4	34.7	19.9	14.9	20.5	58%
2017	2,464.2	1.4%	34.7	35.2	20.4	14.8	19.9	57%
2018	2,499.5	1.4%	35.3	35.6	20.9	14.7	20.5	58%
2019	2,534.9	1.4%	35.4	36.1	21.4	14.7	20.7	59%
2020	2,571.1	1.4%	36.3	36.6	21.5	15.1	21.2	58%
2021	2,608.4	1.5%	37.3	37.0	21.6	15.4	21.9	59%
2022	2,647.0	1.5%	38.6	37.6	21.7	15.8	22.8	59%
2023	2,687.0	1.5%	39.9	38.1	21.8	16.3	23.7	59%
2024	2,727.6	1.5%	40.6	38.7	21.9	16.7	23.9	59%
2025	2,768.2	1.5%	40.6	39.2	22.7	16.5	24.1	59%

estimates are in thousands

* net migration / change

Table 3

Population by Age for Portland-Vancouver, OR-WA

	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 - 74	75 - 79	80 - 84	85 +	Total
1990	108.9	109.8	103.6	95.5	98.2	120.6	136.2	139.1	123.1	89.8	65.5	55.3	55.4	54.8	44.9	35.4	22.8	19.1	1,477.9
1991	111.1	110.8	105.3	97.5	99.5	119.5	135.6	139.8	125.9	94.4	69.0	56.9	55.5	54.8	45.8	36.0	23.7	19.8	1,535.4
1992	114.7	113.2	108.0	101.2	104.5	120.7	135.7	141.0	129.7	101.3	74.7	59.8	55.9	54.6	46.7	36.7	24.8	20.9	1,566.2
1993	117.7	116.0	111.0	105.1	110.0	123.4	136.6	142.3	133.3	107.7	80.6	63.3	56.9	54.6	47.5	37.5	25.9	22.0	1,608.4
1994	120.5	118.9	114.0	108.9	115.2	126.6	138.0	143.7	136.5	113.5	86.5	67.2	58.4	54.8	48.2	38.3	26.8	23.1	1,638.6
1995	122.7	121.3	116.6	112.0	119.0	129.1	138.9	144.5	139.0	118.6	92.3	71.4	60.2	55.3	48.7	39.0	27.6	24.1	1,670.7
1996	124.8	123.7	119.2	115.0	122.7	131.9	140.2	145.4	141.2	123.2	97.8	75.8	62.5	56.0	49.2	39.6	28.4	25.1	1,706.7
1997	127.6	126.5	122.1	118.5	127.5	135.9	142.5	146.9	143.5	127.5	103.3	80.5	65.3	57.1	49.8	40.3	29.2	26.1	1,737.7
1998	130.2	128.9	124.7	121.4	131.0	139.1	144.5	148.1	145.3	131.3	108.4	85.2	68.3	58.5	50.5	40.9	29.8	27.1	1,773.0
1999	132.2	130.7	126.7	123.6	132.9	141.0	145.8	148.9	146.7	134.4	113.0	89.8	71.5	60.0	51.3	41.5	30.4	27.9	1,798.6
2000	132.1	135.0	132.5	127.4	125.4	144.8	148.2	153.8	156.3	149.6	126.9	88.3	61.1	48.5	46.2	42.1	30.0	26.4	1,874.5
2001	136.0	133.3	129.6	126.7	134.6	142.5	146.9	149.4	148.1	138.8	120.5	98.1	77.9	63.6	53.0	42.5	31.4	29.5	1,902.5
2002	138.7	135.2	131.4	128.5	135.4	143.1	147.5	150.0	149.1	141.1	124.2	102.4	81.6	66.0	54.4	43.3	32.0	30.3	1,934.3
2003	140.8	136.9	133.0	130.1	136.7	143.9	148.2	150.5	149.8	142.8	127.4	106.4	85.2	68.5	55.8	44.1	32.6	31.1	1,963.7
2004	144.0	139.9	135.5	132.8	140.5	147.2	150.5	152.1	151.1	144.8	130.6	110.5	89.1	71.4	57.5	45.1	33.2	31.9	2,007.7
2005	147.0	142.6	137.9	135.3	143.5	150.2	152.8	153.6	152.4	146.6	133.6	114.3	92.9	74.4	59.4	46.2	33.9	32.7	2,049.2
2006	149.9	145.4	140.3	137.7	146.5	153.1	155.1	155.3	153.7	148.3	136.3	118.0	96.7	77.5	61.5	47.4	34.7	33.5	2,091.0
2007	152.8	148.2	142.8	140.2	149.4	156.0	157.5	157.1	155.1	150.0	138.8	121.4	100.5	80.7	63.8	48.8	35.5	34.3	2,132.8
2008	155.3	150.7	145.1	142.3	151.3	158.1	159.5	158.7	156.4	151.4	141.0	124.5	104.0	83.9	66.1	50.3	36.4	35.1	2,170.1
2009	157.4	152.8	147.2	144.1	152.5	159.5	161.0	160.0	157.5	152.7	142.9	127.3	107.3	87.1	68.6	51.8	37.3	36.0	2,203.0
2010	159.3	154.8	149.2	145.8	153.5	160.5	162.2	161.1	158.5	153.8	144.7	129.9	110.4	90.2	71.1	53.5	38.3	36.9	2,233.9
2011	161.0	156.8	151.1	147.6	154.6	161.5	163.4	162.3	159.6	155.0	146.3	132.4	113.4	93.3	73.6	55.3	39.4	37.8	2,264.5
2012	162.7	158.7	153.1	149.3	155.8	162.5	164.5	163.5	160.6	156.1	147.8	134.6	116.3	96.3	76.3	57.2	40.6	38.8	2,294.6
2013	164.4	160.5	155.0	151.1	157.1	163.5	165.6	164.6	161.7	157.2	149.3	136.7	119.0	99.2	78.9	59.2	41.9	39.8	2,324.7
2014	166.2	162.6	157.1	153.2	159.1	165.1	167.1	166.0	162.9	158.4	150.7	138.7	121.6	102.1	81.6	61.2	43.2	40.9	2,357.9
2015	168.4	164.8	159.4	155.5	161.6	167.3	168.9	167.6	164.4	159.7	152.2	140.7	124.1	105.0	84.3	63.4	44.7	42.1	2,394.1
2016	170.5	167.0	161.6	157.7	163.9	169.4	170.8	169.2	165.8	161.0	153.7	142.6	126.5	107.7	86.9	65.5	46.2	43.3	2,429.5
2017	172.6	169.1	163.8	159.9	166.1	171.5	172.6	170.9	167.2	162.3	155.1	144.3	128.8	110.3	89.6	67.7	47.8	44.6	2,464.2
2018	174.8	171.3	166.0	162.2	168.4	173.7	174.5	172.6	168.8	163.7	156.5	146.0	130.9	112.9	92.1	70.0	49.4	46.0	2,499.5
2019	177.0	173.5	168.2	164.4	170.8	175.9	176.5	174.3	170.3	165.1	157.9	147.7	133.0	115.3	94.7	72.2	51.0	47.4	2,534.9
2020	179.3	175.7	170.4	166.7	173.2	178.2	178.6	176.2	171.9	166.5	159.3	149.3	134.9	117.6	97.1	74.4	52.7	49.1	2,571.1
2021	181.6	178.0	172.7	169.0	175.7	180.7	180.8	178.1	173.6	168.0	160.7	150.8	136.8	119.9	99.5	76.6	54.4	51.4	2,608.4
2022	184.1	180.3	175.0	171.4	178.3	183.3	183.2	180.2	175.4	169.6	162.2	152.4	138.7	122.0	101.9	78.8	56.2	54.1	2,647.0
2023	186.6	182.8	177.4	173.8	181.0	186.1	185.7	182.4	177.3	171.2	163.7	153.9	140.4	124.1	104.1	80.9	57.9	57.3	2,687.0
2024	189.3	185.3	179.8	176.2	183.7	188.9	188.3	184.7	179.3	172.9	165.2	155.5	142.2	126.1	106.3	83.0	59.7	61.1	2,727.6
2025	191.9	187.8	182.3	178.7	186.4	191.7	191.0	187.0	181.3	174.7	166.8	157.0	143.9	128.1	108.5	85.1	61.4	64.9	2,768.2

In Thousands

Details may not add due to rounding

Source: Metro DRC

Metro01.xls 10/8/02

Table 4

Household by Age of Head for Portland-Vancouver, OR-WA

										Avg. HH
	under 25	25 - 34	35 - 44	45 - 54	55 - 64	65 - 74	75-79	85 over	TOTAL	Size
1990	31.6	125.0	148.0	88.9	66.9	62.4	40.2	12.5	575.5	2.57
1991	30.4	124.5	149.7	94.9	66.6	64.7	42.2	12.9	585.8	2.56
1992	32.0	124.4	152.5	101.9	69.3	65.2	43.4	13.6	602.2	2.58
1993	34.8	126.0	150.9	110.9	71.7	64.5	43.7	13.9	616.5	2.59
1994	38.1	129.5	153.9	114.9	73.6	63.9	43.9	14.3	632.0	2.60
1995	40.8	131.1	156.8	121.8	77.3	65.1	45.2	15.0	653.1	2.57
1996	41.0	133.3	157.0	126.0	81.7	65.5	45.7	15.5	665.6	2.59
1997	42.2	136.0	158.7	134.2	86.1	66.7	46.5	16.1	686.4	2.58
1998	42.9	137.6	159.9	139.7	91.5	68.2	47.3	16.6	703.6	2.58
1999	43.6	138.7	160.9	143.7	96.6	69.5	47.8	17.0	717.8	2.57
2000	44.7	139.2	162.0	146.6	101.3	70.9	48.2	17.4	730.2	2.57
2001	45.8	139.5	163.3	149.1	105.1	72.5	48.7	17.8	741.7	2.57
2002	46.9	139.6	164.5	151.0	108.3	74.3	49.2	18.1	751.8	2.57
2003	47.8	138.8	165.8	153.7	112.8	76.9	50.3	18.6	764.6	2.57
2004	49.9	141.1	168.2	155.9	117.7	79.6	51.2	19.1	782.6	2.57
2005	50.9	142.6	170.2	158.4	122.4	82.9	52.6	19.6	799.6	2.56
2006	51.8	144.3	172.1	161.1	126.6	86.4	54.1	20.1	816.5	2.56
2007	52.5	146.7	176.0	164.0	130.3	89.8	55.5	20.6	835.3	2.55
2008	53.2	148.6	175.0	166.6	134.1	93.3	57.1	21.2	848.9	2.56
2009	54.1	150.2	174.3	169.2	137.3	96.9	58.8	21.7	862.5	2.55
2010	55.1	152.1	174.0	171.6	140.5	100.5	60.7	22.3	876.7	2.55
2011	56.0	154.0	173.7	173.9	143.4	104.2	62.7	22.9	890.7	2.54
2012	56.6	154.9	174.9	175.4	146.4	107.7	64.7	23.5	904.1	2.54
2013	57.2	155.9	176.0	176.9	149.2	111.2	66.8	24.1	917.3	2.53
2014	57.9	157.4	177.5	178.5	151.9	114.6	69.1	24.8	931.6	2.53
2015	58.8	159.3	179.1	180.1	154.6	118.1	71.5	25.5	946.9	2.53
2016	59.6	161.2	180.8	181.7	157.0	121.5	73.9	26.2	961.9	2.53
2017	60.4	163.0	182.4	183.2	159.4	124.8	76.4	27.0	976.6	2.52
2018	61.3	165.0	184.1	184.8	161.6	128.0	78.9	27.8	991.5	2.52
2019	62.1	167.0	185.9	186.4	163.8	131.0	81.5	28.7	1,006.4	2.52
2020	63.0	169.1	187.8	188.1	165.9	134.0	84.1	29.7	1,021.6	2.52
2021	63.9	171.3	189.8	189.8	167.9	136.9	86.7	31.1	1,037.3	2.51
2022	64.8	173.7	191.9	191.5	169.9	139.7	89.3	32.7	1,053.5	2.51
2023	65.8	176.2	194.1	193.4	171.8	142.5	91.8	34.7	1,070.1	2.51
2024	66.7	178.7	196.4	195.2	173.7	145.1	94.4	37.0	1,087.2	2.51
2025	67.7	181.3	198.7	197.1	175.6	147.6	96.9	39.2	1,104.2	2.51
2026	68.6	183.7	201.1	199.1	177.5	150.1	99.4	41.4	1,120.8	2.51
2027	69.4	186.0	203.4	201.0	175.3	152.4	101.8	43.5	1,132.8	2.51
2028	70.2	188.1	205.7	203.0	176.8	154.7	104.1	45.4	1,148.1	2.51
2029	71.0	190.2	208.0	205.0	178.3	156.8	106.5	47.3	1,163.0	2.51
2030	71.8	192.2	210.3	207.0	179.8	159.0	108.7	49.1	1,177.8	2.51

Table 5

Employment for Portland-Vancouver, OR-WA and U.S.													
Industry	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Total Nonfarm Emp.¹¹													
Portland-Vancouver ¹²	891.5	902.2	916.1	944.4	996.2	1,038.8	1,064.5	1,124.8	1,150.1	1,175.1	1,217.0	1,215.6	1,211.3
%change	4.0%	1.2%	1.5%	3.1%	5.5%	4.3%	4.4%	3.7%	2.3%	2.2%	3.6%	-0.1%	-0.4%
U.S. (millions)	116.1	117.1	117.2	119.7	123.1	126.1	126.6	131.7	134.6	137.7	140.4	140.8	140.2
%change	1.4%	-0.9%	0.1%	2.1%	2.9%	2.4%	2.0%	2.5%	2.3%	2.1%	2.0%	0.3%	-0.5%
Nonfarm Self-Employ.													
Portland-Vancouver	168.0	176.3	176.6	178.9	198.5	201.1	206.1	210.6	220.4	232.9	252.2	254.3	253.3
%change	5.5%	4.9%	0.2%	1.3%	9.8%	2.4%	3.5%	1.3%	4.5%	5.7%	8.3%	0.8%	-0.4%
U.S. (millions)	6.7	6.9	6.6	6.9	9.0	8.9	9.0	9.1	9.0	8.8	8.7	8.6	8.5
%change	1.3%	1.5%	-3.1%	4.5%	0.5%	-1.1%	0.6%	1.0%	-1.1%	-1.9%	-1.4%	-0.9%	-1.2%
Wage and Salary Emp.¹³													
Portland-Vancouver	715.2	717.5	731.5	757.8	792.3	830.5	868.3	906.9	923.0	935.7	958.0	954.8	951.3
%change	3.6%	0.3%	1.9%	3.6%	4.6%	4.8%	4.7%	4.3%	1.8%	1.4%	2.4%	-0.3%	-0.4%
U.S. (millions)	109.4	108.3	108.6	110.7	114.1	117.2	119.6	122.7	125.8	128.9	131.8	132.2	131.7
%change	1.4%	-1.1%	0.3%	1.9%	3.1%	2.7%	2.0%	2.6%	2.6%	2.4%	2.2%	0.4%	-0.4%
Manufacturing													
Portland-Vancouver	121.7	119.8	119.9	121.9	126.7	134.9	139.2	145.0	147.0	142.9	145.5	142.2	140.4
%change	2.4%	-1.6%	-0.6%	2.5%	3.9%	6.5%	3.2%	4.2%	1.4%	-2.8%	1.8%	-2.3%	-1.3%
U.S. (millions)	19.1	18.4	18.1	18.1	18.3	18.5	18.5	18.7	18.6	18.6	18.5	17.7	16.9
%change	-1.6%	-3.5%	-1.6%	-0.2%	1.4%	1.1%	-0.2%	1.0%	0.7%	-1.3%	-0.5%	-4.2%	-4.8%
Nondurable Manuf.													
Portland-Vancouver	36.4	36.6	37.2	38.2	39.4	40.3	39.8	39.6	39.2	37.7	38.1	37.2	37.1
%change	3.1%	1.1%	1.1%	2.6%	3.3%	2.2%	-1.3%	-0.4%	-1.1%	-3.7%	0.9%	-2.2%	-0.3%
U.S. (millions)	8.0	7.8	7.8	7.9	7.9	7.8	7.7	7.7	7.6	7.4	7.3	7.1	6.9
%change	-0.4%	-1.6%	-0.1%	0.4%	0.3%	-0.4%	-1.7%	-0.5%	-0.8%	-2.1%	-1.5%	-3.7%	-2.4%
Food Processing													
Portland-Vancouver	9.9	9.9	9.7	9.7	9.8	10.1	10.0	9.8	9.7	9.1	8.9	8.5	8.4
%change	6.1%	-0.6%	-1.3%	-0.3%	0.8%	3.2%	-0.8%	-1.7%	-1.7%	-6.3%	-1.4%	-4.9%	-1.6%
U.S. (millions)	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
%change	1.0%	0.4%	-0.3%	1.1%	-0.1%	0.8%	-0.1%	-0.4%	-0.1%	0.0%	-0.2%	0.0%	0.6%
Textiles & Apparel													
Portland-Vancouver	4.8	4.7	4.6	4.8	5.0	4.9	4.6	4.4	4.3	3.8	3.4	3.5	3.5
%change	2.8%	-2.2%	-2.7%	3.6%	4.4%	-1.5%	-7.0%	-3.1%	-3.0%	-11.5%	-10.1%	3.8%	-0.8%
U.S. (millions)	1.7	1.7	1.7	1.7	1.7	1.5	1.4	1.4	1.4	1.2	1.2	1.0	1.0
%change	-3.8%	-3.0%	0.3%	-1.0%	-0.7%	-3.2%	-6.8%	-3.6%	-3.4%	-8.3%	-7.1%	-10.3%	-7.7%
Paper & Pulp													
Portland-Vancouver	7.2	6.8	6.9	7.0	7.1	7.1	6.5	6.3	6.3	6.1	6.7	6.7	6.6
%change	1.1%	-5.2%	1.3%	1.7%	1.5%	-0.2%	-8.1%	-3.7%	0.9%	-2.9%	9.6%	-1.2%	-0.6%
U.S. (millions)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6
%change	0.1%	-1.3%	0.4%	0.2%	0.1%	0.1%	-1.3%	-0.1%	-0.9%	-1.3%	-1.2%	-3.0%	-3.1%
Printing & Publishing													
Portland-Vancouver	9.7	9.6	9.6	9.9	10.0	10.2	9.9	10.1	10.4	10.8	11.1	11.0	11.4
%change	4.7%	9.6%	0.5%	3.1%	1.1%	1.2%	-3.0%	2.2%	3.0%	3.6%	2.8%	-0.3%	3.4%
U.S. (millions)	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.5	1.5
%change	0.5%	-2.1%	-1.9%	0.7%	1.3%	0.6%	-0.3%	0.7%	0.6%	-0.8%	-0.1%	-3.9%	-2.7%
Nondur. Goods, other													
Portland-Vancouver	5.8	5.9	6.1	6.8	7.6	8.1	8.3	9.0	8.5	8.0	8.0	7.5	7.2
%change	-1.4%	2.0%	9.2%	6.1%	11.0%	7.0%	9.4%	2.2%	-5.5%	-6.3%	-0.5%	-6.4%	-3.9%
U.S. (millions)	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2
%change	0.4%	-1.9%	0.7%	0.7%	0.6%	-0.2%	-0.7%	0.4%	0.4%	-1.0%	-0.5%	-3.1%	-1.8%
Durable Manufacturing													
Portland-Vancouver	85.3	83.0	81.7	83.7	87.3	91.6	99.4	105.4	107.8	105.1	107.4	105.0	103.3
%change	2.0%	-2.7%	-1.6%	2.5%	4.3%	6.4%	5.1%	6.0%	2.3%	-2.4%	2.2%	-2.3%	-1.6%
U.S. (millions)	11.1	10.6	10.3	10.2	10.4	10.7	10.6	11.0	11.2	11.1	11.1	10.6	10.0
%change	-2.5%	-4.9%	-2.7%	-0.6%	2.2%	2.3%	1.0%	2.0%	1.8%	-0.8%	0.3%	-4.5%	-6.4%
Lumber & Wood													
Portland-Vancouver	9.3	8.2	7.8	7.9	7.9	7.8	7.7	8.1	7.9	7.5	7.6	7.5	7.5
%change	-4.6%	-11.8%	-5.0%	0.8%	0.0%	-0.7%	-1.2%	4.8%	-2.9%	-4.6%	1.5%	-2.2%	0.8%
U.S. (millions)	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.6	0.6	0.6	0.8	0.8	0.8
%change	-3.1%	-7.9%	0.7%	4.3%	6.3%	2.0%	1.2%	-2.3%	-2.3%	2.6%	-6.6%	-4.8%	1.3%
Metals													
Portland-Vancouver	18.3	17.1	16.5	16.1	17.1	18.6	19.0	19.8	20.6	20.2	19.9	19.0	18.5
%change	-2.4%	-6.6%	-3.5%	-2.5%	6.3%	9.1%	2.3%	3.9%	4.2%	-2.0%	-1.3%	-4.6%	-2.7%
U.S. (millions)	2.2	2.1	2.0	2.0	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.0
%change	-1.9%	-4.5%	-2.6%	-0.1%	3.2%	3.0%	0.5%	1.3%	1.6%	-0.2%	0.9%	-4.9%	-5.2%
Electronics, total													
Portland-Vancouver	40.1	40.5	39.9	41.7	44.2	49.4	54.2	59.0	58.9	56.0	58.7	59.7	59.2
%change	2.7%	1.1%	-1.4%	4.3%	5.1%	11.8%	9.6%	7.1%	1.4%	-4.9%	5.0%	1.7%	-1.0%
U.S. (millions)	4.8	4.6	4.4	4.4	4.4	4.5	4.6	4.7	4.8	4.7	4.7	4.6	4.1
%change	-2.5%	-4.4%	-3.9%	-0.8%	1.6%	2.6%	2.1%	2.0%	1.3%	-2.5%	0.6%	-4.5%	-8.7%
Nonelectrical Mach.													
Portland-Vancouver	14.1	15.1	14.7	16.0	17.0	18.7	19.9	20.9	19.8	17.8	17.0	15.9	15.9
%change	3.3%	7.4%	-2.9%	9.1%	5.7%	10.5%	6.4%	4.8%	-5.0%	-10.4%	-4.5%	-6.4%	0.0%
U.S. (millions)	2.1	2.0	1.9	1.9	2.0	2.1	2.1	2.2	2.2	2.1	2.1	2.0	1.8
%change	-1.4%	-4.5%	-3.5%	0.1%	3.1%	3.9%	2.3%	2.6%	1.8%	-3.1%	-0.8%	-5.2%	-12.4%
Electrical Mach. & Instr.													
Portland-Vancouver	26.0	25.4	25.2	25.8	27.2	30.7	34.2	37.1	38.0	38.2	41.7	43.8	43.2
%change	2.4%	-2.2%	-0.5%	1.5%	6.3%	12.8%	11.6%	8.5%	5.0%	-2.2%	9.4%	5.0%	-1.3%
U.S. (millions)	2.7	2.6	2.5	2.4	2.4	2.5	2.5	2.6	2.6	2.5	2.6	2.5	2.3
%change	-3.3%	-4.3%	-4.2%	-1.5%	0.4%	1.5%	1.9%	1.6%	1.0%	-2.1%	1.7%	-3.9%	-5.7%
Transportation Equip.													
Portland-Vancouver	10.2	10.0	10.1	10.2	10.2	10.6	10.4	11.1	12.2	13.1	12.7	10.1	9.5
%change	16.3%	-1.9%	1.0%	1.2%	0.1%	3.8%	-1.8%	6.8%	10.1%	7.2%	-3.4%	-20.7%	-5.4%
U.S. (millions)	2.0	1.9	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.8	1.6
%change	-3.0%	-5.0%	-3.1%	-0.0%	0.3%	1.6%	-0.3%	3.4%	2.6%	-0.3%	-2.0%	-5.4%	-8.9%
Durable Goods, other													

Table 5

Employment, Portland-Vancouver OR-WA and U.S.													
Industry	2003	2004	2005	2010	2015	2020	2025	76-00	90-00	00-05	05-10	10-15	15-25
Total Nonfarm Emp.¹¹													
Portland-Vancouver ²	1,240.8	1,289.1	1,320.8	1,484.0	1,631.9	1,795.6	1,979.4	3.2%	3.2%	1.7%	2.4%	1.9%	1.9%
%change	2.4%	3.2%	3.2%	2.1%	1.8%	1.9%	1.9%						
U.S. (millions)	142.2	145.0	147.2	156.1	163.7	171.7	178.9	2.1%	1.7%	0.9%	1.2%	1.0%	0.9%
%change	1.4%	2.0%	1.5%	1.3%	1.0%	1.0%	0.6%						
Nonfarm Self-Employ.													
Portland-Vancouver	257.7	264.2	270.7	308.6	352.0	401.2	457.2	4.0%	4.2%	1.4%	2.7%	2.7%	2.6%
%change	1.7%	2.5%	2.4%	2.5%	2.8%	2.5%	2.6%						
U.S. (millions)	8.5	8.5	8.6	8.7	8.7	8.8	8.8	1.7%	-0.1%	-0.3%	0.3%	0.1%	0.1%
%change	0.1%	0.2%	0.4%	0.2%	0.0%	0.1%	0.1%						
Wage and Salary Emp.¹¹													
Portland-Vancouver	976.5	1,009.3	1,043.5	1,168.7	1,273.1	1,387.7	1,515.5	3.0%	3.0%	1.7%	2.3%	1.7%	1.8%
%change	2.8%	3.4%	3.4%	2.1%	1.6%	1.8%	1.7%						
U.S. (millions)	133.7	136.5	138.6	147.4	155.0	162.9	170.1	2.1%	1.9%	1.0%	1.2%	1.0%	0.9%
%change	1.5%	2.1%	1.5%	1.4%	1.0%	1.1%	0.6%						
Manufacturing													
Portland-Vancouver	144.3	149.4	154.7	165.9	166.9	172.8	177.2	1.7%	-4.9%	1.2%	1.4%	0.4%	0.5%
%change	2.8%	3.6%	3.5%	0.9%	0.4%	0.5%	0.5%						
U.S. (millions)	17.0	17.2	17.3	17.5	17.1	16.9	16.6	-0.2%	-0.3%	-1.3%	0.2%	-0.5%	-0.2%
%change	0.8%	1.4%	0.6%	-0.8%	-0.5%	0.1%	-0.5%						
Nondurable Manuf.													
Portland-Vancouver	37.8	38.6	39.3	40.5	40.5	40.7	40.5	0.6%	0.4%	0.6%	0.6%	0.0%	0.0%
%change	1.8%	2.3%	1.8%	0.0%	0.1%	0.1%	-0.2%						
U.S. (millions)	7.1	7.2	7.3	7.3	7.1	7.0	6.9	-0.4%	-0.8%	-0.1%	-0.1%	-0.5%	-0.2%
%change	2.5%	2.5%	0.7%	-0.7%	-0.6%	0.0%	-0.6%						
Food Processing													
Portland-Vancouver	8.4	8.5	8.5	8.2	7.7	7.2	6.7	-0.7%	-1.0%	-0.9%	-0.8%	-1.2%	-1.4%
%change	0.6%	1.2%	0.4%	-1.6%	-1.3%	-1.2%	-1.6%						
U.S. (millions)	1.7	1.8	1.8	1.7	1.6	1.6	1.6	-0.2%	0.1%	0.8%	-0.5%	-0.8%	-0.2%
%change	1.8%	1.7%	0.0%	-1.2%	-0.6%	0.0%	-0.6%						
Textiles & Apparel													
Portland-Vancouver	3.7	3.9	4.0	3.6	3.1	2.6	2.2	-1.8%	-3.4%	3.1%	-2.0%	-3.1%	-3.3%
%change	6.3%	5.1%	1.3%	-2.7%	-3.2%	-3.0%	-3.5%						
U.S. (millions)	1.0	0.9	0.9	0.9	0.8	0.8	0.8	-2.3%	-3.9%	-4.1%	-1.5%	-0.9%	-0.9%
%change	0.0%	-2.1%	0.0%	-1.1%	0.0%	0.0%	0.0%						
Paper & Pulp													
Portland-Vancouver	6.6	6.7	6.8	6.6	6.2	5.9	5.5	-0.4%	-0.6%	0.1%	-0.5%	-1.1%	-1.3%
%change	0.0%	1.4%	0.9%	-1.1%	-1.1%	-1.2%	-1.4%						
U.S. (millions)	0.6	0.7	0.7	0.6	0.6	0.6	0.6	-0.2%	-0.5%	-0.3%	-0.6%	-1.0%	-0.5%
%change	1.6%	3.2%	0.0%	-1.6%	-1.6%	0.0%	-1.7%						
Printing & Publishing													
Portland-Vancouver	11.7	12.0	12.2	13.1	13.5	13.7	13.8	3.4%	2.4%	2.0%	1.4%	0.5%	0.2%
%change	2.8%	2.4%	2.0%	0.8%	0.4%	0.2%	0.0%						
U.S. (millions)	1.5	1.6	1.6	1.7	1.6	1.6	1.6	1.1%	-0.1%	1.0%	0.6%	0.6%	-0.3%
%change	4.1%	5.3%	2.5%	-0.6%	-1.2%	0.0%	-0.6%						
Nondur. Goods, other													
Portland-Vancouver	7.3	7.5	7.6	8.0	10.1	11.3	12.3	2.5%	3.3%	-0.3%	2.7%	2.3%	2.1%
%change	1.2%	2.7%	4.0%	2.1%	2.5%	2.2%	1.5%						
U.S. (millions)	2.2	2.3	2.3	2.4	2.4	2.4	2.4	0.0%	-0.1%	0.3%	0.3%	0.0%	0.0%
%change	3.2%	3.1%	0.4%	0.0%	0.0%	0.0%	-0.4%						
Durable Manufacturing													
Portland-Vancouver	106.5	110.8	115.5	125.5	128.4	132.1	136.7	2.2%	2.3%	1.4%	1.7%	0.5%	0.6%
%change	3.1%	4.0%	4.1%	1.2%	0.4%	0.7%	0.7%						
U.S. (millions)	9.9	10.0	10.0	10.2	10.0	9.9	9.9	0.0%	0.0%	-2.1%	0.4%	-0.5%	-0.1%
%change	-0.4%	0.5%	0.6%	-0.9%	-0.5%	0.2%	-0.5%						
Lumber & Wood													
Portland-Vancouver	7.5	7.4	7.4	6.8	5.9	5.0	4.2	-0.7%	-2.0%	-0.6%	-1.6%	-2.8%	-3.3%
%change	-0.3%	-1.9%	0.4%	-2.9%	-3.1%	-3.1%	-3.9%						
U.S. (millions)	0.8	0.9	0.9	0.9	0.9	0.8	0.8	0.8%	1.2%	1.2%	0.0%	-0.5%	-1.0%
%change	3.7%	3.6%	2.3%	0.0%	-1.1%	-1.2%	-1.3%						
Metals													
Portland-Vancouver	19.1	19.6	20.1	20.3	19.6	19.1	18.6	1.3%	0.9%	0.1%	0.3%	-0.7%	-0.4%
%change	3.1%	2.8%	2.3%	-0.1%	-0.6%	-0.3%	-0.5%						
U.S. (millions)	2.1	2.1	2.2	2.1	1.9	1.8	1.6	-0.8%	0.3%	-0.6%	-0.7%	-1.9%	-1.5%
%change	3.5%	2.4%	1.4%	-1.4%	-2.6%	-0.6%	-1.8%						
Electronics, total													
Portland-Vancouver	61.2	64.5	69.0	76.6	80.1	84.1	89.7	3.6%	3.9%	1.0%	2.4%	0.9%	1.0%
%change	3.4%	5.5%	5.4%	1.8%	0.9%	1.1%	1.0%						
U.S. (millions)	3.5	3.6	3.6	4.2	4.2	4.4	4.5	0.2%	-0.2%	-4.0%	2.0%	0.0%	0.7%
%change	-4.4%	-2.6%	0.3%	-0.7%	0.5%	0.9%	0.4%						
Nonelectrical Mach.													
Portland-Vancouver	16.4	16.9	17.6	20.2	20.6	21.8	22.9	2.6%	1.9%	0.7%	2.7%	0.6%	0.9%
%change	3.2%	3.1%	4.1%	1.8%	0.8%	1.0%	0.9%						
U.S. (millions)	1.5	1.5	1.5	1.7	1.7	1.8	1.8	0.2%	0.1%	-7.1%	3.1%	0.2%	0.6%
%change	-12.5%	-3.9%	-0.7%	3.6%	0.6%	0.6%	0.5%						
Electrical Mach. & Instr.													
Portland-Vancouver	44.8	47.6	50.4	56.4	59.3	62.4	65.6	4.1%	4.9%	3.8%	2.3%	1.0%	1.0%
%change	3.5%	6.3%	5.9%	1.9%	1.0%	1.1%	1.1%						
U.S. (millions)	2.4	2.3	2.4	2.5	2.5	2.6	2.7	0.2%	-0.4%	-1.8%	1.3%	-0.2%	0.8%
%change	1.7%	-1.7%	0.9%	-3.5%	0.4%	1.2%	0.4%						
Transportation Equip.													
Portland-Vancouver	9.9	10.2	10.5	11.5	11.7	12.0	12.4	2.1%	2.2%	-3.7%	1.8%	0.4%	0.6%
%change	3.6%	2.9%	3.4%	0.9%	-0.1%	0.6%	0.6%						
U.S. (millions)	1.7	1.7	1.7	1.6	1.6	1.5	1.5	0.0%	-0.7%	-2.1%	-1.4%	0.0%	-0.2%
%change	1.2%	1.2%	-0.6%	-1.3%	-0.6%	0.0%	-0.7%						
Durable Goods, other													

Table 5

Employment for Portland-Vancouver, OR-WA and U.S.													
Industry	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Portland-Vancouver	7.5	7.2	7.4	7.9	7.9	8.2	8.1	8.3	8.2	8.3	8.5	8.7	8.6
%change	1.6%	-3.9%	2.1%	7.8%	0.1%	2.8%	-1.1%	3.2%	-1.6%	1.9%	1.5%	3.2%	-1.7%
U.S. (millions)	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.5	1.4
%change	-2.5%	-5.3%	-0.2%	1.8%	3.1%	1.0%	-0.3%	1.5%	2.2%	1.1%	1.7%	-2.6%	-4.7%
Nonmanufact. (exc. military)													
Portland-Vancouver	593.5	597.7	612.6	635.5	655.6	695.6	730.1	761.9	776.0	792.8	812.5	812.5	810.9
%change	3.9%	0.7%	2.5%	3.8%	4.7%	4.5%	5.0%	4.4%	1.9%	2.2%	2.5%	0.0%	-0.2%
U.S. (millions)	90.3	89.6	90.5	92.6	95.8	98.7	101.1	104.0	107.0	110.3	113.3	114.5	114.8
%change	2.1%	-0.5%	0.7%	2.4%	3.5%	3.0%	2.5%	2.9%	2.9%	3.1%	2.7%	1.1%	0.3%
Constr. & Mining													
Portland-Vancouver	36.3	35.3	33.7	35.2	40.1	45.0	51.5	54.5	53.8	52.6	53.9	53.1	53.9
%change	14.1%	-2.6%	-4.5%	4.4%	13.8%	12.2%	14.6%	5.8%	-1.3%	-1.9%	2.0%	-1.4%	0.4%
U.S. (millions)	5.6	5.3	5.1	5.3	5.6	5.7	6.0	6.3	6.6	7.0	7.2	7.4	7.3
%change	-0.5%	-6.4%	-4.1%	2.9%	5.8%	3.0%	4.3%	4.8%	5.1%	5.0%	4.1%	2.6%	-2.0%
Private Service Producers⁴													
Portland-Vancouver	459.2	461.9	474.7	495.6	518.4	542.5	567.2	594.5	606.4	619.3	631.6	651.9	630.5
%change	3.2%	0.6%	2.8%	4.4%	4.8%	4.4%	4.6%	4.8%	2.0%	2.1%	2.0%	0.0%	-0.2%
U.S. (millions)	66.2	66.1	66.7	68.5	71.1	73.6	75.7	78.2	80.6	83.2	85.4	86.2	86.4
%change	2.1%	-0.1%	0.9%	2.7%	3.6%	3.5%	2.8%	3.3%	3.1%	3.2%	2.6%	1.0%	0.2%
Transport., Comm., & Util.													
Portland-Vancouver	41.6	42.0	42.5	43.3	44.9	47.8	49.4	51.7	53.1	54.2	55.4	54.6	54.5
%change	3.6%	1.0%	1.1%	2.0%	3.7%	6.4%	3.4%	4.8%	2.5%	2.2%	2.2%	-1.1%	-0.5%
U.S. (millions)	5.8	5.6	5.7	5.8	6.0	6.1	6.3	6.4	6.6	6.8	7.0	7.1	7.0
%change	2.9%	-0.4%	-0.6%	1.6%	3.0%	2.5%	2.0%	2.5%	3.2%	3.4%	2.7%	0.7%	-0.4%
Trade, total													
Portland-Vancouver	183.4	183.9	186.3	191.4	201.6	208.6	216.7	225.5	229.0	232.3	235.4	233.7	232.1
%change	2.7%	0.3%	1.3%	2.7%	5.3%	3.6%	3.8%	4.0%	1.5%	1.5%	1.3%	-0.7%	-0.5%
U.S. (millions)	25.6	25.4	25.4	25.8	26.7	27.6	28.1	28.6	29.1	29.6	30.3	30.5	30.2
%change	0.4%	-1.6%	0.0%	1.6%	3.5%	3.4%	1.9%	1.9%	1.7%	2.1%	1.9%	0.6%	-0.9%
Retail Trade													
Portland-Vancouver	123.2	126.6	130.9	134.8	142.1	147.0	153.1	157.6	160.1	164.9	168.1	168.1	167.4
%change	3.1%	0.3%	1.8%	3.0%	5.4%	3.5%	4.1%	2.9%	1.6%	3.0%	2.0%	0.0%	-0.4%
U.S. (millions)	19.6	19.3	19.4	19.8	20.5	21.2	21.6	22.0	22.3	22.9	23.3	23.5	23.3
%change	0.6%	-1.6%	0.4%	2.2%	3.7%	3.3%	1.9%	1.7%	1.5%	2.5%	2.0%	0.6%	-0.9%
Wholesale Trade													
Portland-Vancouver	55.2	55.4	55.5	56.6	59.6	61.8	63.6	67.9	68.9	67.5	67.2	65.6	65.0
%change	1.7%	0.4%	0.1%	2.1%	5.2%	3.8%	3.0%	6.8%	1.4%	-2.1%	-0.3%	-2.5%	-0.9%
U.S. (millions)	6.2	6.1	6.0	6.0	6.2	6.4	6.5	6.6	6.8	6.9	7.0	7.0	7.0
%change	-0.2%	-1.5%	-1.4%	-0.3%	3.0%	3.5%	1.7%	2.6%	2.3%	1.6%	1.6%	0.1%	-0.9%
Fin., Ins., & Real Est.													
Portland-Vancouver	52.1	53.0	55.6	59.0	61.1	59.8	63.0	66.5	66.7	66.2	64.5	64.6	64.5
%change	-3.0%	3.3%	3.3%	6.1%	3.7%	-2.2%	5.4%	5.2%	0.5%	-0.7%	-2.6%	0.1%	-0.1%
U.S. (millions)	6.7	6.6	6.6	6.8	6.9	6.8	6.9	7.1	7.4	7.5	7.6	7.6	7.7
%change	0.6%	-0.9%	-0.7%	2.3%	2.0%	-1.3%	1.5%	2.8%	3.9%	2.3%	0.1%	0.6%	0.7%
Services, total													
Portland-Vancouver	182.2	182.1	190.3	201.9	211.7	226.1	238.0	250.9	257.7	266.5	276.3	278.9	279.1
%change	5.5%	-0.1%	4.5%	6.1%	4.8%	6.8%	5.3%	5.4%	2.7%	3.4%	3.7%	0.9%	0.1%
U.S. (millions)	27.8	28.3	29.0	30.2	31.8	33.1	34.5	36.0	37.5	39.0	40.5	41.0	41.5
%change	3.8%	1.5%	2.5%	3.9%	4.6%	4.9%	4.0%	4.6%	4.1%	4.1%	3.6%	1.4%	1.1%
Health													
Portland-Vancouver	49.0	49.7	50.6	52.6	54.3	56.1	57.7	60.2	61.3	62.9	62.2	63.3	64.6
%change	4.3%	1.6%	1.8%	4.0%	3.2%	3.4%	2.8%	4.4%	1.7%	2.6%	-1.2%	1.8%	2.0%
U.S. (millions)	7.6	8.2	8.5	8.6	9.0	9.2	9.5	9.7	9.9	10.0	10.1	10.3	10.7
%change	4.7%	4.7%	3.7%	3.1%	2.7%	2.6%	2.7%	2.4%	1.5%	1.3%	1.2%	2.4%	3.3%
Nonhealth													
Portland-Vancouver	133.2	132.4	139.7	149.3	157.4	169.9	180.3	190.7	196.5	203.7	214.2	215.6	214.5
%change	6.0%	-0.6%	5.6%	6.8%	5.4%	8.0%	6.1%	5.7%	3.0%	3.7%	5.1%	0.7%	-0.5%
U.S. (millions)	20.1	20.2	20.6	21.4	22.6	23.9	25.0	26.3	27.7	29.1	30.4	30.7	30.8
%change	3.5%	0.2%	2.0%	4.3%	5.3%	5.8%	4.6%	5.4%	5.1%	5.0%	4.4%	1.1%	0.4%
Govt., Fed. Civilian													
Portland-Vancouver	15.1	17.7	18.3	16.1	17.8	17.0	17.5	17.8	17.9	17.6	18.5	17.9	18.1
%change	2.5%	-2.0%	3.5%	-13%	-3.0%	0.2%	-0.7%	1.7%	0.6%	-1.7%	5.5%	-3.6%	1.5%
U.S. (millions)	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.0	2.0
%change	6.0%	-4.2%	0.2%	-0.4%	0.1%	-0.2%	-1.3%	-0.7%	1.0%	0.4%	6.0%	-7.0%	1.0%
Govt., Fed. Military													
Portland-Vancouver	8.3	8.4	8.0	7.7	7.3	7.1	7.1	7.1	6.8	6.6	6.8	6.7	6.6
%change	1.8%	1.2%	-4.5%	-3.0%	-5.1%	-2.7%	-0.8%	0.2%	-4.3%	-3.4%	3.5%	-1.3%	-1.3%
U.S. (millions)	1.0	0.9	0.9	0.9	0.8	0.8	0.7	0.7	0.7	0.6	0.6	0.6	0.6
%change	-2.3%	-3.2%	-0.4%	-5.1%	-5.2%	-5.6%	-5.0%	-5.7%	-4.7%	-3.8%	-1.6%	-1.6%	0.0%
Govt., State & Local													
Portland-Vancouver	79.9	82.9	85.8	86.9	86.6	90.6	93.9	95.1	97.9	103.1	108.5	109.7	109.0
%change	3.9%	3.6%	3.6%	1.3%	-0.3%	4.5%	3.7%	1.3%	2.9%	5.4%	5.4%	1.1%	-0.6%
U.S. (millions)	15.2	15.4	15.7	15.9	16.2	16.5	16.6	16.9	17.1	17.5	17.9	18.3	18.5
%change	2.9%	1.4%	1.5%	1.5%	2.1%	1.4%	1.1%	1.2%	1.6%	2.3%	2.1%	2.0%	1.3%

Table 5

Employment, Portland-Vancouver OR-WA and U.S.														
Industry	2003	2004	2005	2010	2015	2020	2025	70-00	90-00	00-05	05-10	10-15	15-25	
Portland-Vancouver	6.9	9.1	9.4	10.3	11.1	11.9	12.8	0.8%	1.2%	2.0%	1.9%	1.5%	1.4%	
%change	3.4%	2.7%	2.7%	1.7%	1.2%	1.5%	1.4%							
U.S. (millions)	1.4	1.5	1.5	1.5	1.5	1.4	1.4	0.1%	2.2%	-0.4%	0.0%	-0.4%	-0.5%	
%change	1.4%	3.5%	0.7%	-0.7%	0.0%	0.0%	-1.4%							
Nonmanufact. (exc. military)														
Portland-Vancouver	832.2	859.9	888.9	1002.9	1104.3	1214.9	1339.3	3.4%	3.2%	1.8%	2.4%	1.9%	1.9%	
%change	2.8%	3.3%	3.4%	2.5%	1.8%	1.9%	1.9%							
U.S. (millions)	116.7	119.3	121.3	129.9	137.9	146.0	153.3	2.7%	2.6%	1.4%	1.4%	1.2%	1.1%	
%change	1.6%	2.2%	1.7%	1.7%	1.2%	1.2%	1.0%							
Constr. & Mining														
Portland-Vancouver	55.5	57.2	59.3	67.7	71.6	76.3	81.0	1.8%	4.0%	1.9%	2.7%	1.2%	1.2%	
%change	4.0%	3.2%	3.6%	2.2%	0.4%	1.6%	0.8%							
U.S. (millions)	7.3	7.5	7.7	6.3	9.0	9.4	9.0	1.8%	2.2%	1.2%	1.6%	1.5%	0.7%	
%change	0.8%	2.7%	1.7%	2.5%	1.2%	0.9%	0.0%							
Private Service Producers⁴														
Portland-Vancouver	649.6	675.6	700.5	794.8	881.3	978.8	1,085.3	3.6%	3.2%	2.1%	2.6%	2.1%	2.1%	
%change	3.0%	4.0%	3.7%	2.4%	2.0%	2.0%	2.0%							
U.S. (millions)	86.1	90.5	92.2	99.8	107.4	114.4	121.2	3.0%	2.6%	1.6%	1.6%	1.5%	1.2%	
%change	2.0%	2.7%	2.0%	1.8%	1.4%	1.2%	1.2%							
Transport., Comm., & Util.														
Portland-Vancouver	55.2	56.7	58.4	64.9	69.8	75.2	80.9	2.0%	2.9%	1.0%	2.1%	1.5%	1.5%	
%change	1.2%	2.7%	2.9%	1.7%	1.6%	1.4%	1.5%							
U.S. (millions)	7.2	7.5	7.7	9.2	8.6	8.8	8.8	1.5%	2.0%	1.9%	1.3%	0.8%	0.3%	
%change	2.8%	3.9%	2.7%	1.5%	0.6%	0.5%	0.1%							
Trade, total														
Portland-Vancouver	238.5	246.3	255.1	288.6	313.5	339.7	367.9	3.1%	2.5%	1.9%	2.3%	1.7%	1.6%	
%change	2.6%	4.1%	4.0%	2.0%	1.5%	1.6%	1.5%							
U.S. (millions)	30.3	30.9	31.3	32.1	33.7	34.9	35.6	2.4%	1.6%	0.6%	0.5%	0.9%	0.6%	
%change	0.4%	1.9%	1.1%	0.8%	1.1%	0.5%	0.5%							
Retail Trade														
Portland-Vancouver	170.8	177.7	184.8	207.0	225.6	245.3	266.3	3.4%	2.7%	1.9%	2.3%	1.7%	1.7%	
%change	2.0%	4.0%	4.0%	2.0%	1.6%	1.7%	1.6%							
U.S. (millions)	23.3	23.7	24.0	24.5	25.7	26.6	27.3	2.5%	1.7%	0.6%	0.4%	0.9%	0.6%	
%change	0.1%	1.8%	1.1%	0.8%	1.1%	0.5%	0.6%							
Wholesale Trade														
Portland-Vancouver	67.7	70.6	71.3	81.6	87.9	94.4	101.6	2.5%	2.0%	1.7%	2.2%	1.5%	1.5%	
%change	4.1%	4.3%	3.9%	1.9%	1.3%	1.4%	1.4%							
U.S. (millions)	7.0	7.2	7.3	7.6	8.0	8.3	8.4	1.9%	1.3%	0.8%	0.9%	1.0%	0.4%	
%change	1.3%	2.3%	1.3%	1.1%	1.1%	0.4%	0.4%							
Fin., Ins., & Real Est.														
Portland-Vancouver	64.7	66.0	68.4	74.2	80.1	85.3	90.2	3.2%	2.2%	1.2%	1.6%	1.5%	1.2%	
%change	0.3%	2.3%	3.4%	1.5%	1.4%	1.2%	1.1%							
U.S. (millions)	7.8	8.0	8.1	8.7	9.1	9.5	9.9	2.5%	1.2%	1.5%	1.2%	1.0%	0.8%	
%change	1.3%	2.3%	2.4%	0.9%	0.9%	0.9%	0.8%							
Services, total														
Portland-Vancouver	291.2	304.5	315.6	367.1	419.0	478.7	546.3	4.7%	4.3%	2.7%	3.1%	2.7%	2.7%	
%change	4.4%	4.6%	3.7%	3.0%	2.5%	2.6%	2.6%							
U.S. (millions)	42.8	44.1	45.1	50.8	56.1	61.4	67.0	4.3%	3.8%	2.2%	2.4%	2.0%	1.8%	
%change	3.1%	3.1%	2.4%	2.8%	1.7%	1.6%	1.7%							
Health														
Portland-Vancouver	66.8	69.1	71.2	82.3	93.5	105.2	118.9	3.5%	2.4%	2.7%	3.0%	2.6%	2.4%	
%change	3.5%	3.4%	3.0%	2.8%	2.4%	2.3%	2.5%							
U.S. (millions)	11.0	11.2	11.4	12.6	14.5	16.6	19.2	4.1%	2.6%	2.5%	2.0%	2.8%	2.8%	
%change	2.6%	2.3%	2.1%	2.1%	3.3%	2.5%	2.6%							
Nonhealth														
Portland-Vancouver	224.4	235.4	244.5	284.8	326.3	373.5	427.4	5.2%	4.9%	2.7%	3.1%	2.8%	2.7%	
%change	4.8%	4.9%	3.9%	3.0%	2.5%	2.7%	2.7%							
U.S. (millions)	31.8	32.9	33.7	38.2	41.6	44.8	47.3	4.3%	4.2%	2.1%	2.5%	1.7%	1.4%	
%change	3.2%	3.3%	2.5%	3.0%	1.1%	1.5%	1.3%							
Govt., Fed. Civilian														
Portland-Vancouver	18.0	17.9	17.9	15.3	19.4	20.4	21.2	0.9%	0.3%	-0.7%	1.5%	0.2%	0.8%	
%change	-0.6%	-0.7%	-0.2%	-5.1%	1.0%	0.9%	0.7%							
U.S. (millions)	2.0	2.0	2.0	2.0	2.1	2.1	2.2	0.8%	0.1%	-1.0%	-0.4%	0.5%	0.8%	
%change	1.0%	0.0%	0.0%	-0.5%	1.0%	0.9%	0.5%							
Govt., Fed. Military														
Portland-Vancouver	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.0%	-1.9%	-0.5%	0.4%	-0.3%	0.1%	
%change	-0.2%	-0.3%	0.5%	-0.7%	0.0%	0.0%	0.0%							
U.S. (millions)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	-1.7%	-4.0%	-0.3%	-1.3%	0.3%	0.3%	
%change	0.0%	0.0%	0.0%	-1.7%	0.0%	0.0%	0.0%							
Govt., State & Local														
Portland-Vancouver	109.2	109.1	111.2	121.0	129.7	139.5	150.8	2.6%	3.1%	0.5%	1.7%	1.4%	1.5%	
%change	0.2%	-0.1%	1.9%	1.3%	1.3%	1.4%	1.6%							
U.S. (millions)	18.6	18.6	18.7	19.0	19.2	19.7	20.2	1.8%	1.6%	0.9%	0.4%	0.2%	0.5%	
%change	0.6%	0.2%	0.4%	0.3%	0.2%	0.5%	0.5%							

1/ Total Employment includes nonfarm wage and salary jobs, military, & self-employed (BEA)

2/ Portland-Vancouver (in thousands) Multnomah, Clackamas, Washington, Yamhill in OR and Clark, WA; U.S. (in millions)

3/ Wage and salary employment by place of work - Current Employment Survey (CES)

4/ PSP includes: TCU, Trade, FIRE and all Services
TCU: Transportation, Communications & Utilities
FIRE: Finance, Insurance & Real Estate

Table 6

Total Employment for Portland-Vancouver, OR-WA

Wage and Salary

	Total (w/Defense)	Proprietors Plus *	Dur. Mfg.	Non-dur. Mfg.	Non-Mfg.	Military
1970	475.6	78.7	56.5	32.1	301.5	6.8
1971	484.9	82.5	55.6	31.2	308.8	6.8
1972	513.3	85.9	59.5	31.9	329.2	6.7
1973	540.5	90.7	66.6	32.6	343.6	7.1
1974	558.9	93.0	69.7	32.3	355.6	8.3
1975	561.1	99.7	63.0	30.8	359.6	8.0
1976	584.6	103.5	66.3	31.8	375.9	7.2
1977	613.3	104.3	71.1	32.4	398.7	6.8
1978	654.9	105.7	81.4	31.5	429.0	7.3
1979	690.3	112.8	87.7	33.1	449.9	6.8
1980	699.3	120.1	86.1	32.7	453.8	6.6
1981	689.4	120.4	80.4	32.1	450.0	6.4
1982	668.3	122.9	72.9	31.0	434.6	6.9
1983	675.1	131.7	68.3	31.4	436.7	7.0
1984	707.4	135.8	74.4	32.3	457.8	7.2
1985	728.5	142.5	75.2	32.2	470.9	7.8
1986	749.5	143.9	74.1	32.3	491.1	8.1
1987	777.9	149.0	75.9	33.8	511.3	8.0
1988	819.3	156.4	80.6	34.0	540.1	8.1
1989	857.6	159.2	83.6	35.3	571.3	8.1
1990	891.5	168.0	85.3	36.4	593.5	8.3
1991	902.2	176.3	83.0	36.8	597.7	8.4
1992	916.1	176.6	81.7	37.2	612.6	8.0
1993	944.5	178.9	83.8	38.2	635.9	7.7
1994	996.2	196.5	87.3	39.4	665.6	7.3
1995	1,038.8	201.1	94.6	40.3	695.6	7.2
1996	1,084.5	208.1	99.4	39.8	730.1	7.1
1997	1,124.8	210.8	105.4	39.6	761.9	7.1
1998	1,150.1	220.4	107.8	39.2	776.0	6.8
1999	1,175.1	232.9	105.1	37.7	792.8	6.6
2000	1,217.0	252.2	107.4	38.1	812.5	6.8
2001	1,215.8	254.3	105.0	37.2	812.5	6.7
2002	1,211.2	253.3	103.3	37.1	810.9	6.6
2003	1,240.7	257.7	106.5	37.8	832.2	6.6
2004	1,280.0	264.2	110.8	38.6	859.8	6.6
2005	1,320.7	270.7	115.3	39.3	888.8	6.6
2006	1,352.0	277.3	118.1	39.7	910.2	6.8
2007	1,382.1	284.9	119.8	39.8	930.7	6.9
2008	1,420.6	293.6	121.8	40.1	958.3	6.9
2009	1,452.7	301.0	124.0	40.5	980.3	6.8
2010	1,483.9	308.5	125.5	40.5	1,002.7	6.8
2011	1,514.2	317.3	125.6	40.4	1,024.1	6.7
2012	1,544.9	326.3	126.2	40.3	1,045.4	6.7
2013	1,575.0	334.7	127.1	40.4	1,066.1	6.7
2014	1,603.2	343.1	127.8	40.5	1,085.1	6.7
2015	1,631.8	352.0	128.4	40.5	1,104.2	6.7
2016	1,662.9	361.6	129.0	40.6	1,125.1	6.7
2017	1,694.2	371.0	129.7	40.6	1,146.2	6.7
2018	1,728.3	381.2	130.4	40.6	1,169.4	6.7
2019	1,761.6	391.2	131.2	40.7	1,191.9	6.7
2020	1,795.5	401.2	132.1	40.7	1,214.9	6.7
2021	1,832.5	412.0	133.1	41	1,240.0	6.7
2022	1,868.2	422.9	134.0	40.7	1,263.9	6.7
2023	1,904.5	434.1	134.9	40.6	1,288.2	6.7
2024	1,942.2	445.6	135.9	40.6	1,313.4	6.7
2025	1,979.3	457.2	136.7	40.5	1,338.2	6.7

In Thousands, Details may not add due to rounding

*Includes partnerships, self-employed, and wage salary workers

Table 7

Wage and Salary Employment for Portland-Vancouver, OR-WA

	Total W & S (exc. defense)	Constr. and		Transp. Com. &		Trade		Finance, Insur., &		Government	
		Mining	Manuf.	Utilities	Whsle.	Retail	Real E.	Service	State & Local	Fed. Civ.	
1970	390.1	17.6	88.6	30.5	32.4	62.1	25.3	69.6	49.9	14.1	
1971	395.7	18.2	86.8	30.2	32.7	63.5	25.6	72.5	51.7	14.4	
1972	420.7	21.4	91.4	31.0	34.5	67.2	29.6	77.6	53.3	14.6	
1973	442.8	21.8	99.2	32.1	36.0	71.6	31.6	81.6	54.5	14.5	
1974	457.6	21.7	102.0	32.2	37.0	74.3	32.3	85.5	57.8	14.8	
1975	453.4	18.7	93.8	30.9	36.4	77.5	32.7	88.5	60.0	15.0	
1976	474.0	20.6	98.0	31.1	37.7	81.9	34.2	93.1	62.4	15.0	
1977	502.2	23.4	103.5	32.5	39.5	87.6	37.9	98.8	64.1	15.0	
1978	541.9	26.9	112.8	34.3	43.2	95.0	41.7	105.2	67.2	15.7	
1979	570.7	28.8	120.8	36.3	45.8	99.4	45.4	110.5	67.8	15.9	
1980	572.6	26.0	118.8	37.1	46.0	99.5	46.6	114.2	68.1	16.4	
1981	562.5	21.9	112.5	37.0	46.1	99.5	46.5	114.8	68.2	16.1	
1982	538.5	18.4	103.9	35.9	43.7	95.6	44.7	112.6	67.6	16.1	
1983	536.4	17.4	99.7	35.5	45.7	95.1	43.7	116.2	67.2	16.0	
1984	564.5	20.7	106.7	36.5	47.7	100.3	44.0	124.1	68.5	16.0	
1985	578.3	21.4	107.4	36.8	48.5	102.2	45.0	131.4	69.2	16.6	
1986	597.5	22.7	106.4	36.8	49.2	105.8	47.6	141.3	71.1	16.7	
1987	620.9	23.4	109.6	37.8	50.0	110.1	50.7	149.0	73.4	16.9	
1988	654.7	26.9	114.7	38.4	51.8	119.2	51.9	159.4	75.0	17.4	
1989	690.2	31.8	118.9	40.2	54.2	124.3	53.7	172.7	76.9	17.6	
1990	715.2	36.3	121.7	41.6	55.2	128.2	52.1	182.2	79.9	18.1	
1991	717.5	35.3	119.8	42.1	55.4	128.6	53.8	182.1	82.8	17.7	
1992	731.5	33.7	118.9	42.5	55.5	130.9	55.6	190.3	85.8	18.3	
1993	757.8	35.2	121.9	43.3	56.6	134.8	59.0	201.9	86.9	18.1	
1994	792.4	40.1	126.8	44.9	59.6	142.1	61.2	211.7	88.6	17.6	
1995	830.5	45.0	134.9	47.8	61.8	147.1	59.8	226.1	90.6	17.6	
1996	869.3	51.5	139.2	49.4	63.6	153.1	63.0	238.1	93.9	17.5	
1997	906.9	54.5	145.0	51.7	67.9	157.6	66.3	250.9	95.1	17.8	
1998	923.0	53.9	147.0	53.1	68.9	160.1	66.7	257.7	97.9	17.9	
1999	935.7	52.8	142.9	54.2	67.5	164.9	66.2	266.6	103.1	17.6	
2000	958.0	53.9	145.5	55.4	67.2	168.1	64.5	276.3	108.5	18.5	
2001	954.8	53.1	142.2	54.8	65.6	168.1	64.6	278.9	109.7	17.9	
2002	951.3	53.3	140.4	54.5	65.0	167.4	64.5	279.1	109.0	18.1	
2003	976.5	55.5	144.3	55.2	67.7	170.8	64.7	291.2	109.2	18.0	
2004	1,009.3	57.2	149.4	56.7	70.6	177.7	66.2	304.5	109.1	17.9	
2005	1,043.5	59.3	154.7	58.4	73.3	184.8	68.4	315.6	111.2	17.9	
2006	1,068.0	60.6	157.7	59.8	75.1	189.5	69.9	323.9	113.5	17.9	
2007	1,090.4	62.4	159.6	61.2	76.6	193.9	71.3	331.9	115.6	17.8	
2008	1,120.2	64.7	161.9	62.5	78.4	198.6	72.3	346.0	117.7	18.0	
2009	1,144.9	66.3	164.5	63.8	80.0	202.9	73.1	356.6	119.4	18.3	
2010	1,168.7	67.7	165.9	64.9	81.6	207.0	74.2	367.1	121.0	19.3	
2011	1,190.2	68.6	166.0	65.9	82.9	210.7	75.4	378.7	122.9	19.2	
2012	1,212.0	70.4	166.5	66.8	84.3	214.9	76.8	388.4	124.7	19.1	
2013	1,233.7	71.1	167.5	67.8	85.6	218.6	78.0	399.4	126.5	19.1	
2014	1,253.4	71.5	168.3	68.9	86.8	222.1	79.1	409.6	128.1	19.2	
2015	1,273.1	71.8	168.9	69.9	87.9	225.6	80.1	419.7	129.7	19.4	
2016	1,294.8	72.3	169.6	71.0	89.1	229.4	81.2	430.9	131.7	19.6	
2017	1,316.5	73.1	170.2	72.0	90.4	233.2	82.3	442.1	133.5	19.8	
2018	1,340.5	74.0	171.0	73.1	91.7	237.2	83.3	454.5	135.6	20.0	
2019	1,363.8	75.0	171.9	74.1	93.1	241.2	84.3	466.5	137.6	20.2	
2020	1,387.7	76.3	172.8	75.2	94.4	245.3	85.3	478.6	139.5	20.4	
2021	1,413.9	77.5	173.8	76.3	95.9	249.6	86.3	492.1	141.8	20.5	
2022	1,438.6	78.3	174.7	77.4	97.3	253.7	87.3	505.2	144.0	20.7	
2023	1,463.7	79.3	175.5	78.6	98.7	257.9	88.2	518.5	146.2	20.9	
2024	1,489.9	80.4	176.4	79.8	100.2	262.1	89.2	532.3	148.4	21.1	
2025	1,515.5	81.0	177.2	80.9	101.6	266.3	90.2	546.2	150.8	21.2	

In thousands

Details may not add due to rounding

A-10

Source: Metro DRC
Metro01.xls 10/8/02

Table 8

Total Employment for Yamhill County, OR

Wage and Salary

	Total (w/Defense)	Proprietors Plus *	Dur. Mfg.	Non-dur. Mfg.	Non-Mfg.	Military
1970	12.4	2.5	1.8	1.1	6.7	0.3
1971	13.1	2.7	2.0	1.0	7.1	0.3
1972	14.0	3.0	2.2	1.1	7.4	0.3
1973	14.9	3.2	2.6	1.1	7.7	0.3
1974	15.8	3.9	2.7	1.0	7.9	0.3
1975	16.9	4.8	2.6	1.0	8.3	0.3
1976	18.1	4.9	3.0	1.1	8.8	0.3
1977	19.5	5.2	3.4	1.2	9.5	0.3
1978	20.9	5.4	3.8	1.2	10.2	0.3
1979	22.4	5.5	4.1	1.3	11.2	0.3
1980	22.9	6.3	3.6	1.3	11.5	0.2
1981	22.3	5.9	3.4	1.4	11.3	0.2
1982	21.6	5.9	3.1	1.4	10.9	0.3
1983	21.7	6.0	3.0	1.4	11.0	0.3
1984	22.3	6.3	3.3	1.5	11.0	0.3
1985	22.6	5.9	3.3	1.4	11.6	0.3
1986	23.3	5.9	3.4	1.5	12.3	0.3
1987	24.1	6.0	3.6	1.6	12.7	0.3
1988	25.1	5.9	3.7	1.5	13.7	0.3
1989	26.1	5.8	3.8	1.8	14.4	0.3
1990	27.1	6.4	3.6	1.8	14.9	0.3
1991	26.9	6.3	3.5	1.9	14.8	0.3
1992	28.4	7.0	3.5	2.0	15.6	0.3
1993	29.3	6.4	3.6	2.0	17.0	0.3
1994	31.0	6.9	3.9	2.0	17.9	0.3
1995	32.4	7.4	4.0	1.9	18.8	0.3
1996	34.5	8.1	4.1	2.1	19.8	0.3
1997	35.1	8.3	4.1	2.2	20.3	0.3
1998	35.7	8.1	4.1	2.3	20.9	0.3
1999	36.8	9.2	4.0	2.3	21.0	0.3
2000	37.5	9.8	4.0	2.2	21.3	0.2
2001	37.0	9.8	3.8	2.1	21.1	0.2
2002	37.1	9.6	3.7	2.0	21.5	0.2
2003	37.9	9.5	3.8	2.1	22.3	0.2
2004	39.5	9.4	4.0	2.4	23.5	0.2
2005	40.9	9.3	4.3	2.5	24.6	0.2
2006	42.0	9.2	4.5	2.7	25.4	0.2
2007	42.6	9.2	4.5	2.8	25.9	0.2
2008	43.1	9.2	4.5	2.8	26.4	0.2
2009	43.7	9.1	4.6	2.8	26.9	0.3
2010	44.3	9.1	4.6	2.9	27.5	0.3
2011	45.0	9.2	4.6	2.9	28.1	0.3
2012	45.8	9.2	4.7	2.9	28.7	0.3
2013	46.5	9.3	4.7	2.9	29.4	0.3
2014	47.3	9.3	4.7	3.0	30.0	0.3
2015	48.0	9.3	4.8	3.0	30.7	0.3
2016	48.8	9.4	4.8	3.0	31.4	0.3
2017	49.7	9.4	4.8	3.0	32.1	0.3
2018	50.5	9.5	4.9	3.0	32.8	0.3
2019	51.3	9.5	4.9	3.0	33.6	0.3
2020	52.2	9.6	5.0	3.0	34.4	0.3
2021	53.1	9.6	5.0	3.1	35.1	0.3
2022	54.0	9.7	5.0	3.1	35.9	0.3
2023	54.9	9.7	5.1	3.1	36.8	0.3
2024	55.9	9.8	5.1	3.1	37.6	0.3
2025	56.8	9.9	5.2	3.1	38.5	0.3

In Thousands, Details may not add due to rounding

*Includes partnerships, self-employed, and wage salary workers

Table 9

Wage and Salary Employment for Yamhill County, OR

	Total Wage & Salary	Constr. and Mining	Manuf.	Transp. Com. & Utilities	Whsle. & Retail Trade	Finance, Insur., & Real Est.	Government	
							Service	Fed. Civ., State & Local
1970	9.6	0.2	2.9	0.4	2.0	0.5	2.0	1.7
1971	10.1	0.3	3.0	0.4	2.1	0.5	2.0	1.8
1972	10.7	0.4	3.3	0.3	2.1	0.5	2.1	2.0
1973	11.4	0.4	3.8	0.4	2.2	0.6	2.2	2.0
1974	11.6	0.4	3.7	0.4	2.2	0.6	2.2	2.1
1975	11.8	0.4	3.5	0.3	2.4	0.6	2.4	2.2
1976	12.9	0.6	4.1	0.3	2.5	0.7	2.5	2.3
1977	14.1	0.7	4.6	0.4	2.8	0.7	2.7	2.3
1978	15.2	0.8	5.1	0.4	3.1	0.8	2.8	2.5
1979	16.6	0.9	5.4	0.4	3.3	0.9	3.3	2.5
1980	16.4	1.1	4.9	0.5	3.2	0.9	3.1	2.6
1981	16.1	0.6	4.9	0.5	3.4	1.0	3.2	2.7
1982	15.4	0.3	4.5	0.5	3.2	1.0	3.3	2.6
1983	15.4	0.4	4.4	0.4	3.2	0.9	3.5	2.6
1984	15.7	0.6	4.7	0.4	3.1	0.9	3.4	2.5
1985	16.3	0.6	4.7	0.5	3.5	1.0	3.5	2.6
1986	17.1	0.6	4.9	0.5	3.8	1.0	3.8	2.6
1987	17.8	0.7	5.2	0.6	3.9	0.9	3.9	2.8
1988	18.9	0.8	5.2	0.7	4.1	0.9	4.3	2.9
1989	19.9	0.9	5.6	0.6	4.4	0.9	4.5	3.1
1990	20.3	0.9	5.4	0.7	4.4	0.8	4.7	3.4
1991	20.2	1.0	5.4	0.8	4.0	0.9	4.7	3.5
1992	21.1	1.0	5.5	0.8	4.2	0.9	5.0	3.8
1993	22.6	1.1	5.6	0.8	4.9	1.0	5.4	3.8
1994	23.8	1.2	5.9	0.7	5.3	1.0	5.8	3.9
1995	24.7	1.3	6.0	0.8	5.5	1.1	6.3	3.8
1996	26.1	1.6	6.2	0.8	6.0	1.0	6.5	3.9
1997	26.5	1.6	6.3	0.9	5.9	1.1	6.8	4.1
1998	27.3	1.6	6.4	0.9	6.0	1.1	7.1	4.2
1999	27.3	1.5	6.3	0.9	6.1	1.1	7.2	4.2
2000	27.5	1.5	6.2	0.9	6.0	1.1	7.3	4.3
2001	27.1	1.6	6.0	0.9	6.0	1.1	7.3	4.3
2002	27.2	1.6	5.7	1.0	6.2	1.0	7.4	4.3
2003	28.2	1.7	5.9	1.1	6.5	1.0	7.6	4.4
2004	29.9	1.7	6.4	1.2	7.0	1.0	8.0	4.6
2005	31.4	1.7	6.8	1.3	7.2	1.0	8.7	4.8
2006	32.5	1.7	7.2	1.3	7.3	1.0	9.2	4.9
2007	33.1	1.7	7.3	1.3	7.4	1.0	9.5	5.0
2008	33.7	1.7	7.3	1.3	7.5	1.1	9.8	5.0
2009	34.3	1.7	7.4	1.3	7.6	1.1	10.1	5.1
2010	34.9	1.7	7.5	1.4	7.8	1.1	10.4	5.2
2011	35.6	1.7	7.5	1.4	7.9	1.1	10.7	5.3
2012	36.3	1.8	7.6	1.4	8.0	1.1	11.0	5.4
2013	37.0	1.8	7.6	1.4	8.2	1.2	11.3	5.5
2014	37.7	1.8	7.7	1.5	8.3	1.2	11.7	5.6
2015	38.4	1.8	7.7	1.5	8.5	1.2	12.0	5.7
2016	39.2	1.9	7.8	1.5	8.6	1.2	12.4	5.8
2017	40.0	1.9	7.9	1.6	8.8	1.2	12.8	5.9
2018	40.7	1.9	7.9	1.6	8.9	1.3	13.2	6.0
2019	41.5	2.0	7.9	1.6	9.1	1.3	13.6	6.1
2020	42.3	2.0	8.0	1.6	9.2	1.3	14.0	6.2
2021	43.2	2.0	8.0	1.7	9.4	1.3	14.4	6.3
2022	44.0	2.1	8.1	1.7	9.5	1.3	14.9	6.4
2023	44.9	2.1	8.1	1.7	9.7	1.4	15.4	6.6
2024	45.8	2.1	8.2	1.8	9.9	1.4	15.8	6.7
2025	46.7	2.2	8.3	1.8	10.0	1.4	16.3	6.8

In thousands
Details may not add due to rounding

Table 10

Personal Income by Major Source, Portland-Vancouver OR-WA

	Total Personal Income	Wages & Salaries	Other Labor Income	Transfer Payments	Dividends		Social Ins. Contribution	Resident Adjust.
					Interest & Rents	Proprietors' Income		
1970	\$4,583,778	\$3,007,793	\$198,709	\$412,942	\$692,965	\$428,469	\$132,699	-\$24,401
1971	4,989,157	3,221,885	226,813	483,247	750,322	464,809	146,766	-11,153
1972	5,557,442	3,606,551	266,059	523,817	809,930	519,746	171,361	2,700
1973	6,258,168	4,050,079	306,828	610,602	915,961	585,458	221,960	11,200
1974	7,092,332	4,529,620	375,583	738,819	1,056,436	628,091	257,619	21,402
1975	7,806,160	4,817,701	446,745	933,504	1,139,852	667,346	272,919	73,931
1976	8,845,638	5,426,508	551,653	1,022,064	1,274,184	798,513	304,392	77,108
1977	9,897,231	6,110,939	670,178	1,098,368	1,457,081	882,529	344,780	22,916
1978	11,452,259	7,131,016	805,845	1,190,498	1,741,584	1,008,637	407,548	-17,773
1979	13,110,100	8,178,315	926,762	1,320,604	2,134,387	1,081,605	484,973	-46,600
1980	14,697,285	8,981,025	1,064,603	1,551,864	2,585,966	1,109,729	539,065	-56,837
1981	16,091,647	9,547,238	1,136,175	1,792,460	3,173,490	1,124,688	623,603	-58,801
1982	16,636,752	9,613,964	1,208,400	2,042,448	3,407,599	1,055,718	649,368	-42,009
1983	17,474,173	9,917,636	1,267,138	2,216,439	3,626,196	1,147,434	673,899	-26,771
1984	19,213,950	10,839,648	1,356,592	2,250,517	4,110,824	1,441,795	744,053	-41,373
1985	20,376,011	11,456,435	1,557,811	2,355,180	4,315,639	1,570,349	828,689	-50,714
1986	21,487,037	12,191,225	1,559,433	2,427,298	4,572,894	1,703,840	903,945	-63,708
1987	22,859,879	13,023,012	1,690,540	2,539,734	4,830,343	1,819,559	967,696	-75,613
1988	25,143,546	14,420,807	1,865,703	2,751,218	5,210,286	2,116,318	1,126,024	-94,762
1989	27,696,108	15,821,423	2,087,312	2,970,906	6,003,996	2,176,977	1,257,941	-106,565
1990	30,517,226	17,359,781	2,347,638	3,240,651	6,485,510	2,590,914	1,382,937	-124,331
1991	32,174,558	18,272,383	2,549,204	3,597,119	6,676,208	2,694,622	1,501,665	-113,313
1992	34,270,886	19,604,662	2,779,411	3,994,778	6,709,608	2,933,704	1,600,197	-151,080
1993	36,735,666	20,855,908	3,003,008	4,283,095	7,224,649	3,259,725	1,710,170	-180,549
1994	39,370,499	22,530,618	3,232,621	4,425,478	8,035,830	3,230,984	1,855,967	-229,065
1995	42,661,456	24,786,516	3,261,021	4,739,211	9,018,831	3,183,367	2,028,071	-299,419
1996	45,872,189	27,300,282	3,335,219	4,911,304	9,453,829	3,454,693	2,205,273	-377,865
1997	49,743,957	30,003,725	3,531,843	5,068,853	10,252,203	3,744,645	2,397,724	-459,588
1998	52,539,011	31,853,197	3,627,459	5,204,265	10,887,713	3,952,727	2,509,026	-477,324
1999	54,874,825	33,361,176	3,716,622	5,422,305	11,256,262	4,245,566	2,633,711	-493,395
2000	59,689,525	36,581,871	3,664,492	5,915,498	12,448,842	4,401,230	2,802,567	-519,840
2001	61,745,373	37,574,109	3,754,668	6,423,055	12,890,789	4,489,748	2,853,232	-533,764
2002	62,987,798	38,112,379	3,795,750	7,226,837	12,682,797	4,589,316	2,877,493	-541,788
2003	66,918,346	40,105,109	4,000,732	8,066,776	13,375,022	4,958,654	3,016,200	-571,748
2004	71,089,969	42,798,284	4,234,611	8,236,851	14,458,692	5,175,429	3,205,704	-608,193
2005	75,024,509	45,721,337	4,511,644	8,234,122	15,187,558	5,423,779	3,405,674	-648,257
2006	78,671,039	48,166,127	4,776,595	8,341,487	15,904,576	5,743,162	3,577,469	-683,439
2007	82,477,778	50,624,365	5,061,721	8,541,691	16,629,023	6,093,994	3,753,660	-719,355
2008	88,509,462	53,640,190	5,598,337	9,029,181	18,278,631	6,705,896	3,974,806	-767,967
2009	93,499,037	56,401,533	5,975,321	9,454,045	19,581,983	7,076,018	4,181,294	-808,568
2010	98,999,632	59,432,456	6,362,448	9,937,627	21,010,511	7,518,578	4,408,734	-853,253
2011	104,062,674	62,724,410	6,577,925	10,517,299	22,317,719	7,492,402	4,674,327	-892,754
2012	109,695,481	66,229,447	6,935,385	11,153,747	23,757,991	7,499,034	4,943,144	-936,978
2013	115,900,868	69,946,070	7,347,287	11,879,447	25,413,108	7,524,095	5,224,624	-984,515
2014	121,521,793	72,974,837	7,767,741	12,674,353	26,197,347	8,401,882	5,459,661	-1,034,707
2015	127,656,746	76,301,544	8,209,052	13,562,728	27,112,316	9,277,134	5,717,521	-1,088,506
2016	135,332,036	80,896,980	8,685,705	14,505,306	29,121,178	9,338,422	6,068,359	-1,147,197
2017	142,527,754	84,989,646	9,185,452	15,512,260	30,196,729	10,240,244	6,385,908	-1,210,669
2018	151,333,496	90,302,422	9,734,608	16,621,350	32,392,066	10,355,660	6,793,639	-1,278,971
2019	159,508,678	94,931,432	10,314,124	17,813,765	33,542,363	11,416,126	7,157,799	-1,351,333
2020	168,188,025	99,866,020	10,931,129	19,108,819	34,722,956	12,535,714	7,548,304	-1,428,309
2021	178,661,799	106,106,217	11,599,455	20,543,721	37,180,694	12,784,847	8,043,175	-1,509,959
2022	188,506,544	111,597,494	12,283,754	22,090,295	38,627,914	14,002,475	8,500,496	-1,594,892
2023	198,842,614	117,317,718	13,006,317	23,748,218	40,172,524	15,267,390	8,986,309	-1,683,245
2024	209,725,681	123,311,858	13,782,631	25,539,422	41,581,796	16,792,542	9,504,187	-1,778,382
2025	221,160,595	129,559,584	14,600,013	27,434,053	43,117,605	18,384,088	10,057,271	-1,877,478

In Thousands

Detail may not add due to rounding

A-13

Source: Metro DRC
Metro01.xls 10/8/02

Table 11

**Personal Income, Total and Per Capita
Portland-Vancouver OR-WA**
**Consumer Price Index, All Earners
(1982-84 = 100)**

	Amount (in thous.)	Percent Change	Infl. Adj. (1996 \$)	Percent Change	Per Capita		U.S.	Percent Change	Port.-Vanc. OR-WA	Percent Change
					Nominal	Infl. Adj. (1996 \$)				
1970	\$4,583,778		\$19,791,972		\$4,368	\$18,861	38.8		38.7	
1971	4,989,157	8.8%	20,999,701	6.1%	4,638	19,520	40.5	4.2%	39.7	2.6%
1972	5,557,442	11.4%	22,760,994	8.4%	5,182	21,223	41.8	3.3%	40.8	2.8%
1973	6,258,168	12.6%	24,039,997	5.6%	5,728	22,003	44.4	6.3%	43.5	6.6%
1974	7,092,332	13.3%	24,285,424	1.0%	6,347	21,732	49.3	11.0%	48.8	12.2%
1975	7,806,160	10.1%	24,381,483	0.4%	6,813	21,279	53.8	9.1%	53.5	9.6%
1976	8,845,638	13.3%	25,931,686	6.4%	7,549	22,132	56.9	5.8%	57.0	6.5%
1977	9,897,231	11.9%	26,847,846	3.5%	8,223	22,306	60.6	6.5%	61.6	8.1%
1978	11,452,259	15.7%	28,225,258	5.1%	9,275	22,859	65.2	7.6%	67.8	10.1%
1979	13,110,100	14.5%	28,450,620	0.8%	10,356	22,474	72.6	11.3%	77.0	13.6%
1980	14,697,285	12.1%	28,164,178	-1.0%	11,324	21,699	82.4	13.5%	87.2	13.2%
1981	16,091,647	9.5%	28,304,360	0.5%	12,239	21,528	90.9	10.4%	95.0	8.9%
1982	16,636,752	3.4%	28,367,360	0.2%	12,551	21,400	96.5	6.2%	98.0	3.2%
1983	17,474,173	5.0%	29,464,524	3.9%	13,269	22,375	99.6	3.2%	99.1	1.1%
1984	19,213,950	10.0%	31,232,014	6.0%	14,451	23,490	103.9	4.4%	102.8	3.7%
1985	20,376,011	6.0%	31,910,323	2.2%	15,179	23,772	107.6	3.5%	106.7	3.8%
1986	21,487,037	5.5%	33,183,770	4.0%	15,855	24,486	109.7	1.9%	108.2	1.4%
1987	22,859,879	6.4%	34,444,416	3.8%	16,693	25,152	113.7	3.7%	110.9	2.5%
1988	25,143,546	10.0%	36,630,223	6.3%	17,978	26,192	118.4	4.1%	114.7	3.4%
1989	27,696,108	10.2%	38,438,701	4.9%	19,390	26,911	124.0	4.8%	120.4	5.0%
1990	30,517,226	10.2%	40,026,911	4.1%	20,649	27,084	130.8	5.4%	127.4	5.8%
1991	32,174,558	5.4%	40,152,118	0.3%	21,421	26,732	136.3	4.2%	133.9	5.1%
1992	34,270,886	6.5%	40,963,269	2.0%	22,082	26,395	140.4	3.0%	139.8	4.4%
1993	36,735,666	7.2%	42,422,459	3.6%	22,997	26,558	144.6	3.0%	144.7	3.5%
1994	39,370,499	7.2%	44,182,743	4.1%	23,957	26,886	148.3	2.6%	148.9	2.9%
1995	42,661,456	8.4%	46,532,176	5.3%	25,377	27,679	152.5	2.8%	153.2	2.9%
1996	45,872,189	7.5%	48,330,661	3.9%	26,610	28,036	157.0	2.9%	158.6	3.5%
1997	49,743,957	8.4%	50,668,791	4.8%	28,062	28,584	160.6	2.3%	164.1	3.4%
1998	52,539,011	5.6%	52,539,011	3.7%	28,995	28,995	163.1	1.6%	167.1	1.9%
1999	54,874,825	4.4%	53,126,207	1.1%	29,749	28,801	166.7	2.2%	172.6	3.3%
2000	59,689,525	8.8%	56,034,380	5.5%	31,844	29,894	172.3	3.3%	178.0	3.1%
2001	61,745,373	3.4%	56,442,297	0.7%	32,455	29,667	177.2	2.8%	182.8	2.7%
2002	62,987,798	2.0%	55,795,489	-1.1%	32,563	28,845	179.7	1.5%	188.6	3.2%
2003	66,918,346	6.2%	57,211,847	2.5%	34,078	29,135	184.1	2.4%	195.5	3.6%
2004	71,089,969	6.2%	58,845,464	2.9%	35,408	29,310	188.7	2.5%	201.9	3.3%
2005	75,024,509	5.5%	60,208,412	2.3%	36,612	29,382	193.3	2.5%	208.2	3.1%
2006	78,671,039	4.9%	61,372,225	1.9%	37,624	29,351	198.0	2.4%	214.2	2.9%
2007	82,477,778	4.8%	62,614,314	2.0%	38,672	29,358	202.7	2.4%	220.1	2.8%
2008	88,509,462	7.3%	64,393,640	2.8%	40,786	29,673	207.5	2.4%	229.7	4.3%
2009	93,499,037	5.6%	66,028,607	2.5%	42,442	29,972	212.3	2.3%	236.6	3.0%
2010	98,999,632	5.9%	67,901,484	2.8%	44,317	30,396	217.3	2.4%	243.6	3.0%
2011	104,062,674	5.1%	69,311,515	2.1%	45,954	30,608	222.8	2.5%	250.9	3.0%
2012	109,695,481	5.4%	71,140,708	2.6%	47,805	31,003	228.7	2.7%	257.7	2.7%
2013	115,900,868	5.7%	73,260,081	3.0%	49,856	31,514	235.1	2.8%	264.4	2.6%
2014	121,521,793	4.8%	74,928,200	2.3%	51,539	31,778	242.0	3.0%	271.0	2.5%
2015	127,656,746	5.0%	76,800,872	2.5%	53,321	32,079	249.5	3.1%	277.8	2.5%
2016	135,332,036	6.0%	79,447,664	3.4%	55,703	32,701	257.7	3.3%	284.6	2.5%
2017	142,527,754	5.3%	81,638,459	2.8%	57,838	33,129	266.4	3.4%	291.7	2.5%
2018	151,333,496	6.2%	84,560,532	3.6%	60,546	33,831	275.6	3.5%	299.1	2.5%
2019	159,508,678	5.4%	86,933,790	2.8%	62,926	34,295	285.1	3.5%	306.6	2.5%
2020	168,188,025	5.4%	89,390,010	2.8%	65,414	34,767	295.2	3.5%	314.4	2.5%
2021	178,661,799	6.2%	92,600,455	3.6%	68,495	35,501	305.6	3.5%	322.4	2.5%
2022	188,506,544	5.5%	95,262,335	2.9%	71,214	35,988	316.5	3.6%	330.7	2.6%
2023	198,842,614	5.5%	97,976,000	2.8%	74,003	36,463	327.8	3.6%	339.1	2.6%
2024	209,725,681	5.5%	100,747,912	2.8%	76,891	36,937	339.8	3.6%	347.9	2.6%
2025	221,160,595	5.5%	103,567,344	2.8%	79,894	37,413	352.2	3.7%	356.8	2.6%

Table 12

Average Weekly and Hourly Earnings, Average Work Hours Per Week, Manufacturing Industries Only

	United States			Portland-Vancouver OR-WA		
	Avg. Weekly Earnings	Avg. Hourly Earnings	Avg. Hours Per Week	Avg. Weekly Earnings	Avg. Hourly Earnings	Avg. Hours Per Week
1970	\$133.83	\$3.36	39.8	\$145.84	\$3.80	38.4
1971	141.87	3.56	39.85	155.90	4.04	38.59
1972	154.86	3.82	40.54	166.44	4.26	39.07
1973	166.38	4.09	40.68	175.96	4.52	38.93
1974	177.33	4.43	40.03	191.82	4.94	38.83
1975	190.45	4.83	39.43	210.92	5.51	38.28
1976	209.43	5.22	40.12	231.49	5.98	38.71
1977	228.67	5.67	40.33	247.23	6.45	38.33
1978	249.45	6.17	40.43	266.39	6.95	38.33
1979	268.80	6.69	40.18	291.90	7.71	37.86
1980	288.87	7.28	39.68	325.66	8.57	38.00
1981	318.48	7.99	39.86	361.28	9.53	37.91
1982	331.50	8.50	39.00	386.77	10.17	38.03
1983	354.26	8.83	40.12	406.26	10.34	39.29
1984	373.76	9.19	40.67	412.42	10.42	39.58
1985	386.56	9.54	40.52	403.68	10.45	38.63
1986	396.11	9.73	40.71	425.86	10.85	39.25
1987	406.51	9.91	41.02	425.30	10.80	39.38
1988	417.18	10.18	40.98	425.20	10.74	39.59
1989	428.95	10.48	40.93	431.79	10.89	39.65
1990	441.65	10.83	40.78	451.56	11.38	39.68
1991	454.69	11.18	40.67	471.74	11.77	40.08
1992	470.48	11.45	41.09	496.05	12.42	39.94
1993	486.86	11.74	41.47	499.84	12.44	40.18
1994	505.68	12.06	41.93	514.88	12.66	40.67
1995	514.47	12.37	41.59	521.95	12.84	40.65
1996	530.72	12.77	41.56	533.12	13.17	40.48
1997	552.46	13.16	41.98	559.76	13.43	41.68
1998	564.03	13.50	41.78	588.72	14.44	40.77
1999	580.33	13.91	41.72	609.59	15.10	40.37
2000	597.07	14.37	41.55	627.17	15.44	40.62
2001	604.17	14.83	40.74	608.06	15.70	38.73
2002	615.37	15.09	40.78	595.84	15.68	38.00
2003	637.31	15.32	41.60	619.77	15.99	38.76
2004	661.30	15.87	41.67	643.12	16.52	38.93
2005	678.26	16.32	41.56	665.98	17.16	38.81
2006	699.92	16.89	41.44	690.05	17.84	38.68
2007	725.28	17.54	41.35	715.89	18.58	38.53
2008	750.88	18.19	41.28	734.77	19.09	38.49
2009	775.23	18.83	41.17	749.01	19.48	38.45
2010	800.65	19.49	41.08	779.32	20.30	38.39
2011	826.37	20.18	40.95	813.10	21.18	38.39
2012	851.13	20.81	40.90	841.29	21.88	38.45
2013	880.17	21.52	40.90	864.49	22.46	38.49
2014	912.70	22.31	40.91	889.66	23.09	38.53
2015	945.96	23.14	40.88	917.73	23.80	38.56
2016	981.22	24.02	40.85	946.61	24.53	38.59
2017	1,015.51	24.89	40.80	977.34	25.30	38.63
2018	1,048.50	25.73	40.75	1,008.13	26.07	38.67
2019	1,082.89	26.60	40.71	1,037.82	26.81	38.71
2020	1,120.05	27.54	40.67	1,069.00	27.58	38.76
2021	1,159.22	28.51	40.66	1,101.92	28.40	38.80
2022	1,204.61	29.59	40.71	1,135.78	29.25	38.83
2023	1,248.68	30.62	40.78	1,172.88	30.19	38.85
2024	1,301.26	31.80	40.92	1,208.62	31.07	38.90
2025	1,350.13	32.89	41.05	1,248.23	32.08	38.91

Source: Metro DRC
Metro01.xls 10/8/02

Table 13

Residential Authorized Permits

	Single Family	Change	Multi-Family	Change
1970	5,500		5,130	
1971	7,740	2,240	9,270	4,140
1972	9,000	1,260	9,950	680
1973	7,490	-1,510	6,010	-3,940
1974	6,120	-1,370	3,160	-2,850
1975	7,200	1,080	2,720	-440
1976	10,190	2,990	5,320	2,600
1977	12,350	2,160	7,590	2,270
1978	11,750	-600	7,510	-80
1979	7,530	-4,220	6,190	-1,320
1980	5,750	-1,780	2,960	-3,230
1981	3,680	-2,070	2,020	-940
1982	2,300	-1,380	1,260	-760
1983	3,850	1,550	790	-470
1984	3,820	-30	1,410	620
1985	4,180	360	4,640	3,230
1986	4,790	610	3,230	-1,410
1987	5,240	450	4,450	1,220
1988	5,980	740	5,080	630
1989	7,090	1,110	9,140	4,060
1990	8,320	1,230	2,960	-6,180
1991	7,060	-1,260	2,020	-940
1992	8,740	1,680	1,260	-760
1993	9,940	1,200	790	-470
1994	10,400	460	1,410	620
1995	9,800	-600	4,640	3,230
1996	10,720	920	3,230	-1,410
1997	10,660	-60	4,450	1,220
1998	10,620	-40	5,080	630
1999	9,900	-720	9,140	4,060
2000	9,300	-600	3,260	-5,880
2001	10,170	870	2,590	-670
2002	10,600	430	2,010	-580
2003	10,160	-440	1,670	-340
2004	10,010	-150	1,590	-80
2005	10,540	530	1,690	100
2006	10,570	30	1,810	120
2007	10,570	0	2,020	210
2008	10,050	-520	2,330	310
2009	9,680	-370	2,690	360
2010	9,750	70	3,150	460
2011	9,800	50	3,650	500
2012	9,900	100	4,210	560
2013	10,010	110	4,620	410
2014	10,190	180	5,070	450
2015	10,330	140	5,440	370
2016	10,360	30	5,760	320
2017	10,500	140	6,060	300
2018	10,600	100	6,360	300
2019	10,700	100	6,620	260
2020	10,780	80	6,960	340
2021	10,910	130	7,250	290
2022	11,000	90	7,450	200
2023	11,120	120	7,630	180
2024	11,260	140	7,810	180
2025	11,340	80	7,940	130

Housing Price Statistics

Median Home Price		Relative Price Index * (1996=100)
U.S.	Portland-Vanc. OR-WA	
\$17,243	\$18,300	69.4
18,588	20,000	69.4
20,008	21,400	66.5
21,716	23,400	65.9
24,032	26,000	65.9
26,453	30,500	70.9
28,573	33,300	70.6
32,080	40,400	78.4
36,536	50,910	87.9
41,679	59,900	92.8
46,562	62,900	89.9
49,612	66,500	90.2
50,784	65,000	86.5
52,373	63,000	78.4
54,227	62,500	75.0
56,522	61,500	71.7
60,205	62,900	68.1
64,206	63,000	62.4
66,941	64,000	59.3
67,106	70,000	63.0
68,937	79,700	69.7
72,632	91,750	79.2
74,778	97,000	83.2
77,056	107,000	88.1
80,268	117,000	91.8
82,435	128,000	96.2
86,702	139,900	100.0
91,085	150,000	102.4
133,958	155,100	102.3
139,592	161,000	105.0
145,455	166,000	104.8
151,404	169,730	104.8
151,235	170,740	107.3
156,281	176,280	107.4
161,319	184,580	110.0
166,022	195,210	113.9
171,127	206,680	118.2
175,706	218,190	122.9
183,084	230,890	126.9
187,752	244,590	132.2
192,212	256,060	136.3
195,797	265,980	140.4
200,378	275,450	143.1
205,593	287,350	146.1
211,185	297,350	149.2
216,967	307,290	152.1
222,912	318,150	154.1
229,025	329,410	157.1
235,330	340,730	158.7
241,841	352,610	161.5
248,558	364,950	164.2
255,468	377,850	166.1
262,559	391,400	169.5
269,801	405,120	172.8
277,254	419,440	176.4
284,953	434,830	180.4

Table 14

Alternate Forecasts for the Portland-Vancouver, OR-WA

	<u>2000</u>	<u>2005</u>	<u>2010</u>	<u>2015</u>	<u>2020</u>	<u>2025</u>	<u>2030</u>	AARG 2000-30
(in thousands)								
Population, total								
Base	1,874.5	2,049.2	2,233.9	2,394.1	2,571.1	2,768.2	2,955.3	1.5%
High	1,874.5	2,087.8	2,299.6	2,453.6	2,701.4	3,026.2	3,391.5	2.0%
Low	1,874.5	1,991.4	2,079.6	2,120.3	2,177.2	2,275.2	2,385.8	0.8%
Age, 0 to 4 years								
Base	133.1	147.0	159.3	168.4	179.3	191.9	204.1	1.4%
High	133.1	158.8	180.9	191.9	210.7	239.0	271.9	2.4%
Low	133.1	133.6	130.0	125.1	124.6	129.1	134.4	0.0%
Age, 5 to 9 years								
Base	132.3	142.6	154.8	164.8	175.7	187.8	199.7	1.4%
High	132.3	147.6	167.4	182.1	200.8	225.5	254.8	2.2%
Low	132.3	135.8	134.6	129.5	127.4	130.0	134.1	0.0%
Age, 10 to 14 years								
Base	127.5	137.9	149.2	159.4	170.4	182.3	193.9	1.4%
High	127.5	139.9	155.4	169.9	189.1	211.8	237.9	2.1%
Low	127.5	134.2	136.1	133.0	130.6	131.6	133.9	0.2%
Age, 15 to 19 years								
Base	124.5	135.3	145.8	155.5	166.7	178.7	190.0	1.4%
High	124.5	136.9	148.5	160.0	179.4	202.3	226.8	2.0%
Low	124.5	131.8	135.4	134.5	133.6	134.8	136.5	0.3%
Age, 20 to 24 years								
Base	133.1	143.5	153.5	161.6	173.2	186.4	197.2	1.3%
High	133.1	146.6	154.5	159.5	181.9	209.4	235.6	1.9%
Low	133.1	136.1	137.7	135.2	137.1	142.3	146.4	0.3%
Age, 25 to 29 years								
Base	142.2	150.2	160.5	167.3	178.3	191.7	203.0	1.2%
High	142.2	153.4	161.8	162.4	182.1	210.9	239.6	1.8%
Low	142.2	142.5	142.0	137.6	139.0	146.1	153.0	0.2%
Age, 30 to 34 years								
Base	146.7	152.8	162.3	168.9	178.6	191.0	202.6	1.1%
High	146.7	155.2	164.1	164.7	178.9	203.9	232.3	1.5%
Low	146.7	147.1	145.9	141.1	140.4	146.2	153.3	0.1%
Age, 35 to 39 years								
Base	149.4	153.6	161.1	167.6	176.2	187.0	198.2	0.9%
High	149.4	155.3	163.0	165.2	175.4	194.6	219.6	1.3%
Low	149.4	149.8	148.9	144.7	142.7	145.8	151.0	0.0%

Table 14

Alternate Forecasts for the Portland-Vancouver, OR-WA

	<u>2000</u>	<u>2005</u>	<u>2010</u>	<u>2015</u>	<u>2020</u>	<u>2025</u>	<u>2030</u>	<u>AARG</u> <u>2000-30</u>
Age, 40 to 44 years								
Base	147.7	152.4	158.5	164.4	171.9	181.3	191.5	0.9%
High	147.7	153.6	160.2	163.5	171.5	185.8	205.8	1.1%
Low	147.7	150.0	150.1	147.3	145.0	146.0	148.8	0.0%
Age, 45 to 49 years								
Base	137.0	146.6	153.8	159.7	166.5	174.7	183.8	1.0%
High	137.0	147.5	155.2	159.8	167.0	178.0	193.5	1.2%
Low	137.0	145.1	148.4	147.9	146.5	146.6	147.8	0.3%
Age, 50 to 54 years								
Base	117.1	133.6	144.7	152.2	159.3	166.8	174.8	1.3%
High	117.1	134.4	146.0	153.0	160.7	170.5	183.0	1.5%
Low	117.1	132.5	141.3	144.5	145.4	146.2	147.3	0.8%
Age, 55 to 59 years								
Base	94.1	114.3	130.0	140.7	149.3	157.0	164.6	1.9%
High	94.1	115.1	131.4	142.0	151.7	161.9	173.2	2.1%
Low	94.1	113.6	127.8	135.9	140.2	143.3	145.9	1.5%
Age, 60 to 64 years								
Base	74.7	92.9	110.4	124.1	134.9	143.9	151.6	2.4%
High	74.7	93.7	112.1	126.0	138.3	150.3	162.0	2.6%
Low	74.7	92.4	109.1	121.3	129.6	135.9	141.4	2.2%
Age, 65 to 69 years								
Base	61.8	74.4	90.2	105.0	117.6	128.1	136.7	2.7%
High	61.8	75.1	91.8	107.1	121.3	135.1	148.2	3.0%
Low	61.8	74.0	89.4	103.4	114.7	124.3	133.2	2.6%
Age, 70 to 74 years								
Base	52.1	59.4	71.1	84.3	97.1	108.5	118.0	2.8%
High	52.1	60.0	72.6	86.5	101.0	115.9	130.3	3.1%
Low	52.1	59.3	70.8	83.8	96.2	108.0	119.9	2.8%
Age, 75 to 79 years								
Base	42.0	46.2	53.5	63.4	74.4	85.1	94.6	2.7%
High	42.0	46.7	55.1	65.8	78.4	93.0	107.7	3.2%
Low	42.0	46.2	53.9	63.9	75.1	87.5	101.2	3.0%
Age, 80 to 84 years								
Base	30.9	33.9	38.3	44.7	52.7	61.4	69.8	2.8%
High	30.9	34.4	39.7	47.0	56.5	69.2	83.2	3.4%
Low	30.9	34.0	38.9	45.7	54.3	65.5	79.2	3.2%

Table 14

Alternate Forecasts for the Portland-Vancouver, OR-WA

	<u>2000</u>	<u>2005</u>	<u>2010</u>	<u>2015</u>	<u>2020</u>	<u>2025</u>	<u>2030</u>	<u>AARG</u> <u>2000-30</u>
Age, 85 and over years								
Base	28.7	32.7	36.9	42.1	49.1	64.9	81.2	3.5%
High	28.7	33.6	39.9	47.3	56.8	69.3	86.0	3.7%
Low	28.7	33.5	39.3	46.3	55.0	66.2	80.9	3.5%
Births, total								
Base	27.5	30.2	32.6	34.3	36.6	39.2	41.7	1.4%
High	27.5	34.7	38.8	39.7	44.3	50.9	58.0	2.5%
Low	27.5	25.7	24.9	24.5	24.7	25.8	27.0	-0.1%
Deaths, total								
Base	13.8	15.3	17.1	19.4	21.5	22.7	26.1	2.2%
High	13.8	13.5	15.1	17.2	19.7	18.9	22.3	1.6%
Low	13.8	13.4	14.7	16.6	18.7	17.6	20.4	1.3%
Migration, total								
Base	16.4	25.4	15.3	21.7	21.6	24.0	20.4	n.m.
High	16.4	29.3	-4.0	20.1	32.0	39.2	39.5	n.m.
Low	16.4	11.2	0.8	-0.5	9.1	13.9	11.9	n.m.
Household, total								
Base	725.4	799.6	876.7	946.9	1,021.6	1,104.2	1,177.8	1.6%
High	725.4	811.1	894.1	956.3	1,049.8	1,171.6	1,308.7	2.0%
Low	725.4	785.9	840.1	876.7	915.1	966.4	1,022.6	1.2%
INCOME								
Per Capita Income, 1996 \$								
Base	\$ 28,320.3	27,875.3	28,836.2	30,432.9	32,982.5	35,493.6	37,532.0	0.9%
High	28,320.3	28,328.1	28,687.1	31,200.8	33,346.7	34,788.1	36,442.2	0.8%
Low	28,319.9	28,317.9	31,563.7	34,070.2	35,229.8	35,438.4	34,479.8	0.7%
Per Capita Income								
Base	\$ 31,787.2	36,602.5	44,305.5	53,306.7	65,396.6	79,872.3	96,087.5	3.8%
High	31,787.2	37,699.3	44,650.1	56,054.2	70,639.3	87,777.8	110,631.9	4.2%
Low	31,786.9	36,770.8	44,517.4	54,545.5	66,281.8	79,367.2	92,498.8	3.6%
Personal Income, 1996 \$ millions								
Base	\$ 53,088.4	57,130.8	64,428.6	72,874.1	84,818.6	98,271.6	110,938.8	2.5%
High	53,088.4	59,154.3	65,981.7	76,568.4	90,101.1	105,294.4	123,614.7	2.9%
Low	53,088.4	56,400.2	65,650.3	72,250.3	76,714.3	80,641.3	82,263.9	1.5%
Personal Income								
Base	\$ 59,689.5	75,017.6	98,990.6	127,646.0	168,173.3	221,140.7	284,015.0	5.3%
High	59,689.5	78,724.4	102,695.6	137,559.6	190,865.5	265,686.4	375,279.3	6.3%
Low	59,689.5	73,234.7	92,589.8	115,667.7	144,329.8	180,602.8	220,691.5	4.5%

Table 14

Alternate Forecasts for the Portland-Vancouver, OR-WA

	<u>2000</u>	<u>2005</u>	<u>2010</u>	<u>2015</u>	<u>2020</u>	<u>2025</u>	<u>2030</u>	<u>AARG</u> <u>2000-30</u>
Wage Disbursements								
Base	\$ 36,581.9	45,721.3	59,432.5	76,301.5	99,866.0	129,559.6	167,863.3	5.2%
High	36,581.9	47,196.0	61,803.9	81,078.0	109,364.3	147,711.8	197,360.2	5.8%
Low	36,581.9	44,660.7	57,279.2	69,862.4	84,178.5	101,627.0	121,649.0	4.1%
Social Security								
Base	\$ 2,802.6	3,405.7	4,408.7	5,717.5	7,548.3	10,057.3	13,420.1	5.4%
High	2,802.6	3,510.9	4,565.9	6,234.6	8,379.9	11,342.9	15,310.7	5.8%
Low	2,802.6	3,323.5	4,225.2	5,758.4	7,775.6	10,569.8	14,562.2	5.6%
Other Labor Income								
Base	\$ 3,664.5	4,511.6	6,362.4	8,209.1	10,931.1	14,600.0	19,385.6	5.7%
High	3,664.5	4,696.6	6,463.9	9,494.8	13,831.5	19,238.3	25,695.9	6.7%
Low	3,664.5	4,495.8	6,146.5	8,231.6	10,833.7	14,332.7	18,932.7	5.6%
Dividends, Interest, & Rent								
Base	\$ 12,448.8	15,187.6	21,010.5	27,112.3	34,723.0	43,117.6	49,724.0	4.7%
High	12,448.8	16,862.7	22,274.2	30,760.9	45,278.4	68,521.3	104,081.6	7.3%
Low	12,448.8	13,993.9	17,330.4	22,978.0	30,894.6	42,335.3	58,264.9	5.3%
Transfer Payments								
Base	\$ 5,915.5	8,234.1	9,937.6	13,562.7	19,108.8	27,434.1	40,326.6	6.6%
High	5,915.5	8,642.9	10,264.5	13,599.4	18,744.7	25,232.8	40,032.7	6.6%
Low	5,915.5	8,520.5	9,548.7	11,912.7	15,117.1	17,992.3	19,935.4	4.1%
Farm Proprietors' Income								
Base	\$ 76.7	75.0	72.5	72.4	82.0	93.1	104.3	1.0%
High	76.7	77.6	80.9	105.6	120.1	120.2	121.6	1.5%
Low	76.7	70.5	74.9	99.1	112.7	112.8	112.4	1.3%
Business Proprietors' Income								
Base	\$ 4,324.5	5,348.7	7,446.1	9,204.7	12,453.7	18,291.0	22,469.6	5.6%
High	4,324.5	5,435.0	7,263.6	9,934.2	13,507.5	18,372.1	19,637.0	5.2%
Low	4,324.5	5,460.2	7,267.4	9,363.5	12,209.4	16,287.2	17,318.6	4.7%

Table 14

Alternate Forecasts for the Portland-Vancouver, OR-WA

	<u>2000</u>	<u>2005</u>	<u>2010</u>	<u>2015</u>	<u>2020</u>	<u>2025</u>	<u>2030</u>	<u>AARG</u> <u>2000-30</u>
(in thousands)								
Employment, total (includes self employed)								
Base	1,210.2	1,314.2	1,477.2	1,625.2	1,788.9	1,972.7	2,151.6	1.9%
High	1,210.2	1,344.3	1,518.3	1,677.3	1,873.4	2,115.9	2,399.9	2.3%
Low	1,210.2	1,290.0	1,431.0	1,525.7	1,609.1	1,709.4	1,814.2	1.4%
Self Employment								
Base	252.2	270.7	308.5	352.0	401.2	457.2	510.1	2.4%
High	252.2	275.9	315.9	355.7	413.6	488.2	576.1	2.8%
Low	252.2	266.1	293.0	316.5	341.3	373.6	408.2	1.6%
Wage & Salary								
Base	958.0	1,043.5	1,168.7	1,273.1	1,387.7	1,515.5	1,641.5	1.8%
High	958.0	1,068.5	1,202.4	1,321.6	1,459.8	1,627.7	1,823.8	2.2%
Low	958.0	1,023.9	1,138.0	1,209.3	1,267.8	1,335.8	1,406.0	1.3%
Manufacturing								
Base	145.5	154.7	165.9	168.9	172.8	177.2	182.9	0.8%
High	145.5	159.1	172.7	181.1	190.0	201.1	214.0	1.3%
Low	145.5	148.9	157.5	158.4	157.8	157.6	157.6	0.3%
Durable Mfg.								
Base	107.4	115.3	125.5	128.4	132.1	136.7	142.3	0.9%
High	107.4	119.3	131.7	139.6	147.9	158.6	170.7	1.6%
Low	107.4	110.4	118.7	120.0	120.3	121.2	122.3	0.4%
Lumber & Wood								
Base	7.6	7.4	6.8	5.9	5.0	4.2	3.6	-2.5%
High	7.6	7.2	6.5	5.7	5.0	4.5	4.0	-2.2%
Low	7.6	7.3	6.3	5.3	4.5	3.8	3.2	-2.8%
Metals: Primary & Fabricated								
Base	19.9	20.1	20.3	19.6	19.1	18.8	18.6	-0.2%
High	19.9	20.5	20.8	20.7	20.6	20.8	21.1	0.2%
Low	19.9	19.7	20.2	19.5	18.6	17.9	17.3	-0.5%
Nonelectrical Machinery								
Base	17.0	17.6	20.2	20.8	21.8	22.9	24.1	1.2%
High	17.0	18.3	20.4	20.9	21.8	23.1	24.6	1.2%
Low	17.0	17.4	19.9	20.0	20.2	20.7	21.3	0.8%
Electrical Machinery & Instruments								
Base	41.7	50.4	56.4	59.3	62.4	65.8	69.9	1.7%
High	41.7	50.7	56.7	61.5	66.0	70.9	75.9	2.0%
Low	41.7	46.3	50.6	53.4	55.2	56.7	58.1	1.1%

Table 14

Alternate Forecasts for the Portland-Vancouver, OR-WA

	<u>2000</u>	<u>2005</u>	<u>2010</u>	<u>2015</u>	<u>2020</u>	<u>2025</u>	<u>2030</u>	<u>AARG</u> <u>2000-30</u>
Transportation Equipment								
Base	12.7	10.5	11.5	11.7	12.0	12.4	12.6	0.0%
High	12.7	11.5	12.7	12.8	13.0	13.5	13.8	0.3%
Low	12.7	10.6	11.6	11.2	10.9	10.7	10.5	-0.6%
Other Durable Mfg.								
Base	8.5	9.4	10.3	11.1	11.9	12.8	13.5	1.6%
High	8.5	11.1	14.5	17.9	21.4	25.8	31.3	4.5%
Low	8.5	9.1	10.1	10.6	11.0	11.5	11.9	1.1%
Nondurable Mfg.								
Base	38.1	39.3	40.5	40.5	40.7	40.5	40.7	0.2%
High	38.1	39.8	41.0	41.6	42.1	42.5	43.3	0.4%
Low	38.1	38.6	38.8	38.4	37.5	36.4	35.2	-0.3%
Food Processing								
Base	8.9	8.5	8.2	7.7	7.2	6.7	6.3	-1.2%
High	8.9	8.8	8.4	7.9	7.4	6.9	6.3	-1.1%
Low	8.9	8.5	8.0	7.3	6.7	6.2	5.6	-1.5%
Textile & Apparels								
Base	3.4	4.0	3.6	3.1	2.6	2.2	2.0	-1.7%
High	3.4	3.9	3.9	3.8	3.8	3.8	3.8	0.4%
Low	3.4	3.5	2.9	2.5	2.3	2.1	1.9	-2.0%
Paper & Pulp								
Base	6.7	6.8	6.6	6.2	5.9	5.5	5.2	-0.9%
High	6.7	6.8	6.7	6.5	6.3	6.1	5.9	-0.4%
Low	6.7	6.9	6.6	6.2	5.7	5.3	4.9	-1.1%
Printing & Publishing								
Base	11.1	12.2	13.1	13.5	13.7	13.8	13.8	0.7%
High	11.1	12.4	13.3	13.6	13.9	14.2	14.5	0.9%
Low	11.1	12.2	12.9	13.0	13.0	12.9	12.8	0.5%
Other Nondurable Mfg.								
Base	8.0	7.8	9.0	10.1	11.3	12.3	13.4	1.7%
High	8.0	8.0	8.8	9.8	10.8	11.6	12.7	1.6%
Low	8.0	7.5	8.5	9.4	9.8	10.0	10.1	0.8%
Nonmanufacturing (except military)								
Base	812.5	888.9	1,002.8	1,104.3	1,214.9	1,338.3	1,458.6	2.0%
High	812.5	909.4	1,029.7	1,140.5	1,269.8	1,426.6	1,609.9	2.3%
Low	812.5	875.0	980.5	1,050.9	1,109.9	1,178.2	1,248.4	1.4%

Table 14

Alternate Forecasts for the Portland-Vancouver, OR-WA

	<u>2000</u>	<u>2005</u>	<u>2010</u>	<u>2015</u>	<u>2020</u>	<u>2025</u>	<u>2030</u>	<u>AARG</u> <u>2000-30</u>
Private Services, total								
Base	685.5	759.8	862.5	955.1	1,055.1	1,166.3	1,275.7	2.1%
High	685.5	778.5	888.3	989.4	1,104.1	1,241.6	1,401.8	2.4%
Low	685.5	752.5	856.7	924.3	979.8	1,042.9	1,108.2	1.6%
Construction & Mining								
Base	53.9	59.3	67.7	71.8	76.3	81.0	85.4	1.5%
High	53.9	60.0	71.2	76.6	79.5	84.9	91.3	1.8%
Low	53.9	58.5	69.5	72.8	71.5	70.5	69.4	0.8%
Transp., Comm., Utilities								
Base	55.4	58.4	64.9	69.9	75.2	80.9	86.5	1.5%
High	55.4	59.4	66.6	71.8	79.0	88.0	98.1	1.9%
Low	55.4	56.5	60.5	62.7	64.7	67.6	70.8	0.8%
Trade, total								
Base	235.4	258.1	288.6	313.5	339.7	367.9	395.6	1.7%
High	235.4	261.4	294.4	322.1	353.2	389.8	430.9	2.0%
Low	235.4	255.3	282.9	301.7	317.4	335.3	353.5	1.4%
Wholesale Trade								
Base	67.2	73.3	81.6	87.9	94.4	101.6	108.6	1.6%
High	67.2	74.5	83.2	90.5	98.7	108.2	119.1	1.9%
Low	67.2	72.6	79.9	84.7	88.7	93.0	97.2	1.2%
Retail Trade								
Base	168.1	184.8	207.0	225.6	245.3	266.3	287.0	1.8%
High	168.1	186.9	211.2	231.6	254.5	281.7	311.8	2.1%
Low	168.1	182.7	203.0	217.0	228.7	242.3	256.3	1.4%
Finance, Ins., & Real Est.								
Base	64.5	68.4	74.2	80.1	85.3	90.2	94.7	1.3%
High	64.5	68.8	75.3	80.7	85.7	90.8	96.1	1.3%
Low	64.5	67.8	73.9	76.8	78.4	79.9	81.6	0.8%
Service, total								
Base	276.3	315.6	367.1	419.8	478.7	546.3	613.4	2.7%
High	276.3	328.9	380.9	438.2	506.7	588.1	685.4	3.1%
Low	276.3	314.4	370.0	410.4	447.8	489.6	532.9	2.2%
Health Services								
Base	62.2	71.2	82.3	93.5	105.2	118.9	133.6	2.6%
High	62.2	74.5	85.5	97.2	113.6	135.2	162.8	3.3%
Low	62.2	71.3	77.7	83.6	90.4	99.0	108.3	1.9%

Table 14

Alternate Forecasts for the Portland-Vancouver, OR-WA

	<u>2000</u>	<u>2005</u>	<u>2010</u>	<u>2015</u>	<u>2020</u>	<u>2025</u>	<u>2030</u>	<u>AARG</u> <u>2000-30</u>
Other Services								
Base	214.2	244.5	284.8	326.3	373.5	427.4	479.8	2.7%
High	214.2	254.4	295.3	340.9	393.1	452.9	522.6	3.0%
Low	214.2	243.1	292.3	326.8	357.5	390.6	424.5	2.3%
Government, total								
Base	133.9	135.7	147.0	155.8	166.6	178.8	189.6	1.2%
High	133.9	137.7	148.1	157.8	172.4	191.7	214.9	1.6%
Low	133.9	129.3	130.5	133.3	136.9	142.0	146.9	0.3%
Federal Civilian, Govt.								
Base	18.5	17.9	19.3	19.4	20.4	21.2	21.8	0.5%
High	18.5	17.5	17.2	17.8	18.8	19.8	20.8	0.4%
Low	18.5	17.5	17.2	17.1	17.1	17.0	17.0	-0.3%
Federal Military, Govt.								
Base	6.8	6.6	6.8	6.7	6.7	6.7	6.7	0.0%
High	6.8	6.8	6.8	6.7	6.7	6.8	6.8	0.0%
Low	6.8	6.8	6.8	6.7	6.7	6.7	6.7	0.0%
State & Local Govt.								
Base	108.5	111.2	121.0	129.7	139.5	150.8	161.1	1.3%
High	108.5	113.4	124.2	133.2	147.0	165.2	187.3	1.8%
Low	108.5	105.0	106.6	109.5	113.1	118.2	123.2	0.4%

Table 15

Employment Forecast for Standardized MetroScope Industry Classification

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
AFF Services & Mining	16.6	16.2	15.6	15.7	15.8	15.7	15.5	15.3	15.2	15.0	14.7
Construction	71.7	70.9	71.1	73.8	75.9	78.4	80.2	82.7	85.7	87.9	89.8
Nondur. Mfg. less Paper	31.9	31.1	31.0	31.6	32.3	32.9	33.2	33.5	33.8	34.2	34.2
Durable Mfg. plus Paper	59.2	55.6	54.3	55.4	56.3	57.4	58.0	58.3	58.6	59.0	59.0
Hi-tech Mfg.	58.1	59.2	58.6	60.4	63.5	66.8	68.9	70.4	72.0	74.0	75.4
Transport & Warehouse	41.3	40.9	40.6	41.0	42.0	43.1	44.2	45.2	46.2	47.1	47.9
Comm. & Utilities	21.8	21.6	21.5	21.7	22.2	22.9	23.4	24.0	24.6	25.1	25.5
Wholesale Trade	74.6	72.9	72.2	74.9	77.9	80.8	82.7	84.5	86.4	88.3	90.0
Retail Trade	201.8	202.2	201.3	204.7	212.3	220.2	225.8	231.4	237.0	242.2	247.2
FIRE	93.5	93.8	93.6	93.6	95.5	98.4	100.6	102.7	104.2	105.4	107.0
Consumer Services	177.5	179.4	178.6	186.5	195.4	202.7	208.4	214.1	223.8	231.0	238.4
Health Services (80+83)	119.2	121.3	123.0	127.2	131.6	135.6	139.1	142.8	148.5	153.2	157.7
Bus. & Prof. Services	83.3	84.2	83.8	87.5	91.7	95.1	97.8	100.5	105.0	108.4	111.9
Government (civilian)	122.3	123.0	122.5	122.3	121.7	123.4	125.6	127.6	129.9	131.9	134.3
TOTAL - excl. military	1172.9	1172.2	1167.7	1196.4	1234.2	1273.4	1303.5	1332.9	1370.9	1402.4	1433.1
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
AFF Services & Mining	14.4	14.0	13.6	13.2	12.6	12.1	11.5	10.9	10.3	9.6	8.9
Construction	91.1	93.7	94.7	95.4	96.0	96.8	98.0	99.3	100.9	102.7	104.5
Nondur. Mfg. less Paper	34.3	34.4	34.6	34.7	34.9	35.1	35.2	35.4	35.5	35.7	35.8
Durable Mfg. plus Paper	58.8	58.8	58.7	58.4	58.3	58.2	58.1	58.0	58.0	58.1	58.1
Hi-tech Mfg.	75.8	76.4	77.5	78.5	79.3	80.2	81.1	81.9	82.9	83.8	84.9
Transport & Warehouse	48.7	49.5	50.2	51.1	51.9	52.8	53.6	54.4	55.3	56.1	57.0
Comm. & Utilities	26.0	26.4	26.8	27.3	27.8	28.2	28.7	29.2	29.7	30.1	30.6
Wholesale Trade	91.6	93.3	94.8	96.2	97.6	99.2	100.6	102.3	104.0	105.6	107.4
Retail Trade	251.9	257.3	262.0	266.5	271.2	276.2	281.1	286.4	291.6	296.8	302.5
FIRE	108.9	111.0	112.8	114.5	116.3	118.0	119.7	121.5	123.0	124.6	126.3
Consumer Services	246.8	253.7	261.7	269.3	276.9	285.1	293.7	303.0	312.1	321.5	331.6
Health Services (80+83)	162.4	167.2	171.9	176.3	180.9	186.0	190.8	196.1	201.2	206.3	212.1
Bus. & Prof. Services	115.9	119.1	122.8	126.4	129.9	133.8	137.8	142.2	146.5	150.9	155.6
Government (civilian)	136.2	138.1	139.9	141.8	143.7	146.1	148.2	150.6	153.0	155.2	157.8
TOTAL - excl. military	1462.7	1492.7	1522.0	1549.5	1577.3	1607.7	1638.1	1671.4	1703.9	1736.9	1773.0
	Annual Avg. Growth Rates for Selected Periods										
	2022	2023	2024	2025	2000-05	2005-10	2010-15	2015-20	2020-25	2000-25	
AFF Services & Mining	8.1	7.2	6.3	5.3	-1.1%	-1.3%	-3.0%	-5.4%	-11.1%	-4.5%	
Construction	105.8	107.2	108.9	110.0	1.8%	2.7%	1.3%	1.4%	1.4%	1.7%	
Nondur. Mfg. less Paper	35.9	36.0	36.1	36.1	0.6%	0.8%	0.4%	0.4%	0.2%	0.5%	
Durable Mfg. plus Paper	58.1	58.1	58.1	58.1	-0.6%	0.5%	-0.2%	-0.1%	0.0%	-0.1%	
Hi-tech Mfg.	85.9	86.9	88.0	89.0	2.8%	2.4%	1.0%	1.1%	1.2%	1.7%	
Transport & Warehouse	57.9	58.8	59.8	60.7	0.9%	2.2%	1.6%	1.6%	1.6%	1.6%	
Comm. & Utilities	31.2	31.7	32.2	32.8	1.0%	2.2%	1.7%	1.7%	1.7%	1.6%	
Wholesale Trade	109.1	110.9	112.6	114.4	1.6%	2.2%	1.6%	1.6%	1.6%	1.7%	
Retail Trade	307.9	313.4	319.0	324.6	1.8%	2.3%	1.9%	1.8%	1.8%	1.9%	
FIRE	127.8	129.4	131.1	132.7	1.0%	1.7%	1.7%	1.4%	1.3%	1.4%	
Consumer Services	341.6	351.9	362.5	373.2	2.7%	3.3%	3.0%	3.0%	3.0%	3.0%	
Health Services (80+83)	217.8	223.7	229.7	235.9	2.6%	3.1%	2.8%	2.7%	2.7%	2.8%	
Bus. & Prof. Services	160.3	165.1	170.1	175.2	2.7%	3.3%	3.0%	3.0%	3.0%	3.0%	
Government (civilian)	160.3	162.8	165.4	168.1	0.2%	1.7%	1.4%	1.5%	1.6%	1.3%	
TOTAL - excl. military	1807.8	1843.1	1879.8	1916.0	1.7%	2.4%	1.9%	1.9%	2.0%	2.0%	

Adjusted to BEA employment levels which includes proprietors.
 Geographic Extent: Multnomah, Clackamas, Washington and Clark

Appendix B:

**U.S. Economic Forecast Details
DRI-WEFA, The U.S. Economy, The 25-Year Focus,
Winter Issue 2002**

THE

U.S. ECONOMY

The 25-Year Focus • Winter Issue

2002

DRI-WEFA prepares 4 U.S. macroeconomic scenarios:

- ❖ Trend Projection (a baseline scenario)
- ❖ Cyclical Projection (a scenario that incorporates business cycles)
- ❖ Optimistic Projection (a high growth scenario)
- ❖ Pessimistic Projection (a low growth scenario)

The Metro Regional Forecast assumes the national growth projections from DRI-WEFA's Trend Projection scenario for the baseline regional forecast. Metro's optimistic and pessimistic alternative growth forecasts are produced using DRI-WEFA's corresponding projection alternatives. The DRI-WEFA cyclical projection is not used in any Metro Regional Forecast.



FORECAST OVERVIEW

This issue of *The U.S. Economy, 25-Year Focus* presents DRI•WEFA's most recent set of long-range projections. Given the detail available in the current DRI•WEFA model, the projections for the next quarter-century cover not just the macro concepts such as output, inflation, and unemployment, but also the more disaggregated variables such as production and employment by industry. This disaggregation provides a variety of concepts for analysts to use in their planning models. Many of these variables serve as inputs to DRI•WEFA's Regional and Energy models.

While the long-range outlooks have been of particular interest to utilities and state and local governments, which have relatively long planning horizons, they can be equally relevant to analysts dealing with shorter intervals. This is especially true of the trend scenario, the principal long-range projection. The trend is completely consistent with DRI•WEFA's February short-term baseline (Control) solution (detailed in the Febru-

ary 2002 issue of *The U.S. Economic Outlook*), which represents our forecast through 2011. Thereafter, the economy is expected to make a transition to "full employment" (4.0-5.0% unemployment), and then evolve gradually along this full-employment growth path. Hence, the transition between the short and long-term forecasts is smooth, making the trend projection an excellent base for ten-year planning purposes and policy simulations.

The Four Long-Term Projections

This *25-Year Focus* presents four projections: baseline, cyclical, optimistic, and pessimistic.

The **trend projection** is the baseline scenario. It assumes that the economy suffers no major mishaps between now and 2027. It grows smoothly, in the sense that actual output follows potential output relatively closely. This projection is best described as depicting the mean of all possible paths that the economy could

EXHIBIT 1

A Comparison of the Past and Future (Percent)

	History 1976-2001	Trend 2002-2027	Cycle 2002-2027	Optim 2002-2027	Pesim 2001-2027
Average Annual Real Growth					
Average Annual Real Growth					
Potential Output	3.1	2.8	2.5	3.4	2.3
GDP	3.3	3.1	3.1	3.7	2.7
Consumption	3.4	3.0	3.2	3.6	2.6
Business Fixed Investment	5.9	5.2	5.2	5.7	4.6
Government	2.1	1.6	1.6	1.8	1.4
Exports	6.6	6.9	6.7	7.0	6.6
Imports	7.7	5.8	6.3	6.1	5.7
Average Annual Growth					
Labor Force	1.6	0.7	0.7	1.0	0.5
Productivity	1.7	2.5	2.2	2.7	2.1
Industrial Production	3.4	3.7	4.9	4.3	2.4
Average Level					
Inflation (Chain-wt. Implicit GDP deflator)	4.0	2.6	3.9	2.1	3.3
Unemployment	6.5	4.9	4.9	4.8	5.1
Average Percent of GDP					
Fuel Import Bill	1.3	1.0	0.9	1.0	1.1
Trade Balance	-1.4	-2.5	-2.9	-3.2	-2.4
Federal Deficit	-2.5	0.0	-1.1	0.5	-2.5
Fixed Investment	11.7	12.9	12.4	13.3	12.5

Note: Growth rates for the projection period are compound annual growth rates calculated between the years 2001 and 2027. Level Variables are averages for the years 2001 to 2027. Interpretation of the historical figures is similar. Unless otherwise stated, all real data are in chained 1996 dollars.

FORECAST OVERVIEW

EXHIBIT 2
Real GDP

(Trillions of chained 1992 dollars)

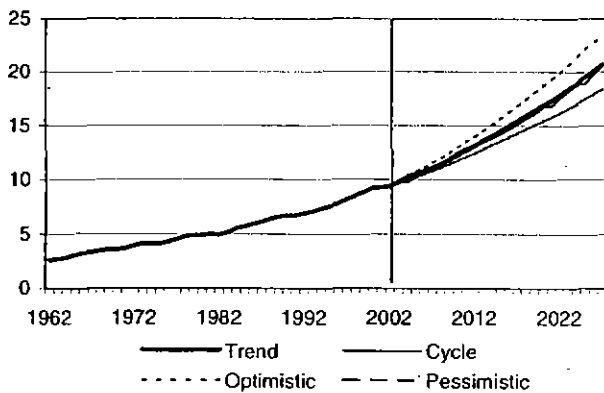
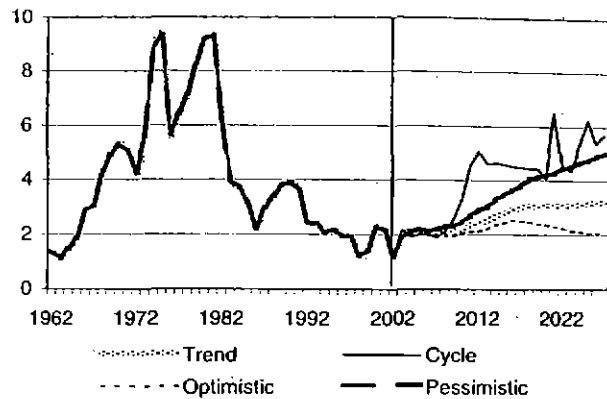


EXHIBIT 3
GDP Price Inflation

(Percent)



follow in the absence of major disruptions. Such disruptions include large oil price shocks, untoward swings in macroeconomic policy, or excessively rapid increases in demand. In all three situations, demographic forces slow the pace of real economic growth after 2010.

The **cyclical projection** is the primary alternative scenario. It superimposes business-cycle behavior on the trend scenario. Economic growth proceeds in a series of starts and stops, with periods of rapid expansion, followed by externally- or policy-induced recessions. The timing of the recessions is merely suggestive. Because it is impossible to predict the exact timing of business

cycles much in advance, it is unwise to focus on specific years. It is also inappropriate to calculate average growth rates between different points in the business cycle.

The **optimistic projection** is the "upside" scenario, in which economic growth proceeds smoothly but more rapidly than in the baseline, while prices rise more slowly. In this projection, population, labor force, and capital stock growth, as well as exogenous technological changes, occur more quickly than in the trend. Potential output thus climbs more rapidly, and because

EXHIBIT 4
Contributions to Real Potential GDP Growth
(Average annual percent change)

	History		Trend		Cycle		Optim		Pessim	
	1979-1989	1989-1999	2001-06	2007-27	2001-06	2007-27	2001-06	2007-27	2001-06	2007-27
Factors of Production: Private Nonresidential										
Labor Force (0.643)	1.1	1.0	0.8	0.5	0.8	0.5	0.9	0.7	0.7	0.3
Capital Stock (0.272)	0.9	1.4	1.1	1.3	0.9	1.3	1.2	1.4	1.0	1.2
Energy (0.084)	0.0	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.1
Govt. Infrastructure (0.022)	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.1
Total	2.1	2.5	2.0	2.0	1.9	2.0	2.3	2.4	1.8	1.7
Contributions to Factor Productivity										
Research and Development	0.3	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.2
Other	0.8	1.0	1.0	0.9	1.0	0.7	1.2	1.2	0.8	0.7
Total	1.1	1.2	1.3	1.2	1.3	0.9	1.5	1.4	1.1	0.9
Output Coverage	-0.2	-0.5	-0.3	-0.4	-0.3	-0.4	-0.4	-0.4	-0.3	-0.4
Real Potential Growth	2.9	3.2	3.0	2.7	2.8	2.5	3.4	3.4	2.6	2.1

Note: Figures in parentheses are production function weights. All real data are in chained 1996 dollars. Labor and capital exclude labor and capital used to produce energy.

EXHIBIT 5
Mortality Assumptions
 (Ultimate levels by 2050)

	Trend/Cycle	Optim	Pessim
Life Expectancy at Birth (Years)			
Male	81.2	83.8	79.5
Female	86.7	88.4	84.9

output is primarily supply-determined in the long run, real GDP grows 0.5 percentage point quicker per year.

The **pessimistic projection** is the “downside” scenario. Here, growth proceeds smoothly, but more slowly than in the baseline, and productivity growth is weaker. In this projection, population, labor force, and capital stock growth, together with exogenous technological changes, occur less rapidly than in the trend. Output thus climbs 0.5 percentage point more slowly per year.

Probabilities

The underlying rate of growth in TREND25YR0202 is consistent with history, as well as with conjecture about the economy’s unfolding structure. It can be regarded as the best unbiased projection of the economy. Although any probabilities attached to long-run projections must be highly subjective, DRI•WEFA believes there is only a 10% chance that the economy’s underlying path will be outside the “bandwidth” encompassed by the optimistic and pessimistic projections.

Key Assumptions

Demographics. Demographic factors are a primary driving force in any long-term economic projection. The population’s growth rate and changes in its composition have considerable impacts on the labor force, the full-employment unemployment rate, housing demand, and other spending categories—most notably, consumption of health services and purchases by state and local governments.

The population projections in DRI•WEFA’s trend and cyclical scenarios are consistent with the Census Bureau’s “middle” projection for the U.S. population. This projection is based on specific assumptions about immigration, fertility, and mortality rates. The fertility rate (the average number of births per woman upon completion of childbearing) will rise from its current level of 2.0 to about 2.2 in 2027, while the mortality rate

should continue to improve—with life expectancy for men and women rising steadily from 74.1 and 79.8 years, respectively, in 1999 to 77.6 and 83.6 years, respectively, in 2027. Meanwhile, net immigration (including undocumented immigration) is estimated to rise from only 960,000 persons in 1999 to 979,000 in 2027. Based on these assumptions, the U.S. population will average 0.8% growth per year through 2027, down from the 1.0% pace during the last 25 years. Thus total population will rise from 273.1 million in 1999 to 343.0 million in 2027.

The age distribution of the population is also an important factor in the long-term outlook. As baby boomers begin to retire, the share of the U.S. population aged 65 years and over will jump from 13% in 2010 to 19% by 2027, pushing up outlays for Social Security, Medicare, and Medicaid. In addition, the growth rate of the working-age population will slow more than that of the overall population. After increasing 1.1% annually over the past 25 years, the population aged 16 to 64 years will grow 0.8% annually during 1999–2014 and just 0.2% per year thereafter.

The optimistic and pessimistic alternatives embody population projections different from those in the trend. The optimistic outlook assumes the U.S. population will increase more quickly because of higher net immigration. Conversely, the pessimistic alternative constricts growth in the labor force because of lower assumed net immigration from the start of the forecast period. As a result, annual population growth averages 1.3% in the optimistic scenario and just 0.5% in the pessimistic scenario. By the end of the forecast interval, the current population increases to 390 million in the optimistic

EXHIBIT 6
The Percentage of the Population Aged 65 and Older Rises

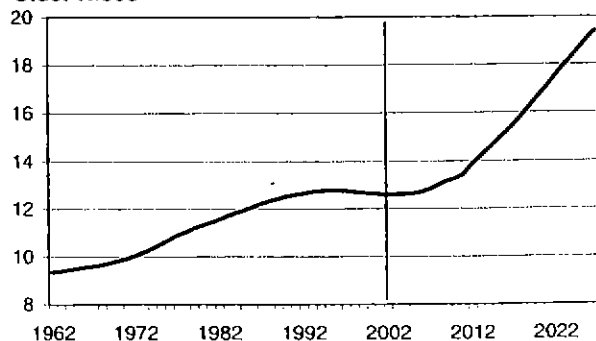
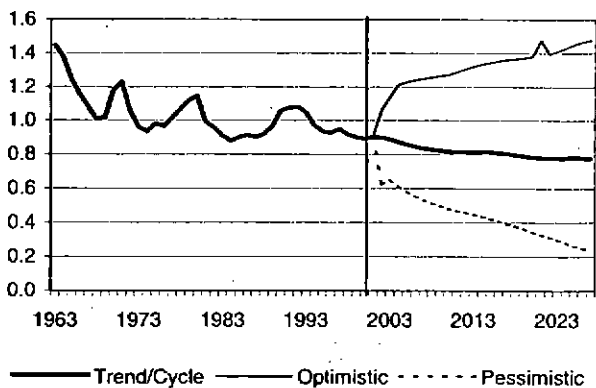


EXHIBIT 7
Population Growth
(Percent)



projection, but to only 310 million in the pessimistic scenario compared with 343 million in the baseline.

The Census Bureau has yet to revise its projections to make them consistent with the 2000 census. The revised projections, which will be released in late 2002, will show a larger population; the revised 2000 estimates were raised to 281.4 million, up from 275.3 million.

Fiscal Policy. We expect federal spending on defense, transfer payments, and federal aid to state and local governments to consume a larger share of GDP than previously thought. As a result, the federal government should post surpluses in the unified budget, averaging 0.02% of GDP from 2001 through 2027.

In the longer run, the baby boomers' retirement will cause a gradual disappearance of the surplus, despite some increases in the Social Security tax rate. In the trend scenario, the (unified) surplus falls, but does not return to a deficit until fiscal 2018.

Monetary Policy and Inflation. Monetary policy remains important in the long-term projections, not so much in determining the level of output, but rather in determining the rate of inflation. Ultimately, the Federal Reserve decides on the "steady-state" rate of inflation. Monetary policy can cause inflation to accelerate by being overly accommodative and pushing the unemployment rate temporarily below the rate at which inflation is stable. Alternatively, it can cause inflation to decelerate by being restrictive and pushing the unem-

ployment rate temporarily above the rate at which inflation is stable.

The monetary authorities choose to keep short-term interest rates slightly below their equilibrium levels throughout the forecast period in the trend projection, causing a slow but steady increase in inflation. Consequently, the rate of inflation—as measured by the chain-weighted GDP price index—rises from 1.4% in 1999 to 2.2% by 2010 and 3.2% in 2027.

Bond yields will generally move parallel to the funds rate over the forecast interval, but run somewhat higher. The yield on ten-year treasuries stays below 6.0% through 2007. Thereafter, the combination of higher short-term rates and increased government borrowing pushes up the ten-year bond rate to 9.6% by 2027. The forecast implies a real federal funds rate of about 2.0% and a real long-term bond rate between 2.5% and 3.0%—in line with historical averages.

In the cyclical scenario, periods of overly expansive monetary policy are followed by intervals of overly restrictive policy, which translates into the periodic acceleration and deceleration of inflation. In the optimistic scenario, the Fed is assumed to keep a tight rein on the money supply, permitting little acceleration of inflation. Conversely, in the pessimistic scenario, the central bank is assumed to be reluctant to put the economy through the pain necessary to bring inflation back to baseline levels, choosing instead to tolerate an inflation rate that eventually exceeds 6%.

EXHIBIT 8
The Federal Surplus Shrinks as the Population Ages

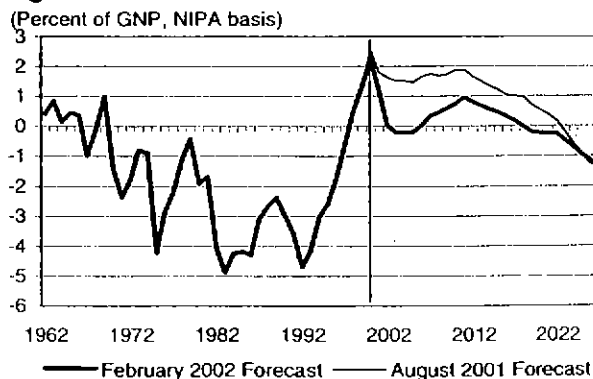
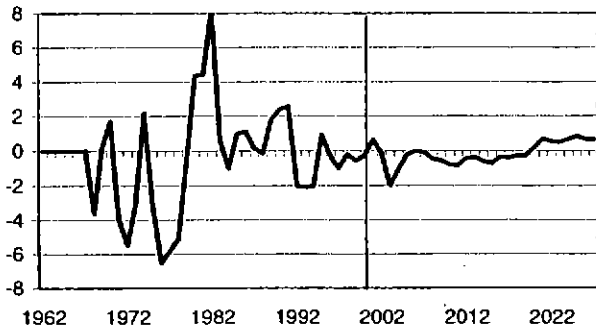
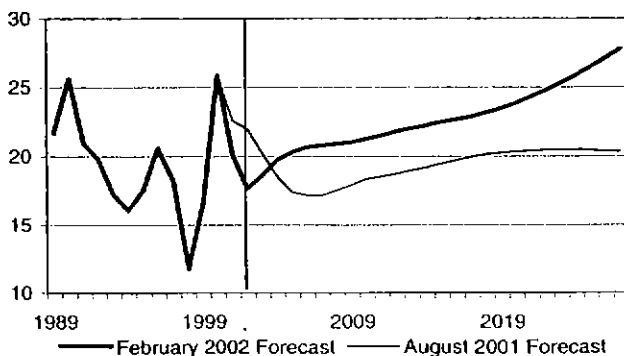


EXHIBIT 9
Short-Term Interest Rates Will Settle at Their Equilibrium
 (Federal funds rate less nominal GDP growth, percentage points)



Energy. Except for temporary spikes (such as this year's), DRI-WEFA's Energy Service expects the average acquisition price of foreign oil to remain below \$30 per barrel until 2015. With worldwide demand steadily increasing, however, the OPEC cartel will maintain some pricing power. Energy price inflation should thus heat up early in the next decade. Although it is impossible to predict the precise timing of price changes, the trend projection assumes that oil prices hover around \$25 per barrel through the end of 2012. Thereafter, the forecast shows oil prices climbing steadily to \$59 per barrel by 2027. The West Texas Intermediate price for oil is projected to reach \$63.1 per barrel by 2027, compared with the average price of \$26.4 in 2000.

EXHIBIT 10
Real Oil Prices Are Higher in the Long Term
 (Refiners' acquisition cost of imported crude, 1996 dollars/barrel)



In the long run, scarcity tends to bid energy prices up, while new technologies tend to hold them down. In the end, we project that scarcity will win out, with the real price of imported oil rising from about \$20.0 a barrel in 2001 to \$27.0 a barrel in 2027.

The oil price path in the cyclical scenario has a major spike in 2020, where oil producers are assumed to mimic their behavior of the 1970s, raising oil prices substantially when the world economy is close to a cyclical peak. In the pessimistic scenario, nominal oil prices are higher than in the trend. In the optimistic scenario, both nominal and real oil prices are below what they are in the trend.

International. In all three projections, the major U.S. trading partners are assumed to follow a growth pattern similar to that in the United States, with the pace of growth (in real consumption) averaging 2.45% over the forecast period, down from an average 2.8% over the past 25 years. This slowdown reflects demographic forces similar to those operating in the United States, as well as the maturation of many developing economies. The dollar's exchange rate will depreciate steadily through 2027, in order to keep the country's current account deficit from growing too fast.

Variations in the international environment help explain some of the differences among the alternative scenarios. A faster (slower) rate of growth abroad partially explains the higher (lower) level of exports in the optimistic (pessimistic) scenario. Meanwhile, a cycle in the real exchange rate due to swings in domestic interest

EXHIBIT 11
Oil Price Paths Across the Four Scenarios
 (Refiners' acquisition cost of imported crude, 1996 dollars/barrel)

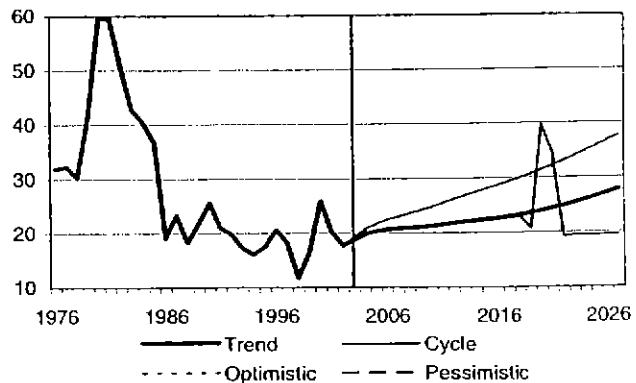
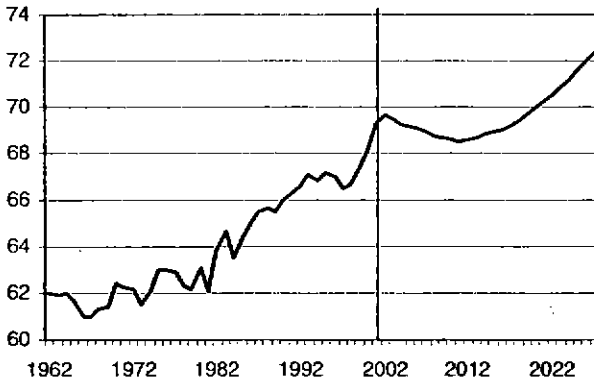


EXHIBIT 12
The Consumption Share Will Keep Rising
 (Percent of GDP)



rates helps explain the trade pattern in the cyclical scenario.

Demand Mix. Although the overall level of output is determined by supply conditions, many mixes of aggregate demand are consistent with that level of output. Over the forecast period, the demand mix will be dominated by the retirement of baby boomers. The consumption share of GDP rises because senior citizens continue to spend, even though they are no longer directly producing GDP. In addition, federal government outlays for Social Security and Medicare explode, further boosting

consumption relative to GDP. Between 2011 and 2027, consumption's share of GDP jumps from 69% to more than 72%.

The sum of the remaining shares of GDP must decline to make room for the rising share devoted to consumption. Government spending will bear some of the burden— between 2011 and 2026, government's share of GDP will decline by more than three percentage points.

Methodology over the Short-Term Forecasting Horizon

The trend remains consistent with the February Control forecast through 2011. The two bandwidth scenarios, optimistic and pessimistic, take the trend solution as their starting point and immediately diverge from it— according to their own underlying assumptions—at the beginning of the solution interval. This ensures that growth is always higher in the optimistic alternative, and lower in the pessimistic alternative. However, while average GDP growth, inflation, unemployment, and interest rates may be higher or lower than in the trend, depending on which is appropriate, these relationships will not necessarily hold for every individual quarter of the forecast period.

*by Patrick J. Newport, Mike Montgomery
 and Michael Donnelly*

TABLE 1

Capsule Summary of the Long-Term Projections

	Trend	Cyclical
General Outlook	The economy exhibits mild variations in growth and approaches its balanced-growth path. Inflation rises slowly, averaging 3.0%.	Typical business-cycle fluctuations.
I. Principal Exogenous Assumptions		
Demographic	Projections consistent with the Census Bureau's latest middle-growth forecast, which assumes a leveling off of the fertility rate at 2.2 births, an ultimate mortality rate of 77.6 years for men and 83.6 years for women, and net immigration of 912,000–954,000 per year.	
Energy imports	Real oil prices remain stable. No embargoes are assumed.	Sharp price hikes occur in periods of peak demand.
Food prices	Wholesale farm prices average 1.5% annual increases.	Wholesale farm prices average 2.9% annual increases. Inflation spikes in 2020.
II. Principal Policy Dimensions		
Tax changes	Lower personal income tax rates. Corporate tax falls to 33.0% as the national debt shrinks.	Fluctuates with the business cycle.
Growth of federal government purchases	Real, +1.2% per year.	Real, +12% per year. Growth pattern resembles the trend's.
Transfers	Real growth of 4.0% per year.	Real growth of 4.0% per year.
Budget deficit	Surplus averages 0.02% of GDP.	Deficit averages 0.3% of GDP.
Average federal government share of GDP	18.5%	19.2%
Monetary policy	Sufficient funds made available to promote stable credit growth. Money (M2) growth averages 5.3%.	Fluctuations in monetary policy contribute to severity of cycles. M2 averages 5.6% annual growth.
Federal funds rate	Rises gradually over forecast period.	Ranges between 1.75% and 9.50%.
Nonborrowed reserves	Steadily rises over forecast period.	Steadily rises over forecast period.

FORECAST OVERVIEW

TABLE 1 (Continued)

Capsule Summary of the Long-Term Projections

	Trend	Cyclical
III. Behavior of Economic Agents		
Consumers	Consumer confidence weakens as inflation picks up.	Cyclical swings in confidence, income, and wealth cause large fluctuations in expenditures, particularly on durable goods.
Average annual real consumption growth	3.0%	3.2%
Business	Decisions made in relatively stable environment.	Fluctuations in output, interest rates, and inflation lead to fluctuations in investment.
Average fixed investment share in GDP	13.0%	12.4%
Average share of corporate cash flow in GNP	10.9%	10.2%
State and local government	Real expenditures dictated by demographics and ability to raise taxes. Average real growth in purchases of 1.7% per year.	Average real growth in purchases of 1.7% per year.
Federal budget position (Fiscal years)	Surpluses through 2017.	Deficits starting in 2013.
International		
Average annual wholesale price inflation for major trading partners	1.8% (OECD countries) 3.7% (Developing countries)	1.9% (OECD countries) 3.8% (Developing countries)
U.S. exchange rate	Declines over forecast period.	Declines over forecast period.
IV. Other Parameters		
Average annual productivity growth	2.5%	2.2%
Average annual potential output growth	2.8%	2.5%
Consumer price inflation	Demand pressures and a return of moderate oil and food price inflation gradually push consumer price inflation from 2.5% in 1999 to 3.7% in 2027.	Periodic demand surges, oil price shocks, and more aggressive wage responses boost the average inflation rate.
Consumer price index		
Average annual increase	3.0%	4.3%
Peak annual	3.75% (2027)	6.7% (2027)
Hourly earnings		
Average annual rise	4.4%	5.6%
Peak annual	5.0% (2026)	7.8% (2027)
Housing market	Demographics dictate slower growth of the housing stock after 1998.	Cycles in incomes and monetary policy affect the housing sector more severely.
Median new home price in 2027	\$393,300	\$512,700
Average annual rise	3.1%	4.1%
Unemployment	Hovers about 5.0%.	Annual rates vary between 3.0% and 7.0%.
Average rate	4.9%	4.9%

TABLE 1 (Continued)

Capsule Summary of the Long-Term Projections

	Optimistic	Pessimistic
General Outlook	High growth.	Low growth.
	Deviations from trend due to differences in demographic assumptions, productivity growth, and investment.	
I. Principal Exogenous Assumptions		
Demographic	Projections above the trend are a result of higher net immigration.	Projections below the trend due to lower net immigration.
Energy imports	By 2027, oil import bill reaches \$528 billion.	Oil prices rise steadily, reaching \$97 per barrel by 2027. Oil import bill reaches \$553 billion by 2027.
Food prices	Wholesale farm prices rise 1.5% annually.	Wholesale farm prices average 2.6% annual increases.
II. Principal Policy Dimensions		
Tax changes	Similar to trend.	Similar to trend.
Growth of federal government purchases	Real, +1.2% per year.	Real, +1.3% per year.
Transfers	Real growth of 4.3% per year.	Real growth of 3.8% per year.
Budget deficit	The government runs a surplus through forecast period.	Deficits in most years.
Average federal government share of GDP	17.5%	20.6%
Monetary policy	Stable and predictable.	Tight policies required to contain rising inflationary pressures.
Federal funds rate	Settles at 5.0%.	Rises continually over forecast period.
Nonborrowed reserves	2.4% average growth.	2.0% average growth.

FORECAST OVERVIEW

TABLE 1 (Continued)

Capsule Summary of the Long-Term Projections

	Optimistic	Pessimistic
III. Behavior of Economic Agents		
Consumers	Consumer confidence weakens as inflation rises.	Lower real incomes depress consumer expenditures, especially on durable goods.
Average annual real consumption growth	3.6%	2.6%
Business	High demand expectations plus low inflation and interest rates enhance the business environment.	Higher inflation, higher interest rates, and weaker demand make investors more cautious.
Average fixed investment share in GDP	13.3%	12.5%
Average share of corporate cash flow in GNP	11.1%	10.4%
State and local government	Average real growth in purchases of 2.1% per year.	Average real growth in purchases of 1.5% per year.
Federal budget position (Fiscal years)	Government runs surplus through forecast period.	Deficits after 2001.
International		
Average annual wholesale price inflation for major trading partners	1.6% (OECD countries) 3.4% (Developing countries)	2.5% (OECD countries) 4.4% (Developing countries)
U.S. exchange rate	Declines over forecast period.	Declines over forecast period.
IV. Other Parameters		
Average annual productivity growth	2.7%	2.1%
Average annual potential output growth	3.4%	2.3%
Consumer price inflation	Hovers below 3.0%.	Inflation accelerates, approaching 6.0% in 2027.
Consumer price index		
Average annual increase	2.5%	3.7%
Peak annual	2.9% (2017)	5.7% (2027)
Hourly earnings		
Average annual rise	4.2%	4.7%
Peak annual	4.7% (2017)	6.2% (2027)
Housing market	The higher population projections push the housing stock above the trend.	Lower real incomes and high cost of funds depress housing starts.
Median new home price in 2027	\$336,600	\$498,700
Average annual rise	2.6%	4.2%
Unemployment	Remains near trend throughout forecast period.	Remains near trend throughout forecast period.

SLOW GROWTH AND RISING INFLATION: THE TREND PROJECTION

Highlights

- Real GDP growth will average 3.1% per year during 2001-27. Growth slows after 2012 as baby boomers retire.
- The outlook for inflation remains moderate. CPI inflation will average 3.0% per year over the forecast period. Core inflation will average 3.0%.
- High investment and a more slowly growing labor force should result in higher productivity growth. Nonfarm business productivity growth averages 2.5% over the forecast period, compared with the 1.7% average experienced since 1975.
- After worsening through 2002, the current account deficit will narrow, but remain negative. The deficit will hover between 3% and 4% of GDP during most of the projection period.
- Real oil prices will creep up over the forecast period. The real price of imported oil rises from about \$20.0 a barrel in 2001 to \$27.0 a barrel in 2027.
- The labor market will stay tight, with the unemployment rate remaining below 5.0% through most of the forecast period.
- Solid economic growth, combined with only moderate increases in federal spending, will result in surpluses throughout most of the forecast period.

Introduction

Economists focus on the short run. Will the Federal Reserve raise interest rates? Is the stock market overvalued? Will we have a recession next year? This focus is understandable. We care more about what will happen tomorrow than what will happen three years from today. The focus, though, is misplaced. When historians look back on the 20th century, the most striking economic fact that will distinguish it from previous centuries will not be the 21 recessions, but rather the steady, inexorable rise in per capita income.

The driving force behind rising per capita income is one that economists still do not quite understand: productivity growth. They agree that new technologies eventually make workers more productive, but many questions remain under debate. What determines the pace of tech-

nological progress? How long does it take for new technologies to catch on? How does an innovation such as the Internet compare with the invention of the transistor, the airplane, or the electric bulb? Not knowing these answers makes productivity—and the course of the economy—extremely tricky to forecast.

A further complication made this forecast even trickier. Productivity, before the current slowdown, was surging, possibly because of what Alan Greenspan called “a revolution in information technologies.” Although productivity growth eased as the economy slowed in 2001, recent data indicate that it is surging again. Will the productivity boom continue much longer? While there are several promising new technologies in the pipeline, we think things will settle, with productivity growth rising faster than it did in during the 1970s and 1980s, but slower than in the second half of the 1990s.

Long-Term Forecast Assumptions

In the trend scenario, we assume an environment free of exogenous shocks. Economic output will converge towards its potential level, with all resources fully utilized. As a result, the growth rates of output, real incomes, real expenditures, and the general standard of living of the population are determined by the growth rate of potential GDP. The long-range outlook is dominated by supply factors, such as population growth and demographics, labor force participation rates, average weekly hours worked, national saving and capital stock accumulation, productivity growth, fiscal and monetary policies, foreign developments, and internationally determined prices.

Population and Demographics

DRI-WEFA's population projections are based on the Census Bureau's middle series assumptions for fertility, life expectancy, and net immigration. These projections have the U.S. population expanding at an annual rate of 0.8% between 2000 and 2027, when the population reaches 344 million. Growth in the older age cohorts will be stronger as the baby boomers age. The 65 years and over population share rises from 12.5% in 2001 to 19.5% in 2027.

THE FOUR SCENARIOS: THE TREND PROJECTION

The population projections do not incorporate the 2000 Census estimates. When the Census updates its population projections later this year, the population numbers should be 2-3% higher than currently projected.

Productivity and Aggregate Supply

It is the economy's ability to increase supply in the long run that determines its potential growth path. Growth in aggregate supply depends on the increase in the labor force, the growth of the capital stock, and improvements in productivity.

DRI•WEFA believes productivity growth will exceed its recent historical average and average 2.5% per year during 2001–27. This is lower than the stellar 2.9% average annual growth achieved during the 1960s, although higher than the 1.7% annual growth rate for 1975-2000. The pickup in productivity growth, particularly over the next decade, is largely due to robust growth in equipment spending and new technologies.

The real capital stock will grow 4.5% annually, compared with 4.2% in 1976-2001. The declining price of capital goods relative to other inputs accounts for the robust capital stock growth rates.

Government Policy

The government sector's share of GDP will decline over the forecast period. Public purchases (both state and local) as a share of GDP will decrease from 18.0% in 2001 to 14.3% in 2027. This reduction in the government's share of the economy is concentrated in the federal sector. The reduction in federal spending as a

EXHIBIT 1
The Labor-Force Participation Rate Will Drop
(Percent)

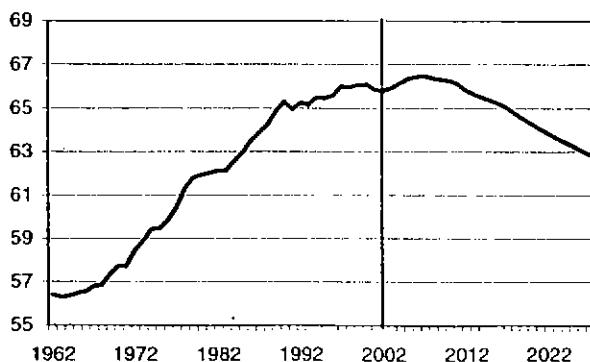
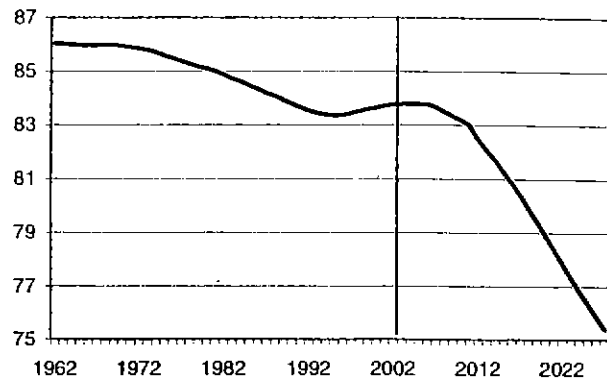


EXHIBIT 2
Population Aged 16-65 as a Percent of the Total
Adult Population



percentage of GDP will largely be the result of a declining defense share. State and local spending as a share of GDP will shrink from 12.0% in 2001 to 10.0% in 2027.

DRI•WEFA expects the federal government to record a surplus through 2017. The federal surplus will average 0.2% of GDP over the entire forecast period. Our projections are based upon the assumption that Congress and the executive will find it politically difficult to spend or tax away the Social Security surplus, and consequently, the publicly held debt will decline over time. We also expect state and local governments will run surpluses throughout the forecast period, since, statutorily, most states are required to do so.

Monetary Policy and Financial Markets

The Federal Reserve decides on the "steady-state" rate of inflation. Monetary policy can cause inflation to accelerate by being overly accommodative. Alternatively, it can cause inflation to decelerate by being restrictive. The monetary authorities choose to keep short-term interest rates slightly below their equilibrium levels throughout the forecast period in the trend projection, causing a slow but steady increase in inflation. Consequently, the rate of inflation—as measured by the chain-weighted GDP price index—rises from 1.3% in 2002 to 2.2% by 2010 and 3.2% in 2027.

Bond yields will generally move parallel to the funds rate over the forecast interval, but run somewhat higher. The yield on ten-year treasuries stays below 6.0% through 2007. Thereafter, the combination of higher short-term rates and increased government borrowing

EXHIBIT 3

Contribution to New Jobs

(Payroll employment, cumulative percent change)

	History			Trend	
	1976 -1986	1986 -2001	2002 -2007	2008 -2017	2018 -2027
Manufacturing	4.5	-2.3	-4.7	-8.2	-7.6
Mining and Construction	6.4	4.8	2.3	6.6	-5.5
Government	8.4	12.4	9.2	8.5	15.8
Private Services	80.6	85.0	93.2	93.1	97.3
Total New Jobs (Millions)	20.4	34.4	8.5	12.2	6.2

pushes up the ten-year bond rate to 9.6% by 2027. The forecast implies a real fed funds rate of about 2.0% and a real long-term bond rate close between 2.5% and 3.0%—in line with historical averages.

Oil Prices

Except for temporary spikes (such as this year's), DRI-WEFA's Energy Service expects the average acquisition price of foreign oil to remain below \$30 per barrel until 2015. With worldwide demand steadily increasing, however, the OPEC cartel will maintain some pricing power. Energy price inflation should, therefore, heat up early in the next decade. Although it is impossible to predict the precise timing of price changes, the trend projection assumes that oil prices hover around \$25 per barrel through the end of 2012. Thereafter, the forecast shows oil prices climbing steadily to \$59 per barrel by 2027. The West Texas Intermediate price for oil is pro-

jected to reach \$63.1 per barrel by 2027, compared with the average price of \$26.4 in 2000.

In the long run, scarcity tends to bid energy prices up, while new technologies tend to hold them down. In the end, we project that scarcity will win out, with the real price of imported oil rising from about \$20.00 per barrel in 2001 to \$27.00/barrel in 2027.

Foreign Assumptions

The major U.S. industrialized trading partners are assumed to follow a growth pattern similar to that in the United States, with the pace of growth averaging 2.5% over the forecast period, down from an average 2.8% over the past 25 years. This slowdown reflects demographic forces similar to those operating in the United States. The developing countries that trade with the United States will grow 4.6%, about the same as during the past 25 years.

The dollar will have to depreciate steadily against foreign currencies throughout the forecast period in order to keep the U.S. current account deficit from growing too fast. Over the forecast period, the real U.S. trade-weighted dollar with industrialized countries depreciates 0.5% annually.

Long-Term Forecast Highlights

Real GDP. The trend projection assumes that the U.S. economy experiences no major mishaps between now and 2027. The projection is identical with our February short-term forecast through 2011, and represents

EXHIBIT 4

Manufacturing's Share of Total Employment Continues to Slide

(Percent)

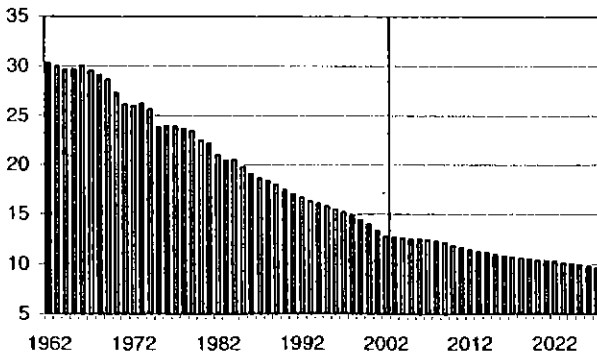


EXHIBIT 5

Potential Output Growth Will Slow

(Percent)

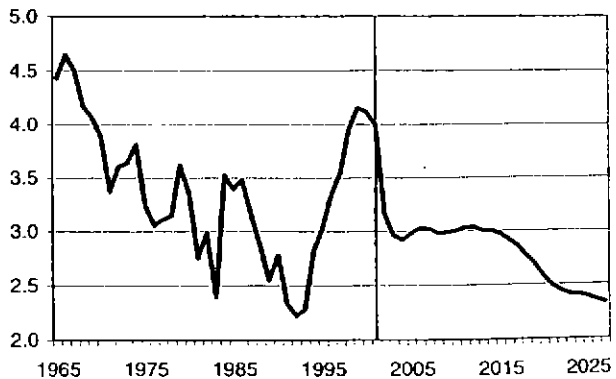
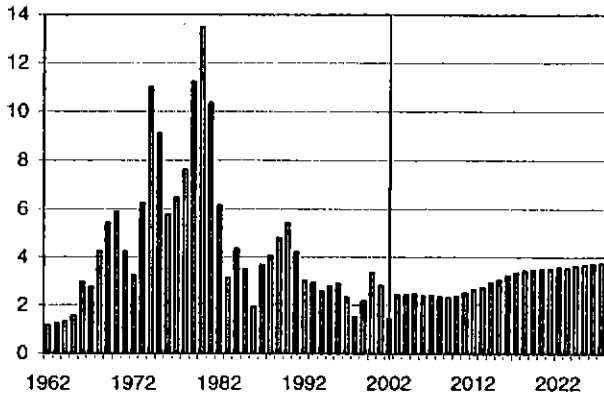


EXHIBIT 6
Consumer Price Inflation
 (Percent)



DRI•WEFA's best estimate of the economy's path over that period. Beyond 2011, the projection should be interpreted as the mean of all possible "near-full-employment" paths the economy could follow. The smooth-growth characteristics of the trend projection make it most useful for tasks largely impervious to short-term cyclical fluctuations, such as planning capacity additions and evaluating new markets. This projection is also the best base from which to evaluate the effects of various assumptions about key exogenous elements, such as fiscal policy or energy prices, on the overall economic outlook.

Annual real GDP growth averages 3.1% during 2001-27, compared with 3.0% during 1976-2001. The economy's underlying growth rate will slow after 2011 as baby boomers begin to retire, slowing labor force growth. Potential output growth should hold up fairly well in the future, with greater business fixed investment and R&D spending offsetting the slowdown in labor force growth. Eventually, though, the effects of weaker labor force growth become dominant and, in a sense, self-perpetuating. As output growth drops off, business fixed investment rises more slowly, limiting capital stock growth and thus future output gains.

Employment. Slower long-run increases in the labor force indicate more moderate long-run employment growth in the future. Total civilian employment will rise at an average annual rate of 1.0% from 2000 to 2005 and will moderate to an average growth rate of 1.1% for the rest of the forecast period. Total establishment employment will rise from 131.4 million in 2000 to 173.5 million in 2027, an increase of 32%. This growth is significantly slower than the astonishing gain of 49.7 million (63%) recorded in the previous 25 years. Manufacturing's share of total employment will continue to decline over the forecast period, falling to 10.1% in 2027 from 14.1% in 2000. The broad service sector will generate an increasing share of employment growth in the forecast period, although the share of employment accounted for by the federal government will decline during the forecast period.

EXHIBIT 7
The Federal Funds Rate
 (Percent)

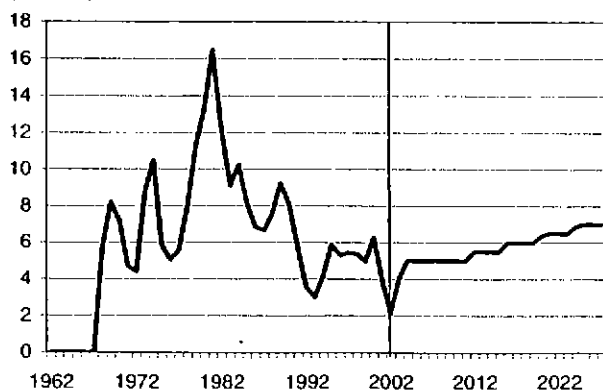


EXHIBIT 8
The Consumption Share Rises Steadily
 (Percent of GDP)

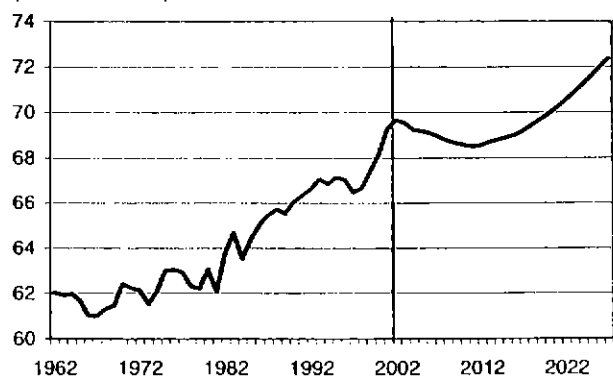


EXHIBIT 9

Personal Consumption Slows in Trend Scenario
(Average annual percent change)

	History			Trend	
	1976 -1986	1986 -2001	2002 -2007	2008 -2017	2018 -2027
Total Personal Consumption	3.3	3.3	3.0	3.2	3.0
Durable Goods	5.4	5.4	4.0	4.2	4.8
Autos & Parts	5.1	3.2	2.7	2.0	3.2
Furniture & Appliances	6.2	8.2	5.4	5.9	6.0
Software	N/A	38.3	9.2	6.2	6.7
Ophthalmic Goods	5.8	3.6	3.3	5.7	7.1
Other Durable Goods	4.2	5.4	4.2	5.4	5.5
Nondurable Goods	2.4	2.8	2.8	3.2	3.4
Food & Beverages	1.7	2.1	1.9	2.2	2.2
Prescription & Over-the-Counter Drugs	4.4	5.4	4.4	6.1	6.4
Clothing & Shoes	5.9	4.7	4.4	4.4	4.2
Gasoline & Oil	1.3	1.5	2.3	2.2	1.4
Fuel Oil & Coal	-5.6	-0.8	1.0	-0.6	-0.8
Tobacco Products	-1.2	-2.2	-1.2	-1.3	-4.8
Other Nondurable Goods	3.8	4.3	4.4	4.3	4.3
Services	3.5	3.1	2.8	3.1	2.7
Housing	2.9	2.1	1.8	1.4	1.0
Household Operation	2.7	3.5	3.7	4.5	4.7
Electricity	3.1	2.0	3.1	2.4	2.3
Natural Gas	-1.1	0.9	1.5	1.2	1.3
Telephony	5.1	7.8	7.0	7.9	7.7
Other	2.4	1.9	1.4	2.8	2.6
Transportation	3.2	3.1	2.2	1.8	1.2
Motor Vehicle Leases	N/A	N/A	6.9	6.3	1.9
Other Transportation	N/A	N/A	1.6	1.1	1.1
Personal Business Services	4.7	4.0	3.1	2.8	1.9
Free Financial Services	5.5	3.6	3.6	2.2	1.1
Medical	3.8	2.9	3.0	3.9	3.4
Recreational	5.7	4.8	6.1	5.1	3.6
Other Services	3.4	3.2	1.6	2.6	2.8

Note: All real data are in chained 1996 dollars.

Inflation. Over the long run, inflation is a monetary phenomenon. Its future course will be determined by policies implemented by Alan Greenspan and his successors. Since we do not know who his successors will be, we assumed the following in the 25-year forecast:

- The Fed will attempt to keep inflation contained over the first ten years of the forecast period.
- In the second half of the forecast period, as baby boomers start retiring, labor markets will tighten, putting pressure on wages. We assume that the Fed will allow inflation to creep up rather than slow the economy—possibly inducing a recession—to keep inflation checked.

The CPI is expected to average 3.0% annual increases between 2000 and 2027, somewhat less than the 4.0% average from 1947 to 2000. The broader-based GDP deflator will rise 2.6% per year. The acceleration of inflation over the projection period reflects a more

accommodative Federal Reserve attitude in response to pressures created by the aging population

Consumption. Expenditures, in the long term, are primarily determined by the growth of real permanent income, demographic influences, and changes in relative prices. The share of personal consumption expenditures in GDP will rise slightly over the forecast interval, and should account for 72% of the overall economy by the end of the forecast horizon. Real consumption expenditure growth will average 3.0% per year over the forecast period.

With total output growth easing, real consumer spending gains will slow from 3.2% annually between 1973 and 2000 to 2.9% during 2001–26. In per capita terms, growth will advance about 2.0% per year, 0.4% below the 1975-2000 rate. Most consumption categories are expected to slow, except for health-care spending, which will pick up again after 2012.

The share of consumption devoted to services will rise, mainly because of rising health expenditures, while that for goods will fall over the forecast period.

The long-term outlook for auto and light truck sales calls for a slowdown in the rate of increase relative to past performance. Vehicle sales growth will average close to 0.8% over the next 25 years. Light-vehicle sales are forecasted to reach 21.3 million units by 2027.

Although the number of vehicles per person has increased significantly in the past 20 years, the United States is approaching a saturation point in the rate of vehicle ownership. Future growth in vehicle sales will

EXHIBIT 10
Light-Vehicle Sales
(Millions of units)

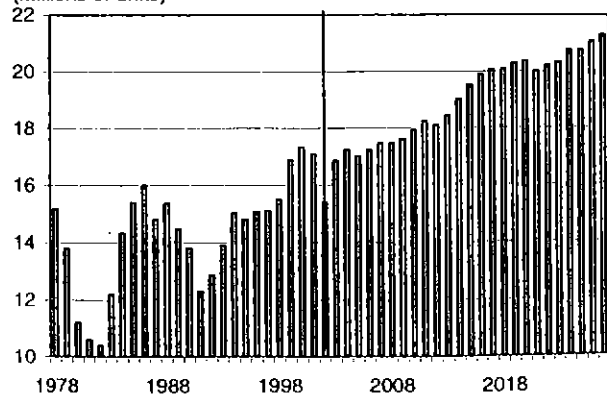
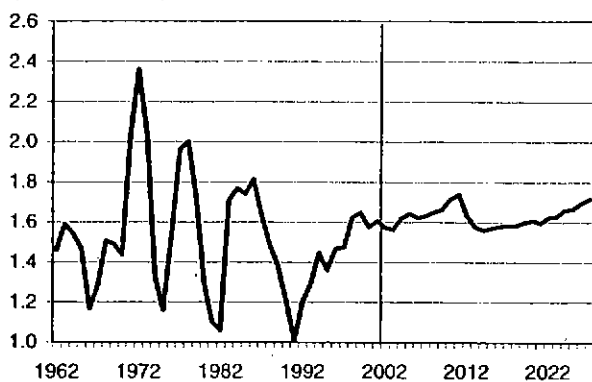


EXHIBIT 11
Housing Starts
 (Millions of units)



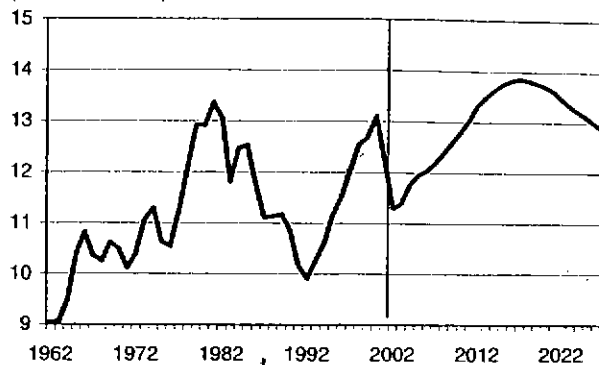
be primarily driven by growth in population and demand for replacement vehicles. Automobile sales should be relatively strong throughout the projection period, averaging 9.2 million units per year. Total light-vehicle sales (cars plus light trucks) reached 145 million units in the 1990s and will reach 171 million in the subsequent decade, compared with 135 million during the 1980s.

According to DRI•WEFA's Energy Service, real energy-intensive consumption (gasoline, fuel oil, coal, electricity, and natural gas) should increase 1.7% per year through 2027, compared with 1.5% annual gains since 1970. Energy conservation efforts will continue. This stems partly from a stock/flow phenomenon: despite the trend toward minivans and sport/utility vehicles, for example, the average new vehicle is still more fuel-efficient than the existing stock. Gasoline usage per vehicle should fall for several more years, even if relative energy prices remain flat. Similar considerations apply to business capital and housing stocks. The ongoing employment shift from manufacturing to services also implies lower energy usage per unit of output.

Real personal disposable income, which climbed 3.1% between 1970 and 2000, will rise 2.9% annually over the next 25 years—in line with the slowdown in total output growth. This does not take into account the rising volume of withdrawals from existing retirement plans.

Housing. Household growth clearly depends on population growth, but real incomes, employment, the age distribution of the population, and societal values also

EXHIBIT 12
Investment's Share of GDP Will Turn Down After 2015
 (Percent of GDP)



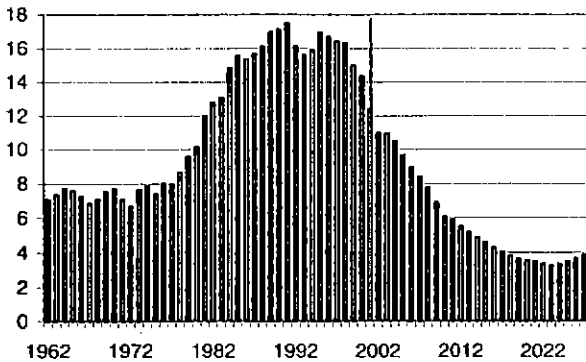
influence it. Net additions to the housing stock are closely linked to household growth, which is the primary driver of housing starts. Many analysts tend to overlook another key factor for housing starts: the geographic location of the demand for net additions.

The 25–34 age cohort is key for the demand for new housing. This is the age group where individuals typically purchase their first home. The demand for new housing was boosted by the large gains in this age group in the late 1960s and 1970s, as the baby-boom generation entered the housing market. Unfortunately for the housing sector, the baby-boom generation began to pass through this age bracket in the mid-1980s, limiting the demand for additions to the housing stock. The number of households in this cohort will begin a modest

EXHIBIT 13
Saving and Investment Shares of GNP
 (Percent)

	History			Trend	
	1976 -1986	1986 -2001	2002 -2007	2008 -2017	2018 -2027
Household	10.3	7.4	4.4	4.0	3.4
Business	9.1	9.2	9.6	10.8	11.8
Government	-3.4	-2.5	-0.8	-0.3	-1.4
Total Saving	15.9	14.0	13.2	14.5	13.8
Total Investment	16.5	13.9	11.8	13.6	13.1
Gross Private Investment	17.3	15.8	16.3	17.2	16.4
Nonresidential Fixed Investment	12.1	11.3	11.8	13.4	13.5
Residential	4.5	4.1	4.1	3.5	2.6
Change in Inventories	0.6	0.4	0.3	0.3	0.2
Net Foreign Investment	-0.8	-1.9	-4.5	-3.6	-3.2
Statistical Discrepancy	0.9	0.0	-1.3	-0.9	-0.7

EXHIBIT 14
Net Interest Paid by the Federal Government
 (Percent of federal government expenditures, excluding investment)



increase after 2005. The overall headship rate will gradually increase toward older segments due to the shift in the age composition.

The demographic demand for housing will be higher over the next 25 years than over the past 25 years. Thus, housing starts are projected to average 1.7 million units annually from 2001 to 2027, above the 1.5 million average for 1971-2000. Meanwhile, the housing stock will climb from 109.3 million units to 142.0 million units.

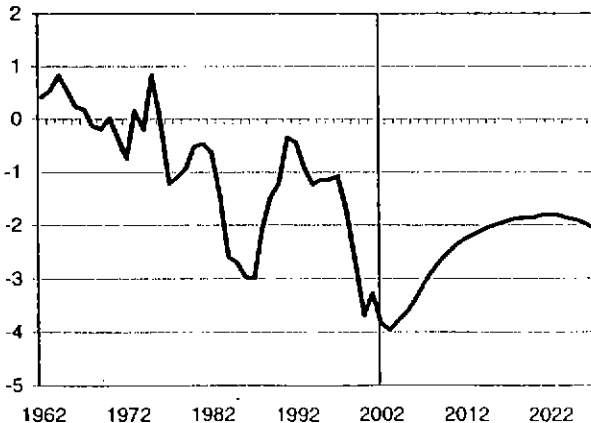
Business Fixed Investment. Good profitability and solid demand growth should keep investment healthy over the next 25 years. The share of GDP devoted to business fixed investment will hover about 12-13% of GDP through most of the forecast period. The effective capital stock (in 1996-dollar terms) is projected to increase 4.5% annually, just above the average growth rate recorded for 1971-2001. Inventory investment will remain a small percentage of GDP. Although inventories have played significant roles during past business cycles, inventory investment represents an average in the stable growth scenario and is thus artificially smooth. Capital inflow will contribute to net domestic investment throughout the forecast period, although federal deficits clearly hurt it in the later years of the forecast. The government saving projection assumes that state and local governments continue to run modest operating surpluses.

The composition of investment will continue to change in the forecast period; structures' share of investment will decline modestly, while equipment's share rises. This is a continuation of a long-standing trend, and is a direct result of declining relative prices for equipment and software.

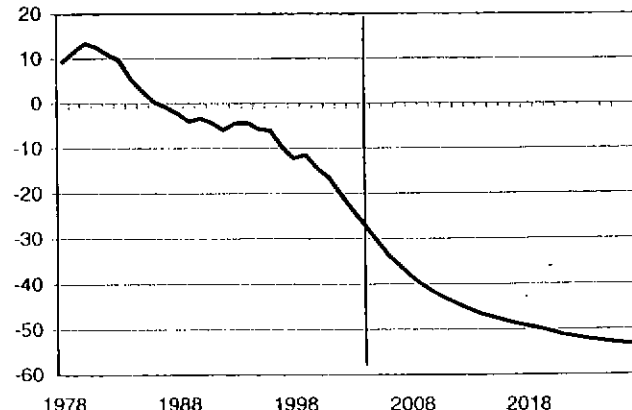
International Trade. A decline in the exchange rate, combined with modest unit labor cost growth, will stimulate U.S. exports abroad and result in an eventual

EXHIBIT 15
The Trade Outlook
 (Percent of GDP)

The Goods and Service Trade Balance



Net U.S. Investment Position



THE FOUR SCENARIOS: THE TREND PROJECTION

EXHIBIT 16
Ratio of Manufacturing Output to Real GDP
 (1996=100)

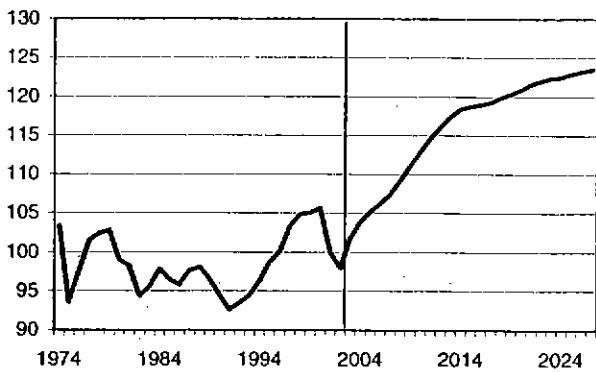
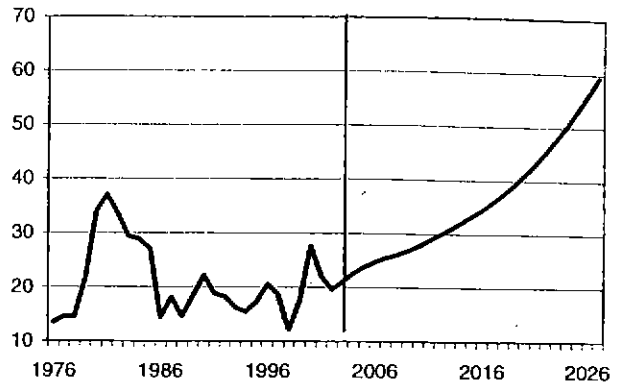


EXHIBIT 17
Foreign Oil Prices
 (Dollars per barrel)



improvement in the U.S. current account balance. DRI•WEFA projects that real exports will expand at an average annual rate of 6.9% over the entire forecast

period. Real imports, meanwhile, will grow at an average annual rate of 5.8%.

THE FOUR SCENARIOS: THE TREND PROJECTION

TABLE 1
Summary for the U.S. Economy--TREND25YR0202

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Composition of Real GDP (Annual percent change)													
Gross Domestic Product	1.0	4.0	3.9	3.0	2.9	2.9	3.3	3.4	3.6	3.4	3.4	3.3	3.3
Final Sales	0.3	3.7	3.8	3.2	2.9	2.9	3.3	3.4	3.6	3.4	3.4	3.3	3.3
Gross National Product	1.1	3.7	3.7	3.0	2.8	2.9	3.3	3.4	3.6	3.4	3.3	3.3	3.3
Total Consumption	1.9	3.6	3.3	2.8	2.6	2.6	2.9	3.1	3.3	3.2	3.3	3.3	3.2
Durable Goods	-0.6	6.7	4.4	2.5	3.2	3.2	2.9	3.6	4.5	4.4	2.6	4.1	4.8
Non-durable Goods	2.0	3.2	3.2	2.8	2.5	2.4	2.7	2.8	3.0	3.0	3.3	3.3	3.3
Services	2.4	3.1	3.1	2.9	2.6	2.5	3.0	3.1	3.2	3.1	3.4	3.2	3.0
Nonres. Fixed Investment	-4.6	6.7	8.5	6.1	5.0	5.5	6.4	6.6	6.7	6.7	7.2	6.3	6.3
Equipment and Software	-2.3	8.3	10.4	7.4	6.1	6.3	7.5	7.8	7.8	7.7	7.8	7.5	7.4
Computers	10.8	14.9	18.2	19.9	20.1	19.8	19.1	18.4	17.9	17.2	17.5	17.7	17.2
Software	6.0	8.6	9.0	10.4	10.6	10.6	10.8	10.9	11.0	11.1	11.5	11.2	10.4
Communications Equipment	-9.1	8.7	11.1	8.0	8.1	6.7	7.3	7.7	7.5	7.4	7.1	6.1	6.4
Light Vehicles	-3.4	8.9	6.7	1.9	2.9	3.4	5.1	5.0	4.8	4.6	4.4	4.1	4.5
Other	-6.4	6.7	10.6	5.2	2.0	2.2	4.0	4.4	4.5	4.1	4.0	3.4	3.6
Private Nonres. Structures	-11.0	1.9	3.0	2.0	1.2	3.1	3.1	2.9	3.1	3.8	5.3	2.6	2.6
Buildings and Other	-9.8	3.4	3.0	2.2	1.6	2.7	3.8	4.0	3.9	4.5	6.2	2.9	2.9
Residential Fixed Investment	-0.5	1.3	1.3	1.7	0.5	1.0	2.3	2.0	3.1	3.1	-1.2	-1.9	0.1
Exports	-8.6	7.6	9.3	7.9	8.1	7.8	7.4	7.4	7.1	6.9	7.0	7.6	7.7
Imports	0.6	6.5	5.2	4.5	4.1	4.0	4.1	4.5	4.8	4.7	5.4	6.0	6.3
Federal Government	4.5	4.7	2.3	1.0	0.6	0.5	0.7	0.8	1.2	-0.2	0.8	1.0	1.0
State and Local Governments	1.8	2.1	1.8	2.0	1.8	1.5	1.5	1.4	1.4	1.4	1.5	1.6	1.8
Billions of Dollars													
Real GDP (Chained 1996 \$)	9416.7	9794.5	10172.5	10480.1	10783.7	11100.7	11470.3	11862.4	12287.2	12709.2	13140.7	13575.2	14029.7
Gross Domestic Product	10431.3	11058.7	11728.4	12339.3	12957.3	13615.6	14360.7	15161.8	16042.4	16979.5	17987.3	19048.4	20212.2
Prices and Wages (Annual percent change)													
GDP Price Index (Chain-Wt.)	1.2	1.9	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.5	2.5	2.7
CPI - All Urban Consumers	1.4	2.4	2.5	2.5	2.4	2.4	2.4	2.3	2.4	2.5	2.7	2.8	3.0
Excl. Food & Energy	2.5	2.6	2.6	2.6	2.6	2.5	2.5	2.4	2.5	2.6	2.8	2.9	3.1
Producer Price Index - Fin. Gds.	-1.4	0.8	1.4	1.3	1.1	1.0	1.1	1.1	1.2	1.4	1.5	1.6	1.7
Emp. Cost Index - Total Comp.	3.3	2.9	3.0	2.9	3.1	3.2	3.3	3.4	3.6	3.8	4.0	4.1	4.4
Output per Hour	2.8	3.4	2.4	2.3	2.3	2.3	2.4	2.4	2.4	2.3	2.9	2.6	2.4
Other Key Measures													
Industrial Production (% ch)	-1.3	7.5	5.7	4.0	3.6	3.7	4.7	4.8	4.8	4.7	4.5	4.3	4.0
Nonfarm Inven. Accumulation (Billion chained 1996 \$)	15.6	53.3	58.9	41.8	39.6	40.4	45.4	47.9	52.1	52.4	53.0	54.0	57.0
Consumer Confidence Index	93.2	92.2	94.7	93.7	91.8	91.6	92.2	92.8	94.8	94.8	90.9	91.7	91.9
Housing Starts (Mil. units)	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.6	1.6	1.6
Light-Vehicle Sales (Mil. units)	15.4	16.9	17.3	17.0	17.3	17.5	17.5	17.6	17.9	18.3	18.1	18.4	19.0
Unemployment Rate (%)	6.0	5.8	5.1	5.0	5.1	5.1	5.0	4.8	4.4	4.2	4.5	4.6	4.6
Payroll Employment (% ch.)	-0.4	1.6	2.1	1.6	1.2	1.1	1.2	1.3	1.4	1.2	0.7	0.9	1.1
Federal Budget Surplus (Unified, CY, bil. \$)	5.3	-7.4	-20.5	-8.9	32.0	80.4	101.0	130.5	160.8	207.9	128.1	115.3	103.3
Foreign Trade													
Curr. Account Balance (Bil. \$)	-459.8	-535.5	-567.2	-579.5	-588.3	-590.5	-599.0	-605.7	-618.5	-627.4	-671.3	-701.3	-733.6
Foreign Crude Oil (\$ per barrel)	19.6	21.0	22.7	23.8	24.8	25.5	26.1	26.9	27.7	28.7	29.8	30.9	32.1
Financial Markets													
Money Supply (M2, billion \$)	5821.9	6136.3	6424.4	6726.3	7043.9	7379.1	7735.7	8115.5	8521.4	8955.3	9396.4	9869.4	10378.0
Percent Change	7.6	5.4	4.7	4.7	4.7	4.8	4.8	4.9	5.0	5.1	4.9	5.0	5.2
Thirty-Year Mortgage Rate (%)	7.1	7.4	7.5	7.4	7.4	7.4	7.3	7.3	7.3	7.3	7.7	7.8	7.9
Ten-Year Treasury Note Yield (%)	5.3	5.8	5.9	5.9	5.9	5.9	6.0	6.0	6.1	6.1	6.5	6.6	6.7
Treasury Bill Rate (%)	2.0	3.7	4.6	4.6	4.6	4.6	4.6	4.6	4.7	4.7	5.1	5.1	5.1
Federal Funds Rate (%)	2.2	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.5	5.5	5.5
Prime Rate (%)	5.2	7.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.5	8.5	8.5
S&P 500 Stock Index	1161.5	1237.8	1324.7	1423.7	1507.5	1599.0	1692.3	1786.0	1876.8	1973.8	2103.1	2235.8	2376.6
Incomes													
Personal Income (% ch)	2.5	5.3	5.7	4.8	4.7	4.8	5.3	5.4	5.7	5.9	6.0	5.9	6.2
Real Disposable Income (% ch)	2.2	3.5	3.5	2.7	2.3	2.3	3.0	3.1	3.3	3.3	3.4	3.3	3.3
Saving Rate (%)	1.9	1.8	2.0	1.8	1.3	1.0	1.0	1.1	1.2	1.3	1.5	1.5	1.6
Profits After Tax (% chya)	4.8	8.4	1.0	2.2	5.0	5.3	7.4	6.8	7.2	7.1	7.2	7.7	8.7

THE FOUR SCENARIOS: THE TREND PROJECTION

TABLE 1 (Continued)
Summary for the U.S. Economy--TREND25YR0202

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Composition of Real GDP (Annual percent change)													
Gross Domestic Product	3.3	3.3	3.3	3.1	3.1	3.0	2.7	2.8	2.8	3.0	2.9	3.0	3.1
Final Sales	3.3	3.3	3.3	3.1	3.1	3.0	2.7	2.7	2.8	3.0	2.9	3.0	3.1
Gross National Product	3.3	3.2	3.3	3.1	3.2	2.9	2.7	2.8	2.9	2.9	3.0	3.1	3.1
Total Consumption	3.2	3.2	3.2	3.1	3.2	3.0	2.7	2.8	2.9	3.1	3.0	3.2	3.3
Durable Goods	4.4	4.6	4.4	4.1	4.8	4.3	3.1	4.6	4.6	5.8	4.7	5.6	5.5
Nondurable Goods	3.3	3.4	3.4	3.4	3.4	3.3	3.2	3.1	3.3	3.4	3.5	3.6	3.6
Services	3.0	3.0	3.0	2.9	2.9	2.7	2.5	2.5	2.6	2.7	2.7	2.7	2.8
Nonres. Fixed Investment	6.2	6.0	5.7	5.1	5.0	4.8	4.1	3.9	4.0	4.4	4.3	4.3	4.4
Equipment and Software	7.2	7.0	6.5	6.1	5.8	5.4	4.8	4.8	4.9	5.2	4.9	5.0	5.1
Computers	16.2	15.3	14.8	14.1	13.4	13.3	13.9	14.1	14.2	14.1	14.1	14.2	14.5
Software	9.6	8.8	8.0	7.2	6.4	5.6	4.8	4.1	4.0	4.0	4.0	4.0	4.0
Communications Equipment	6.7	6.6	5.6	6.0	6.1	5.8	4.5	4.8	5.3	5.6	4.7	5.0	5.5
Light Vehicles	4.6	4.6	4.2	4.0	4.3	4.1	2.8	3.9	4.2	4.6	3.8	4.4	4.5
Other	3.8	4.0	3.8	3.6	3.7	3.7	3.2	3.5	3.9	4.5	4.2	4.3	4.3
Private Nonres. Structures	2.8	2.8	3.0	2.0	2.3	2.6	2.0	0.8	0.8	1.5	1.9	1.9	1.8
Buildings and Other	3.2	3.2	3.5	2.2	2.5	2.9	2.3	0.9	0.9	1.6	2.2	2.0	1.9
Residential Fixed Investment	1.5	1.7	1.4	1.0	1.5	1.4	0.2	1.6	1.1	2.2	1.2	1.9	2.0
Exports	7.6	7.6	7.6	7.5	7.5	7.6	7.5	7.5	7.5	7.6	7.6	7.6	7.6
Imports	6.5	6.7	6.8	6.8	7.0	7.1	6.6	6.8	6.9	7.4	7.2	7.4	7.5
Federal Government	1.0	1.0	1.0	1.0	1.0	1.9	0.2	0.9	1.1	1.1	1.1	1.1	1.2
State and Local Governments	1.8	1.9	1.9	1.9	1.8	1.9	1.8	1.8	1.8	1.8	1.8	1.9	1.8
Billions of Dollars													
Real GDP (Chained 1996 \$)	14497.0	14982.6	15472.0	15955.3	16457.7	16952.7	17404.5	17884.0	18393.1	18945.6	19497.8	20091.0	20707.6
Gross Domestic Product	21465.4	22631.1	24290.8	25819.3	27444.1	29145.8	30839.9	32679.3	34638.8	36797.4	39063.7	41540.2	44187.4
Prices and Wages (Annual percent change)													
GDP Price Index (Chain-WI.)	2.8	2.9	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.2	3.2	3.2
CPI - All Urban Consumers	3.1	3.3	3.4	3.5	3.5	3.5	3.5	3.6	3.6	3.6	3.7	3.7	3.8
Excl. Food & Energy	3.2	3.4	3.5	3.6	3.6	3.7	3.7	3.7	3.7	3.8	3.8	3.9	3.9
Producer Price Index - Fin. Gds.	1.8	1.9	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.2
Emp. Cost Index - Total Comp.	4.5	4.7	4.7	4.7	4.6	4.7	4.5	4.6	4.4	4.5	4.4	4.5	4.4
Output per Hour	2.6	2.5	2.7	2.8	2.6	2.4	2.3	2.2	2.4	2.1	2.3	2.3	2.4
Other Key Measures													
Industrial Production (% ch)	3.5	3.4	3.4	3.5	3.5	3.3	3.1	3.0	3.0	3.1	3.1	3.2	3.2
Nonfarm Inven. Accumulation (Billion chained 1996 \$)	58.1	61.5	60.5	60.3	63.2	63.1	58.8	62.1	66.4	72.8	71.7	76.9	79.7
Consumer Confidence Index	91.2	91.3	90.0	88.4	88.3	87.8	86.7	86.7	86.6	87.7	87.2	87.8	87.4
Housing Starts (Mil. units)	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.7
Light-Vehicle Sales (Mil. units)	19.5	19.9	20.1	20.1	20.3	20.4	20.0	20.2	20.3	20.8	20.8	21.1	21.3
Unemployment Rate (%)	4.6	4.5	4.6	4.8	5.0	5.0	5.1	5.1	5.2	5.1	5.1	5.0	5.1
Payroll Employment (% ch.)	1.0	1.1	0.9	0.7	0.8	0.9	0.7	0.8	0.7	1.1	0.9	0.9	0.9
Federal Budget Surplus (Unified, CY, bil. \$)	90.2	66.8	38.5	-3.5	-48.2	-58.2	-63.6	-66.6	-147.7	-230.1	-336.1	-436.8	-530.9
Foreign Trade													
Curr. Account Balance (Bil. \$)	-770.5	-833.3	-873.4	-917.2	-972.6	-1054.9	-1083.0	-1119.2	-1176.8	-1292.1	-1372.0	-1465.0	-1568.2
Foreign Crude Oil (\$ per barrel)	33.3	34.6	35.9	37.5	39.2	41.0	43.1	45.3	47.7	50.2	53.1	56.1	59.3
Financial Markets													
Money Supply (M2, billion \$)	10925.3	11483.7	12087.8	12738.9	13438.5	14158.6	14915.3	15723.3	16586.0	17473.6	18412.9	19423.1	20509.1
Percent Change	5.3	5.1	5.3	5.4	5.5	5.4	5.3	5.4	5.5	5.4	5.4	5.5	5.6
Thirty-Year Mortgage Rate (%)	8.0	8.5	8.5	8.6	8.7	9.1	9.2	9.3	9.3	9.7	9.8	9.9	10.0
Ten-Year Treasury Note Yield (%)	6.9	7.3	7.3	7.4	7.5	7.8	7.9	8.0	8.0	8.4	8.5	8.6	8.6
Treasury Bill Rate (%)	5.2	5.6	5.6	5.7	5.7	6.0	6.1	6.1	6.1	6.5	6.6	6.6	6.6
Federal Funds Rate (%)	5.5	6.0	6.0	6.0	6.0	6.4	6.5	6.5	6.5	6.9	7.0	7.0	7.0
Prime Rate (%)	8.5	9.0	9.0	9.0	9.0	9.4	9.5	9.5	9.5	9.9	10.0	10.0	10.0
S&P 500 Stock Index	2526.4	2685.6	2854.9	3034.8	3226.1	3429.4	3645.6	3875.3	4119.2	4378.3	4653.7	4946.1	5256.8
Incomes													
Personal Income (% ch)	6.3	6.6	6.6	6.5	6.5	6.6	6.3	6.4	6.3	6.6	6.5	6.7	6.7
Real Disposable Income (% ch)	3.3	3.4	3.2	3.1	3.1	2.8	2.4	2.5	2.7	3.0	2.9	2.9	2.9
Saving Rate (%)	1.8	2.0	2.0	1.9	1.8	1.6	1.4	1.1	0.9	0.8	0.6	0.4	0.1
Profits After Tax (% chya)	8.3	5.1	8.4	8.2	7.5	2.9	3.6	4.2	5.4	1.8	3.4	4.9	5.7

THE FOUR SCENARIOS: THE TREND PROJECTION

TABLE 2
Supply Conditions--TREND25YR0202

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Percent Change													
Unsmoothed Potential Output	3.0	2.9	2.9	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Components													
Labor Hours	0.6	0.8	0.9	0.8	0.9	0.8	0.7	0.7	0.6	0.7	0.6	0.6	0.6
Capital Stock	1.4	0.8	0.9	1.1	1.2	1.3	1.3	1.3	1.4	1.4	1.5	1.5	1.5
Energy Usage	-0.1	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1
Research and Development Stock	0.3	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
Stock of Infrastructure Capital	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Smoothed Potential Output	3.2	3.0	2.9	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Productivity													
Labor Output per Hour	2.8	3.4	2.4	2.3	2.3	2.3	2.4	2.4	2.4	2.3	2.9	2.6	2.4
Percent													
Industrial Supply Conditions													
Vendor Performance	50.2	52.9	53.6	52.7	52.0	51.8	52.2	52.4	52.9	52.6	52.2	51.9	51.7
Factory Operating Rate	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Labor Availability													
Civilian Unemployment Rate	6.0	5.8	5.1	5.0	5.1	5.1	5.0	4.8	4.4	4.2	4.5	4.6	4.6
Full-Employment Unemployment Rate	5.1	5.1	5.0	5.0	4.9	4.8	4.7	4.7	4.6	4.5	4.5	4.5	4.5
Finance													
Net Mortgage Acquisitions (% change)-28.4	-10.9	-6.9	0.2	2.9	7.3	11.3	10.1	9.0	9.1	1.5	-1.4	1.7	
Nominal Corp. Cost of Financial Capital 4.9	4.9	5.0	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.3	5.4	5.5	
Real Cost of Financial Capital	3.8	3.8	3.9	3.9	3.8	3.8	3.8	3.7	3.7	3.9	3.9	4.0	
Personal Saving Rate	1.9	1.8	2.0	1.8	1.3	1.0	1.0	1.1	1.2	1.3	1.5	1.5	1.6
Money Supply (M2, % change)	7.6	5.4	4.7	4.7	4.7	4.8	4.8	4.9	5.0	5.1	4.9	5.0	5.2

THE FOUR SCENARIOS: THE TREND PROJECTION

TABLE 2 (Continued)

Supply Conditions--TREND25YR0202

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Percent Change													
Unsmoothed Potential Output	2.9	2.9	2.8	2.7	2.7	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.3
Components													
Labor Hours	0.5	0.5	0.4	0.4	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Capital Stock	1.5	1.5	1.5	1.4	1.4	1.3	1.2	1.2	1.1	1.1	1.1	1.1	1.1
Energy Usage	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Research and Development Stock	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Stock of Infrastructure Capital	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Smoothed Potential Output	3.0	2.9	2.9	2.8	2.7	2.6	2.5	2.4	2.4	2.4	2.4	2.4	2.3
Productivity													
Labor Output per Hour	2.6	2.5	2.7	2.8	2.6	2.4	2.3	2.2	2.4	2.1	2.3	2.3	2.4
Percent													
Industrial Supply Conditions													
Vendor Performance	51.6	51.7	51.5	51.3	51.4	51.1	50.5	50.6	50.8	51.1	51.1	51.5	51.7
Factory Operating Rate	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Labor Availability													
Civilian Unemployment Rate	4.6	4.5	4.6	4.8	5.0	5.0	5.1	5.1	5.2	5.1	5.1	5.0	5.1
Full-Employment Unemployment Rate	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Finance													
Net Mortgage Acquisitions (% change)	4.4	3.0	5.2	5.4	5.7	2.8	-0.4	1.3	0.8	1.5	1.7	4.9	5.5
Nominal Corp. Cost of Financial Capital	5.6	5.8	5.9	6.0	6.0	6.2	6.2	6.2	6.3	6.4	6.4	6.5	6.5
Real Cost of Financial Capital	4.1	4.2	4.2	4.3	4.3	4.4	4.4	4.3	4.3	4.3	4.3	4.3	4.3
Personal Saving Rate	1.8	2.0	2.0	1.9	1.8	1.6	1.4	1.1	0.9	0.8	0.6	0.4	0.1
Money Supply (M2, % change)	5.3	5.1	5.3	5.4	5.5	5.4	5.3	5.4	5.5	5.4	5.4	5.5	5.6

A RANGE OF POSSIBILITIES: THE OPTIMISTIC AND PESSIMISTIC PROJECTIONS

Highlights

- Real GDP advances 3.7% per year on average over the next 25 years in the optimistic scenario (optim). This is above the 3.2% growth rate recorded between 1975 and 2001, and higher than the projected averages of 3.1% in the baseline (trend) and 2.7% in the pessimistic scenario (pessim).
- Despite optim's strong growth, inflation as measured by the GDP deflator averages a moderate 2.2%. This compares with the averages of 2.6% in the trend and 3.3% in pessim.
- In optim, the federal budget remains in surplus throughout the forecast period; in pessim, deficits start appearing in 2001.
- In optim, capital formation is strong through 2018, with business fixed investment soaring beyond 15.0% of GDP. Investment's share of GDP then declines slowly but steadily, ending at 13.5% by 2027.
- Output per man-hour rises 2.7% in optim, 2.5% in trend, and 2.1% in pessim.

The optimistic scenario is characterized by strong GDP growth and moderate inflation, with higher rates of growth in capital spending and factor-productivity relative to the trend. The pessimistic alternative (which encompasses opposite assumptions on labor force, capital stock, and factor productivity) exhibits higher inflation than optim, partly because of escalating energy prices.

In the optimistic case, real GDP growth averages 3.7% annually, which is above the 3.2% gains achieved during 1975-2001 (Exhibit 1). Consumer price inflation, on the other hand, averages only 2.2%, well below the previous 25-year rate of 4.8%. The high-growth, low-inflation environment depicted here is especially favorable to durable-goods spending categories such as business

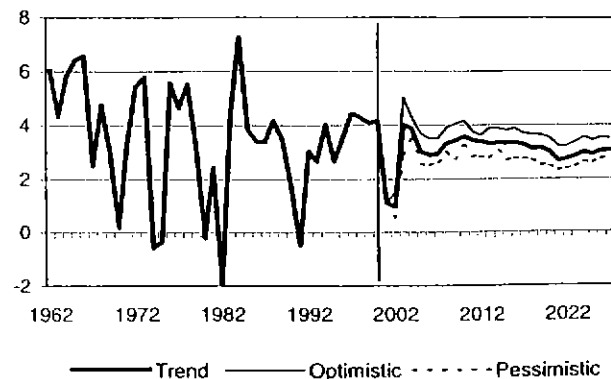
fixed investment, housing construction, and motor vehicles. In contrast, the low-growth environment of the pessimistic projection debilitates these same sectors. For example, in optim, business investment in equipment and software is 11% higher than its trend level by 2027, while in pessim it is 10% lower.

Projection Detail

Participation Rates and the Labor Force. These two scenarios incorporate different demographic assumptions from those in the trend, leading to varying labor-force growth and participation rates. The optimistic outlook assumes that the U.S. population will grow more quickly because of higher net immigration. The pessimistic alternative constricts growth in the labor force, the result of lower assumed net immigration. As a result, the U.S. population increases from 273 million in 1999 to 392 million by 2027 in the optim, but to just 311 million in the pessim, compared with the 344 million in the trend. Annual population growth averages 1.3% in optim, but only 0.5% in pessim.

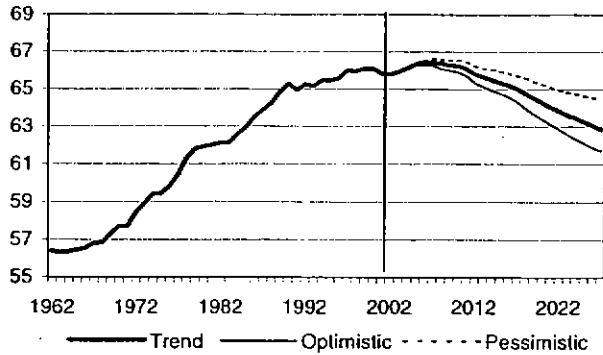
Thus, by 2027, the adult population (aged 16 and over) is roughly 11% higher in optim than in the trend, while it is 7% lower in pessim. These results directly affect the

EXHIBIT 1
Output Growth Will Weaken
(Real GDP, annual percent change)



THE FOUR SCENARIOS: THE OPTIMISTIC AND PESSIMISTIC PROJECTIONS

EXHIBIT 2
Labor-Force Participation Rates Retreat
After 2010
 (Percent)



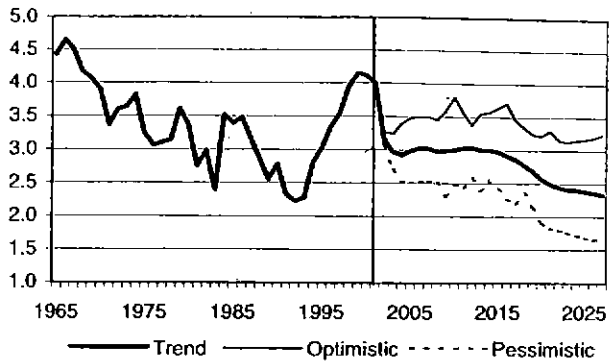
labor force. By 2027, the civilian labor force is 9% higher in optim and 4% lower in pessim relative to the trend. Labor-force growth averages 1.0% in optim and 0.5% in pessim over the next 25 years, compared with the 0.7% annual gains in the trend.

EXHIBIT 3
Bandwidth Projections at a Glance
 (Percent difference from trend in 2027)

	2027		
	Optim	Pessim	Spread
Real GDP Growth	4.6	3.7	0.9
CPI Inflation	-0.5	2.7	-3.2
Real GDP	3.7	2.7	1.0
Consumption	3.6	2.6	1.0
Motor Vehicles	3.4	0.7	2.7
Nonresidential Fixed Investment	5.7	4.6	1.1
Residential Fixed Investment	2.9	-0.3	3.2
Exports	7.0	6.6	0.4
Imports	6.1	5.7	0.4
Total Government	1.8	1.4	0.4
Chain-Wt. Implicit GDP Deflator	2.1	3.3	-1.2
Output per Hour	2.7	2.1	0.6
Real Short-Term Interest Rates (Basis pts.)	0.0	0.0	0.0
Federal Funds Rate (Basis pts.)	0.9	3.5	-2.5
Unemployment Rate (% pts.)	0.2	0.4	-0.2
Foreign Crude Oil (\$/barrel)	31.2	74.2	-43.1
Real After-Tax Profits	4.5	0.8	3.7
Real Disposable Income	3.5	2.7	0.8
Population	1.3	0.4	0.9
Real Disposable Income Per Capita	2.1	2.3	-0.1
Light Vehicle Sales (Mil. Units)	294.3	35.7	258.6
Housing Starts (Mil. Units)	1.5	-0.7	2.2

Note: All data represent compound annual growth rates calculated over the entire forecast period, except where units are given. Data accompanied by units represents the absolute change over the forecast period. All real data are in chained 1996 dollars.

EXHIBIT 4
Actual Output Growth Will Be Constrained by
Slower Potential Output Gains
 (Potential output, percent change)



Potential Output. Over the longer term, the economy's actual growth is constrained by the expansion of potential output. The optimistic scenario, with its above-trend supply factors, yields average potential output growth of 3.7% per year through 2027. In the pessimistic scenario, with its slower labor-force and capital-stock growth, potential production is limited to 2.3% gains over the forecast interval (Exhibit 4).

Inflation. The subdued inflation in the optimistic scenario depends on relatively low energy prices and moderate wage increases. When combined with faster productivity growth, consumer price inflation averages

EXHIBIT 5
Consumer Price Inflation
 (Percent)

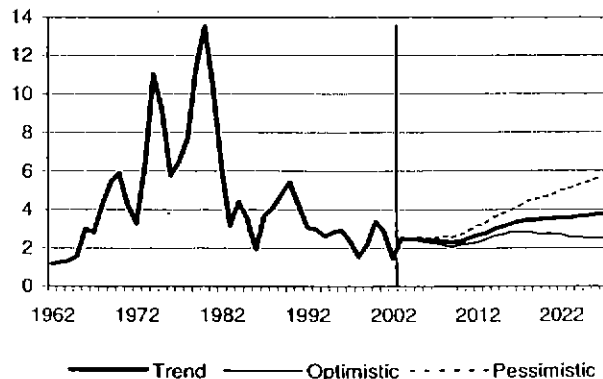
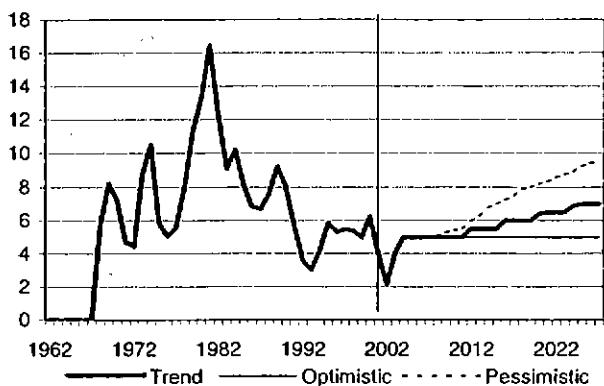


EXHIBIT 6
The Federal Funds Rate
(Percent)



only 2.5% per year through 2027, compared with 3.0% in the trend and 4.5% over the past 25 years (Exhibit 5).

In the pessimistic case, inflation is fanned by higher crude oil prices. Thus, although the GDP deflator recedes to less than 3.0% early in the forecast period, it then reaccelerates to over 5.0% in 2027. Rising energy prices, wages, and import prices combine to push consumer price inflation up to nearly 6.0% annually in 2027. Consumer price inflation averages 3.7% per year through 2027, compared with 3.0% in the trend.

Financial Conditions. The federal funds rate averages 6.7% in pessim and 4.9% in optim, just below as in the trend (Exhibit 6). The rate would be higher in pessim, but the Federal Reserve compromises between fighting the inflationary forces of rising oil prices and pushing the economy into recession. At the long end of the maturity spectrum, the 10-year government bond yield rises to 8.6% in optim and 11.8% in pessim. The steeper yield curve in pessim reflects mounting concerns about the inflationary outlook, given the Fed's accommodative monetary policy and accelerating inflation.

Consumer Spending and Income. Real consumer spending averages 3.6% annual growth in optim, 0.6 percentage point above the trend rate. Real per capita consumption expands an average of 2.3%, compared with its 2.4% annual rate since 1970.

Income-sensitive durable goods are affected the most (Exhibit 7). Spending on consumer durables rises an average 5.1% per year in optim, 1.0 percentage point stronger than the trend growth rate; in pessim, growth in

EXHIBIT 7
Personal Consumption
(Average annual percent change)

	History		Optim		Pessim	
	1976-1986	1986-2001	2002-2007	2008-2027	2002-2007	2008-2027
Total Personal Consumption	3.5	3.3	3.4	3.7	2.4	2.7
Durable Goods	5.7	5.3	4.2	5.4	2.5	3.5
Autos & Parts	6.5	2.6	1.7	3.9	0.3	0.7
Furniture & Appliances	5.6	8.5	7.2	6.7	4.6	5.4
Software	N/A	45.7	11.6	6.9	10.1	6.6
Ophthalmic Goods	4.5	5.6	2.3	5.5	2.0	6.7
Other Durable Goods	4.1	5.7	4.7	6.1	3.4	4.8
Nondurable Goods	2.6	2.9	3.2	3.8	2.4	2.9
Food & Beverages	2.0	2.1	2.1	2.5	1.5	1.9
Prescription & Over-the-Counter Drugs	4.3	5.4	4.5	6.6	4.0	5.9
Clothing & Shoes	5.6	4.9	5.3	4.9	3.8	3.7
Gasoline & Oil	1.2	1.8	2.6	2.4	2.0	1.2
Fuel Oil & Coal	-4.8	0.0	1.6	-0.1	0.9	-1.1
Tobacco Products	-0.3	-2.3	-0.5	-1.4	-0.7	-4.0
Other Nondurable Goods	3.8	4.3	4.9	4.8	4.1	4.0
Services	3.6	3.2	3.3	3.4	2.4	2.5
Housing	2.9	2.2	2.4	2.0	1.5	0.6
Household Operation	3.0	3.6	4.0	4.9	2.9	4.3
Electricity	3.5	2.3	3.3	2.9	2.5	2.0
Natural Gas	-0.4	0.6	1.8	1.7	0.9	0.8
Telephony	5.5	7.6	7.0	8.3	5.4	7.4
Other	2.0	2.2	2.1	2.8	1.1	2.9
Transportation	3.3	3.4	2.9	1.8	2.1	1.6
Motor Vehicle Leases	N/A	N/A	3.8	3.1	2.0	6.0
Other Transportation	N/A	N/A	2.8	1.6	2.1	0.9
Personal Business Services	5.3	4.0	3.9	3.1	2.6	2.0
Free Financial Services	6.5	3.8	4.4	2.4	3.4	1.4
Medical	3.9	3.0	3.4	3.9	2.7	3.4
Recreational	6.0	4.9	6.3	5.1	5.3	3.8
Other Services	3.4	3.3	2.4	3.4	0.9	2.2

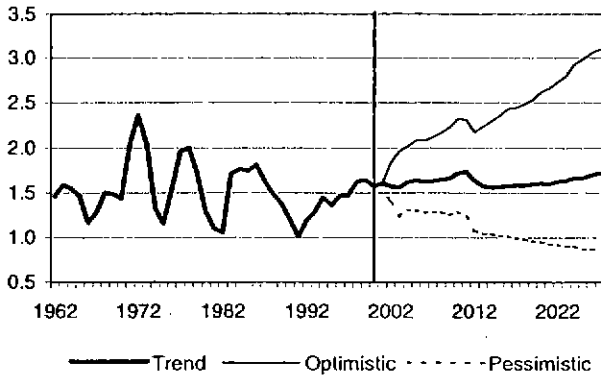
Note: All real data are in chained 1996 dollars.

the same spending category averages just 3.3%: In the optimistic scenario, light-vehicle sales average 21.3 million units per year, pushing the stock of cars and light trucks 15% above its trend level by 2027. Real personal income averages 3.4% annual gains in optim, up from 2.9% in the trend. Income grows only 2.6% per year in pessim. Interest income in pessim is bolstered by higher interest rates and larger federal deficits.

Housing. Since the demographic forces of population growth and household formation are the main long-term determinants of new residential construction, we would expect the housing outlook to be weaker in pessim and stronger in optim relative to the trend. In fact, the disparity between interest rates in the two bandwidth alternatives drives their respective housing outlooks even further apart. The conventional mortgage rate averages 7.91% in optim, below its 9.77% average in pessim and 8.27% average in the trend.

THE FOUR SCENARIOS: THE OPTIMISTIC AND PESSIMISTIC PROJECTIONS

EXHIBIT 8
Demographics and Interest Rates Determine the Housing Outlook
 (Housing starts, millions of units)



Housing starts average slightly more than 2.42 million units per year (or 795,000 units above trend) in optim and 1.08 million (or 539,000 below trend) in pessim (Exhibit 8). By 2027, the housing stock in optim is 12% above the trend level, while in pessim it stands 8% below. Because of the gloomier inflation picture in pessim, the slower economy pushes the average nominal price of a new home to only \$608,600 in 2027, compared with \$478,000 in the trend and \$410,000 in the optimistic alternative.

Business Fixed Investment. The extremely volatile investment sector reacts strongly to the differing

EXHIBIT 9
Business Fixed Investment
 (Percent of GDP)

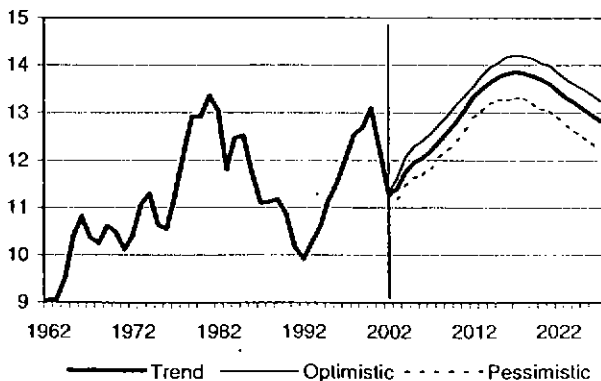


EXHIBIT 10
Saving and Investment Shares of GNP
 (Percent)

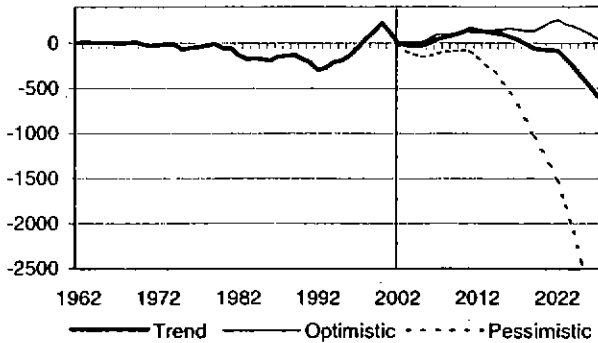
	History		Optim		Pessim	
	1976-1986	1986-2001	2002-2007	2008-2027	2002-2007	2008-2027
Household	10.4	7.4	4.4	2.9	4.7	5.5
Business	9.1	9.2	9.8	11.5	9.6	10.7
Government	-3.5	-2.5	-0.4	-0.3	-1.6	-4.0
Total Saving	16.0	14.0	13.8	14.0	12.7	12.3
Total Investment	16.7	13.9	12.4	13.3	11.2	11.5
Gross Private Investment	17.0	15.8	17.1	17.8	15.6	15.9
Nonresidential Fixed Investment	12.0	11.3	12.1	13.8	11.6	13.1
Residential	4.4	4.1	4.6	3.7	3.8	2.6
Change in Inventories	0.5	0.4	0.4	0.3	0.3	0.3
Net Foreign Investment	-0.4	-1.9	-4.8	-4.5	-4.4	-4.4
Statistical Discrepancy	0.9	0.0	-1.3	-0.8	-1.4	-0.8

assumptions in the alternatives. Business investment suffers long-term damage in pessim, as weak final demand and higher interest rates raise the cost of capital, lower the rate of return on investments, and weaken investor confidence (Exhibit 9). The economy's overall sluggishness also hurts the profitability of corporations, limiting the funds available for investment. Thus, real investment in equipment and software grows only 5.8% annually in the pessimistic case, compared with 6.2% in the trend and 6.7% in the optimistic scenario.

Corporations may choose from several options to finance plant and equipment expansion. The type of inflationary environment in which they operate is likely to influence whether they finance by issuing stocks or bonds, selling short-term commercial paper or obtaining bank loans, or using internally generated funds. The higher inflation in the pessimistic environment encourages firms to rely more heavily on relatively scarce internal funds to finance investment—avoiding the payouts associated with stocks, bonds, and bank loans. In addition, high inflation depresses the real value of depreciation allowances, constraining corporate cash flow and, subsequently, business fixed investment.

Government. The taxation policy assumptions in the two bandwidth scenarios are similar to those in the trend. The government expenditure assumptions are different, however, largely reflecting the different growth paths and demographic assumptions of the optim and pessim projections. In pessim, a weaker economy leads to a higher ratio of federal spending to GDP. Higher interest rates on past debt and larger operating deficits

EXHIBIT 11
Federal Budget Paths Diverge in the Bandwidth Scenarios
 (Billions of dollars)



boost federal interest payments, exacerbating the persistent shortfalls.

Federal government outlays as a share of GDP average 117.5% in optim and 18.5% in the trend. They are higher, at 20.6% of GDP, in pessim because of the slower economy and the need to make larger transfer payments. The federal budget averages an annual deficit of \$6.2 billion in the trend projection and a surplus of \$34.6 billion in the optimistic scenario, but averages a deficit of \$202 billion in pessim.

Unlike the federal government, state and local governments must maintain budgets close to balance. Therefore, their spending is tied closely to available revenue,

EXHIBIT 12
Corporate Cash Flow as a Percent of GNP

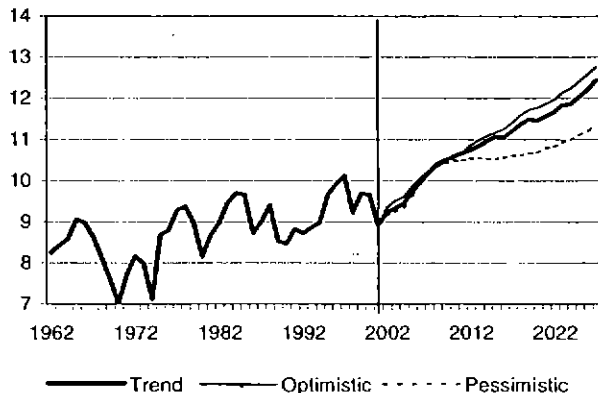
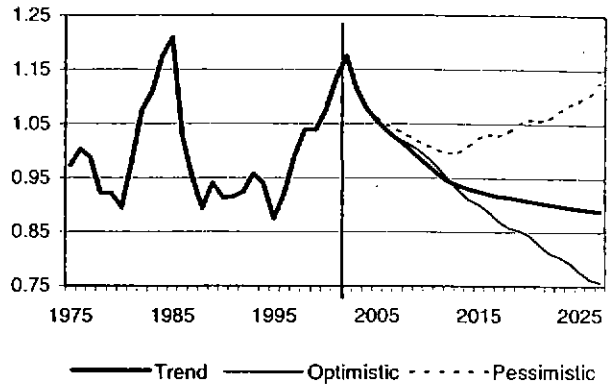


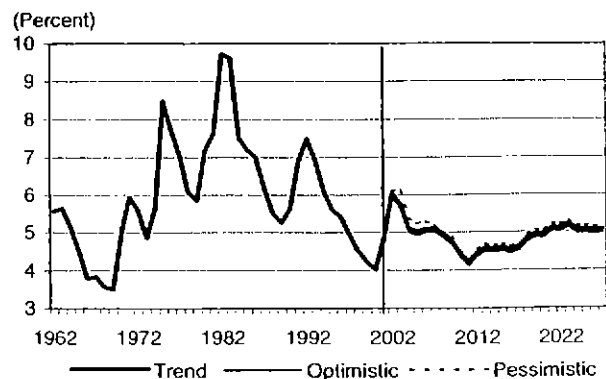
EXHIBIT 13
The Dollar's Real Trade-Wtd Exchange Rate
 (Versus developed-country currencies)



which is created by economic activity within their regions. Increases in state and local government purchases average 2.1% in optim, 1.7% in trend, and 1.5% in pessim.

International. The world is assumed to become more open to trade in all the scenarios, but it opens up most quickly in the optimistic alternative and most slowly in the pessimistic projection. In the optimistic outlook, the nation's major trading partners are also assumed to experience strong output growth and low inflation, although the relative performance of the United States improves slightly when compared with the trend. Real export growth averages 7.0% per year in optim, versus

EXHIBIT 14
Unemployment Varies Only Slightly Across the Bandwidth Alternatives



THE FOUR SCENARIOS: THE OPTIMISTIC AND PESSIMISTIC PROJECTIONS

6.9% in the trend; real import growth averages 6.1% annually in optim, versus 5.8% in the trend.

Industrial Production and Employment. In the pessimistic scenario, the index of industrial production is 13% below the pessim level by 2027. Total nonfarm employment is 4% lower, consistent with the labor-force participation projections. The pattern of employment losses by industry reflects output differences from trend levels, as well as productivity losses in individual industries.

Over the projection period, total payroll employment rises by 39.8 million in the trend, 52.8 million in optim, and 32.3 million in pessim; the last 25 years saw total payrolls increase by about 54 million workers. Total

EXHIBIT 15

Production Growth by Industry

(Average annual percent change)

	History		Optim		Pessim	
	1976 -1986	1986 -2001	2002 -2007	2008 -2027	2002 -2007	2008 -2027
High						
Electrical Machinery	7.0	14.1	10.7	10.3	10.4	9.5
Non-Electrical Machinery	3.6	7.5	7.4	5.7	6.2	4.3
Rubber and Plastics Products	4.2	4.3	3.1	5.0	1.0	2.3
Utilities	1.3	2.1	2.7	3.2	1.5	2.1
Fabricated Metal Products	0.5	2.2	1.1	2.5	-0.8	1.2
Chemicals and Products	1.8	2.9	3.4	4.9	1.7	1.9
Medium						
Transportation Equipment	2.2	3.1	3.8	2.8	2.5	1.3
Instruments	5.3	2.2	3.3	3.3	2.0	2.2
Paper and Products	2.2	2.0	2.4	2.7	1.1	0.8
Textile Mill Products	1.4	0.7	3.0	1.6	0.9	0.1
Miscellaneous Manufactures	0.7	2.5	0.7	2.7	-0.9	1.2
Primary Metals	-2.7	1.9	0.5	3.9	-2.0	-0.3
Stone, Clay and Glass	0.7	2.0	2.9	1.4	-0.9	-0.6
Furniture and Fixtures	2.4	3.0	3.2	1.8	0.3	-0.3
Petroleum Products	0.1	1.7	1.8	1.3	0.9	0.3
Low						
Food and Products	2.4	1.8	1.1	1.1	0.5	0.7
Mining	1.1	-0.8	0.3	1.0	-0.2	0.5
Lumber and Wood Products	2.0	1.7	2.6	2.1	-2.6	-1.7
Printing and Publishing	3.9	1.5	-0.1	1.2	-1.3	0.2
Tobacco Products	0.2	-0.4	-0.8	-0.5	-0.9	-4.1
Apparel and Products	1.9	-0.7	-2.8	-2.7	-4.2	-2.9
Leather and Products	-3.7	-4.3	-8.0	-0.6	-8.0	-1.1
Summary						
Total Production	2.2	3.4	2.4	3.2	1.4	2.1
Manufacturing	2.4	3.8	2.5	3.3	1.5	2.1
Durables Manufacturing	2.6	5.4	3.1	4.0	2.3	3.6
Nondurables Manufacturing	2.2	1.9	1.7	2.8	0.4	0.6
Final Products	2.7	2.9	3.4	3.5	2.1	2.0
Consumer Goods	2.1	2.2	2.4	2.9	1.1	1.0
Business Equipment	2.8	5.8	5.2	5.1	3.9	4.0
Defense Equipment	5.1	-1.0	3.4	-0.6	3.4	-0.6
Intermediate Products	2.2	2.5	1.6	2.2	-0.5	0.6
Materials	1.7	4.3	8.1	10.2	7.6	9.2

Note: Industries are ranked according to their average annual growth rates in the trend scenario for the entire forecast period.

EXHIBIT 16

Contribution to New Jobs

(Cumulative percent change)

	History		Optim		Pessim	
	1976 -1986	1986 -2001	2002 -2007	2008 -2027	2002 -2007	2008 -2027
Manufacturing	4.5	-2.3	-1.8	-4.6	-19.0	-17.4
Mining and Construction	6.4	4.8	9.8	10.8	-10.6	-7.9
Government	8.4	12.4	8.7	15.5	11.5	10.5
Private Services	80.6	85.0	83.2	78.3	118.2	114.8
Total New Jobs (Millions)	20.4	34.4	11.6	-25.9	5.8	13.8

employment in the optimistic scenario is 7.6% above its trend level by 2027. Manufacturing employment falls from 18.5 million in 2000 to 17.8 million in 2027. In pessim, manufacturing payrolls decline to 14.7 million.

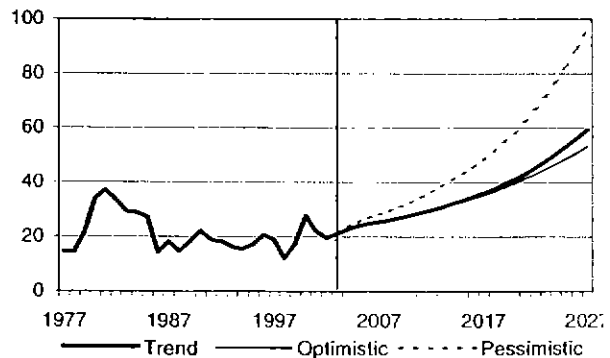
Energy. The optimistic scenario assumes that energy availability is greater than in the trend, facilitating stronger economic growth by the United States and its major trading partners. Total U.S. energy usage is boosted to 167 quadrillion British thermal units (quads) by 2027 in this scenario, compared with 143 quads in the trend.

In the long run, production costs determine energy prices. Technological improvements lower production costs, but drilling deeper holes raises them. In all three scenarios, higher drilling costs win out: in both optim and trend, the real oil price rises to \$28 per barrel by the end of the projection period (Exhibit 17). Energy-efficiency gains are made in all scenarios, but lower fuel prices hinder such developments in optim.

EXHIBIT 17

Foreign Oil Prices Rise

(Average refiners' acquisition price of imported oil, dollars/barrel)



THE FOUR SCENARIOS: THE OPTIMISTIC AND PESSIMISTIC PROJECTIONS

TABLE 1
Summary for the U.S. Economy - Optimistic Outlook

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Composition of Real GDP (Annual percent change)													
Gross Domestic Product	1.5	5.0	4.3	3.7	3.5	3.5	3.9	4.1	4.2	3.8	3.6	3.9	3.9
Final Sales	0.7	4.7	4.3	3.8	3.5	3.5	3.9	4.0	4.2	3.8	3.6	3.9	3.9
Gross National Product	1.7	4.6	4.1	3.7	3.4	3.4	3.8	4.0	4.1	3.7	3.7	3.8	3.8
Total Consumption	2.2	4.1	3.8	3.5	3.4	3.3	3.8	4.0	4.1	3.9	3.9	3.7	3.7
Durable Goods	0.7	8.0	4.8	3.5	4.2	4.3	4.3	5.5	5.9	5.1	3.9	4.9	5.3
Nondurable Goods	2.1	3.6	3.7	3.4	3.1	3.0	3.4	3.7	3.8	3.7	3.7	3.7	3.6
Services	2.5	3.6	3.7	3.6	3.4	3.3	3.8	3.9	3.8	3.8	3.9	3.5	3.4
Nonres. Fixed Investment	-3.9	9.5	9.4	6.8	5.6	6.2	6.9	7.0	7.4	6.5	6.6	7.1	6.6
Equipment	-1.7	10.2	10.8	7.8	6.4	6.7	7.7	8.1	8.2	7.7	7.6	8.1	7.9
Computers	11.1	15.3	18.8	20.4	20.6	20.2	19.8	19.1	18.7	18.1	18.2	18.0	17.3
Software	6.0	8.7	9.2	10.6	10.8	10.8	11.1	11.2	11.3	11.5	11.8	11.4	10.5
Communications	-8.5	12.7	14.0	9.3	8.9	7.0	7.0	7.7	7.8	6.5	6.4	7.6	7.0
Light Vehicles	-2.4	11.9	6.4	2.7	3.6	3.8	5.5	5.7	5.6	4.4	4.2	5.6	5.1
Other	-5.7	9.1	10.8	5.4	2.2	2.7	4.2	4.7	4.9	4.1	3.5	4.0	4.5
Private Nonres. Structures	-9.8	7.4	5.6	3.9	3.4	4.8	4.4	4.1	5.1	3.2	3.9	4.6	3.2
Buildings and Other	-8.2	10.7	6.2	4.6	4.2	4.8	5.4	5.4	6.2	3.6	4.3	5.3	3.6
Residential Fixed Investment	5.0	10.6	0.4	3.3	1.4	2.1	3.3	3.3	4.6	2.6	-2.8	1.9	3.1
Exports	-8.7	7.6	9.7	8.1	8.3	7.9	7.3	7.1	6.7	6.4	6.7	7.5	8.1
Imports	1.1	7.8	5.5	5.1	4.7	4.7	5.0	5.6	5.8	5.1	5.3	6.1	6.3
Federal Government	4.5	4.7	2.3	1.0	0.6	0.5	0.7	0.8	1.2	-0.2	0.8	1.0	1.0
State and Local Governments	2.1	2.3	2.2	2.3	2.0	1.8	1.7	1.8	2.0	1.6	1.7	2.0	2.1
Billions of Dollars													
Real GDP (Chained 1996 \$)	9468.5	9943.7	10368.1	10750.6	11128.8	11521.3	11973.1	12459.1	12978.9	13466.6	13955.6	14500.3	15060.7
Gross Domestic Product	10496.9	11255.1	11983.9	12679.7	13384.5	14131.2	14969.1	15878.2	16878.9	17880.5	18920.5	20092.5	21359.5
Prices and Wages (Annual percent change)													
GDP Price Index (Chain-Wt.)	1.3	2.1	2.1	2.0	2.0	2.0	1.9	1.9	2.0	2.1	2.1	2.2	2.4
CPI - All Urban Consumers	1.5	2.6	2.5	2.4	2.3	2.2	2.1	2.1	2.2	2.2	2.3	2.5	2.6
Excl. Food & Energy	2.5	2.7	2.6	2.5	2.4	2.4	2.3	2.2	2.3	2.3	2.4	2.6	2.7
Producer Price Index - Fin. Gds.	-1.3	1.1	1.4	1.3	1.0	0.9	0.9	0.9	1.0	1.1	1.1	1.3	1.5
Emp. Cost Index - Total Comp.	3.3	3.0	3.1	3.1	3.3	3.4	3.5	3.5	3.7	3.9	4.1	4.1	4.3
Output per Hour	2.9	3.8	2.2	2.6	2.6	2.6	2.8	2.6	2.4	2.6	3.2	3.0	2.7
Other Key Measures													
Industrial Production (% ch)	-0.6	8.8	5.9	4.6	4.3	4.3	5.2	5.5	5.4	4.8	4.6	5.0	4.6
Nonfarm Inven. Accumulation (Billion chained 1996 \$)	24.2	64.5	64.5	49.8	47.6	48.6	54.3	58.6	61.7	57.0	56.4	64.4	66.1
Consumer Confidence Index	95.3	94.3	97.0	95.8	93.6	93.4	93.9	95.6	97.4	95.9	92.5	93.5	93.7
Housing Starts (Mil. units)	1,831	1,964	2,019	2,085	2,082	2,118	2,164	2,225	2,321	2,309	2,175	2,235	2,297
Light-Vehicle Sales (Mil. units)	15.7	17.4	17.8	17.7	18.0	18.3	18.5	18.9	19.4	19.7	19.8	20.3	21.1
Unemployment Rate (%)	5.9	5.7	5.0	4.9	5.0	5.0	4.9	4.7	4.3	4.1	4.4	4.5	4.5
Payroll Employment (% ch.)	0.0	2.1	2.6	1.9	1.5	1.4	1.5	1.7	1.9	1.3	0.7	1.1	1.3
Federal Budget Surplus (Unified, FY, bil. \$)	13.3	30.7	16.2	38.4	86.3	136.1	134.5	151.2	167.4	174.5	104.1	129.0	136.0
Foreign Trade													
Curr. Account Balance (Bil. \$)	-468.6	-570.4	-607.6	-632.6	-654.8	-677.2	-710.7	-747.7	-799.6	-840.7	-883.8	-952.9	-1024.3
Foreign Crude Oil (\$ per barrel)	19.6	21.1	22.9	24.1	25.0	25.7	26.4	27.1	27.9	28.9	29.8	30.8	31.9
Financial Markets													
Money Supply (M2, billion \$)	5826.3	6153.9	6457.0	6778.4	7119.1	7461.2	7868.7	8283.5	8728.8	9203.8	9710.9	10251.9	10831.7
Percent Change	7.7	5.6	4.9	5.0	5.0	5.1	5.2	5.3	5.4	5.4	5.5	5.6	5.7
Thirty-Year Mortgage Rate (%)	7.0	7.4	7.4	7.3	7.3	7.5	7.5	7.5	7.6	7.7	7.7	7.8	7.9
Ten-Year Treasury Note Yield (%)	5.3	5.8	5.9	5.9	6.0	6.2	6.4	6.5	6.6	6.6	6.7	6.8	7.0
Treasury Bill Rate (%)	2.0	3.7	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Federal Funds Rate (%)	2.2	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Prime Rate (%)	5.2	7.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
S&P 500 Stock Index	1164.6	1339.8	1479.7	1646.3	1789.7	1911.9	2049.9	2206.2	2314.6	2479.9	2803.9	2962.7	3099.2
Incomes													
Personal Income (% ch)	2.9	6.3	6.3	5.4	5.3	5.3	5.7	5.9	6.2	6.1	5.8	6.0	6.2
Real Disposable Income (% ch)	2.5	4.1	4.1	3.4	3.0	3.1	3.9	4.1	4.2	4.0	3.5	3.6	3.7
Saving Rate (%)	2.0	1.9	2.1	1.9	1.4	1.1	1.2	1.3	1.4	1.5	1.2	1.1	1.2
Profits After Tax (% chya)	10.0	14.0	1.4	3.2	5.5	4.9	8.6	7.0	6.8	7.2	9.8	9.2	8.5

THE FOUR SCENARIOS: THE OPTIMISTIC AND PESSIMISTIC PROJECTIONS

TABLE 1 (Continued)

Summary for the U.S. Economy - Optimistic Outlook

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Composition of Real GDP (Annual percent change)													
Gross Domestic Product	3.8	3.9	3.7	3.7	3.6	3.5	3.2	3.2	3.4	3.6	3.4	3.6	3.5
Final Sales	3.8	3.9	3.7	3.7	3.6	3.5	3.2	3.2	3.4	3.6	3.4	3.5	3.5
Gross National Product	3.8	3.9	3.7	3.6	3.6	3.6	3.3	3.3	3.4	3.6	3.5	3.6	3.6
Total Consumption	3.7	3.7	3.6	3.7	3.7	3.6	3.3	3.3	3.5	3.8	3.6	3.7	3.8
Durable Goods	5.3	5.9	4.8	4.8	5.5	5.9	4.3	5.0	5.5	7.3	5.8	6.3	6.3
Nondurable Goods	3.7	3.8	3.7	3.8	3.8	3.8	3.6	3.6	3.8	3.9	3.9	4.0	4.1
Services	3.4	3.3	3.4	3.4	3.4	3.2	3.0	2.9	3.1	3.2	3.2	3.2	3.3
Nonres. Fixed Investment	6.3	6.6	5.7	5.5	5.4	5.0	4.8	4.1	4.5	5.1	4.9	4.9	5.0
Equipment	7.5	7.3	6.7	6.4	6.1	5.8	5.4	5.2	5.4	5.8	5.6	5.7	5.7
Computers	16.5	15.8	15.0	14.3	13.8	13.8	14.3	14.5	14.8	14.8	14.7	14.7	15.3
Software	9.8	9.1	8.3	7.5	6.7	6.1	5.3	4.7	4.6	4.8	4.8	4.8	4.9
Communications	6.5	6.8	6.2	6.3	6.2	5.9	5.4	4.9	4.9	5.5	5.2	5.2	5.1
Light Vehicles	4.7	5.3	4.4	4.5	4.7	4.5	3.9	4.1	4.5	5.4	4.5	4.8	4.8
Other	4.2	4.2	4.1	4.0	4.0	4.0	3.7	3.9	4.3	4.8	4.6	4.8	4.7
Private Nonres. Structures	3.2	4.7	2.9	2.9	3.6	2.9	3.4	1.2	2.1	3.2	2.8	2.8	2.8
Buildings and Other	3.6	5.4	3.3	3.2	4.0	3.2	3.8	1.3	2.4	3.6	3.1	3.1	3.1
Residential Fixed Investment	2.9	3.6	2.2	1.8	2.5	2.9	2.1	2.8	2.5	4.2	2.9	2.9	2.5
Exports	8.2	8.1	8.1	8.2	8.0	7.7	7.6	7.7	7.7	7.4	7.4	7.6	7.4
Imports	6.5	6.7	6.4	6.6	7.0	7.2	6.5	6.5	7.0	7.6	7.1	7.1	7.5
Federal Government	1.0	1.0	1.0	1.0	1.0	1.9	0.2	0.8	1.0	1.1	1.1	1.1	1.1
State and Local Governments	2.2	2.4	2.2	2.2	2.2	2.2	2.3	2.1	2.2	2.3	2.3	2.3	2.4
Billions of Dollars													
Real GDP (Chained 1996 \$)	15634.2	16240.8	16840.3	17455.9	18091.7	18729.2	19331.6	19955.4	20630.3	21365.6	22098.0	22882.8	23687.1
Gross Domestic Product	22707.3	24185.2	25703.0	27300.2	28970.2	30700.8	32415.6	34211.2	36118.7	38197.7	40318.7	42610.0	45013.4
Prices and Wages (Annual percent change)													
GDP Price Index (Chain-Wt.)	2.4	2.5	2.5	2.5	2.4	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.1
CPI - All Urban Consumers	2.7	2.8	2.9	2.9	2.8	2.7	2.7	2.7	2.6	2.6	2.5	2.5	2.5
Excl. Food & Energy	2.8	3.0	3.0	3.0	2.9	2.9	2.8	2.8	2.7	2.7	2.6	2.7	2.6
Producer Price Index - Fin. Gds.	1.4	1.5	1.5	1.5	1.3	1.3	1.3	1.2	1.0	1.0	1.0	1.0	1.0
Emp. Cost Index - Total Comp.	4.3	4.4	4.5	4.4	4.2	4.2	4.0	4.0	3.7	3.8	3.7	3.7	3.6
Output per Hour	2.7	2.6	3.0	3.2	3.0	2.6	2.4	2.4	2.7	2.4	2.5	2.5	2.5
Other Key Measures													
Industrial Production (% ch)	4.2	4.3	4.0	4.2	4.1	4.0	3.8	3.6	3.6	3.5	3.2	3.2	3.1
Nonfarm Inven. Accumulation (Billion chained 1996 \$)	67.2	69.9	67.4	69.1	72.0	71.8	66.3	67.7	73.7	79.2	75.0	79.1	79.7
Consumer Confidence Index	93.8	94.1	91.6	90.3	90.2	91.0	89.6	89.2	89.3	91.0	90.4	91.0	90.9
Housing Starts (Mil. units)	2,358	2,433	2,449	2,479	2,536	2,622	2,659	2,734	2,799	2,927	2,986	3,056	3,094
Light-Vehicle Sales (Mil. units)	21.8	22.5	22.8	22.9	23.3	23.7	23.9	24.2	25.1	25.5	26.0	26.5	26.5
Unemployment Rate (%)	4.5	4.4	4.5	4.7	4.9	4.9	5.0	5.0	5.1	5.0	5.0	4.9	5.0
Payroll Employment (% ch.)	1.3	1.5	1.0	0.8	1.0	1.2	1.1	1.0	0.9	1.3	1.1	1.2	1.3
Federal Budget Surplus (Unified, FY, bil. \$)	143.1	158.0	149.2	140.4	142.9	187.8	245.0	273.0	229.7	210.3	177.3	133.6	97.1
Foreign Trade													
Curr. Account Balance (Bil. \$)	-1085.9	-1153.1	-1213.7	-1279.1	-1357.8	-1440.3	-1499.1	-1567.6	-1654.1	-1777.6	-1887.4	-2013.5	-2139.9
Foreign Crude Oil (\$ per barrel)	33.0	34.1	35.3	36.6	38.0	39.6	41.2	43.0	44.8	46.7	48.8	50.9	53.2
Financial Markets													
Money Supply (M2, billion \$)	11452.4	12119.0	12831.3	13591.3	14399.5	15256.5	16158.2	17106.1	18105.3	19160.3	20271.2	21442.6	22679.0
Percent Change	5.7	5.8	5.9	5.9	5.9	6.0	5.9	5.9	5.8	5.8	5.8	5.8	5.8
Thirty-Year Mortgage Rate (%)	8.0	8.1	8.1	8.2	8.2	8.3	8.3	8.4	8.4	8.5	8.5	8.6	8.6
Ten-Year Treasury Note Yield (%)	7.0	7.1	7.2	7.2	7.3	7.3	7.3	7.3	7.3	7.4	7.4	7.4	7.5
Treasury Bill Rate (%)	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.6	4.6
Federal Funds Rate (%)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Prime Rate (%)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
S&P 500 Stock Index	3284.0	3514.1	3776.2	4046.8	4305.9	4601.4	4873.6	5042.1	5333.2	5636.0	6009.3	6263.5	6507.4
Incomes													
Personal Income (% ch)	6.3	6.6	6.3	6.2	6.2	6.2	5.9	5.8	5.7	5.9	5.8	5.9	5.9
Real Disposable Income (% ch)	3.7	3.7	3.5	3.4	3.4	3.2	2.8	2.9	3.2	3.4	3.3	3.4	3.4
Saving Rate (%)	1.2	1.3	1.2	1.0	0.7	0.3	-0.2	-0.5	-0.8	-1.1	-1.5	-1.8	-2.1
Profits After Tax (% chya)	7.4	7.6	8.0	8.7	7.4	4.9	4.2	3.3	5.1	3.8	3.6	3.6	3.4

THE FOUR SCENARIOS: THE OPTIMISTIC AND PESSIMISTIC PROJECTIONS

TABLE 2

U.S. Population - Optimistic Outlook

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Millions of Persons													
Total Population	281.2	284.4	287.8	291.3	295.0	298.6	302.4	306.2	310.1	314.1	318.2	322.4	326.7
Under 5	19.2	19.5	19.9	20.2	20.6	21.1	21.5	22.0	22.5	23.0	23.5	23.9	24.4
5 to 15	43.5	43.4	43.5	43.7	43.9	44.2	44.5	44.3	44.1	45.1	46.3	47.0	47.9
16 and Over	218.4	221.4	224.4	227.4	230.4	233.4	236.4	239.9	243.5	246.0	248.4	251.5	254.4
16 to 21	25.0	25.5	25.8	26.2	26.5	26.7	26.9	27.6	28.4	27.8	27.0	26.9	26.8
21 to 64	158.0	160.1	162.4	164.6	166.7	168.8	170.6	172.6	174.7	176.8	178.2	179.9	181.5
65 and Over	35.4	35.8	36.2	36.7	37.2	37.9	38.8	39.7	40.5	41.4	43.2	44.6	46.1
Annual Rate of Change													
Total Population	1.1	1.1	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Under 5	1.2	1.6	1.8	1.9	2.0	2.1	2.2	2.2	2.2	2.2	2.1	2.0	1.9
5 to 15	-0.5	-0.2	0.3	0.4	0.5	0.6	0.8	-0.5	-0.5	2.4	2.6	1.4	1.9
16 and Over	1.4	1.4	1.4	1.3	1.3	1.3	1.3	1.5	1.5	1.0	1.0	1.2	1.2
16 to 21	3.1	2.2	1.2	1.3	1.2	0.9	0.6	2.8	2.6	-2.1	-2.6	-0.4	-0.7
21 to 64	1.2	1.3	1.4	1.4	1.3	1.3	1.1	1.2	1.2	1.2	0.8	1.0	0.9
65 and Over	0.9	1.1	1.2	1.3	1.4	1.8	2.6	2.2	2.1	2.3	4.2	3.4	3.3
Population Structure - Percents of Total													
Under 5	6.8	6.9	6.9	6.9	7.0	7.1	7.1	7.2	7.3	7.3	7.4	7.4	7.5
5 to 15	15.5	15.3	15.1	15.0	14.9	14.8	14.7	14.5	14.2	14.4	14.6	14.6	14.7
16 and Over	77.7	77.9	78.0	78.1	78.1	78.2	78.2	78.4	78.5	78.3	78.1	78.0	77.9
16 to 21	8.9	9.0	9.0	9.0	9.0	9.0	8.9	9.0	9.1	8.8	8.5	8.4	8.2
21 to 64	56.2	56.3	56.4	56.5	56.5	56.5	56.4	56.4	56.3	56.3	56.0	55.8	55.6
65 and Over	12.6	12.6	12.6	12.6	12.6	12.7	12.8	13.0	13.1	13.2	13.6	13.8	14.1
Mortality													

Percent of Population 65 and Over	12.6	12.6	12.6	12.6	12.6	12.7	12.8	13.0	13.1	13.2	13.6	13.8	14.1
The Impact of Shifts in Population Age Groups													
Dependency Ratio (a)	0.96	0.95	0.94	0.93	0.93	0.93	0.94	0.93	0.93	0.94	0.96	0.97	0.98
Ratio of Stock of Cars													
to Driving-Age Population	0.58	0.57	0.56	0.55	0.55	0.54	0.53	0.53	0.52	0.52	0.52	0.51	0.51
Ratio of New Car Sales													
to Driving-Age Population	0.07	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Ratio of Stock of Houses and Mobile Homes													
to Population 21 and Over	0.62	0.62	0.62	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Ratio of Stock of Multi-Unit Houses													
to Population 21 and Over	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16	0.16	0.16	0.16

a. The dependency ratio here is defined as the ratio of the number of people not in the civilian labor force or in the military to the number of people that are.

THE FOUR SCENARIOS: THE OPTIMISTIC AND PESSIMISTIC PROJECTIONS

TABLE 2 Continued)

U.S. Population - Optimistic Outlook

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Millions of Persons													
Total Population	331.1	335.5	340.1	344.7	349.5	354.3	359.5	364.5	369.7	375.0	380.4	386.0	391.7
Under 5	24.8	25.3	25.7	26.1	26.5	26.9	27.4	27.8	28.2	28.7	29.1	29.6	30.1
5 to 15	48.2	48.7	49.9	51.2	52.5	53.4	54.4	55.5	56.6	57.6	58.7	59.7	60.8
16 and Over	258.0	261.5	264.5	267.5	270.4	274.0	277.7	281.3	284.9	288.7	292.6	296.6	300.8
16 to 21	27.3	27.8	27.8	27.9	27.9	28.5	28.9	29.4	29.9	30.5	31.1	31.8	32.5
21 to 64	183.1	184.5	185.8	187.0	188.1	189.1	190.5	191.4	192.5	193.6	194.9	196.2	197.7
65 and Over	47.6	49.2	50.9	52.6	54.5	56.4	58.3	60.4	62.5	64.5	66.6	68.6	70.6
Annual Rate of Change													
Total Population	1.3	1.4	1.4	1.4	1.4	1.4	1.5	1.4	1.4	1.4	1.4	1.5	1.5
Under 5	1.8	1.7	1.7	1.6	1.6	1.6	1.5	1.5	1.6	1.6	1.6	1.7	1.6
5 to 15	0.8	1.0	2.5	2.5	2.7	1.6	2.0	2.0	1.9	1.9	1.8	1.8	1.7
16 and Over	1.4	1.4	1.1	1.1	1.1	1.3	1.4	1.3	1.3	1.3	1.4	1.4	1.4
16 to 21	1.9	2.0	-0.1	0.2	0.0	2.2	1.6	1.7	1.8	1.9	2.1	2.1	2.2
21 to 64	0.8	0.8	0.7	0.6	0.6	0.6	0.7	0.5	0.5	0.6	0.6	0.7	0.8
65 and Over	3.3	3.3	3.4	3.4	3.5	3.5	3.5	3.6	3.4	3.2	3.2	3.0	2.9
Population Structure - Percents of Total													
Under 5	7.5	7.5	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.7	7.7	7.7
5 to 15	14.6	14.5	14.7	14.8	15.0	15.1	15.1	15.2	15.3	15.4	15.4	15.5	15.5
16 and Over	77.9	77.9	77.8	77.6	77.4	77.3	77.3	77.2	77.1	77.0	76.9	76.9	76.8
16 to 21	8.2	8.3	8.2	8.1	8.0	8.0	8.0	8.1	8.1	8.1	8.2	8.2	8.3
21 to 64	55.3	55.0	54.6	54.2	53.8	53.4	53.0	52.5	52.1	51.6	51.2	50.8	50.5
65 and Over	14.4	14.7	15.0	15.3	15.6	15.9	16.2	16.6	16.9	17.2	17.5	17.8	18.0
Mortality													
Percent of Population 65 and Over	14.4	14.7	15.0	15.3	15.6	15.9	16.2	16.6	16.9	17.2	17.5	17.8	18.0
The Impact of Shifts in Population Age Groups													
Dependency Ratio (a)	0.98	0.99	1.00	1.01	1.03	1.04	1.05	1.06	1.07	1.08	1.09	1.10	1.11
Ratio of Stock of Cars													
to Driving-Age Population	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51
Ratio of New Car Sales													
to Driving-Age Population	0.08	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.09	0.09	0.09	0.09	0.09
Ratio of Stock of Houses and Mobile Homes													
to Population 21 and Over	0.63	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.65	0.65	0.65	0.65
Ratio of Stock of Multi-Unit Houses													
to Population 21 and Over	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16

a. The dependency ratio here is defined as the ratio of the number of people not in the civilian labor force or in the military to the number of people that are.

THE FOUR SCENARIOS: THE OPTIMISTIC AND PESSIMISTIC PROJECTIONS

TABLE 3

Supply Conditions - Optimistic Outlook

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Percent Change (SAAR)													
Unsmoothed Potential Output	3.1	3.3	3.4	3.5	3.5	3.5	3.4	3.7	3.8	3.5	3.4	3.6	3.6
Components													
Labor Hours	0.8	1.0	1.0	1.0	1.0	0.9	0.8	1.0	1.0	0.7	0.6	0.8	0.8
Capital Stock	1.4	0.8	1.0	1.2	1.3	1.4	1.4	1.4	1.5	1.5	1.6	1.6	1.6
Energy Usage	0.0	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.2
Research and Development Stock	0.3	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
Stock of Infrastructure Capital	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Smoothed Potential Output	3.3	3.2	3.4	3.5	3.5	3.5	3.4	3.6	3.8	3.6	3.4	3.6	3.6
Productivity													
Labor (Output per hour)	2.9	3.8	2.2	2.6	2.6	2.6	2.8	2.6	2.4	2.6	3.2	3.0	2.7
Percent													
Industrial Supply Conditions													
Vendor Performance	50.9	54.2	54.0	53.3	52.4	52.1	52.7	52.7	52.7	52.3	52.0	52.0	51.6
Manufacturing Capacity Utilization	0.73	0.77	0.78	0.79	0.79	0.80	0.80	0.81	0.82	0.82	0.82	0.82	0.82
Labor Availability													
Civilian Unemployment Rate	5.9	5.7	5.0	4.9	5.0	5.0	4.9	4.7	4.3	4.1	4.4	4.5	4.5
Full-Employment Unemployment Rate	5.1	5.1	5.0	5.0	4.9	4.8	4.7	4.7	4.6	4.5	4.5	4.5	4.5
Finance													
Net Mortgage Acquisitions (% change)	19.8	6.8	-3.0	5.1	4.7	4.9	5.8	5.5	9.6	3.8	-3.5	4.9	4.7
Nominal Corp. Cost of Financial Capital (%)	5.0	4.9	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.2	5.2	5.2	5.3
Real Corp. Cost	3.8	3.8	3.9	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.9
Personal Saving Rate (%)	2.0	1.9	2.1	1.9	1.4	1.1	1.2	1.3	1.4	1.5	1.2	1.1	1.2
Money Supply (M2, % change)	7.7	5.6	4.9	5.0	5.0	5.1	5.2	5.3	5.4	5.4	5.5	5.6	5.7

THE FOUR SCENARIOS: THE OPTIMISTIC AND PESSIMISTIC PROJECTIONS

TABLE 3 (Continued)

Supply Conditions - Optimistic Outlook

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Percent Change (SAAR)													
Unsmoothed Potential Output	3.7	3.7	3.4	3.3	3.2	3.3	3.3	3.1	3.1	3.2	3.2	3.2	3.3
Components													
Labor Hours	0.9	0.8	0.5	0.5	0.5	0.6	0.7	0.6	0.6	0.6	0.6	0.7	0.7
Capital Stock	1.6	1.6	1.6	1.5	1.5	1.4	1.4	1.3	1.3	1.2	1.2	1.2	1.2
Energy Usage	0.2	0.2	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1
Research and Development Stock	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Stock of Infrastructure Capital	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Smoothed Potential Output	3.6	3.7	3.5	3.3	3.2	3.2	3.3	3.2	3.1	3.2	3.2	3.2	3.2
Productivity													
Labor (Output per hour)	2.7	2.6	3.0	3.2	3.0	2.6	2.4	2.4	2.7	2.4	2.5	2.5	2.5
Percent													
Industrial Supply Conditions													
Vendor Performance	51.2	51.0	50.9	51.0	51.1	50.7	49.8	49.9	50.3	50.6	50.4	50.7	50.5
Manufacturing Capacity Utilization	0.82	0.82	0.82	0.82	0.81	0.81	0.80	0.80	0.79	0.79	0.78	0.78	0.77
Labor Availability													
Civilian Unemployment Rate	4.5	4.4	4.5	4.7	4.9	4.9	5.0	5.0	5.1	5.0	5.0	4.9	5.0
Full-Employment Unemployment Rate	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Finance													
Net Mortgage Acquisitions (% change)	4.7	7.8	4.4	4.5	3.5	1.9	1.3	-0.5	0.4	3.9	1.5	1.8	1.3
Nominal Corp. Cost of Financial Capital (%)	5.4	5.5	5.6	5.6	5.6	5.6	5.6	5.6	5.5	5.5	5.5	5.5	5.5
Real Corp. Cost	3.9	4.0	4.0	4.0	3.9	3.9	3.8	3.8	3.7	3.7	3.6	3.6	3.6
Personal Saving Rate (%)	1.2	1.3	1.2	1.0	0.7	0.3	-0.2	-0.5	-0.8	-1.1	-1.5	-1.8	-2.1
Money Supply (M2, % change)	5.7	5.8	5.9	5.9	5.9	6.0	5.9	5.9	5.8	5.8	5.8	5.8	5.8

THE FOUR SCENARIOS: THE OPTIMISTIC AND PESSIMISTIC PROJECTIONS

TABLE 4
Summary for the U.S. Economy - Pessimistic Outlook

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Composition of Real GDP (Annual percent change)													
Gross Domestic Product	0.6	2.9	3.6	2.6	2.5	2.7	3.0	2.8	3.3	2.8	2.8	2.8	3.0
Final Sales	-0.1	2.6	3.5	2.7	2.5	2.7	3.0	2.8	3.2	2.9	2.8	2.8	3.0
Gross National Product	0.7	2.6	3.3	2.6	2.4	2.6	2.9	2.7	3.2	2.8	2.8	2.6	2.8
Total Consumption	1.7	2.8	2.9	2.4	2.2	2.3	2.6	2.5	3.0	2.7	2.8	2.7	2.9
Durable Goods	-1.5	3.9	4.6	2.3	3.0	3.4	2.7	1.8	4.5	3.4	1.9	1.9	4.1
Nondurable Goods	1.8	2.8	3.0	2.5	2.1	2.1	2.4	2.3	2.7	2.6	3.0	3.0	3.2
Services	2.3	2.5	2.5	2.3	2.1	2.2	2.7	2.6	2.8	2.7	2.9	2.8	2.7
Nonres. Fixed Investment	-5.2	4.1	7.4	5.4	4.5	5.5	6.5	5.8	6.5	6.2	6.6	5.9	6.4
Equipment	-2.6	6.4	9.6	7.1	6.1	6.4	7.5	7.2	7.5	7.4	7.4	7.2	7.2
Computers	10.8	14.1	17.5	19.4	19.7	19.3	18.6	17.9	17.3	16.7	17.2	17.4	16.7
Software	6.0	8.3	8.7	10.2	10.4	10.4	10.6	10.7	10.8	10.9	11.4	11.0	10.2
Communications	-9.5	5.0	6.1	5.3	8.1	8.1	8.1	7.3	7.2	7.3	6.4	5.5	5.2
Light Vehicles	-4.1	5.5	6.7	1.6	2.5	3.6	5.1	3.6	4.8	4.1	3.7	3.5	4.6
Other	-6.9	4.4	10.2	5.2	2.0	2.1	4.0	3.7	4.0	3.7	3.3	3.1	3.5
Private Nonres. Structures	-12.0	-2.4	0.7	0.1	-0.7	2.4	3.2	1.1	3.1	2.4	3.9	1.4	3.5
Buildings and Other	-11.3	-2.4	-0.1	-0.3	-1.0	1.7	3.9	1.6	4.0	2.7	4.6	1.5	4.2
Residential Fixed Investment	-4.4	-7.2	2.2	0.5	-0.4	0.6	1.7	0.0	2.6	0.8	-5.6	-1.8	1.1
Exports	-8.6	7.6	9.1	7.6	7.7	7.3	6.9	6.9	6.6	6.2	6.4	6.8	6.9
Imports	0.3	5.1	4.9	4.3	4.0	4.1	4.1	4.0	4.8	4.5	5.1	6.0	6.8
Federal Government	4.5	4.7	2.3	1.0	0.6	0.5	0.7	0.8	1.2	-0.2	0.8	1.0	1.0
State and Local Governments	1.6	1.9	1.5	1.8	1.6	1.2	1.3	1.0	1.2	1.0	1.2	1.3	1.6
Billions of Dollars													
Real GDP (Chained 1996 \$)	9377.9	9651.4	9996.4	10253.8	10511.4	10791.4	11118.0	11424.5	11796.6	12132.3	12475.9	12823.3	13212.7
Gross Domestic Product	10384.9	10885.1	11511.0	12068.2	12633.6	13253.9	13968.1	14683.6	15534.7	16407.0	17362.4	18382.3	19566.5
Prices and Wages (Annual percent change)													
GDP Price Index (Chain-WI.)	1.2	1.9	2.1	2.2	2.1	2.2	2.3	2.3	2.5	2.7	2.9	3.0	3.3
CPI - All Urban Consumers	1.4	2.4	2.5	2.6	2.5	2.5	2.6	2.6	2.7	2.9	3.2	3.3	3.6
Excl. Food & Energy	2.5	2.5	2.6	2.7	2.6	2.7	2.7	2.7	2.8	3.0	3.2	3.4	3.7
Producer Price Index - Fin. Gds.	-1.4	0.8	1.3	1.5	1.2	1.2	1.4	1.3	1.5	1.8	2.0	2.1	2.3
Emp. Cost Index - Total Comp.	3.3	2.7	2.7	2.7	2.8	2.9	3.2	3.3	3.5	3.9	4.1	4.2	4.6
Output per Hour	2.6	3.0	2.2	2.0	2.1	2.0	2.1	2.2	2.0	1.9	2.3	2.3	2.0
Other Key Measures													
Industrial Production (% ch)	-0.8	6.1	5.4	3.7	3.3	3.3	3.9	3.7	4.0	3.4	3.1	2.8	2.5
Nonfarm Inven. Accumulation (Billion chained 1996 \$)	9.2	40.4	55.2	36.8	35.2	37.2	41.1	38.5	47.2	43.2	43.9	45.5	52.6
Consumer Confidence Index	91.6	87.3	91.2	90.0	89.5	90.4	91.2	90.5	94.2	93.4	89.9	88.9	90.3
Housing Starts (Mil. units)	1,391	1,242	1,311	1,306	1,279	1,283	1,284	1,251	1,291	1,238	1,079	1,043	1,046
Light-Vehicle Sales (Mil. units)	15.2	16.1	16.6	16.4	16.6	17.0	17.0	16.8	17.2	17.3	17.1	16.8	17.2
Unemployment Rate (%)	6.1	6.1	5.4	5.2	5.3	5.2	5.0	4.9	4.5	4.3	4.6	4.7	4.7
Payroll Employment (% ch.)	-0.7	0.8	1.5	0.9	0.8	1.0	1.2	0.9	1.5	1.2	0.8	0.6	1.1
Federal Budget Surplus (Unified, FY, bil. \$)	-5.4	-70.8	-118.8	-131.1	-106.6	-74.3	-56.9	-43.2	-36.3	-35.6	-160.9	-242.5	-320.5
Foreign Trade													
Curr. Account Balance (Bil. \$)	-454.7	-511.9	-547.2	-557.2	-563.1	-569.2	-582.7	-587.6	-606.0	-621.9	-660.2	-716.9	-796.5
Foreign Crude Oil (\$ per barrel)	19.8	21.6	23.8	25.5	27.0	28.3	29.6	31.0	32.6	34.5	36.4	38.5	40.7
Financial Markets													
Money Supply (M2, billion \$)	5818.7	6119.9	6395.2	6683.3	6984.1	7300.5	7635.2	7981.6	8347.7	8734.7	9129.9	9541.6	9964.2
Percent Change	7.5	5.2	4.5	4.5	4.5	4.5	4.6	4.5	4.6	4.6	4.5	4.5	4.4
Thirty-Year Mortgage Rate (%)	7.1	7.5	7.7	7.6	7.7	7.7	7.7	7.8	7.9	8.0	8.4	8.9	9.3
Ten-Year Treasury Note Yield (%)	5.3	5.8	6.1	6.1	6.2	6.2	6.3	6.5	6.6	6.8	7.2	7.6	8.1
Treasury Bill Rate (%)	2.0	3.7	4.6	4.6	4.6	4.6	4.7	4.9	5.0	5.1	5.5	5.9	6.3
Federal Funds Rate (%)	2.2	4.0	5.0	5.0	5.0	5.0	5.1	5.3	5.4	5.5	5.9	6.3	6.8
Prime Rate (%)	5.2	7.0	8.0	8.0	8.0	8.0	8.1	8.3	8.4	8.5	8.9	9.3	9.8
S&P 500 Stock Index	1152.8	1017.2	1002.5	1105.4	1226.7	1292.2	1362.9	1434.8	1491.1	1554.9	1622.7	1633.1	1649.9
Incomes													
Personal Income (% ch)	2.3	4.4	5.3	4.5	4.5	4.7	5.3	5.2	5.7	5.9	6.1	6.1	6.7
Real Disposable Income (% ch)	1.9	2.9	3.4	2.3	1.8	2.0	2.7	2.5	3.1	3.0	3.1	3.1	3.3
Saving Rate (%)	1.9	2.0	2.5	2.3	1.8	1.4	1.4	1.5	1.7	2.0	2.3	2.7	3.2
Profits After Tax (% chya)	1.9	3.4	1.0	1.5	5.6	5.3	7.1	4.1	7.1	3.9	6.0	4.6	5.5

THE FOUR SCENARIOS: THE OPTIMISTIC AND PESSIMISTIC PROJECTIONS

TABLE 4 (Continued)
Summary for the U.S. Economy - Pessimistic Outlook

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Composition of Real GDP (Annual percent change)													
Gross Domestic Product	2.7	2.8	2.7	2.7	2.5	2.5	2.3	2.4	2.5	2.6	2.6	2.7	2.8
Final Sales	2.7	2.8	2.7	2.7	2.5	2.5	2.3	2.4	2.4	2.6	2.6	2.7	2.8
Gross National Product	2.5	2.7	2.6	2.5	2.4	2.4	2.3	2.2	2.3	2.5	2.4	2.5	2.7
Total Consumption	2.7	2.9	2.8	2.7	2.7	2.6	2.4	2.4	2.5	2.7	2.6	2.8	2.9
Durable Goods	2.7	4.4	3.1	3.0	3.5	4.4	3.0	3.7	3.7	5.6	4.1	4.9	5.1
Nondurable Goods	3.1	3.2	3.1	3.2	3.1	3.0	2.8	2.7	2.8	2.9	3.0	3.1	3.1
Services	2.6	2.6	2.6	2.5	2.5	2.3	2.2	2.1	2.2	2.3	2.3	2.4	2.6
Nonres. Fixed Investment	5.8	5.3	5.4	5.1	4.2	4.0	4.2	3.5	3.3	3.7	3.7	3.7	3.7
Equipment	6.7	6.4	6.3	5.9	5.3	4.9	4.6	4.4	4.4	4.6	4.4	4.4	4.5
Computers	16.2	15.4	14.4	13.6	13.3	13.1	13.4	13.4	13.5	13.5	13.3	13.2	13.6
Software	9.5	8.7	7.7	6.9	6.1	5.3	4.4	3.5	3.3	3.4	3.2	3.1	3.0
Communications	4.8	4.6	5.9	5.4	4.4	4.4	5.1	5.4	5.0	5.3	5.4	5.4	5.5
Light Vehicles	3.3	3.8	4.1	3.9	3.0	3.4	3.2	3.6	3.4	4.1	3.6	3.8	4.0
Other	3.2	3.0	3.3	3.5	3.2	3.0	3.0	3.5	3.6	3.9	3.8	3.9	4.0
Private Nonres. Structures	2.4	1.3	2.5	2.4	0.3	0.8	2.6	-0.1	-0.7	0.4	0.9	0.8	0.9
Buildings and Other	2.7	1.4	3.0	2.7	0.1	0.8	3.1	-0.9	-1.1	0.2	0.9	0.6	0.7
Residential Fixed Investment	0.1	0.7	0.0	0.1	-0.1	0.3	-0.6	0.0	-0.5	0.8	-0.3	0.2	1.5
Exports	6.5	6.2	6.4	6.8	6.9	6.9	7.1	7.6	7.9	8.0	8.1	8.3	8.5
Imports	6.8	6.9	6.6	6.8	6.9	7.1	6.5	6.5	6.7	7.3	7.0	7.2	7.5
Federal Government	1.0	1.0	1.0	1.0	1.0	1.9	0.3	0.9	1.1	1.1	1.2	1.2	1.2
State and Local Governments	1.5	1.5	1.6	1.8	1.6	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.7
Billions of Dollars													
Real GDP (Chained 1996 \$)	13567.8	13943.9	14326.6	14716.4	15089.5	15466.2	15826.2	16201.9	16600.5	17037.9	17478.3	17956.3	18465.3
Gross Domestic Product	20789.0	22140.5	23612.4	25237.7	26943.6	28777.4	30700.8	32827.1	35149.2	37755.4	40570.7	43717.9	47208.0
Prices and Wages (Annual percent change)													
GDP Price Index (Chain-Wt.)	3.5	3.6	3.8	4.1	4.1	4.2	4.3	4.5	4.5	4.7	4.8	4.9	5.0
CPI - All Urban Consumers	3.8	3.9	4.2	4.5	4.6	4.7	4.8	5.0	5.1	5.3	5.4	5.6	5.7
Excl. Food & Energy	3.9	4.1	4.3	4.6	4.7	4.8	4.9	5.2	5.2	5.4	5.6	5.7	5.9
Producer Price Index - Fin. Gds.	2.4	2.5	2.7	3.0	3.0	3.1	3.2	3.5	3.5	3.7	3.8	4.0	4.1
Emp. Cost Index - Total Comp.	4.7	5.0	5.2	5.3	5.2	5.4	5.3	5.5	5.4	5.6	5.6	5.7	5.7
Output per Hour	2.0	2.1	2.3	2.1	2.0	2.0	2.1	1.8	2.1	1.7	1.9	2.0	2.0
Other Key Measures													
Industrial Production (% ch)	1.4	1.2	1.2	1.3	0.9	0.8	0.8	0.7	1.1	1.5	1.9	2.5	3.3
Nonfarm Inven. Accumulation (Billion chained 1996 \$)	47.6	50.9	51.4	53.7	52.4	54.4	53.5	56.5	61.1	68.0	68.9	75.1	80.8
Consumer Confidence Index	88.6	89.1	87.2	86.7	85.4	85.1	83.9	83.7	83.6	84.9	84.0	84.6	84.5
Housing Starts (Mil. units)	1.019	1.019	0.995	0.981	0.961	0.956	0.931	0.920	0.901	0.903	0.873	0.869	0.880
Light-Vehicle Sales (Mil. units)	17.1	17.3	17.1	16.9	16.7	16.8	16.6	16.6	16.5	16.9	16.8	16.9	17.0
Unemployment Rate (%)	4.7	4.6	4.7	4.9	5.1	5.1	5.2	5.2	5.3	5.2	5.2	5.1	5.2
Payroll Employment (% ch.)	0.8	0.8	0.6	0.8	0.7	0.7	0.5	0.7	0.6	1.0	0.8	0.9	1.0
Federal Budget Surplus (Unified, FY, bil. \$)	-436.0	-543.3	-677.7	-830.3	-1019.2	-1169.0	-1320.0	-1500.4	-1775.3	-2051.7	-2388.6	-2760.1	-3142.5
Foreign Trade													
Curr. Account Balance (Bil. \$)	-869.4	-945.6	-1045.9	-1163.7	-1273.4	-1398.9	-1513.8	-1656.8	-1811.0	-1993.8	-2205.8	-2443.4	-2694.8
Foreign Crude Oil (\$ per barrel)	43.1	45.6	48.3	51.3	54.7	58.4	62.4	66.9	71.8	77.1	83.0	89.3	96.2
Financial Markets													
Money Supply (M2, billion \$)	10413.1	10895.1	11405.1	11943.1	12526.9	13154.0	13828.7	14546.4	15318.0	16150.6	17036.7	17997.0	19054.6
Percent Change	4.5	4.6	4.7	4.7	4.9	5.0	5.1	5.2	5.3	5.4	5.5	5.6	5.9
Thirty-Year Mortgage Rate (%)	9.7	10.0	10.4	10.8	11.1	11.4	11.6	11.9	12.2	12.5	12.9	13.1	13.3
Ten-Year Treasury Note Yield (%)	8.4	8.7	9.0	9.4	9.7	9.9	10.1	10.4	10.7	11.0	11.3	11.6	11.8
Treasury Bill Rate (%)	6.6	6.8	7.1	7.4	7.6	7.8	7.9	8.2	8.4	8.6	8.8	9.0	9.1
Federal Funds Rate (%)	7.0	7.2	7.5	7.9	8.0	8.2	8.3	8.6	8.8	8.9	9.3	9.4	9.5
Prime Rate (%)	10.0	10.2	10.5	10.9	11.0	11.2	11.3	11.6	11.8	11.9	12.3	12.4	12.5
S&P 500 Stock Index	1669.7	1772.4	1833.7	1864.4	1912.8	2031.7	2170.6	2280.0	2400.3	2589.9	2772.4	2968.1	3212.7
Incomes													
Personal Income (% ch)	6.7	6.9	7.1	7.3	7.3	7.4	7.3	7.5	7.5	7.9	8.0	8.3	8.4
Real Disposable Income (% ch)	3.2	3.1	3.0	3.0	2.9	2.5	2.2	2.3	2.5	2.7	2.6	2.7	2.7
Saving Rate (%)	3.7	3.9	4.2	4.4	4.6	4.6	4.5	4.4	4.5	4.5	4.5	4.5	4.4
Profits After Tax (% chya)	3.5	6.2	5.8	4.8	4.6	3.6	5.1	2.1	4.3	3.7	3.2	5.3	8.3

THE FOUR SCENARIOS: THE OPTIMISTIC AND PESSIMISTIC PROJECTIONS

TABLE 5
U.S. Population - Pessimistic Outlook

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Millions of Persons													
Total Population	279.9	281.7	283.5	285.1	286.7	288.2	289.7	291.1	292.5	293.9	295.2	296.5	297.8
Under 5	18.9	18.8	18.7	18.6	18.6	18.5	18.5	18.5	18.6	18.6	18.6	18.7	18.7
5 to 15	43.7	43.6	43.4	43.2	42.8	42.4	41.8	42.3	41.6	42.0	41.3	41.5	40.8
16 and Over	217.3	219.3	221.3	223.3	225.3	227.3	229.3	230.3	232.3	233.3	235.3	236.3	238.3
16 to 21	24.5	24.8	25.0	25.3	25.8	26.2	26.6	26.1	26.6	26.0	26.3	25.6	25.9
21 to 64	157.5	159.0	160.4	161.8	163.0	164.1	164.8	165.7	166.6	167.6	167.9	168.4	168.8
65 and Over	35.3	35.6	35.9	36.2	36.6	37.1	37.9	38.5	39.2	39.7	41.2	42.4	43.6
Annual Rate of Change													
Total Population	0.6	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4
Under 5	-0.6	-0.4	-0.5	-0.4	-0.3	-0.2	0.0	0.1	0.1	0.2	0.2	0.2	0.1
5 to 15	-0.1	-0.2	-0.4	-0.7	-0.8	-1.0	-1.2	1.0	-1.5	0.8	-1.7	0.7	-1.8
16 and Over	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.4	0.9	0.4	0.9	0.4	0.8
16 to 21	1.2	1.0	0.9	1.3	1.7	1.5	1.7	-2.0	1.8	-2.2	1.1	-2.7	1.4
21 to 64	0.9	0.9	0.9	0.8	0.7	0.7	0.5	0.5	0.5	0.6	0.1	0.3	0.3
65 and Over	0.5	0.8	0.8	0.9	1.0	1.3	2.2	1.7	1.6	1.4	3.7	3.0	2.8
Population Structure - Percents of Total													
Under 5	6.7	6.7	6.6	6.5	6.5	6.4	6.4	6.4	6.3	6.3	6.3	6.3	6.3
5 to 15	15.6	15.5	15.3	15.1	14.9	14.7	14.4	14.5	14.2	14.3	14.0	14.0	13.7
16 and Over	77.6	77.8	78.1	78.3	78.6	78.9	79.2	79.1	79.4	79.4	79.7	79.7	80.0
16 to 21	8.8	8.8	8.8	8.9	9.0	9.1	9.2	9.0	9.1	8.8	8.9	8.6	8.7
21 to 64	56.3	56.4	56.6	56.7	56.8	56.9	56.9	56.9	57.0	57.0	56.9	56.8	56.7
65 and Over	12.6	12.6	12.7	12.7	12.8	12.9	13.1	13.2	13.4	13.5	14.0	14.3	14.6
Mortality													

Percent of Population 65 and Over	12.6	12.6	12.7	12.7	12.8	12.9	13.1	13.2	13.4	13.5	14.0	14.3	14.6
The Impact of Shifts in Population Age Groups													
Dependency Ratio (a)	0.96	0.95	0.94	0.92	0.91	0.90	0.90	0.90	0.89	0.89	0.89	0.90	0.89
Ratio of Stock of Cars													
to Driving-Age Population	0.58	0.57	0.56	0.55	0.55	0.54	0.53	0.53	0.52	0.52	0.51	0.51	0.50
Ratio of New Car Sales													
to Driving-Age Population	0.07	0.07	0.08	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Ratio of Stock of Houses and Mobile Homes													
to Population 21 and Over	0.62	0.62	0.62	0.62	0.62	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.62
Ratio of Stock of Multi-Unit Houses													
to Population 21 and Over	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16

a. The dependency ratio here is defined as the ratio of the number of people not in the civilian labor force or in the military to the number of people that are.

THE FOUR SCENARIOS: THE OPTIMISTIC AND PESSIMISTIC PROJECTIONS

TABLE 5 (Continued)

U.S. Population - Pessimistic Outlook

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Millions of Persons													
Total Population	299.1	300.3	301.5	302.6	303.7	304.8	305.8	306.7	307.7	308.5	309.3	310.1	310.9
Under 5	18.7	18.7	18.7	18.7	18.6	18.6	18.5	18.4	18.3	18.2	18.1	18.0	17.9
5 to 15	41.1	41.3	41.5	40.7	40.8	40.9	40.9	41.0	41.0	41.0	40.9	40.9	40.8
16 and Over	239.3	240.3	241.3	243.3	244.3	245.3	246.3	247.3	248.3	249.3	250.3	251.2	252.1
16 to 21	25.4	25.0	24.6	25.4	25.1	24.9	24.8	24.7	24.6	24.6	24.6	24.6	24.6
21 to 64	169.1	169.3	169.2	169.1	168.9	168.5	168.1	167.5	167.0	166.4	165.8	165.2	164.7
65 and Over	44.8	46.1	47.5	48.9	50.3	51.9	53.5	55.1	56.7	58.3	59.9	61.4	62.8
Annual Rate of Change													
Total Population	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2
Under 5	0.1	0.0	-0.1	-0.2	-0.2	-0.3	-0.4	-0.4	-0.5	-0.5	-0.6	-0.6	-0.6
5 to 15	0.6	0.5	0.5	-2.0	0.3	0.2	0.1	0.1	0.0	0.0	-0.1	-0.2	-0.1
16 and Over	0.4	0.4	0.4	0.8	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
16 to 21	-2.0	-1.7	-1.4	3.0	-1.0	-0.8	-0.6	-0.3	-0.2	-0.1	0.0	0.1	0.1
21 to 64	0.2	0.1	0.0	-0.1	-0.1	-0.2	-0.3	-0.3	-0.3	-0.3	-0.4	-0.4	-0.3
65 and Over	2.8	2.8	3.0	3.0	3.0	3.0	3.1	3.1	2.9	2.7	2.7	2.5	2.3
Population Structure - Percents of Total													
Under 5	6.3	6.2	6.2	6.2	6.1	6.1	6.0	6.0	6.0	5.9	5.9	5.8	5.8
5 to 15	13.7	13.7	13.8	13.4	13.4	13.4	13.4	13.4	13.3	13.3	13.2	13.2	13.1
16 and Over	80.0	80.0	80.0	80.4	80.4	80.5	80.6	80.6	80.7	80.8	80.9	81.0	81.1
16 to 21	8.5	8.3	8.2	8.4	8.3	8.2	8.1	8.0	8.0	8.0	8.0	7.9	7.9
21 to 64	56.5	56.4	56.1	55.9	55.6	55.3	55.0	54.6	54.3	53.9	53.6	53.3	53.0
65 and Over	15.0	15.3	15.7	16.1	16.6	17.0	17.5	18.0	18.4	18.9	19.4	19.8	20.2
Mortality													
Percent of Population 65 and Over	15.0	15.3	15.7	16.1	16.6	17.0	17.5	18.0	18.4	18.9	19.4	19.8	20.2
The Impact of Shifts in Population Age Groups													
Dependency Ratio (a)	0.89	0.90	0.90	0.90	0.90	0.90	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Ratio of Stock of Cars													
to Driving-Age Population	0.50	0.50	0.49	0.49	0.48	0.48	0.48	0.48	0.47	0.47	0.47	0.47	0.46
Ratio of New Car Sales													
to Driving-Age Population	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Ratio of Stock of Houses and Mobile Homes													
to Population 21 and Over	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62
Ratio of Stock of Multi-Unit Houses													
to Population 21 and Over	0.16	0.16	0.16	0.16	0.16	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15

a. The dependency ratio here is defined as the ratio of the number of people not in the civilian labor force or in the military to the number of people that are.

THE FOUR SCENARIOS: THE OPTIMISTIC AND PESSIMISTIC PROJECTIONS

TABLE 6

Supply Conditions - Pessimistic Outlook

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Percent Change (SAAR)													
Unsmoothed Potential Output	2.8	2.6	2.5	2.5	2.5	2.5	2.5	2.2	2.6	2.4	2.6	2.3	2.7
Components													
Labor Hours	0.5	0.7	0.8	0.8	0.8	0.7	0.7	0.3	0.7	0.5	0.7	0.4	0.7
Capital Stock	1.4	0.8	0.8	0.9	1.1	1.1	1.2	1.2	1.3	1.3	1.4	1.4	1.4
Energy Usage	-0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1
Research and Development Stock	0.3	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
Stock of Infrastructure Capital	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Smoothed Potential Output	3.1	2.7	2.5	2.5	2.5	2.5	2.5	2.3	2.5	2.4	2.6	2.4	2.5
Productivity													
Labor (Output per hour)	2.6	3.0	2.2	2.0	2.1	2.0	2.1	2.2	2.0	1.9	2.3	2.3	2.0
Percent													
Industrial Supply Conditions													
Vendor Performance	49.7	51.7	53.3	52.5	52.1	52.1	52.5	52.5	53.2	52.6	52.0	52.1	52.0
Manufacturing Capacity Utilization	0.73	0.74	0.76	0.76	0.77	0.77	0.78	0.78	0.79	0.80	0.80	0.80	0.81
Labor Availability													
Civilian Unemployment Rate	6.1	6.1	5.4	5.2	5.3	5.2	5.0	4.9	4.5	4.3	4.6	4.7	4.7
Full-Employment Unemployment Rate	5.1	5.1	5.0	5.0	4.9	4.8	4.7	4.7	4.6	4.5	4.5	4.5	4.5
Finance													
Net Mortgage Acquisitions (% change)	-34.7	-28.6	-12.8	-7.8	-0.8	13.7	22.7	13.6	12.5	5.8	-4.5	-0.2	7.5
Nominal Corp. Cost of Financial Capital (%)	4.9	5.1	5.3	5.3	5.3	5.4	5.4	5.5	5.5	5.6	5.8	6.1	6.4
Real Corp. Cost	3.8	3.9	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.2	4.4	4.6	4.9
Personal Saving Rate (%)	1.9	2.0	2.5	2.3	1.8	1.4	1.4	1.5	1.7	2.0	2.3	2.7	3.2
Money Supply (M2, % change)	7.5	5.2	4.5	4.5	4.5	4.5	4.6	4.5	4.6	4.6	4.5	4.5	4.4

THE FOUR SCENARIOS: THE OPTIMISTIC AND PESSIMISTIC PROJECTIONS

TABLE 6 (Continued)

Supply Conditions - Pessimistic Outlook

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Percent Change (SAAR)													
Unsmoothed Potential Output	2.3	2.3	2.2	2.4	2.0	1.9	1.8	1.8	1.7	1.7	1.7	1.7	1.6
Components													
Labor Hours	0.3	0.3	0.2	0.5	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2
Capital Stock	1.4	1.4	1.3	1.3	1.2	1.2	1.1	1.1	1.0	0.9	0.9	0.9	0.9
Energy Usage	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Research and Development Stock	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Stock of Infrastructure Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Smoothed Potential Output	2.4	2.3	2.2	2.4	2.1	1.9	1.8	1.8	1.8	1.7	1.7	1.7	1.6
Productivity													
Labor (Output per hour)	2.0	2.1	2.3	2.1	2.0	2.0	2.1	1.8	2.1	1.7	1.9	2.0	2.0
Percent													
Industrial Supply Conditions													
Vendor Performance	51.5	51.8	51.8	51.3	51.3	51.5	51.3	51.3	51.7	52.1	52.3	53.0	53.6
Manufacturing Capacity Utilization	0.80	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.82	0.82	0.83
Labor Availability													
Civilian Unemployment Rate	4.7	4.6	4.7	4.9	5.1	5.1	5.2	5.2	5.3	5.2	5.2	5.1	5.2
Full-Employment Unemployment Rate	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Finance													
Net Mortgage Acquisitions (% change)	4.2	6.4	6.9	8.4	3.3	2.8	4.2	0.9	0.4	4.5	3.7	6.3	10.1
Nominal Corp. Cost of Financial Capital (%)	6.7	6.9	7.1	7.4	7.7	7.8	8.0	8.1	8.3	8.5	8.7	8.8	9.0
Real Corp. Cost	5.1	5.2	5.4	5.6	5.8	5.9	5.9	6.0	6.1	6.1	6.2	6.3	6.3
Personal Saving Rate (%)	3.7	3.9	4.2	4.4	4.6	4.6	4.5	4.4	4.5	4.5	4.5	4.5	4.4
Money Supply (M2, % change)	4.5	4.6	4.7	4.7	4.9	5.0	5.1	5.2	5.3	5.4	5.5	5.6	5.9

Appendix C: Metro Economic Review Panel

Dennis Yee, chief economist	Metro
Karen Larson, GIS economist	Metro
Richard Bolen, DRC manager	Metro
Robert Anderson, economist	Bonneville Power Administration
Thomas Aston, economist	U.S. Department of Housing and Urban Development
Betty Atteberry, director	Westside Economic Alliance
Joe Cortright, consultant	Impresa, Inc.
Eric Hovee, consultant	E. D. Hovee & Company
Steve Kelly, senior planner	Washington County
Gene Leverton, consultant	Gene Leverton & Associates
John McConaughy, transportation planner	WSDOT
Eric Moore, employment economist	Oregon Employment Department
Amy Vanderbuilt, employment economist	Oregon Employment Department
Hossein Parandvash, chief economist	City of Portland Water Bureau
Ken Pearrow, GIS demographer	Clark County
Tom Potiowski, state economist	Oregon Office of Economic Analysis
Lynn Peterson, transportation planner	Tri-Met
Tony Rufolo, professor	Portland State University
Not in attendance:	
Barry Edmonston, director	Portland State University - CPRC
George Hough Jr., demographer	Portland State University - CPRC
Kanhaiya Vaidya, state demographer	Oregon Office of Economic Analysis

Metro Economic Development Review Panel

Community & Economic Development officials:

Doug Rux	Tualatin City
Janet Young	Beaverton City
Larry Pederson	Hillsboro City
Mary Gibson	Port of Portland
Mike Ogan	Portland Development Commission
Pam Neal	CREDC
Renate Mengelberg	Clackamas County
Shelly Parini	Gresham City

The views and economic outlook in this report are the sole responsibility of Metro's Data Resource Center. The review panels were instructed to offer any insights they may have, critique and then evaluate the accuracy and reasonableness of the regional forecast. The comments of the review committees were considered and incorporated into the regional forecast as interpreted by the Metro chief economist.

**Appendix D:
Model Documentation Summary**

Metro Regional Economic Model

Presented to the 32nd Annual
Pacific Northwest Economic Conference

May 1998

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Metro Regional Economic Model

0. Abstract

Portland Metro presents its version of a regional economic model with embedded input-output coefficients as explanatory variables in the model's employment sector equations. The Metro model implements the integration strategy as described by Coomes et al (1991), Stover (1994), and Rey (1997). Coomes et al first described the I-SAMIS model technique for linking I-O and econometric models. Stover evaluates the efficacy of using Census benchmark I-O tables as technical coefficients for creating the inter-industry demand variables (IDV) in each industry employment equation. Rey clarifies the theoretical underpinnings of the IDV and the use of a national I-O matrix as a proxy for an unavailable regional matrix. The regional model implemented by Metro is based on this integrated approach as described by the literature. This paper describes Metro's regional model and presents the empirical estimates and some results from our study. It is shown that the Metro model contains reasonable parameter estimates and produces forecast estimates within tolerable limits.

Key words: integrated regional econometric and input-output model; inter-industry demand variable; forecasting

1. Introduction.

For metropolitan areas, the federal ISTEA (Intermodal Surface Transportation Efficiency Act) legislation has generated a considerable amount of study into the relationship between urban growth and transportation. ISTEA requires an understanding of how choices made in transportation and land-use simultaneously impact each other. In addition, Metro (the metropolitan planning organization for the Portland, OR metropolitan region) initiated its own 50-year regional planning framework to encourage more compact urban development. Influence from the Metro Region 2040 Framework plan and ongoing interest to link transportation and land use modeling has been the main stimulus behind Portland Metro's regional model development.

In Portland, Metro has responded to the planning and information demands of ISTEA and Region 2040 with two operational models: one designed and patterned after so-called integrated regional econometric and input-output methodologies and the second a micro-simulation model based on theories between the interaction of land-use and transportation. The two models taken together are used by Metro planners to forecast regional economic and population growth, future real estate and land prices, and future population or household distributions in each forecast analysis zone.

The focus of this paper is to describe the regional economic and demographic model. The organization of this paper begins with an introduction in section 1, followed in section 2 by a description of the integrated econometric and I-O modeling approach for the Metro model's employment equations, and concluding in section 3 with empirical results and our conclusions.

The region is defined to be the Portland-Vancouver CMSA¹⁴. The regional model includes a fully described employment sector with manufacturing industries disaggregated to two-digit SIC and nonmanufacturing in one-digit SIC. The model also includes econometrically estimated regional wage rates, components of regional personal income, and non-stochastic equations which estimate regional production (indexed). Also included in the model is a cohort-component population model linked by a stochastic net migration equation to regional economic/employment growth.

¹⁴ The CMSA includes the Oregon counties of Multnomah, Clackamas, Washington, Yamhill, and the Washington county of Clark.

2. Metropolitan Regional Model Described

Integration strategies for combining econometric and input-output models for regional forecasting and policy analysis have been gaining attention in regional economic literature. This attention is based on blending the analytical and policy properties found in input-output modeling with the strengths and features available from traditional econometric forecasting models. Input-output models generally perform well in analyzing inter-industry impacts and policy alternatives, but are not as well suited in forecasting future years. Structural econometric models are designed for forecasting and are constructed in a fashion to maximize this capability. The integration of a structural econometric model with an input-output matrix for regional forecasting and analysis is the marriage of these two approaches in an effort to create a combined model that exceeds the capabilities of the traditional models taken individually. However, Metro has so far employed the regional model as a device for forecasting population and employment growth in the region.

The initial theoretical approach of the Metro economic model was fundamentally based on a traditional export-based structural econometric model formulation for the Portland-Vancouver MSA. A structural econometric model of the Portland region had never before been constructed for long-range planning in the history of Metro and its predecessor the Columbia Regional Association of Governments (CRAG). The structural model included detailed stochastic estimates of industry manufacturing and nonmanufacturing employment, wage rates for aggregations for groupings of manufacturing and nonmanufacturing industries, components of regional income, and a net-migration equation linking economic growth with future population increases. A five-year age-cohort survival model provided annual estimates of population growth along with changes in employment, wages, and income from the econometric half of the model.

Early testing of the structural model yielded surprisingly effective inter-industry employment impact estimates. However, continued concern over the model's lack of specific input-output features prompted a make-over in the theoretical formulation of the model. Research into integrating regional econometric models with input-output models revealed three main strategies for combining regional econometric and input-output models: *linking, coupling, and embedding* strategies.

The Portland Metro economic model adopts an embedding integration strategy similar to the one used by the I-SAMIS (integrated-small area modeling of the industrial sector) model from the St. Louis MSA (metropolitan statistical area). This paper describes Metro's results from its attempt at combining a traditional export-based regional econometric model and the technical coefficients of a national input-output matrix.

2.1 Data and Methodology

The input-output table used in the embedding strategy derives from the U.S. Bureau of Economic Analysis (BEA) industry-commodity flow table. The table includes considerably wider industry detail than is possible in a regional model. The disaggregate industry data is collapsed into broader aggregate estimates of industry-commodity flow which match the desired industry employment detail of the Metro economic model. This means that the 90 industries/commodities shown in the national input-output matrix collapses to 20 industries in the desired Metro model.

The procedure combines the input-output matrix to the econometric model using an *inter-industry demand variable* (IDV) in equations for industry employment in the model. The parameter of the IDV is determined by regression and therefore not pre-determined or fixed as in other embedding strategies. Generalization of the industry employment equations in the Metro economic model are as follows:

$$E_{jt} = \beta_j * IDV_{jt} + \sum_{a=1}^m v_{aj} N_{ajt} + \sum_{b=1}^n \rho_{bj} R_{bjt} + \varepsilon_{jt}$$

where,

- E_{jt} = employment in industry j at time t
- IDV_{jt} = inter-industry dependent variable for industry j at time t
- N_{ajt} = national variables $a_1 \dots a_m$ for industry j at time t
- R_{bjt} = national variables $b_1 \dots b_n$ for industry j at time t
- β_j = regression parameter for inter-industry variable for industry j at time t

- V_{aj} = parameter estimate for national variables for industry j
- ρ_{aj} = parameter estimate for national variables for industry j
- ϵ_{jt} = stochastic error term for industry j at time t .

The employment equation represents one of twenty manufacturing or nonmanufacturing industry sector. Explanatory variables for employment in any industry j may (or may not) include national drivers and/or aggregate regional macroeconomic drivers, such as: population, personal income, sector wage rates, land development activity, productivity or output production indexes, etc.

The inter-industry dependent variable is defined as follows:

$$IDV_{jt} = \sum_{j \neq i}^n C_{ij} E_{jt}$$

where,

- C_{ij} = commodity by industry direct requirements coefficient
- E_{jt} = employment in industry i at time t

The commodity by industry direct requirements coefficient is taken from the 1987 *Use of Commodities by Industry Table* and groupings of each industry/commodity are collapsed to the desired industry detail. The cross product of the direct requirement coefficients matrix and the industry employment matrix results in an IDV term for an industry j with an historical time-series equal to the number of time periods for the matrix of employment. Thus, the IDV term provides an historical measurement of the inter-industry demand linkage between industry j and all the other industries in the region.

3. Empirical Results

Table 1, nearby, summarizes the employment demand equations from the Metro economic model. In all but one equation, the IDV term is statistically significant at the 1 percent level (except in health services in which the term was not positive and significant). Specification of employment equations with the IDV variable seems to provide both satisfactory statistical fit and explanatory information. (In the following section, we shall compare an ex ante forecast with actual employment data to see how the model equations have performed in an out of sample forecast.)

According to the findings made by Stover, he suggests that "in general, the IDV is a useful explanatory variable in those industrial sectors where the output serves as an input for other local industries." The health service industry (SIC 80) is certainly an industry which serves mostly final demand and has little interaction with other industries in the region, and therefore the IDV term was found to be insignificant and not a useful explanatory variable in the Metro health service employment equation.

Stover goes on to suggest that the estimated coefficient for the IDV term may be an indicator of the degree of inter-industry interactions and a measure of the strength of this relationship¹⁵. In our log-log formulation of each employment equation, the IDV term may be interpreted in terms of an elasticity measurement. The empirical results in each equation show the estimated IDV to be relatively inelastic – although some more inelastic than others. Our interpretation is that the more inelastic IDV's indicate a lesser dependence of the particular industry with all other industries in the regional economy. Generally, the inelastic nature of the IDV term in each of the employment equations suggests to us that the regional industries in the Portland MSA are relatively less dependent and have less inter-industry interactions with one another than perhaps in other regional economies. This also suggests that the mix of industries in the Portland MSA may have stronger commodity flow relationships with industry sectors outside of the region.

The empirical findings of the model estimations reveal no major surprises with the use of the IDV as an explanatory term and seems consistent with the recent literature on the matter. The Metro model in all but one equation found satisfactory fits, and in the industry sector that produced unsatisfactory statistics, the IDV term was excluded.

¹⁵ Rey also agrees so long as the estimation of the employment equations with the IDV term is unrestricted.

3.1 Equation Listing

Table 1. Metro Regional Economic Model – Employment Equations

Industry	Intercept	Inter-Industry Demand Variable	Real Industry Wage Rate	Other Regional Explanatory Variable(s)	Industry Output Index	Industry Productivity Index	Other National Explanatory Variable(s)	Durbin-Watson	Adj.-R ²
Food Processing	0.8951 (4.33)	0.4313 (7.86)						1.43	0.90
Textile & Apparel	1.8235 (3.51)	0.5364 (3.24)			0.6339 (4.10)	-0.9456 (4.45)		2.06	0.96
Lumber & Wood Products	3.9579 (6.33)	0.1931 (3.49)	-0.7740 (4.45)	0.0392 ^a (2.52)	0.1665 (2.17)		0.1259 ^b (1.82) 0.1854 ^c (3.05)	1.84	0.99
Paper & Pulp	2.8822 (5.37)	0.4538 (6.68)	-0.2147 (2.69)	Dummy ^d		-0.3167 (2.37)		2.12	0.86
Printing & Publishing	-0.8372 (2.36)	0.7828 (12.95)		Dummy ^d	0.5009 (12.95)	-0.2917 (1.75)		1.98	0.99
Metals	3.2341 (5.31)	0.6420 (11.08)	-0.3558 (2.18)	Dummy ^d			0.2324 ^e (3.42) -0.1267 ^f (1.84)		
Nonelectrical Machinery	0.1343 (0.52)	0.6500 (8.33)			0.2472 (3.98)	-0.1664 (2.03)	0.1307 ^g (2.94)	1.98	0.99
Electrical Mach. & Instruments	1.6767 (2.47)	0.4399 (6.59)	0.4657 (2.88)		0.2203 (2.22)		0.2424 ^h (2.37)	1.59	0.99
Transportation Equipment	1.5380 (1.63)	0.7122 (8.66)	-0.2629 (2.27)				-0.3074 ⁱ (1.85)	1.94	0.93
Other Durable Goods	-1.1273 (2.20)	0.6684 (9.32)			0.3547 (3.11)			1.95	0.98
Other Nondurable Goods	-3.6252 (8.87)	0.6360 (7.08)			0.6457 (5.81)			1.87	0.99
Construction & Mining	-0.7889 (0.65)	0.4222 (5.91)		0.0490 ^a (2.25)	0.3062 (4.38)			1.81	0.99
Transp., Comm. & Utilities	1.2896 (6.09)	0.6672 (15.98)				-0.0803 (3.00)		1.03	0.99
Wholesale Trade	1.0729 (4.14)	0.5493 (7.65)		0.2121 ⁱ (2.60)		-0.0934 (2.04)		2.09	0.99
Retail Trade	-0.4829 (0.58)	0.2614 (7.46)				-0.1976 (4.61)			
Finance, Ins. & Real Estate	1.1425 (2.38)	0.4526 (3.18)		0.0207 ^a (2.00)			4.4556 ^j (1.91)	2.03	0.99
Health Services	-4.7777 (7.63)		-0.3480 (2.73)	0.40540 ^k (4.01)			0.4933 ^l (7.15)	2.13	0.99
Nonhealth Other Services	-0.0397 (0.11)	0.3706 (5.76)	-0.1535 (1.53)				0.1294 ^m (4.09) 0.9847 ⁿ (7.64)	1.70	0.99
State & Local Government	0.2365 (0.26)	0.2881 (5.21)	-0.2537 (4.95)					1.44	0.99

a. Regional building permits, number of dwelling units

b. (U.S. fixed investment in nonresidential structures, 1992\$)/(Gross Domestic Product, 1992\$)

- c. (U.S. fixed investment in residential structures, 1992\$)/(Gross Domestic Product, 1992\$)
- d. dummy variable(s) for periods of work stoppages
- e. (U.S. fixed investment in nonresidential producer durable industrial equipment, 1992\$)/(Gross Domestic Product, 1992\$)
- f. 1990\$ exchange rate index, weighted average, U.S. dollar vs. 18 countries, Morgan Guaranty. A polynomial distributed lags was used in the employment equation for the metals industry (the exchange rate statistic reported is a summation of the lags).
- g. Exports of Computer Goods, nominal \$
- h. (U.S. investments in information processing equipment)/(Gross Domestic Product) in nominal \$
- i. Regional retail trade employment
- j. U.S. employment in Finance, Insurance & Real Estate (FIRE)
- k. Regional total personal income, 1992\$
- l. Regional proxy of per capita share of U.S. consumption of medical services, 1992\$
- m. U.S. exports of Services, total, 1992\$
- n. U.S. Service employment, less employment in health services (SIC 80)

Each employment equation is specified in log-log form and estimated using OLS and corrected for autocorrelation. Since the data are quarterly frequency, the Durbin-Watson statistic that we report is modified to detect the existence of a fourth-order autocorrelation.¹⁶ Durbin Watson statistics to test for first-order autocorrelation report generally nothing significant.

3.2 Forecast Results and Conclusions

Table 2. Employment Forecast

Wage & Salary Employment	1995			1996			1997			MAPE* 1995-97
	Forecast	Actual	%diff	Forecast	Actual	%diff	Forecast	Actual	%diff	
Nonfarm, Total	813,288	812,800	0.06%	848,981	851,800	-0.33%	878,852	897,400	-2.07%	0.8%
Food Processing	9,875	10,100	-2.23%	9,855	10,000	-1.45%	9,985	9,700	2.94%	2.2%
Textile & Apparel	4,967	4,900	1.37%	4,957	4,600	7.76%	4,942	4,500	9.82%	6.3%
Lumber & Wood	7,666	7,800	-1.72%	7,449	7,700	-3.26%	7,218	7,800	-7.46%	4.1%
Paper & Pulp	6,956	7,100	-2.03%	6,641	6,500	2.17%	6,549	6,300	3.95%	2.7%
Printing	10,304	10,200	1.02%	10,469	9,900	5.75%	10,698	10,300	3.86%	3.5%
Metals	18,159	18,700	-2.89%	18,770	19,000	-1.21%	18,592	19,600	-5.14%	3.1%
Nonelectrical	18,496	18,700	-1.09%	19,032	19,900	-4.36%	19,432	21,300	-8.77%	4.7%
Electrical Mach. & Instruments	29,350	30,600	-4.08%	31,728	34,200	-7.23%	34,562	36,900	-6.34%	5.9%
Transportation	10,210	10,600	-3.68%	9,884	10,400	-4.96%	9,748	10,900	-10.57%	6.4%
Other Durable	10,049	8,200	22.55%	10,192	8,200	24.29%	10,193	8,300	22.81%	23.2%
Other Nondurable	7,957	8,000	-0.54%	8,469	8,800	-3.76%	8,669	9,400	-7.78%	4.0%
Construction & Mining	44,640	44,900	-0.58%	46,578	51,600	-9.73%	48,920	64,500	-24.16%	11.5%
Transp., Comm. & Utilities	46,926	47,800	-1.83%	48,708	49,400	-1.40%	50,461	50,600	-0.27%	1.2%
Wholesale Trade	63,077	61,800	2.07%	65,790	63,600	3.44%	67,959	66,700	1.89%	2.5%
Retail Trade	147,364	147,000	0.25%	155,832	153,100	1.78%	160,366	160,800	-0.27%	0.8%
FIRE	61,392	59,800	2.66%	64,379	63,000	2.19%	67,166	65,900	1.92%	2.3%
Health Services	55,847	56,100	-0.45%	57,167	57,700	-0.92%	58,892	59,100	-0.35%	0.6%
Nonhealth Services	170,243	169,900	0.20%	180,287	180,300	-0.01%	189,612	189,600	0.01%	0.1%
State & Local Government	89,810	90,600	-0.87%	92,794	93,900	-1.18%	94,888	95,200	-0.33%	0.8%

In total, the mean absolute percent error is under 0.8 of a percent for the forecast years nonfarm wage and salary employment. In particular, the employment equations for noni

*Mean Absolute Percent Error

¹⁶ Wallis test for fourth-order autocorrelation; J. Johnston, *Econometric Methods*, 3rd Edition, p. 317

industries exhibit consistently lower MAPE's than the manufacturing and producer industry equations. The two highest being other nondurables (includes SIC 25, 32, and 39) and construction and mining. The high MAPE's do not necessarily point to a misspecification, but could mean that these two particular industries are just subject to wider variance. This is probably more likely in the manufacturing sector than in nonmanufacturing as the results reveal.

During this periods, the Portland Metro area has experienced above average employment growth which has exceeded the U.S. average. The regional model has apparently captured the current trend and seems to have produced reasonably accurate projections for this short term period. Of course as the forecast period extends out, we see increasing volatility from the 1994 base year. Nevertheless, we have deemed the regional forecast to be sufficient for our planning purposes and are generally pleased with the model's performance and accuracy.

In this paper, we have described the employment sector of the Portland Metro economic model. We took an econometrically estimated structural model and re-estimated each of its employment equations by embedding the technical coefficients of a national input-output table using the so-called inter-industry demand variable. The IDV is purported to indicate the degree of inter-industry trade between a particular industry and all others in the region.

The Metro formulation with the IDV is in log-log specification which in turn easily shows the degree of elasticity of this inter-industry relationship. A higher elasticity in the IDV term suggests greater economic relationship between the particular industry and other industries in the region. More inelastic IDV's suggest that the particular industry is more highly linked or dependent to national trends and trade conditions. All the regional employment IDV's indicate inelastic coefficients which suggest the latter regional inter-industry conditions may exist.

In closing, the IDV appears to be a useful explanatory variable. Integration of an input-output table produces significant parameter estimates, and also provides reasonable and statistically good fitting model equations overall. Sensitivity tests of the multiplier impacts (incomplete and not reported in this paper) also reveal reasonable results.

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Metro Report

Appendix A
Item 3
Ordinance 02-969 B

2002-2022 **Urban Growth Report:** A Residential Land Need Analysis

August 2002
Updated December 2002



METRO
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2002-2022 Urban Growth Report:
A Residential Land Need Analysis

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Conclusion

The Residential Urban Growth Report (UGR) is a technical document estimating the capacity for providing housing within the Urban Growth Boundary (UGB), and comparing this capacity with the expected growth for the next 20 years. The 2002 Residential UGR provides a portion of the technical findings needed to verify the State Goal 14 requirements needed to amend the UGB.

The Residential UGR compares the Regional Population and Housing Forecast with the zoned land capacity from 24 cities and three counties to determine whether a 20-year land supply is available inside the current UGB. A series of additions and subtractions are made to better estimate the land supply.

If a deficit is found ORS 197.296 and Metro Code provide several options for addressing the deficit. Three options available to the region include: 1) expand the UGB by the number of acres necessary to meet housing needs, 2) create additional capacity inside the UGB by adopting additional regulations or other measures, 3) combine expansion of the UGB and policy changes to meet a shortfall. Policy changes could take the form of upzoning, minimum floor area ratio (FAR) requirements or incentives that optimize development of land. The Department of Land Conservation and Development has stated that Metro can only take credit for increases in capacity if a regional regulation or measure has been adopted.

In brief, the housing need (demand number) for the 2000-2022 1/2 time frame is 220,700 units. The estimated capacity within the existing UGB is 177,300 units, which results in a deficit of 43,400 units. With additional measures to encourage greater refill in Centers, the capacity of the UGB can reasonably be expected to increase to 183,300 units, thereby reducing the deficit to 37,400 units. Specific assumptions and policy choices associated with this estimate are elaborated in the report. Table 1 is an overall synopsis of the housing needs analysis.

**2000-2022 Urban Growth Report
 Dwelling Unit Capacity Estimate & Need
 2002-2022 Regional Forecast
 of Residential Land Need
 November 2002**

Line No.		SUPPLY	DEMAND
Residential Demand Estimates (in Households)			
1a/	4-County Population Forecast (July 2000 to Dec. 2022) - 22 1/2 years		744,200
1b/	4-County Household Forecast (July 2000 to Dec. 2022) - 22 1/2 years		312,100
2/	Capture 68% of 4-County Forecast in Metro UGB		212,200
3/	plus: 4% vacancy rate		8,500
4/	Household Demand in the Metro UGB:		220,700
July 2000 Vacant Land Inventory (all zones):		Metro UGB	
5/	Gross Vacant Land	44,000	
6a/	less: Title 3 (Water Quality Protection)	7,600	
6b/			
7/	Gross Vacant Buildable Acres (GVBA) - rounding	36,400	
8/	less: Fed., State, Municipal exempt land (actual count)	1,700	
9/	less: Acres of Platted Single Family Lots (actual count)	2,000	A
10/	less: Acres for Places of Worship and Social Org. (per capita basis)	700	C
11/	less: Major Easements (Natural Gas, Electric & Petroleum) (actual count)	700	R
12/	less: Acres for New Streets (0%, 10%, 18.5%)	4,900	E
13/	less: Acres for New Schools (per capita student basis: H=45, M=55, E=70)	900	S
14/	less: Acres for New Parks (based on SDC fees)	1,100	
15/	Net Vacant Buildable Acres (NVBA)	24,400	
 NVBA by Type:		Metro UGB	
16/	Net Vacant Buildable Acres – Employment see Employment Land Need Analysis		
17/	Net Vacant Buildable Acres - Residential	14,900	
	Net Vacant Buildable Acres (NVBA)	14,900	
		Metro UGB	
18/	Dwelling Unit Capacity at Current Local Zoning (as of Jan. 2001)	108,700	
19/	add: Res. Development in vac. Mixed Use Areas (MUC)	10,400	U
20/	less: Units Lost to Underbuild @ 20%	(23,800)	N
21/	add: Units from Residential Refill @ 26.3%	58,000	I
22/	add: Minimum Development Capacity on Title 3 land (actual count)	500	T
23/	add: Units from Platted Single Family Lots (actual count)	14,000	S
24/	add: Land Adjustments (land capacity for these items not included in line 18/)		
24a/	Pleasant Valley Master Plan	5,000	
24b/	Villebois Village	2,300	
24c/	Marylhurst Convent town center development	700	
24d/	Washington Square regional center plan update	1,500	
25/	Subtotal: Dwelling Unit Capacity	177,300	
26/	Net Need in Residential Dwelling Units (DEFICIT):		(43,400)
27/	add: Added policy actions inside UGB (refill: +2.7% centers)	6,000	
28/	Adjusted Dwelling Unit Capacity	183,300	
29/	Net Need for Residential Households (DEFICIT):		(37,400)

Chapter 1

Introduction to the Report

Purpose

State land use law and Metro Code require periodic review of the Metro's UGB to assess its capacity to accommodate future urban growth for a 20-year period. The *2002 Residential Urban Growth Report* (UGR) represents the technical findings needed to verify that State Goal 14, has been met in order to amend the UGB.

The Residential UGR is a blending of science, policy and technical assumptions in a study that estimates regional housing capacity. This report uses the best available research about urban growth boundaries, capacity and economic growth to estimate regional housing need (demand). The supply (inventory) estimates in this report are to the maximum extent possible grounded in scientific research and up-to-date geographic information system (GIS) data. Where data are inconclusive, policy assumptions are recommended based on region wide goals and objectives.

State law, Metro Code and current policy direction provided by the Executive Office are all integral to estimating supply and demand. These estimates, therefore, represent a mix of regulation, policy and technical findings. State law ORS 197.269(2) requires at least 20 years supply of buildable land be provided for residential development. In addition to planning for future housing, Metro also plans for a 20-year land supply for commercial and industrial development which is addressed in the 2002 UGR: An Employment Land Need Analysis.

UGR Update – What's New?

Two Reports

The 2002 UGR has been separated into two companion reports – A Residential Land Need Analysis and An Employment Land Need Analysis.

In general, the methodology used for calculating the regional housing capacity in the Residential UGR has remained constant for the past several years, making it an almost rote exercise. Calculating employment land need on the other hand has proved to be a more complex procedure, and staff is currently exploring better methods to more accurately determine the regional need. Due to the distinct character of the methodologies, staff developed two stand-alone reports – A Residential Land Need Analysis and An Employment Land Need Analysis. This report deals solely with the residential land need analysis.

Upzone/Ramp-Up/Underbuild

Several methodological changes are included in the 2002 edition of the Residential UGR. These changes are in response to implementation of the Functional Plan requirements and a review of our technical practices. Most jurisdictions have adopted minimum density standards (80 percent of the underlying zoning) and are in compliance with Title 1, Table 1 targets of the Urban Growth Management Functional Plan. Achieving compliance with Table 1 targets is an indication that local jurisdictions have completed all zoning changes to increase capacity and therefore the upzone and ramp-up factors from the 1997 UGR are no longer necessary. Ramp-up had been included in prior UGRs as a discount to the anticipated upzone by local governments to account for the time it takes to make the required Functional Plan changes. The Functional Plan requires local governments to set minimum residential density standards at 80 percent of the maximum allowed.

Accessory Dwelling Units

Staff conducted a review of the accessory dwelling units factor. In review, we believe that to call out accessory dwelling units as a separate factor double counts both refill rate and the density assumptions for vacant land. In addition to this, efforts to track the construction of these units have proven difficult. Thus they are not called out separately in this report as an addition to land capacity.

Major Utility Easements

A new deduction from the land supply is being made for major utility easements in order to comply with State law and to more fully account for all non-buildable lands. The type of easements and the land area removed from buildable land is detailed in Chapter 4.

Residential Vacancy Rate

A residential vacancy rate of 4 percent is specifically called out in the 2002 Residential UGR. Although a 5 percent residential vacancy rate has been assumed in past editions of the UGR it had not been called out as part of the adjustments to the land demand discussion.

Adjustments

A new factor called adjustments has been added to this report. An allowance is reserved for adjustments to the buildable land supply so that the most accurate information is available for the 2002 Residential UGR. The "supply" was based on 2000 vacant land data and zoning and adjustments provide a way to report and more accurately account for major land use changes that have occurred since that time. Specific adjustments are outlined in the Summary Table on page 4 and are listed in detail in Appendix B.

New Model

Output from the new MetroScope model is used for portions of the 2002 Residential UGR. The MetroScope model is a set of decision support tools developed to evaluate changes in economic conditions, land use trends and transportation activity within the region. The four models that comprise MetroScope include an economic model, travel model and two real estate location models. All these models interact with the Metro GIS and the Regional Land Information System (RLIS) to allow mapping of results and maintenance of spatial relationships between data. The model is run in five-year iterations between the land use and transportation models. The purpose of bringing the four models together into a single, integrated framework is to allow them to interact with each other, producing more accurate predictions of future conditions and allowing them to better reflect the full effects of policy choices.

Five potential growth case studies were run to test the effectiveness of a range of policy options in implementing the 2040 Growth Concept or making changes to enhance the effectiveness of the existing policies. Each case study was a test of a unique set of policy objectives. A Base Case study tested the impacts of the application of current 2040 Growth Concept policies. An I-5 Trade Corridor case study tested whether major transportation improvements to the I-5 trade corridor diminish or enhance the effectiveness and the implementation of the 2040 Growth Concept. A third case study tested whether developing a new complete community in the Damascus area would effectively accommodate a 20-year need for land. An Enhanced 2040 Centers case study tested whether additional policies and incentives would enhance the functionality of 2040 Centers while limiting UGB expansion. Selected parts of this information helped provide the range of possible outcomes from different UGB decisions. Of particular importance to this report are the model outputs for the refill and capture rates.

Centers Research

Metro is evaluating the Centers identified on the 2040 Growth Concept map to determine if there is additional capacity to be found within these areas that would effect the bottom line numbers for this Residential UGR, testing capacity and policy effectiveness.

Centers are the keystone of the region's strategy to manage growth. The adopted Regional Framework Plan and the Functional Plan establish policy directions, regulations and recommendations to strengthen Centers. The hierarchy of Centers designated on the 2040 Growth Concept map includes the Central City, 7 Regional Centers, 30 Town Centers and the Station Communities around light rail stations.

Metro conducted a three-phased study to examine Centers. Phase I was a series of interviews with local government staff. Phase II of the Centers study consisted of an economic analysis examining why Metro's Centers are not developing at the densities anticipated. Phase III identified tools and developed an action plan designed to answer strategic and regional level implementation questions. A fuller discussion of the implications of the research is in the Increase in Refill Rate section in Chapter 5 of this report. A copy of the studies can be found on Metro's website at www.metro-region.org.

Background

In 1997, Metro Council adopted the Regional Framework Plan and in 1996, the Functional Plan requirements. The plans provided coordinated guidance to local jurisdictions to manage future urban growth. In December 1997, the first UGR was issued and approved by Metro Council. The 1997 UGR concluded that there was a deficit of 32,370 dwelling units and a nearly 2,900 acre job shortfall.

Earlier in 1997, the Oregon Legislature enacted ORS 197.299¹ that required Metro to show substantial progress towards meeting this land need, within two years of identifying any shortfall in supply. At least half the need was to be accommodated by the end of 1998 and the remainder by the end of 1999. Accommodating 20 years of residential capacity within the UGB can be accomplished by increasing the size of the UGB or adopting policies to increase capacity of lands within the current boundary. Metro Code and State Law require review of the UGB capacity at least every five years.² The last complete review was conducted for the 1997-2017 period.

Consistent with State law, the Metro Council in December 1998 amended the UGB by adding 3,549 gross acres. The Metro Council also indicated their intent to add an additional 1,831 acres by resolution on the same date. These actions by the Metro Council met the requirement in State law to satisfy at least half of the land need identified in the 1997 UGR by the end of 1998. By the conclusion of 2000, the 1997-2017 UGB review was completed with two major changes recognized. First, the original need for 32,370 dwelling units was disallowed by DLCD because it was based upon 200-foot stream setbacks, which had not been implemented. This effectively eliminated the need for the "second half" of the needed UGB expansion of 1,831 acres. Second, the courts rejected 939 acres of expansion requiring this shortfall to be made up in the 2002 assessment.

Key Points:

- *State law requires that 20-year supply of land be provided within the UGB.*
- *The need estimates found in the UGR blend regulation, policy choices and technical findings.*
- *A deficit of 939 acres from the 1997-2017 UGB assessment must be made up in this round.*

¹ ORS 197.299 was introduced as HB 2709.

² ORS 197.296 was introduced as HB 2493.

2002 Periodic Review

Metro – Periodic Review

To comply with state law to ensure the land supply is adequate for a 20-year period, Metro requested the Land Conservation and Development Commission (LCDC) place Metro in a process called "periodic review" for the UGB. Periodic review is a cooperative process between the state, local governments and other interested persons.

Periodic review of the UGB takes place to assure that the process of reviewing and amending the UGB complies with statewide planning goals and that adequate provisions are made for needed housing, employment, transportation and public facilities and services. The law requires cities and counties to do periodic review every 5 to 15 years, depending upon their size and location. Small cities and counties are exempt. Metro must do periodic review every 5 to 10 years. Metro's last periodic review was completed in December 1992.

This periodic review includes a two-phase process. The first phase addressed legislative amendments to the UGB for the period 1997-2017 and was completed in September 2000, when the Metro Council determined that a 20-year supply of land was available. The second phase began in the fall of 2000 and covers the 20-year period from 2002 to 2022. The UGB may be amended if a demonstrated need exists.

Report Outline

The Dwelling Unit Estimate Summary Table (Table 1) summarizes the need analysis for housing. Table 1 illustrates deductions made to the gross vacant buildable acres (GVBA) to arrive at net vacant buildable acres (NVBA). Chapter 2 summarizes the regional population and dwelling unit forecast. Chapter 3 in this report expands in detail on lines 1 – 4 of the Summary Table dealing with demand. Chapters 4 and 5 provide more detail on lines 6 – 27 dealing with supply.

Chapter 2 2002-2022 Regional Forecast

Summary

As a basis for estimating future regional housing and employment demand, the baseline 2002-2022 Regional Forecast developed by Metro represents the most likely and reasonable "middle-of-the-road" growth projection. The forecast assumes a policy neutral stance on growth management and transportation policies in the region. What this means is that the forecast carries out the regulations and policies that are in force today and extrapolates their likely impacts in producing housing and employment demand projections (regional need) for the region. The forecast extends from July 2000 to December 2022, a period of 22.5 years. This is due to the fact that the best available data exists for 2000, based upon the July 2000 aerial photos and there must be a 20-year land supply from the date of the decision, which will be in December 2002.

The regional economic forecast is based on a framework of how the region has responded to historical trends – including economic, industry, demographic, national and global forces at work in the region. The regional baseline population and household forecast is tied to the economy of the region by the interaction of migration and employment trends/comparative economic strengths with neighboring state economies. A continuing vibrant regional economy will continue to draw migrants in the pursuit of greater economic opportunity and regional amenities. More importantly, about half of the region's future population growth will be based on demographic characteristics of the region that exist today. Population growth will continue because residents will have children, and their children will have children.

Lastly, the regional baseline forecast was not derived to predict the variations in growth caused by recessions nor firm-level decisions such as the behavior of a single company. The forecast does not forecast business cycles. Instead, the forecast is meant to be indicative of what trajectory or growth path the region is likely to have during the next 20 to 30 years. By looking at historical trends and relationships, by discerning emerging trends, and folding into the regional forecast the expert opinions of regional experts and national forecasters (DRI-WEFA), the regional baseline forecast represents the reasonable approach available for the upcoming UGB decisions.

Alternative growth projections could also be considered, but have been deemed to be less likely and less reasonable approaches. Optional assumptions based on different national and international outlooks could easily produce a higher or lower regional forecast, but are less plausible. DRI-WEFA and other national sources have produced alternative U.S. growth scenarios which could be used to prepare regional high or low growth outlooks, but they represent a much lower probability of materializing in the future.

As part of completing periodic review, Metro will produce a high and low forecast later this year to accompany its regional baseline forecast. Based on national estimates, the baseline regional forecast represents more than an 80 percent probability while a significantly higher or lower regional forecast faces less than a 10 percent probability each of happening.

Actions taken by public agencies throughout the region could have the effect of increasing or decreasing this forecast (examples include – but are not limited to – Columbia River channel deepening, truck access into the Columbia Corridor, decreased investment in transportation and airport capacity, inadequate higher education financing, economic development incentives, and quality of life oriented actions such as clean water and access to open space).

Chapter 3 Residential Demand Analysis

Residential Demand – Overview

Residential Demand is taken directly from the Regional Economic and Population Forecast.³ A four-county population and household forecast from July 2000 to December 2022 (which equals 22.5 years) provides the basis for the demand estimate. The July 2000 vacant land inventory is being used as the basis for estimating supply. The December 2002 demand forecast is being used to insure a 20-year supply for the December 2002 decision. Population in the Metro region is expected to increase at a moderate pace of 1.6 percent per year. By the year 2022, population growth is expected to add another 744,200 residents to the region (in the four-county SMSA).⁴

In terms of the Metro UGB, population growth is expected to add 525,000 more residents or about another 212,000 households (or 220,700 dwelling units assuming a 4 percent vacancy rate). Metro Council had extensive discussions about the use of a vacancy rate. In Appendix A, Table Note 3, there is a description of the range considered for vacancy rate. Metro may look into vacancy rate as part of Task 3. These UGB figures are based on a 68 percent capture rate, which has been the historic rate between 1980 and 2000.

During the 1990s, about two-thirds of new residents had never lived in the Portland area before. Net immigration will still be a force driving population growth in the future, but a lesser one. Only about half of the region's population increase during the next 20 years will come from migration; the remainder will come from residents having children.⁵

Regional population growth is expected to average about 1.6 percent per year through 2030, as compared to about 2 percent from 1970 to 2000. Population will increase more rapidly in the near term as current conditions favor an economic rebound, which will attract greater number of migrants. Over the long haul, the average growth rate per year will start to taper off as regional economic growth moderates.⁶

Key Points:

- *Population growth through the forecast period is expected to increase at a moderate pace of 1.6 percent per year.*
- *By the year 2022, population growth is expected to add another 744,000 residents to the region.*
- *Migration contributes 50 percent of population growth.*

Capture Rate

Since the geographic extent of the Residential UGR is the limits of the UGB, a forecast of housing units (dwelling units) is derived for the portion of growth anticipated to occur inside the UGB. This proportion of growth (capture rate) is the fraction of dwelling units predicted to occur in the UGB relative to the total amount of growth overall in the four-county region (Multnomah, Clackamas, Washington and Clark Counties). The 1997 UGR, as well as subsequent updates, assumed the capture rate for the UGB to be 70 percent for households. Capture rate in the 2002-2022 Residential UGR is assumed to be 68 percent.

³ Economic Report to Council 2000-2030 Regional Forecast, preliminary draft March 2002.

⁴ SMSA four counties include Clackamas, Clark, Multnomah and Washington Counties.

⁵ 2000-2030 Regional Forecast, preliminary draft March 2002.

⁶ 2000-2030 Regional Forecast, preliminary draft March 2002.

Capture rate data is drawn from two sources; historic and future estimates. Historic estimates are available from 1980 up through year 2000. The basis for the capture rate is derived from historical data from 1980 through 1998. Historical data indicate a capture rate of 54 percent to 77 percent. The table listed below shows the range of capture rates.

**Table 2
Metro Region Historical Capture Rates**

Metro Capture Rates - 5 years:	1980-85	1985-90	1990-95	1995-00
Households	65.5%	53.7%	76.6%	68.8%
Metro Capture Rates - 10 years:	1980-90		1990-00	
Households	58.2%		72.9%	
Metro Capture Rates - 20 years:	1980-00			
Households	67.8%			

Future estimates of capture rates, based on specific land use assumptions, are an output from the MetroScope model.⁷ Five potential growth case studies were run to test the effectiveness of a range of policy options in implementing the 2040 Growth Concept or making changes to enhance the effectiveness of these policies. Each case study was a test of a unique set of policy objectives. A Base Case study tested the impacts of the application of current 2040 Growth Concept policies. An I-5 Trade Corridor case study tested whether major transportation improvements to the I-5 trade corridor diminish or enhance the effectiveness and the implementation of the 2040 Growth Concept. A third case study tested whether developing a new complete community in the Damascus area would effectively accommodate a 20-year need for land. An Enhanced 2040 Centers case study tested whether additional policies and incentives would enhance the functionality of 2040 Centers while limiting UGB expansion.

MetroScope case studies capture rates range from 52 percent to 79 percent depending upon the amount of land added to the UGB and the amount of capacity made available within the UGB. As experience and modeling has shown, capture rates can vary based on a number of different factors. The reasonable range of capture rates to assume based upon both historic and modeled rates, range from 65 to 75 percent.

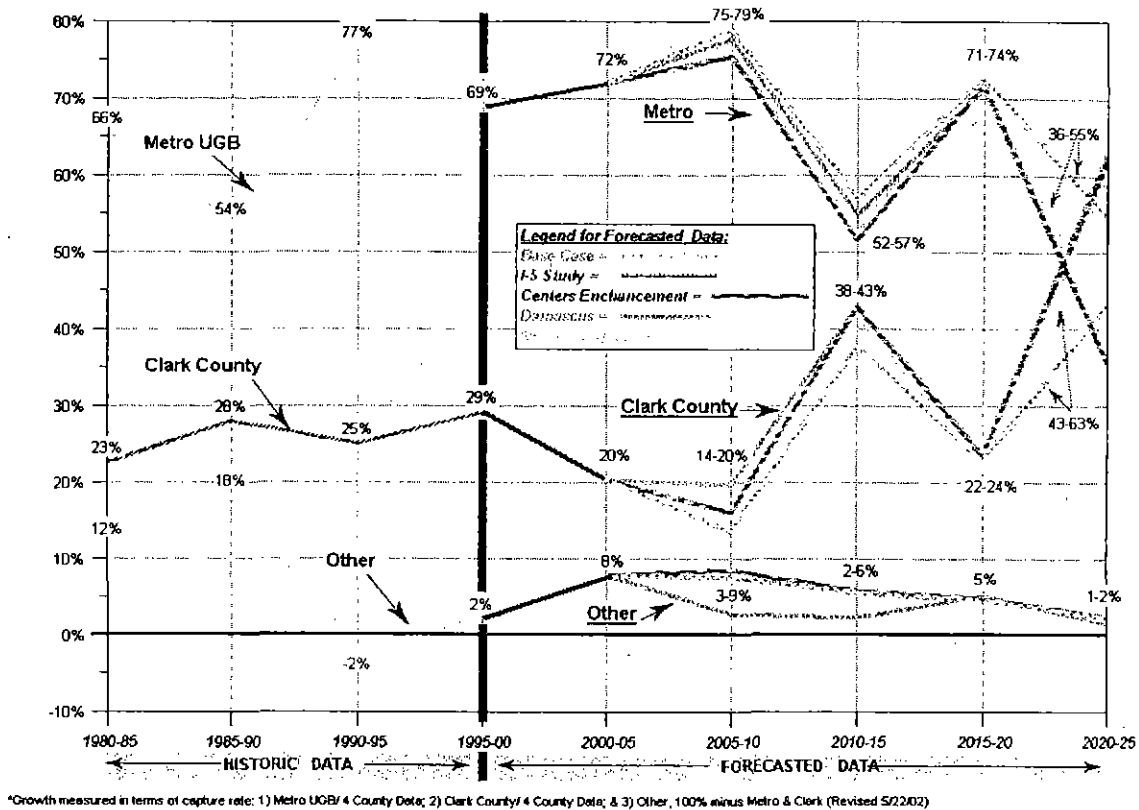
The Capture Rate Graph (Figure 1 - Household-Share of Growth) illustrates a direct relationship between the capacity within the Metro UGB, Clark County's UGA and is reflected in capture rates. In other words, a policy that holds a tight Metro UGB pushes growth to Clark County, whereas a policy that allows a larger UGB means less proportional growth in Clark County.

It is assumed that the remaining residential growth will locate to Clark County, unincorporated portions of the tri-county area, and cities located beyond the Metro UGB (e.g., Banks, Barlow, Canby, Estacada, Gaston, Molalla, North Plains and Sandy).

⁷ The MetroScope Model is a decision support tool developed to evaluate changes in economic conditions, land use trends and transportation activity. Five case studies were modeled and produced estimates of capture rates in five-year increments from 2000 up through 2025.

Figure 1

HOUSEHOLDS - SHARE OF GROWTH*, 1980-2025
Clackamas, Multnomah, & Washington Counties In Oregon; & Clark County In WA



Magnitude of Capture Rate Choices

Capture rate changes produce substantial swings in the amount of households that need to be accommodated within the UGB. Three scenarios are illustrated in Table 3 that show the effect of differing capture rates on the regional forecast (65 percent, 70 percent, 75 percent) with the resulting change in demand from the recommended 68 percent capture rate.

Table 3

CAPTURE RATES	65%	70%	75%
Four-County Housing Forecast within the Metro UGB	202,800	218,400	234,000
4-County with 4% Vacancy Rate	210,900	227,100	243,400

Changes in the capture rate result in an increase in the need of approximately 3,200 dwelling units per 1 percent increase in the rate. Assuming a lower capture rate than previously will have consequences to neighboring communities, because the overall population within the four-county area is only partially affected by the size of the Metro UGB. If the capture rate in the Metro UGB is pushed downward,

together with limits on the Clark County UGA, the demand for dwelling units is shifted to neighboring communities like Banks, Scappoose, Canby, etc. Selection of the capture rate should take into consideration impacts on surrounding communities.⁸

Effects of the Capture Rate on Residential Refill Rates

Generally, there is an inverse relationship between residential refill rates and the capture rate, although this relationship can be affected by a number of different factors. Essentially, the higher the refill rate the less new vacant land (UGB expansion) Metro needs to add to accommodate growth. The lower the refill rate, the more land Metro will need to add to the UGB. This year, the decision process has benefited from the addition of a new tool – capture rate and refill rate outputs from the MetroScope model. As shown by MetroScope, limited UGB expansion results in higher market demand for refill but not at a sufficient rate to avoid shifting a share of growth outside the Metro UGB. Conversely, a larger expansion ensures growth is accommodated in the Metro UGB but undermines market demand for refill.

Some key refill rate findings from the MetroScope analyses suggest that:

- Higher refill rates are achievable through an aggressive program of incentives for development in designated mixed-use Centers. Selection of a refill rate should be tied to how aggressive a Centers incentive program is adopted.
- Higher than planned redevelopment and infill rates (refill) can be achieved but at the expense of lower capture rates and higher home prices.
- For residential purposes, maximizing the use of Centers substantially increases residential refill and reduces overall residential vacant land consumption.
- Demand for refill in Centers is highest in the central city areas.

Key Points:

- *The overall residential capture rate assumed in the 2002 Residential UGR is 68 percent*
- *A capture rate of 68 percent is assumed to indicate the average proportion of residential growth that will occur within the UGB until 2022. The rates are derived from the two decades of historic data and MetroScope modeling results.*
- *Historical capture rates from 1980-2000 ranged between 54 percent and 77 percent.*
- *Capture rates from MetroScope model case studies from 2000 - 2020 range from 52 percent to 79 percent.*
- *A reasonable range to consider for this Residential UGR is 65 percent to 75 percent.*

⁸ For more detailed information about capture rates please refer to June 3, 2002 memo from Lydia M. Neill, Principal Regional Planner to Andy Cotugno, Planning Director, and the MetroScope findings report.

Chapter 4

Buildable Lands Analysis – Determining the Region’s 20-Year Land Supply

Land Inside the UGB

The 2002 UGB contains 235,549 acres. December 1998 UGB amendments brought approximately 3,000 additional acres into the boundary.⁹

Vacant Land Inventory

Metro’s Data Resource Center (DRC) has been producing a regional Vacant Land Study every other year since 1990. The most recent Vacant Land Study completed is based on digital aerial photography flown in July 2000. This study identifies fully and partially developed parcels within the Metro region. As part of updating the data for the 2002 Residential UGR, the supply of vacant land on hand is derived from the stock of vacant land data identified by the July 2000 data. Based on this careful inventory, there is a total of 43,900 gross vacant acres.¹⁰

Metro defines vacant parcels as tax lots with no improvement value or building(s). In addition, Metro has defined partially vacant parcels as those with an undeveloped portion of a lot that is larger than one-half acre.

In updating each year’s vacant lands inventory, DRC staff focus on removing areas from the previous year’s inventory that have become developed. Each parcel in the UGB is examined. Building permit data collected from local jurisdictions assist with this effort. County tax assessor data are also checked to ensure that the parcel in question has no improvement value located on it (an improvement value would indicate that the parcel is developed or at least partially developed).

In addition to removing developed areas from the vacant land data layer, staff may identify additional vacant lands that were undetected in the previous year’s inventory. This occurred with the 1998 update. Metro’s 2000 aerial photos have a higher level of resolution (one-foot pixels) than the 1998 aerial photos (two-foot pixels), allowing greater precision in the identification of vacant areas. Each year since Metro began measuring vacant lands the accuracy of Metro’s vacant lands data has incrementally improved.

Metro’s definition of vacant land follows very specific guidelines. The following points clarify important attributes of Metro’s vacant land analysis methodology.

- Vacant lands do not indicate whether a vacant parcel is listed on the market to be sold and developed. The vacant lands inventory process does not include a qualitative judgement about a parcel’s desirability for development, or identification of issues that would affect development.
- The vacant lands data alone do not necessarily indicate that the parcel is buildable. The Residential UGR starts with vacant lands, and using GIS, removes the areas that are considered environmentally constrained such as wetlands and floodplains (i.e., there is an important distinction between vacant lands and vacant *buildable* lands).

⁹ Includes Pleasant Valley Maser Plan, Dammasch Town Center concept, South Hillsboro and excludes Stafford and Bethany which were remanded by the courts.

¹⁰ Source: RLIS 2000 data.

Key Points:

- *Aerial photography was flown in July 2000.*
- *Partially vacant land is defined as vacant parcels with an undeveloped portion of the lot that is greater than one-half acre (over 20,000 square feet).*
- *Vacant land is defined as any undeveloped parcel/tax lot and any partially undeveloped lot with the undeveloped portion larger than one-half acre.*
- *Vacant land data do not imply a degree of development readiness or current marketability.*

Gross Vacant Acres to Gross Vacant Buildable Acres

Environmentally Constrained Land

Environmentally constrained land is deducted from Gross Vacant Land to arrive at Gross Vacant Buildable Acres (GVBA). Metro's Stream and Floodplain Protection Plan (Title 3 of the Functional Plan) was adopted by Metro Council in June 1998. It requires cities and counties within the Metro UGB to meet regional performance standards relating to water quality and floodplain management. This analysis assumes that all riparian areas beyond those defined in Title 3 are buildable. Environmentally constrained land is protected under Title 3 of the Metro Functional Plan. Through Metro's Title 3 process, 7,600 vacant acres¹¹ of environmentally sensitive land has been identified. Environmentally constrained lands include only water quality and flood management areas (as defined in Title 3 of the Functional Plan), consisting of:

Title 3 Restrictions

- 1996 flood inundation areas and FEMA floodplains.
- Wetlands, from an enhanced National Wetlands Inventory and local wetland inventories.
- Wetland Areas, 50 feet from the edge of wetland.
- Riparian Areas, variable riparian corridor between 15 feet and 200 feet depending on the area drained by the water feature and the slope of the land adjacent to the water.

Steep Slopes Beyond Title 3

The buildable lands analysis assumes that upland areas with slopes greater than or equal to 25 percent outside of adopted Title 3 riparian areas have development potential.¹² The development potential on steep slopes is assumed to be current zoning.

Development on Environmentally Constrained Land (Title 3)

Environmental constrained lands do not have the same development capacity as buildable lands. These types of land include steep slopes, flood plains, wetlands, natural resource and riparian areas.

Although environmentally constrained land is not included in the net vacant buildable land inventory, some low-density type development has historically occurred in these areas. Capacity on these lands is calculated by each environmental land component (i.e., floodplains, 1996 flood areas, and steep slopes outside of Title 3 regulated areas). Lots located wholly within Title 3 areas continue to be allotted one dwelling unit per tax lot, because Metro code allows this exemption to Title 3 limitations. Approximately 500 tax lots are located wholly within the Title 3 regulated areas and therefore would result in additional capacity of approximately 500 dwelling units which is accounted for on line 22 of Table 1.

¹¹ Source: RLIS 2000 data.

¹² The 1997 UGR assumed these areas were environmentally constrained. The June 1998 adoption of Title 3 regulations did not protect these lands unless falling within water quality and flood management areas.

Additional Technical Notes on Capacity Estimates

Steep Slopes

Steep slopes are defined as those areas greater than 25 percent slope. In the past (1997 UGR), these areas have been considered unbuildable. These lands are more expensive to develop, are less efficient to develop because of topographic constraints and may have life and property safety concerns due to geologic hazards. In the 1999 UGR Update it was stated that the historical rate of development in steep sloped areas was estimated by examining building permit data from 1995 through 1998. The historical rate and current zoned capacities on these lands were reported as approximately the same (6.4 dwelling units per 5 acres). Therefore, in the 2002 Residential UGR, current zoning is assumed. To the extent steep slopes are included in Title 3 coverage, they are treated as Title 3 areas (see above).

Floodplains

Floodplains are defined as areas located within the 100-year floodplain and indicated on the Federal Emergency Management Agency's (FEMA) maps¹³, and/or the area inundated by the 1996 flood. Structures located in the floodplain can cause life and property losses in the floodplain and downstream. Most jurisdictions allow construction in the flood plain as long as the finished floor elevation is located at least one foot above the FEMA flood elevation. Title 3 allows construction in the floodplain with balanced cut and fill. Balanced cut and fill requirements may decrease future construction in the floodplain due to cost. Land within the 100-year floodplain and 1996 flood inundation area (located outside of the Title 3 water quality and riparian areas) are assumed to develop at zoned capacity.

Cities and Counties in Compliance with Title 3 Requirements¹⁴

Standard	No. Jurisdictions Applicable	No. Jurisdictions in Compliance	Percent Implemented
Floodplain	25	22	88%
Water Quality	26	19	73%
Erosion Control	27	25	93%

Key Points

- *Environmentally constrained lands do not have the same development capacity as buildable lands.*
- *These types of land include steep slopes, flood plains, wetlands, natural resource and riparian areas.*
- *Capacity in Title 3 regulated lands is estimated at 500 dwelling units based upon one unit per lot.*
- *Capacity on non-Title 3 regulated steep slope lands and floodplains and 1996 flood areas is based on current zoning.*

Gross-to-Net Reductions

GVBA are further refined to account for future streets, schools, parks, places of worship/fraternal organizations, and major utility easements over the 20-year planning period.

¹³ Maps distributed by FEMA.

¹⁴ As of July 25, 2002.

Federal, State, Municipal Exempt Land

A total of 1,700 acres of federal, state, county and city owned land have been removed from gross vacant buildable acres (GVBA).¹⁵ The data was identified from tax assessor codes for exempt uses. No dwelling unit capacity is assumed on these lands because they are assumed to address public facility needs for cities, counties and federal agencies. Housing Authority and Portland Development Commission lands were not removed from gross vacant buildable acres because they are in public ownership to provide housing capacity. This method is consistent with that used in the 1997 UGR and subsequent updates.

Vacant Single Family – Platted Lots

All parcels less than 3/8 of an acre are temporarily set aside from the inventory of GVBA. These parcels do not receive reductions for future streets, parks, schools and places of worship/fraternal organizations, because they are assumed to have sufficient right-of-way already dedicated to serve them because of their small size and they are already platted to their minimum possible size. A total of 2,000 acres of small platted lots are temporarily removed from GVBA.¹⁶

In single family zones, capacity on these parcels is assigned one dwelling unit per parcel rather than the underlying zoning classification. The dwelling capacity (one per lot) on this subset of vacant land is later added back to the final supply estimates when the residential portion of net vacant buildable land is converted into a dwelling unit capacity estimate.

Lots less than 3/8 of an acre but zoned for non-residential or multi-family purposes are also not reduced in capacity by the gross-to-net reduction calculation for similar reasons as stated above. However, these individual parcels are included back into net vacant buildable acres to compute dwelling unit capacity for multi-family development and employment land supply respectively based upon the zoning classification assigned to that parcel. This is consistent with the method used in the 1997 UGR and subsequent updates.

Future Streets

As noted above no reduction for future streets is applied to parcels less than or equal to 3/8 of an acre in size. A 10 percent reduction is applied to parcels between 3/8 of an acre and one-acre. Staff assumes due to the smaller size of these parcels that the likelihood is great they are already served by some street access and that only limited further right-of-way would be required. An 18.5 percent reduction is applied to parcels larger than one acre. The total deduction for new streets is 4,900 acres.¹⁷

The 18.5 percent reduction is based on a study of subdivision development during 1997 and 1998 on all parent parcels larger than one acre. A total of 170 platted subdivisions were reviewed from each of the three counties. Of these subdivisions, the average amount of land used for streets was 18.5 percent. Although this rate is applied globally to all vacant land, it was derived from measuring only single family lots.

The 18.5 percent rate applies to all street classifications. Expansion of freeway and arterial streets suggested in the RTP will partially occur within existing rights of way or adjacent to already developed parcels. The RTP estimates that approximately 1,600 acres are required for these future expansions. The 18.5 percent assumption for all vacant land provides enough land for these acres because of the

¹⁵ Source: RLIS 2000 data.

¹⁶ Source: RLIS 2000 data.

¹⁷ Source: 2000 RLIS data.

excess land assumed for multi-family and non-residential parcels that require substantially less than 18.5 percent for streets. These rates were used in the 1997 UGR and subsequent updates.

Review of the Street Right-of-way Widths

Metro Council has asked staff to review the local street allowance based on the implementation of the Transportation Planning Rule (TPR) to allow narrower streets. Most of the local governments have completed this work and allow a variety of street designs to be used in new subdivisions depending upon topography, functional classification, anticipated traffic volumes and adjoining uses. The recommended pavement width for narrow streets (curb to curb) is between 20 to 28 feet although right-of-way is needed to accommodate more than just curb to curb pavement width. Additional right-of-way is required to accommodate street trees in planter strips, sidewalks and driveway aprons that meet ADA standards. With additional storm water run-off concerns right-of-way widths are not likely to be reduced further although pavement widths may be reduced.

To evaluate whether the narrow street widths were being applied an additional analysis of newly dedicated right-of-way (2001) was conducted by DRC staff. A sample was collected of 395 right-of-way segments in Washington, Clackamas and Multnomah Counties within the UGB. Most right-of-way segments ranged from 30-65 feet in width with the most common being 50 feet. The second most frequent width was 35 feet. The average length was between 268 to 276 feet. Portland had the greatest number of new dedications. From this data it was difficult to discern whether the dedication was only for a portion of the width of the street (i.e., 35 feet of a 70 right-of-way). To examine whether the percentage of street right-of-way dedicated is adequate for different size parcels an additional study would need to be undertaken to examine subdivision plats. This information is not available from the RLIS database and would involve obtaining copies of the plats from each of the counties. For this report, the existing 0-10-18.5 percent deductions will be used. This assumption produces a deduction of a total of 4,900 acres for new streets.

Future Public Schools

Acres for New Schools

In order to estimate the amount of land dedicated for future schools, the ratio of students per acre by elementary, middle and high school is used to calculate the school land need. In past UGRs, this pencils out to 70 students per acre figured for an elementary school, 60 students per acre for a middle school and 55 students per acre for a high school. These ratios are based on the amount of land school district staff believe they will be able to obtain for each of the school types. There are three ways to approach how Metro estimates the amount of land necessary for future schools. One approach is based on what the school district wants to build. The second approach is based on what the school district can obtain under constrained land conditions, and the last approach is based on current conditions.

A projection of student population growth is estimated from the regional forecast. This projection is adjusted to coincide with the UGB capture rate. The estimates are also adjusted to account for the number of students believed to attend private schools or being home schooled. Approximately 90 percent of all students attend public schools.

Each of these options represents a different set of assumptions for how much land per student is required.

"Ideal" Site Size Requirements

	<u>Students Per Acre Ratio</u>	<u>Site Size</u>	<u>Enrollment Size</u>
High School	55	40 acres	2,200 students
Middle School	60	20	1,200
Elementary School	70	10	700

"Constrained" Site Size Requirements – 20% Denser than Ideal

	<u>Students Per Acre Ratio</u>	<u>Site Size</u>	<u>Enrollment Size</u>
High School	65	40 acres	2,600 students
Middle School	70	20	1,400
Elementary School	85	10	850

Actual Student Land Need Ratio, 2001

	<u>Students Per Acre Ratio</u>
High School	50
Middle School	40
Elementary School	52

The "constrained" option was selected with the addition of 200 acres for the 2002 Residential UGR. A total of 900 acres are needed for new schools.

Future Parks

History

The amount of land needed for development of future parks is computed based upon a park ratio of acres of parkland per 1,000 residents. The 1997 Update to the UGR was based on a 1998 survey rate of 20.9 acres per 1,000 residents. This ratio was updated from 14.4 acres per 1,000 that was used in the 1997 UGR. This ratio was based on an inventory of parks and open spaces completed in 1997 (Metro's Greenspaces Department). The park ratio included neighborhood parks, wildlife refuges and preserves, Metro and municipal open spaces, and regional parks. From this need, acquisitions inside and outside the UGB through the Greenspaces bond measure were subtracted producing a net set aside for parks. The 20.9 ratio used in the 1997 Update resulted in a need of 8,598 acres which was then reduced by 4,900 acres for parks and open space acquisitions (past and future) both inside and outside of the UGB. The total deduction for parks was 3,678 acres (3,700 rounded).¹⁸

Review by MPAC Parks Subcommittee

The MPAC Parks Subcommittee was charged with making an estimate recommendation for future park land needs. They explored five possible methods of estimating future parks and their likely impact on the housing and job capacity calculations within the Metro UGB.¹⁹ A summary description of each approach follows:

1) Existing Ratio. This is an estimate based on the existing ratio of acres of parks to people and forecasting new parks from the forecast of new people in the region (20.6 acres per 1,000 residents). Using this method, future parks could consume as many as 10,860 acres.

2) Active Parks Ratio. This is an estimate based on active parks - the active parks being lands like playgrounds and ball fields, the passive parks being features like steep slopes, streams, etc. This

¹⁸ Source: Technical Appendix to Dwelling Unit Capacity Estimates for the 1999 UGR, December 1999.

¹⁹ For more information about the MPAC Parks Subcommittee report, refer to A Background Report for Estimating Future Parks and their Capacity Implications within the Metro UGB, June 19, 2002.

method yields an estimate of about 2,290 acres of new active parks. Passive park lands, likely to have little development potential, are not accounted for in this paper.

3) Historic Rate. This approach looks at the actual rate of addition of park and open spaces to the UGB for several different periods. This method yields an estimate of at least 8,000 acres of new parks land need.

4) Parks-to-Developed Land Ratio. This method estimates future parks based on the past ratio of parks to developed land. However, while it documents that there are about 16 acres of parks and open space for every 100 acres of developed land as of the year 2002, it does not yield a year 2022 estimate.

5) Fiscal Resource. This is an estimate based on the existing fiscal resources available to purchase new lands. This is estimated in large part based on estimates of existing system development charges as well as any dedicated local bond measures also available to purchase open space. This method yields an estimate of about 1,050 acres.

The MPAC Parks Subcommittee believes the best estimate for future parks is about 1,050 acres over the next 20 years. This estimate is based on what is financially justifiable by using available revenue sources (primarily system development charges). It should be noted that this estimate does not take into account the impact of future funding mechanisms that may be approved and implemented in the future. It is also based on acquisition of those types of parks that could be expected to be provided in conjunction with new development and that would need to be located on lands that could otherwise accommodate new jobs or housing. These lands would accommodate active parks that usually need relatively flat building sites to accommodate playgrounds, sports fields, etc. It was also the conclusion of the MPAC Subcommittee that this does not reflect the desired level of parks throughout the UGB. Subsequent to this, MPAC recommended 2,300 acres based on the expectation that resources exceed the base System Development Charges level, but Council selected 1,100 acres because they felt they couldn't count on the extra funds.

At this time, 1,050 acres are assumed to be needed for future parks, as recommended by the MPAC Parks Subcommittee. For purposes of the Residential UGR, 1,050 acres has been rounded to 1,100 acres.

Future Places of Worship and Fraternal Organizations

The total deduction for places of worship is 700 acres.²⁰ The land need for future places of worship and fraternal organizations are based upon a ratio of 1.4 acres per 1,000 persons which reflects existing conditions that was calculated in 1994 for the 1997 UGR. An estimate of the ratio applied to population projections and the amount of land for future need for places of worship and fraternal organizations are calculated and then the current vacant land holdings of these organizations are deducted from the future need. Rather than removing the specific parcels owned by places of worship and fraternal organizations, these parcels were retained as part of the region's buildable land supply, and 700 acres of land need was deducted proportionally from parcels of gross vacant buildable land, in the same manner as schools and parks. Approximately 85 percent of the need for these uses are estimated to occur in residential areas, with the remaining 15 percent in commercial areas (based on historic land holding patterns). The same assumption was used in the 1997 UGR and subsequent updates.

²⁰ Source: RLIS 2000 data.

Re-use and Redevelopment of Church Lands

Metro Council pointed out that there are a number of religious organizations that have developed affordable and senior housing on church owned lands that were previously committed for religious purposes. It appears that although this is occurring it is difficult to accurately measure how many of these instances have taken place. Staff has queried Metro Housing program staff and some local governments to get a sense of where these changes have taken place and the frequency of the occurrence.

Anecdotal evidence has indicated that churches are frequently broadening their mission and providing more social services, daycare and education. Although this has obvious benefits to the community, this may raise compatibility issues in residential neighborhoods where most churches are located. Most zoning codes currently permit church uses to occur in residential and commercial zones. In addition to providing some of the services mentioned above, there have been some instances where church sites are redeveloped for housing use.

Redevelopment of church sites may be most applicable in areas found in older neighborhoods that are losing membership as their membership ages. Although St. Anthony's in southeast Portland has been developed as a model for the Archdioceses of Portland that they hope can be replicated in other parts of the country the decision to undertake this type of development is up to the individual parish. Individual parishes within the Catholic Church are responsible for buying, selling and developing their land and there is no overall stated mission by the church to require or encourage this type of activity.

The Housing Technical Advisory Committee (HTAC) examined the St. Anthony's model and tried to assess the probability of replicating this elsewhere in the region. An initial search of church properties in RLIS as well as contacts with church groups proved difficult and was not pursued.

Because of the lack of evidence of a trend that these lands are fulfilling some of the housing demand it is recommended that redevelopment activity on these types of lands be monitored in the future to ascertain whether redevelopment of these sites is occurring by developing parking lots, excess land or converting church buildings to housing uses. In the meantime, selection of an appropriate refill rate could include a judgement of the rate of this redevelopment activity.

Major Utility Easements

The total amount of actual land used for easements by natural gas, electric and petroleum utilities, and radio and TV towers is 700 acres.²¹ Radio and TV tower tax lots were identified and removed from the buildable land inventory. Easements for major utilities consist of linear corridors of land based on specific width requirements for public safety. These include a 75-foot easement requirement for Bonneville Power Administration lines and natural gas lines, and a federal 50-foot standard for petroleum pipelines. Easements typically allow very limited uses and do not allow the construction of buildings in these areas and are therefore removed from the buildable land inventory. This deduction is a new factor that has been included to more fully approximate non-buildable land.

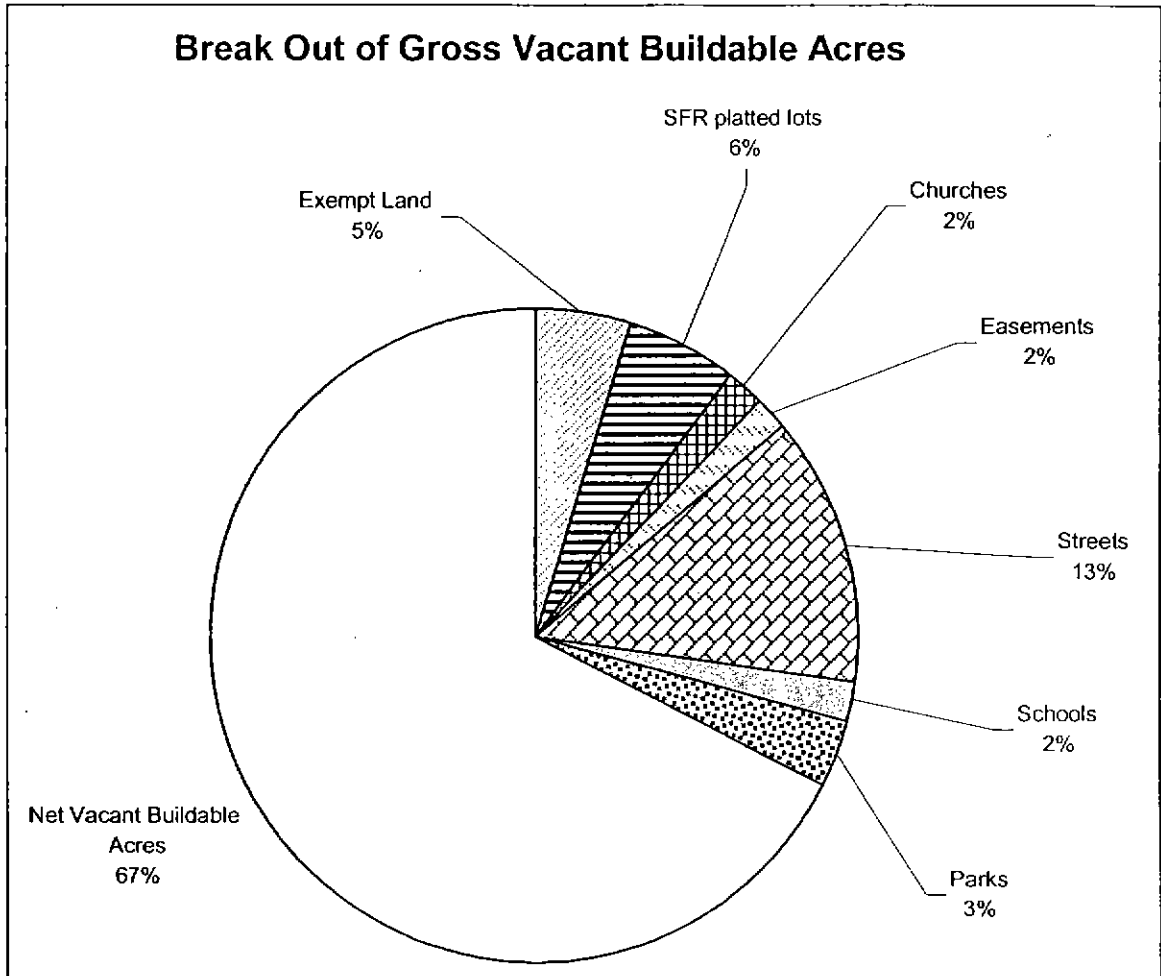
Gross vacant buildable land minus land needed for future streets, schools, parks, places of worship/fraternal organizations, and major utility easements yields Net Vacant Buildable Acres. The aggregate rate of reduction from GVBA based upon these various components is approximately 25 percent.

²¹ Source: RLIS 2000 data.

Figure 2: Break Out of Total Gross Vacant Buildable Acres

Figure 2 graphically depicts the relative size of each category of land that is removed from gross vacant buildable acres.

Figure 2



Net Vacant Buildable Land

The region's dwelling unit capacity is estimated from net vacant buildable acres (NVBA). NVBA is broken out by residential uses according to the underlying zoning of each parcel. A total of 14,900 acres of NVBA is available for conversion to residential uses.

Land Adjustments

A new factor is reserved for adjustments to the buildable land supply so that the most accurate information is available for the 2002 Residential UGR. The vacant and buildable land supply is based on 2000 aerial photography that was flown in July 2000. There may be instances where local governments have adopted area plans, such as the Washington Square Regional Center, that increase the residential or employment capacity of lands that was not reflected in the 2000 land supply and 2000 zoning. In addition, federal, state or local governments may have sold vacant public properties that are now available for development such as the Dammasch Hospital site in Wilsonville. There also may be

instances where the Standard Regional Zoning information has been incorrectly identified. A set of decision making rules help guide which lands will be considered for adjustments to the 2002 Residential UGR and which lands will be reconciled during the next legislative process.

A table of all changes is included as Appendix B to the Residential UGR. These changes are anticipated to be ongoing.²²

Decision Rules for Buildable Land Supply Changes

All changes to the buildable land supply must have taken place by December 31, 2002. Any subsequent changes effective after this date would be picked up in a subsequent UGB analyses. A minimum of 20 acres is required because this analysis is conducted on a regional level. Changes would be made to the buildable land supply based on:

- Only those areas will be considered where formal land use action has taken place.
- Errors in a Standardized Regional Zone (SRZ) assignment.
- Mapping error; either an incorrect assignment to vacant or developed categories.
- Change in the categorization of land from public to private ownership, (minimum of 20 acres in size).

²² For more information about land adjustments please refer to May 17, 2002 Memo.

Chapter 5 Residential Supply Analysis

Itemized Accounting of Residential Dwelling Unit Capacity

After adjusting GVBA by various gross-to-net factors (i.e., exempt land, platted lots, future streets, easements, schools, parks and places of worship), the amount of vacant land remaining becomes Net Vacant Buildable Acres (NVBA). The land that is zoned for residential purposes is separated to create the supply of vacant residential land for capacity calculation. This is the vacant land that residential dwelling units can be constructed upon. NVBA available to be converted to dwelling unit capacity totals 14,900 acres.

Dwelling Unit Capacity at Current Local Zoning Densities

Net vacant buildable acres are converted to dwelling unit capacity by aggregating local zoning classifications to Metro's Standard Regionalized Zones (SRZs). RLIS is the source for current local zoning (through 2001). SRZs normalize 746 different zoning categories across 24 cities and 3 counties. SRZs assume the average density in each zone when the assignments are made to the regionalized category. This density applied to the specific location of net buildable acre yields dwelling unit capacity. This is consistent with the method used in the 1999 UGR Update.

Standard Zoning Designations

A new list of standard zoning designations was included in the 1999 Update of the 1997 UGR. Metro staff defined a broader set of zoning designations, to capture a greater level of detail from approximately 746 different zoning categories that now exist throughout the region. The standard zoning designation list was last updated in 2002. The 26 standard regional zoning designations are shown below in Table 4.

Table 4 – Standard Regional Zoning Designations

Standard Regional Zone And Abbreviation	Dwelling Unit Per Net Acre
RRFU (Rural or Future Urban)	10.0
FF (Agricultural or Forestry)	10.0
SRF1 (Single Family 1)	2.0
SRF2 (Single Family 2)	3.0
SRF3 (Single Family 3)	4.5
SRF4 (Single Family 4)	6.0
SRF5 (Single Family 5)	7.5
SRF6 (Single Family 6)	10.0
SRF7 (Single Family 7)	16.5
MFR1 (Multi-family 1)	20.0
MFR2 (Multi-family 2)	40.0
MFR3 (Multi-family 3)	75.0
MFR4 (Multi-family 4)	100.0
MUC1 (Mixed Use Center 1)	14.1
MUC2 (Mixed Use Center 2)	25.9
MUC3 (Mixed Use Center 3)	58.8
CC (Central Commercial)	0
CG (General Commercial)	0
CN (Neighborhood Commercial)	0

Standard Regional Zone And Abbreviation	Dwelling Unit Per Net Acre
CO (Office Commercial)	0
IL (Light Industrial)	0
IH (Heavy Industrial)	0
IA (Industrial Area)	0
IMU (Mixed Use Industrial)	0
PF (Public Facilities)	0
POS (Parks and Open Space)	0

As was discussed above, SRZs represent a range of densities. The previous step uses the midpoint of the range. Dwelling capacity based on these current zoning densities is 108,700 units (prior to the adjustments noted below).

Key Points:

- *The 746 unique local zones have been collapsed into the 26 SRZs.*
- *Gross vacant buildable land minus land needed for future streets, schools, parks, places of worship/fraternal organizations, and major utility easements yields NVBA.*
- *A new deduction is being made for major utility easements in order to more fully account for all buildable lands.*
- *A new factor has been added to reflect adjustments to the 2002 buildable land supply so that the most accurate capacity information is available for the 2002 Residential UGR.*

Residential Development in Mixed Use Areas

Dwelling unit capacity is adjusted to account for additional units generated by residential development on vacant land in mixed-use zones. Additional housing unit capacity from residential development in mixed-use areas is estimated at 10,400 dwelling units.

Underbuild Rate

Underbuild represents a statistical estimate of the dwelling unit capacity lost due to residential development at less than maximum permitted densities in residential zones. The underbuild accounts for such factors as poor access, steep slopes, small or odd shaped lots, neighborhood common areas, greenways, storm water detention areas and many other site specific conditions, that make it difficult to develop at full capacity as indicated by the zoning.

Flexible local codes may allow the market to respond more efficiently to physical constraints. Higher market demand for residential lots may make it more economical to develop solutions to constraints. Higher land prices have the effect of decreasing underbuild because there is a greater profit incentive to use land more efficiently and build closer to maximum densities.

Under the Metro Code Section 3.07.120, regulations establish a minimum density requirement that specifies that residential development must at least be constructed at 80 percent of the maximum density. This requirement was adopted by Metro Council in November 1996 and is being implemented by local jurisdictions through code changes. In effect, the Functional Plan provides assurance that underbuild will be no more than 20 percent for residential development within the UGB. Because this is a regulated floor for zoning capacity the UGR assumes that 80 percent of capacity in residential zoning districts will be achieved. In the 1997 UGR, the Metro Council adopted a rate of 21 percent underbuild

for single family residential development as a result of a study conducted in 1995. For this report, the underbuild rate is assumed to be 20 percent.

Underbuild is reported as a loss of 23,800 dwelling units from zoned capacity.

Residential Refill Rate

Residential refill is defined as development of new residential units on any lot defined in the Metro database as "developed." Refill is a term that includes both infill and redevelopment. Redevelopment occurs when a structure is removed and another built in its place. Infill occurs when more units are constructed on an existing developed site. Since "vacant" land includes any tax lot or any part of a tax lot that has a vacant portion larger than 1/2 acre, this includes development on an existing developed lot or partially developed lots with a vacant portion smaller than 1/2 acre.

Observed residential refill rates were obtained from a Technical Report Residential Refill Study conducted in February 1999 that reported a rate of 25.4 percent. This study was repeated in January 2000 and was entitled Report on the Residential Refill Study for 97-98 reported a rate of 26.3 percent. The studies found that a point estimate of the refill rate could vary based on economic cycles, policy changes and incentives. Policy changes and incentives can increase the rate and the rate is expected to increase over time. Data from these studies suggest that the amount of land added to the UGB is inversely related to refill rates. These rates are averages for the entire region, but reflect areas of the region that have refill rates that are much higher (central city and other areas with high demand and limited supply) and other areas are lower than the regional average. Areas with lower refill rates are most likely due to lessened demand, lower land prices, age of buildings and/or where there is a more readily available supply of vacant land. Development prefers greenfield or vacant sites to sites with constraints that must be resolved prior to development. Redevelopment issues include site contamination, building remediation or land assembly that increase development costs and add uncertainty to the process. These constraints may be offset by the fact that refill parcels are likely to have transportation access and utilities already available.

In the 1999 UGR Update, the Metro Council choose an aspirational refill rate of 28.5 percent. At the time this rate was adopted, existing experience from a study and adopted policies supported a refill rate between of 26.3 percent and 28.5 percent.

Residential Refill Rates

REFILL RATES	
Historical Refill Rates	25.4% to 26.3%
1999 UGR Rate	28.5%

The 2002 Residential UGR assumes a historical refill rate of 26.3 percent and proposes changes to increase the refill rate to 29 percent based on past trends, modeled rates, computation of accessory dwelling units and a combination of incentives and minor policy changes. ORS 197.296(6) provides the legal basis for this proposed increase.

"197.296 (6) If the housing need determined pursuant to subsection (3)(b) of this section is greater than the housing capacity determined pursuant to (3)(a) of this section, the local government shall take one or more of the following actions to accommodate the additional housing need:

- (a) Amend its urban growth boundary to include sufficient buildable lands to accommodate housing needs for the next 20 years. As part of this

process, the local government shall consider the effects taken pursuant to paragraph (b) of this subsection. The amendment shall include sufficient land reasonably necessary to accommodate the siting of new public school facilities. The need and inclusion of lands for new public school facilities shall be a coordinated process between the affected public schools districts and the local government that has the authority to approve the urban growth boundary;

- (b) Amend its comprehensive plan, regional plan, functional plan or land use regulations to include new measures that demonstrably increase the likelihood that residential development will occur at densities sufficient to accommodate housing needs for the next 20 years without expansion of the urban growth boundary. A local government or metropolitan service district that takes this action shall monitor and record the level of development activity and development density by housing type following the date of the adoption of the new measures:
or
- (c) Adopt a combination of the actions described in paragraphs (a) and (b) of this subsection."

Modeled Refill Rates

The MetroScope model produces forecasted refill rates as an output from the model. Rates from the model case studies are helpful in choosing a rate that best reflects the Metro Council's objectives and policy choices for the region. The MetroScope model rates range from 26.6 percent to 50.7 percent depending upon the policy assumptions imbedded in each case study. For example- the Centers and Hold the UGB case studies produced refill rates between 44-50 percent using a very aggressive incentive program that was spread across the region in most all regional and town centers. Even the Damascus case study produced higher refill rates that were spread over the region even though the targeted incentives were located in the Damascus area. Table 5²³ illustrates the different refill rates that could be used to estimate the potential for refill related development if additional capacity was provided through upzoning, incentives or implementation of other programs in different employment zones. For example, the use of incentives in Centers can boost the refill rate by making this type of land more attractive for development.

2040 Centers Implementation Strategy

Metro's consultants recommended that Metro policy focus on the implementation of Regional and Town Centers. The Centers policy needs to start with a recognition that the region's Centers are all evolving at different rates in terms of planning, market position and implementation. Metro can and should play a role in each of the three stages of Centers development. In broad terms, it is helpful to think about the evolution of Centers in three stages: planning, emerging and maturing. Implementation assistance can and should be tailored to each stage along the evolutionary cycle of Centers growth.

The study recommended that the definition of Centers in the Regional Framework Plan be enhanced to better define the concept of Centers without adding more regulatory language dictating densities, mix of uses or transportation requirements.

The primary policy change should focus on implementation. To date, development in Centers has been lacking due to a combination of market realities and the fact that Centers are the most difficult places in the region to do development. Metro policy can facilitate development in Centers through its role as teacher and coach. Amendments to the Functional Plan should provide flexibility for local governments

²³ Table excerpted from Table 3 Localized Refill Rates – MetroScope Case Studies, UGR Primer, June 3, 2002.

to encourage the types of development that is most appropriate for their communities while at the same time encouraging development in Centers. An in depth discussion of Metro's recommended policies are contained in the 2040 Refinement Report, Policy Recommendations.

The Residential UGR anticipated an additional 2.7 percent capacity in designated mixed-use Centers will be achieved through incentives, MTIP, and additional measures to achieve a final refill rate at 29 percent.

New policy directions for inclusion in the Metro Code or the Regional Framework that focus on developing successful Centers include:

- Refine the definition of a Center. The 2040 Growth Concept refers to a "Neighborhood Center" but does not expand on this. The hierarchy of Centers could be expanded to include this type of Center that is smaller than a Town Center.
- Develop additional policies to strengthen Center development. A regional strategy for Centers could include investment in Centers by Metro and efforts by Metro to secure complementary investments by others.
- Monitor and develop performance measures for Centers to determine whether strategies for Centers are succeeding and report the results to the region and the state.
- Develop an incentive program to assist in implementation.
- Focus appropriate types of development in Centers including corresponding policies in other areas such as restricting commercial uses in significant industrial areas.

Next Steps in the Evolution of Centers

A work program to implement the recommendations from the Centers studies and the MPAC Jobs Subcommittee will be developed. This will include development of new Centers policies. Issues that need further examination are:

- Determining the relationship between the Centers and Corridors
- Examining the relationship between the Centers and Employment and Industrial Areas
- Measuring performance
- Determining a process for categorizing and prioritizing the Centers
- Agency roles for Centers development
- Addressing regulations

Accessory Dwelling Units

In November 1996, Metro Council adopted the Functional Plan with a requirement that cities and counties not prohibit the construction of at least one accessory dwelling unit within any detached single family dwelling. Local Governments had a deadline to amend their codes accordingly by February 1999. Based on this requirement in the Functional Plan, the capacity analysis in the 1999 UGR Update provided for accessory units as a proportion of the total number of single family dwellings. In each successive preparation of the UGR all factors are evaluated by staff to determine if they can be supported by available data or if a new methodology can be developed to more accurately reflect market conditions. After review of the accessory dwelling unit factor staff recommended deleting this separate line item due to the fact that accessory dwelling units have proved difficult to count and track. Accessory dwelling units are more appropriately included as an incidental component of the refill rate and as part of the densities assumed on vacant land.

Why do we Expect Increases to Refill Rates in the Future?

The Residential UGR is forecasting a very small increase in the refill rate within the next 20 year period because of several factors. First, the magnitude of change of a refill rate from 26.3 percent to 29 percent is extremely small when the results of that change take place over a 20 year period. For

example, a 6,000 dwelling unit deficit (difference between 26.3 and 29 percent refill rate) over 20 years is only 300 units per year or when compared equally to 24 cities it amounts to an increase of 12.5 units per year. In summary this small increase in the refill assumption is valid for the following reasons:

- Past trends- Metro Refill Studies confirmed rates increasing from 25.4 to 26.3 percent
- 2040 continues to play out in Regional and Town Center development
- Model confirmation- MetroScope confirmed the rate of 26 percent with the Base case model run²⁴
- MetroScope model runs confirm that incentives do indeed produce higher refill rates
- Incentives and policy adjustments will be targeted at areas where demand is greatest such as Regional and Town Centers that are performing well and the Central East Side Industrial District
- Accessory dwelling units are now included in the refill rate
- New Refill Study- will be performed as part of Performance Measures follow up work

When do we expect to see changes in the refill rate?

Undoubtedly time will pass before changes in the refill rate can be observed in either a localized basis or regionally. The reason for this delay is that policy changes take time to be drafted and implemented. In addition, the market needs time to respond to policy changes and the availability of incentives to create measurable results also takes time. Examples of incentive programs range from increased MTIP allocations, implementation of additional urban renewal districts, and availability of additional resources to recruit and locate target business in Regional and Town Centers. Selected policy changes in specific areas could raise the rates in those areas as well as the overall regional refill rate and justify the use of a higher refill rate in the 2002 Residential UGR. The Central east side Industrial district has a refill rate in the Base case of 40 percent which increases to upwards of 90 percent in the Centers and Hold the UGB cases. Granted these cases applied a very aggressive refill strategy that is not expected to be duplicated for this area but it shows the tremendous upside for realizing a higher refill rate (both localized and regionally). No other Center showed such a dramatic increase. For example- the City of Portland will be developing a work program to review the plan for the Central City area in 2003. This work is anticipated to take approximately one year to complete. Amending a plan that could allow more housing opportunities in this district generally takes 3-4 years to complete. Certainly this planning and allowance for market adjustments can be accomplished with the 20 year planning horizon and justify a slightly higher overall regional rate.

Based upon proposed adoption of a "Centers" strategy, including the application of MTIP funding to areas that are achieving increased centers development Metro is proposing a 29 percent refill rate.

²⁴ The difference between the observed rate of 26.3% and the Base case of 26.6% is probably not statistically significant.

Table 5: Localized Refill Rates – MetroScope Case Studies

Employment Zones	Areas ²⁵	Base Case	Damascus	Centers	Hold the UGB	Rate Differences Between Base and Hold UGB
106	Central Eastside	40.4	42.0	90.4	96.1	55.7
304, 306	Beaverton	52.1	54.1	68.1	67.7	15.6
202, 203	Clackamas TC	20.25	45.4	27.9	31.25	11.0
124	Gresham	15.6	20.1	36.6	38.0	22.4
311, 312	Hillsboro	34.2	38.75	45.1	44.7	10.5
206	Oregon City	19.8	35.7	39.3	38.8	19.0
101	Portland CBD	99.6	99.6	99.7	99.8	.2
303	Tigard	53.0	54.0	72.8	72.4	19.4
301	Tualatin	13.1	25.9	34.9	34.4	21.3
211	Wilsonville	11.5	18.0	16.8	20.3	8.8
213	West Linn	7.1	7.7	12.9	17.1	10.0
All zones	Regional Rate ²⁶	26.6	32.3	44.0	50.7	24.1

Key Points

- *Metro Refill Study confirms a refill rate between 26.3 and 30 percent.*
- *MetroScope model runs confirm that incentive programs can produce higher refill rates.*
- *A key finding from this research is that the region's needs and Metro's function have changed since the adoption of the existing policies related to the 2040 Growth Concept.*
- *Focus policy changes on implementation.*
- *By focusing on incentives in Centers we can achieve a refill rate of 29 percent.*
- *A work program to implement the recommendations from the Centers studies and the MPAC Jobs Subcommittee will be developed.*

²⁵ Areas are rough approximations of regional and town center boundaries. Regional and town center boundaries do not nest within MetroScope employment zones.

²⁶ Includes all zones not just those listed in the selected areas above.

Appendix A

Table Notes

- 1a-1b. Source: Metro Data Resource Center, Metro Report, Economic Report to the Metro Council, 2000-2030 Regional Forecast, March 2002, preliminary draft.
2. Source: Capture rate assumption derived from MetroScope base case study and the historical capture rate from 1980-98. The capture rate is defined as the proportion of housing (or employment) that locates inside the Metro UGB relative to the four-county area (Multnomah, Clackamas, Washington and Clark). Other case study options which were tested and investigated with the MetroScope real estate and land use model indicate a range of potential capture rates depending on different land use policy assumptions.

Case Study Option Test Scenario:	Periodic Capture Rates (percent)					Entire 2000-25
	2000-05	2005-10	2010-15	2015-20	2020-25	
Base Case	71.9	79.0	57.0	72.6	54.5	66.2
I-5 Transportation Study	71.9	79.0	57.0	72.6	54.5	66.0
Centers Enhancement	71.9	75.4	51.5	71.8	35.5	59.0
Damascus/New Community	71.9	77.7	54.9	71.1	35.6	60.0
No UGB Expansion	71.9	75.7	52.5	73.5	37.7	60.4

Source: MetroScope case studies

Metro Region Capture Rates

Metro Capture Rates - 5 years:	1980-85	1985-90	1990-95	1995-00
Households	65.5%	53.7%	76.6%	68.8%
Metro Capture Rates - 10 years:	1980-90		1990-00	
Households	58.2%		72.9%	
Metro Capture Rates - 20 years:	1980-00			
Households	67.8%			

Historical Capture 1980-98 = 70%

Source: Census reports, building permits, PSU population estimates as compile by Metro DRC.

3. Source: Metro DRC analysis as compiled from Portland General Electric vacancy data. We assume a vacancy rate of 4 percent based on the average historical trend. Vacancy rates vary widely from year-to-year based on available housing supply and the amount of current demand. Speculation by homebuilders in one period may tend to overbuild and create a surplus stock, which pushes up the vacancy rate. In periods of strong population growth, vacancy rates fall due to higher demand for housing. In slack periods vacancy rates may rise due to lower

population demand. The PGE data show vacancy rates swings of between 3.5 percent to 7.6 percent and the 2000 Census estimate of 6.2 percent. Finally, vacancy rates may never decrease close to zero because of "frictional vacancy." People change homes all the time, so in order to facilitate these moves, there necessarily has to be a percentage of the housing stock that remains unoccupied.

4. Dwelling Unit Demand is calculated from the household forecast with the 4 percent vacancy rate added to the projected change in household total to arrive at this figure.
5. Source: Metro RLIS, 2000. Vacant Land Analysis.
- 6a. Source: Metro RLIS, 2000. GIS tabulation of Title 3 regulation for water quality protection. This data layer includes five parts: 1) streams and rivers, 2) variable 75 to 200 foot riparian buffer (for water quality protection only), 3) 1996 flood area, 4) 100-year flood plain and 5) wetlands.
7. Gross Vacant Buildable Acres is calculated as the difference in gross vacant land less Title 3 setbacks for water quality protection.
8. Source: Metro RLIS, 2000. Land that is identified in the county assessors' records as tax exempt and owned by federal, state or municipal authorities is set aside from the buildable land and assumed to be reserved for future public facilities.
9. Source: Metro RLIS, 2000. Individual tax lots (i.e., platted lots) zoned for single family and under 3/8 acre are set aside from the supply of buildable land. We assume one dwelling unit for each lot. This is added back into the dwelling unit capacity estimate in line 23. – Lots are reported in acres and later translate to units.
10. Source: Metro RLIS, 2000. Estimated future land need for future churches is determined on a per capita basis of 1.4 acres per 1,000 future residents. This rate was determined in 1994 for the 1997 UGR.
11. Source: Metro RLIS, 2000. Actual GIS tabulation of known major easements for radio/TV towers, natural gas, petroleum and electricity lines intersecting with Metro's vacant land data. (Note: significant portions of the easements show development existing on it today.)
12. Source: Metro Data Resource Center analysis of street dedications in new subdivisions, unpublished GIS report, 1994. In this study, we determined that subdivisions or areas greater than one acre which have developed for residential purposes usually dedicate up to 18.5 percent of the initial buildable lot area for street. If the initial development site is under 3/8 acre, we found that the existing street network provided sufficient access to home sites. Development sites between 3/8 and one acre usually dedicated about 10 percent of the initial site area to streets.
13. Source: Interviews with local school district building facilities managers and site selection committees. The three methods assumed a different student per acre ratio for determining future school land need. The estimated land need ranged from 700 to 1,200 acres. (**Sample may not be scientifically representative.**) Council acknowledged a greater need for schools by choosing a deduction for future schools of 900 acres.

14. The 1997 UGR park ratio included neighborhood parks, wildlife refuges and preserves, Metro and municipal open spaces and regional parks.

The methods under consideration for calculating future parkland provide a range of values from 10,860, to 8,000, to 2,290 to 1,050 acres depending upon the ratio used. The MPAC Parks Subcommittee recommended a method based on the existing fiscal resources available to purchase new lands. This method yields an estimate of 1,050 acres (1,100 acres rounded).

15. Net Vacant Buildable Acres is a term of art in the Urban Growth Report. This estimate of land supply/inventory is the amount of vacant land that is available for accommodating future jobs and housing after deducting for the gross-to-net factors previously described.
16. Amount of Net Vacant Buildable Areas for accommodating future employment. – See the 2002-2022 Urban Growth Report: An Employment Land Need Analysis.
17. Amount of Net Vacant Buildable Areas for accommodating future housing.
18. Source: RLIS 2001 for zoning and 2000 Vacant Lands Analysis for buildable lands. The calculation of dwelling unit capacity is the product of residential land standardized regional zone designations that correspond to single and multi-family densities per local zones.
19. An estimate of the amount of vacant mixed use land designated in town centers and regional centers which will go toward brand new housing units. This figure does not account for mixed use redevelopment which will also add dwelling units to the region's capacity. The mixed use redevelopment amount is accounted for in line 21.
20. Based on what Metro's functional plan requires and regulates municipalities and counties to achieve at least 80 percent of their stated zoning densities.
21. Source: Metro Redevelopment Study, 1998. The latest actual readings of the amount of redevelopment is 25.4 percent (1994-96) and 26.5 percent (1996-98) of all new residential units are developed on parcels that Metro has identified as developed in its Vacant Land Inventory procedures.

MetroScope Case Study Options	Estimated Refill Rate
Base Case	26.6%
I-5 Transportation Study	26.6
Centers Enhancement	44.0
Damascus/New Community	32.3
No UGB Expansion	50.7

Metro Council in its prior decision assumed an "aspirational" residential refill rate of 28.5 percent.

22. Source: Metro RLIS, 2000. An actual count of the number of tax lots which are wholly inside the Title 3 Water Quality protection area.

23. Source: Metro RLIS, 2000. The actual number of tax lots under 3/8 of an acre regardless of single family zoning density is added back as the number of already platted lots.
- 24.- Land adjustments are the land capacity for those items not included in line 18.
- 24d. See Appendix B.
25. Dwelling Unit Capacity is the summation of all the adjusted dwelling unit factors from above.
26. Additional policy actions effectively increase the refill rate by 2.7 percent to a total of 29 percent.
27. Adjusted dwelling unit capacity takes into consideration the effects of the additional policy actions applied inside of the UGB.
28. The estimated need is the difference between supply (i.e., dwelling unit capacity) and demand. The amount is negative which indicates a shortage of capacity in the current UGB.

Appendix B

Land Adjustments

Criteria:

- changes between July 2000 and December 2001
- formal action has been taken
- error in a SRZ
- mapping error
- change in the categorization of land from public to private ownership and a minimum of 20 acres in size

Villebois

Tax Lots:

31W15 02800 42 acres
31W15 02900 130 acres

City has this zoned for public facilities. Although planning efforts have been undertaken, there is no adopted plan for rezoning the area at this time. There is a Master Plan that was adopted by resolution in 1997. It is not an element of the comprehensive plan nor has any rezoning taken place. At this time, there is a study of this area in progress which is refining the Master Plan and rezoning is anticipated early next year to start the PUD process.

Although it is not in the Comprehensive Plan, it is possible to assume 2,300 dwelling units for this area for two reasons.

First, there is a reference in the Wilsonville Comprehensive Plan that states that development of the area has to be in conformance with the Master Plan which calls for 2,300 dwelling units. Second, in selling the property, the State placed a condition that at least 2,300 housing units would be built there. Right now, there is no estimate of employment capacity but it is expected that the employment uses would serve the housing and not, due to transportation limitations, become a destination area. There is an intent to provide employment and some thought is being given to design a community that is very supportive of home base occupations.

The Metro SRZ is General Commercial; maybe more appropriate as SFR 7.

West Hayden Island

Tax Lots:

2N1E19 00100	37 acres
2N1E19 00200	1 acre
2N1E19 00300	54 acres
2N1E28 00200	87 acres
2N1E29 00200	23 acres
2N1E29 00300	410 acres
2N1E29 00400	15 acres
2N1E30 00100	11 acres
2N1E30 00200	78 acres
2N1E30 00300	28 acres
2N1E30 00400	4 acres
2N1E33B 00200	6 acres

2N1E33B 00300	27 acres
2N1E33B 00400	3 acres
2N1E33B 00500	12 acres
2N1E33B 01100	1 acre
2N1W24 00100	1 acre

Total approximate acres: 798

Zoning brought into the UGB for a marine terminal only. The City has maintained the County's agricultural/forestry zoning.

The Metro SRZ for this site is Agricultural or Forestry which assumes 10 units to the acre, need to amend the Metro SRZ to Heavy Industrial, Parks/Open Space or Public Facilities.

Marylhurst

Tax Lots:

21E14 00300	55 acres
21E14 00400	52 acres
21E14 00401	7 acres
21E14 00402	8 acres

Total approximate acres: 122

Zoning: Lake Oswego has zoned this property Office Commercial and Office Campus. The 1995 Master Plan allows for 680 dwelling units.

Current Metro SRZ is Office Commercial that does not assume housing, need to amend the Metro SRZ to MUC 1.

Rosemont School

Tax Lots – numerous starts with 1N1E15BD

The site is approximately 8 acres and will accommodate 165 dwelling units.

Current Metro SRZ is MFR 1; this is the correct SRZ.

Camp Withycombe

Tax Lots:

22E09A 00900	43 acres
22E09A 00901	5 acres
22E10 00601	123 acres
22E10 00602	27 acres
22E10 00691	37 acres

Total approximate acres: 235

The State of Oregon owns Camp Withycombe. The area including the firing ranges was purchased by ODOT for Sunrise Corridor. The land, suitable for development, which would remain after the highway is built, is likely to be less than 20 acres in size and have wetland and hazardous material issues. The remaining portion of the camp (other than the firing ranges) will continue to be used for military purposes.

Current Metro SRZ is Heavy Industrial, need to amend to Public Facilities.

Durham Quarry

Tax Lots:

2S113AC01200	8 acres	Tigard
2S113DB00100	20 Acres	Tualatin

There is a Mixed-use Overlay Zone on the Quarry. Through an IGA, Tualatin is dealing with the application. Housing is an allowed use at a range of 25-50 units per acre but not required. There will be approximately 3,000 jobs generated at full build out of the quarry. There has been some interest in developing housing but the bulk of the development is most likely to be commercial.

Current Metro SRZ is Mixed Use Industrial on the Tigard portion and General Commercial on the Tualatin portion. This needs to be amended to Office Commercial or, if we want to assume some housing will be developed, MUC 2.

Washington Square Regional Center

Tigard portion adopted in February 2002. As it is a Regional Center, it is included in the amendments even though it was adopted after December 2001. There are no changes to Washington County and Beaverton portions.

Added capacity of 1,500 housing units and 4,465 jobs, approximately 986 acres.

Amend the Metro SRZ.

Downtown Lake Oswego

Metro SRZ is Central Commercial, should be amended MUC 2.

Alpenrose Dairy

Tax Lots:

1S1E18 00100	51.4 acres
1S1E8CC 00100	.4 acres

It is used for industrial purposes but it is zoned and the comp plan designation is for low density housing. R-10 – 10,000 sq. ft. lots and R-7 – 7,000 sq. ft. lots.

Current Metro SRZ is either SFR4 or SFR5, needs to be amended to SFR3.

Rock Creek – Happy Valley

Tax Lots:

various 12E36D, 22E01(A,B&D), 23E06(B&D)

Housing Capacity is 2,997

Job Capacity is 904

Current Metro SRZ is Rural Residential and Agricultural, needs to be amended to MUC 1, MUC 2, SFR 2 and SFR 5.

Coffee Creek Prison

Tax Lots:

Map 3S-1-3AB Tax Lots 500, 600, 700, 701, 702

Map 3S-1-3A Tax Lots 1300, 1301, 1400, 1500, 1600, 1601

Map 3S-1-3AA Tax Lots 800, 900, 1000, to include the Bonneville Power Administration easement
119 Acres

At build out, the prison will house 1,252 inmates and employ 430 people.

Current Metro SRZ is Mixed Use Industrial, should be amended to SFR6.

Former Urban Reserve No. 55

300 Acres

The City has not rezoned this property. A consultant has been hired to prepare a plan for this area. The Court of Appeals decision was rendered in February 2002 and the City did not develop any plans during the appeal period.

Current Metro SRZ is Rural Residential, this is the correct SRZ at this time.

Appendix C

Document Reference Section

Many different documents were used for background information in creating the Residential UGR. For additional information please refer to the following list of documents:

- Economic Report to the Metro Council: 2000-2030 Regional Forecast – March 2002
- 2000 Vacant Land Supply Inventory
- UGR Primer – June 2002
- Centers Study – June 2002
- School Site Staff Report – July 2002
- Land Adjustments Memo – May 17, 2002
- Parks Subcommittee Report – June 2002
- MetroScope Findings Report – 2002

Metro Report

Appendix A
Item 4
Ordinance 02-969 B

2002-2022 **Urban Growth Report:** An Employment Land Need Analysis

August 2002
Updated December 2002



METRO
PEOPLE PLACES
OPEN SPACES



Metro

People places • open spaces

Metro serves 1.3 million people who live in Clackamas, Multnomah and Washington counties and the 24 cities in the Portland metropolitan area. The regional government provides transportation and land-use planning services and oversees regional garbage disposal and recycling and waste reduction programs.

Metro manages regional parks and greenspaces and owns the Oregon Zoo. It also oversees operation of the Oregon Convention Center, the Portland Center for the Performing Arts and the Portland Metropolitan Exposition (Expo) Center, all managed by the Metropolitan Exposition Recreation Commission.

For more information about Metro or to schedule a speaker for a community group, call (503) 797-1510 (public affairs) or (503) 797-1540 (council).

Your Metro representatives

Executive Officer – Mike Burton; Auditor – Alexis Dow, CPA; Metro Council – Presiding Officer Carl Hosticka, District 3; Deputy Presiding Officer Susan McLain, District 4; Rod Park, District 1; Bill Atherton, District 2; Rex Burkholder, District 5; Rod Monroe, District 6; David Bragdon, District 7.

Web site: www.metro-region.org

2002-2022

Urban Growth Report:

An Employment Land
Need Analysis

- Industrial land demand
- Industrial supply data
- Commercial land demand
- Commercial supply data

A 20-year land need analysis prepared
for the Metro Council

Updated December 2002

Mike Burton
Executive Officer

Planning Department
Andy Cotugno
Director

Prepared by Dennis Yee
Chief Economist
Data Resource Center

UGR Summary Findings

A pro-forma Industrial & Commercial Land Need Assessment 2002-2022

Key Assumptions

- ❖ Accuracy and reasonableness of peer reviewed regional economic forecast
- ❖ Status quo land use and transportation policy – neutral forecast assumption
- ❖ MetroScope “base case” implications and results
 1. nonresidential capture rate (75%)
 2. nonresidential refill rates (50% - commercial, 35% industrial)
 3. vintage industrial relocation rate (-45%)
 4. commercial encroachment of vacant industrial inventory (2,800 net acres)
 5. commercial demand refill of vintage industrial development (2,250 net acres)
 6. density – commercial and industrial FAR and sq. ft. per employee projections
- ❖ Industry employment-to-building type aggregation assumptions
- ❖ Past parcel-level development pattern to forecast future parcel needs
- ❖ RLIS & RILS 2000 industrial tier designations
- ❖ Zoning (as of January 2001) of vacant land inventory (as of July 2000)

Resulting in the following commercial and industrial land need conclusions:

Table A.

Commercial Land Need Assessment

Commercial Inventory			Commercial Demand			Commercial Surplus		
lot size	No. of Lots	Net Acres	lot size	No. of Lots	Net Acres	lot size	No. of Lots	Net Acres
under 1	3373	951.9	under 1	6031	3015.3	under 1	(2658)	(2063.4)
1 to 5	917	2076.3	1 to 5	258	775.2	1 to 5	659	1301.1
5 to 10	151	976.0	5 to 10	30	227.6	5 to 10	121	748.4
10 to 25	57	793.1	10 to 25	16	288.7	10 to 25	41	504.4
25 to 50	12	371.4	25 to 50	5	192.5	25 to 50	7	179.0
50 to 100	7	465.1	50 to 100	5	375.0	50 to 100	2	90.1
100 +	0	0.0	100 +	0	0.0	100 +	0	0.0
UGB total	4517	5633.9	UGB total	6346	4874.4	UGB total	(1829)	759.6

Table B.

Industrial Land Need Assessment

Industrial Inventory			Industrial Demand			Industrial Deficit		
lot size	No. of Lots	Net Acres	lot size	No. of Lots	Net Acres	lot size	No. of Lots	Net Acres
under 1	504	64.2	under 1	3007	1503.6	under 1	(2503)	(1439.4)
1 to 5	354	683.2	1 to 5	743	2230.4	1 to 5	(389)	(1547.3)
5 to 10	96	743.0	5 to 10	240	1802.5	5 to 10	(144)	(1059.5)
10 to 25	57	874.5	10 to 25	114	2000.2	10 to 25	(57)	(1125.7)
25 to 50	27	965.7	25 to 50	20	740.1	25 to 50	7	225.6
50 to 100	4	261.4	50 to 100	10	723.9	50 to 100	(6)	(462.4)
100 +	1	89.0	100 +	4	365.2	100 +	(3)	(276.2)
UGB total	1043	3681.0	UGB total	4138	9366.0	UGB total	(3095)	(5684.9)

The Metro Council adopted new measures to protect and maintain the supply of industrial land for future industrial users. An amendment to Metro regulation Title 4 was adopted in December 2002 to limit the size and square footage of retail and officer users who would otherwise find industrial locations suitable and desirable for their place of business. Both the development community and special interest conservation groups found common ground on this legislation which the Metro Council overwhelmingly adopted as part of its findings of this Urban Growth Report.

The impact of Title 4 is only tentative as specifically identified restrictions and their employment and economic impacts are presently unknowable. Moreover, the Council has yet to adopt a map that clearly designates what area(s) of the region should specifically be regulated under the Title 4 measures. Only a concept map exists, which is unsatisfactory to more precise economic analysis and impact estimates.

Table C.

Tentative Estimate of Title 4 Land Need Impact

20 Year Industrial Shortfall Assessment:

Preliminary UGR finding:	5,684.9 net acres	deficit
Plus: RSIA protection effect	<u>1,400.0 net acres</u>	
Net Shortfall:	4,284.9 net acres	deficit

20 Year Commercial Net Need Assessment:

Preliminary UGR finding:	759.6 net acres	surplus
Less: RSIA relocated demand	<u>900.0 net acres</u>	
Net Shortfall:	140.4 net acres	deficit

Table Notes:

Table C. assumes that the designation of "Regionally Significant Industrial Areas" (RSIA) under Title 4 could place off limits up to 1,400 net acres of vacant industrial land from further commercial encroachment, thus leaving these acres available to future industrial users. In addition, an additional 900 net acres demand is shifted to the commercial need side. An approximate assumption is that these "relocated" commercial users would consume commercial (or mixed use) land. Because commercial land is more expensive, there would be a density increase to offset the loss of cheaper industrial land in accordance with the displacement.

Urban Growth Report: 2000 – 2022 (UGR 2002)

An Assessment of Non-Residential Land Need

Purpose.

In order to determine if the Metro region has sufficient quantities of employment land to serve and sustain the economic vitality of the Portland-Vancouver metropolitan area, periodically – at least every five (5) years, Metro undergoes a public-examination of the adequacy of vacant buildable employment land inside its current boundary. This boundary is known as the Metro Urban Growth Boundary (UGB). This unseen line separates and distinguishes the urban environment of cities and counties with that of adjacent farm and forest land. Metro and State policy has been to maintain a stock of at least 20 years of vacant buildable land for purposes of accommodating future economic growth and expansion.

The purpose of the Urban Growth Report (UGR) is to provide the Metro Council with factual information necessary to support its amendment, if needed, of the Metro UGB. Using this information relative to state policy objectives, the Metro Council determines if a need exists. The Metro Council may determine whether to meet that need through actions to more efficiently use land already within the UGB, expand the UGB, or both. The Council is scheduled to make a decision by December 2002. The Council's decision will in part be based on the conclusions in this UGR and the Council's own findings.

This "UGB report" represents a *pro-forma* analysis between the supply (i.e., current inventory) and the demand (i.e., a forecast) for future employment land need. Employment land need includes land zoned by cities and counties for industrial, commercial and mixed use purposes. The demand for employment land is based on a regional economic forecast prepared by Metro and reviewed by an independent panel of regional economists. The inventory of employment land is based on the Metro Data Resource Center's (DRC) annual "Vacant and Buildable Lands Analysis"¹.

The Urban Growth Report² is a land accounting method for counting the current supply of buildable vacant industrial and commercial zoned land and compares this inventory with future employment land demand projections. The land demand projections are estimated from the regional economic/employment forecast and job density and floor-to-area-ratio projections. Redevelopment and infill (also known collectively by the term of art – *refill*) are also considered. A region-wide surplus exists if the inventory of employment land exceeds a 20 year projected land demand. A region-wide deficit exists if a shortfall exists between the supply and demand. The Metro Council will make its UGB decision based, in part, on this *pro-forma* region-wide conclusion of a surplus or deficit.

¹ The vacant land data is published annually and made available to the public through Metro's RLIS Lite CD-ROM.

² Metro Data Resource Center, "1997 Urban Growth Report Update", Sept. 1999 (prior version covering the need from 1997 to 2017).

The UGR is prepared in a pro-forma or “as-if” accounting format as opposed to a purely technical forecast and inventory measurement statement of land needs and UGB capacity. This pro-forma style has evolved through legal challenges, policy debates, and new technical forecasting methods to include policy aspirations, state statutes, administrative land use rules and state land use goals that influence how the supply and demand of vacant employment land is measured.

A new technical approach has been added to the UGR methodology for assessing non-residential land need. This approach is described in this report. This new approach provides a much more realistic and market aware analysis of the highly fluid and dynamic structure of the industrial and commercial land markets. Finally, the bottom line of this report is to determine whether a surplus or deficit in employment land exists in today’s UGB capacity estimate.

Background.

In the 1997-2017 Urban Growth Report³, it was determined that there was sufficient quantities of employment zoned land to satisfy an expected need for 20 years. No additional land was added to the UGB for industrial or commercial need at that time.

Five years later – 160,000 more residents and 80,000 more jobs, over 1,100 gross acres of industrial and commercial land has been absorbed by new growth in the span of 5 years. The Metro region is faced with a decision to make up for a possible shortfall of employment land. Metro policy is to replenish within the borders of the UGB an estimate of 20 years of industrial and commercial land at each periodic review.

1997 - 2002 Growth Stats.

- ❖ 160,000 more residents
- ❖ 125,000 babies
- ❖ 85,000 new migrants
- ❖ 80,000 more jobs
- ❖ 1,100 employment acres absorbed

Regional Industrial Land Study Findings.

Findings from the two phases of the Regional Industrial Land Study were folded into this UGR. Completed in December 1999, the Regional Industrial Land Study⁴ (RILS) brought attention to the need to consider “near-term” industrial land availability – not simply the 20 year land supply. The main thrust of the “phase 2” RILS study was to create a classification scheme to quantify industrial land (zoned industrial by local zoning) need. The RILS report created the following categories:

³ Metro, “1997 Urban Growth Report Update”, September 1999 and “Urban Growth Report – Final Draft”, December 18, 1997

⁴ Otak, Inc., “Regional Industrial Land Study for the Portland-Vancouver Metropolitan Area”, Dec. 1, 1999, (A “Phase 2” report prepared for a consortium of public and private interest groups to determine the adequacy of industrial land in an around the Portland metropolitan area.)

Regional Industrial Land Study Land Definitions

Tier A – “ready-to-go” industrial land

Tier B – “constrained” industrial land (e.g., environmental overlays, lacks adequate roads/ transportation access, ownership – land banking and leasing, marine or airport restrictions on use)

Tier C – industrial sites under 1 acre and/or likely to develop as commercial use

Tier D – redevelopable industrial sites, brownfields

With these new “tiered” industrial land parameters, the Metro Council can begin to address the market availability question. The conclusions from the RILS report indicate that there is a short-run as well as a long-run component of employment land need. This raises the issue of whether the Metro Council can reasonably consider applying 100% of the industrial supply towards meeting a 20 year expected land need obligation.

Completed in October 2001, the RILS task force raised the region’s awareness and a concern that the Metro region was quickly running out of “large lot industrial parcels”⁵. This task force concluded that the region had a need during the next 20 years for 15 large lot parcels (assuming a 75% capture rate, then 14 large lots are needed within the Metro UGB). This conclusion was based on a 25-year (2000-2025) “mid-point” analysis with a “confidence-range” from a low of 6 large lots up to 24. Also, the large lot conclusion was for a larger geographic area that included 6 metropolitan counties – Multnomah, Clackamas, Washington, Yamhill, Columbia and Clark⁶.

A Metro conclusion as compared with the RILS results, of course, will differ for two reasons:

1. A shorter forecast period for the Metro analysis– 2000 to 2022 – three years less
2. A smaller geographic unit – Metro UGB – which is smaller in area and includes primarily the urban portions of Multnomah, Clackamas and Washington counties.

Though the point-estimates are not the same, we conclude that there is NO statistically valid difference between the Metro conclusions (shown later) and the RILS findings and conclusions. In fact, the Metro UGR findings on jobs need borrows significantly from the research approach employed by the RILS consultant team.

In addition to the RILS large lot need conclusion, the task force concluded several interesting industrial characteristics that should be included within the context of the Metro UGB decision:

- ❖ It may be desirable to mix industrial and commercial uses on industrial land when it can be shown that the commercial portion of the development enhances opportunities to create industrial development when a strictly-industrial project will not “pencil-out”.
- ❖ Not all environmental restrictions impose hardships on industrial projects when the developer is capable of incorporating the natural features of a wetland or other biological function(s) into the development as an amenity.

⁵ Large industrial parcels are defined as tax lots greater than 50 gross acres.

⁶ Otak, Inc., “Technical Appendix, Phase 3: Regional Industrial Land Study for the Portland-Vancouver Area”, Oct. 31, 2001, Appendix G, pp. 53-67

New UGR Information & Assumptions.

As part of estimating the capacity of the Metro UGB and assessing the need for further expansion of capacity inside the Metro UGB, this report represents an update of the inventory and accounting of vacant land zoned for industrial, commercial and mixed use. In addition, a new estimate of future land demand is calculated based on the latest economic data and information available as of February 2002.

This report describes in detail updated information, new methods of calculating capacity, new concepts for evaluating the supply and demand for industrial and commercial land need.

On the supply-side, this report has included the following updated information:

1. July 2000 Vacant & Buildable Land Analysis
2. Official Title 3 Map extent
3. January 2001 zoning information⁷
4. Updating the zoning look-up with Metro's SRZ (standardized regional zone designations)
5. RILS 2000 vacant land data update⁸
6. MetroScope "Base-Case Scenario"⁹ (redevelopment and infill supply information)

On the demand-side, this report has included the following updated information:

1. population and households
2. Census 2000, SF1, Demographic Profiles¹⁰
3. DRI-WEFA, 4th Quarter 2001, U.S. Macroeconomic Outlook

New Information - Highlights

- ❖ Industrial Refill – vintage relocation & vacant land demand
- ❖ Commercial Refill – new dynamic of how industrial refill supply is converted to commercial uses
- ❖ Commercial Development on Vacant Industrial Land Supply
- ❖ Firm Size & Parcel Size Demand Forecast
- ❖ Commercial and Industrial Building Type Demand Forecast
- ❖ Regional Industrial Land Study (RILS)
- ❖ MetroScope "Base Case Scenario – one of five Case Studies"

⁷ In the City of Portland, we have assumed comprehensive plan designations in place of current zoning. And in cities or areas that we know zoning has changed materially, we have adjusted the zoning capacity to reflect these modifications.

⁸ Source: Otak, "Metro Vacant Industrial Land Map Update-Project No. 11282", April 29, 2002, maps and memorandum, completed by Otak under contract with Metro.

⁹ MetroScope represents Metro DRC's state-of-the-art land use allocation model. The model is capable of taking the regional forecast of jobs and households and distributing the forecasted regional totals into smaller geographic units (e.g., census tracts, employment zones and TAZ's). The methodology employed for the growth allocation is based on economic theories that describe "real-world" reactions to market forces – supply, demand and prices. The base case scenario represents a simulation of potential real world events and the resulting market-based reactions to these events. The main assumption is that land use and transportation policies today will be in force in future years. As a result, market reactions can be tested and measured such as future refill and capture rates. MetroScope case studies test alternative growth strategies.

¹⁰ U.S. Census Bureau, "Profile of General Demographic Characteristics: 2000", Table DP-1, Portland-Vancouver MSA counties (Multnomah, Clackamas, Washington, Yamhill, and Clark)

4. MetroScope “Base-Case Scenario” (density results, redevelopment and infill demand information, refill rates)
5. Aggregate Employment Capture Rate Study (unpublished report)

Considerable angst and debate has ensued since the completion of the 1997-2017 Urban Growth Report concluded that at that time there was a sufficient and adequate supply of both industrial and commercial land on hand to meet a future 20 year need. The current report incorporates a new approach of accounting for industrial availability and supply (Otak – RILS 2000 Update and RILS – phase 2 & 3 reports) as well as new categories and methods of calculating industrial and commercial land demand. This approach with new methods and categories will provide policy makers with more insight into “how industrial and commercial markets work” as the Metro Council debates the merits of expanding the UGB.

The new regional forecast and non-residential land need report include the following calculation refinements:

- ❖ Firm Size and Parcel Size Demand Forecast
- ❖ Three (3) Commercial building type uses (office, retail and medical/government)
- ❖ Three (3) Industrial building type uses (warehouse/distribution, general industrial and tech/flex)
- ❖ Incorporates new Redevelopment and Infill (Refill) dynamics for Commercial and Industrial uses
- ❖ Explicitly identifies Commercial encroachment on Industrial supply

Report Organization.

This report is organized into three main topics. The first section explains how the regional forecast is utilized to estimate future industrial and commercial land demand. The remaining two sections describe the industrial land need and commercial land need for the Metro UGB.

- ❖ Employment Forecast
- ❖ Industrial Land Need: Demand Forecast vs. Supply
- ❖ Commercial Land Need: Demand Forecast vs. Supply
- ❖ Amendment to Title 4: Protection of Regionally Significant Industrial Areas for the preservation of industrial land – New Metro ordinance

Employment Forecast

Introduction.

The calculation of regional employment land need all starts with a sector-by-sector projection of how many new jobs are forecasted to appear during the next 20 year period¹¹. The regional employment forecast provides the underpinnings for the determination of future industrial and commercial land need. Regional employment projections are prepared by SIC (Standard Industrial Classifications – a classification method used by federal data collection sources). Each category of employment is matched-up with an industrial or commercial land need category. This report assumes three (3) industrial use categories and three (3) commercial use categories (or building types).

Industrial Building Types:

- ❖ Warehouse/Distribution
- ❖ General Industrial
- ❖ Tech/Flex

Commercial Building Types:

- ❖ Office
- ❖ Retail
- ❖ Medical/Government

Generally, what determines future industrial land need is employment growth in the manufacturing employment sector, wholesale trade industries, some service industries (software, repair, and automotive servicing firms), and transportation service industries. The remaining SIC's are assumed to flow into commercial building/land needs.

Forecast Land Need Assumptions:

- ❖ Commercial Refill Rate: 50%
- ❖ Industrial Refill Rate: 35%
- ❖ Industrial Relocation Rate: -45%

Not all the employment forecasted by the regional forecast study are projected to absorb vacant land, a significant proportion of commercial and industrial land needs are met by redevelopment and infill (refill). The

methodology takes into account about 50 percent of new commercial development needs will be satisfied by more intense use of existing commercial structures and land supply. Almost 35 percent of net new industrial needs will be accommodated through industrial refill.

What drives industrial land need is complicated by employment categories (Standard Industrial Classifications – SIC) that do not stack into building types as neatly as we assume for the data we have. By our definitions, in many places across the region, commercial development and jobs exist in industrial zones and visa-versa. Industrial zones throughout the region specifically allow some commercial development in industrial zones. Typically, this commercial “encroachment” is desirable as retail and service establishments (e.g., restaurants, banks, etc.) may provide necessary ancillary services to the firms and labor force employed in these areas. However, in excess, it is detrimental because it represents a significant loss of land for industrial purposes and surrounding land prices are bid up by incremental commercial development. In turn this may price out existing and future industrial development(s).

¹¹ Metro Data Resource Center, “Economic Report to the Metro Council”, DRAFT, March 2002

Due to the cross-development of industrial and commercial uses, the methodology in this report attempts to calibrate future land need and land supply between commercial and industrial encroachment. We find that the direction of cross-development is of two types:

1. commercial development in industrial refill spaces
2. new commercial development in vacant industrial spaces

Assuming research findings from the MetroScope “base case” scenario, we are able to estimate the cross-development needs of commercial demand and industrial supply in a pro-forma fashion. The supply and demand findings are simulations or a set of “what-if” results as if the MetroScope research findings carry out the status quo of emerging and current market trends and land use plus transport policies. What this implies is that the inventory from RLIS is augmented by estimates of redevelopment and infill, cross-consumption of industrial land by commercial users, etc. (More detailed discussion is developed in later sections.)

Data and Assumptions.

The main objective of this report is to provide a balanced estimation of commercial and industrial land need and an accurate assessment of long-term regional land supply for future employment growth. We have met this objective by preparing land demand projections that estimate the future need for commercial and industrial land arrayed by a range of parcel sizes and by building type (commercial and industrial uses). In addition, we provide the usual net vacant industrial and commercial land need calculations (i.e., net acre deficits (or surplus) of commercial and industrial land need).

The remainder of this section of the report steps the reader through the data analysis of transforming the regional employment forecast into a forecast of land need.

1. Regional Forecast

(source: “Economic Report to the Metro Council”, March 2002).

The regional forecast starts out as an estimate of job growth by standard industrial classifications (SIC). Each SIC is then grouped into 1 of 6 building types (i.e., Warehouse Distribution (W/D), General Industrial (GI), Tech/Flex (TF), office, retail, or medical/government (Med./Gov.)). The regional forecast is now arranged by the amount of employment for each building type which leads to an estimate of future land demand by commercial or industrial land need by these types of building uses (see table 1).

Table 1.

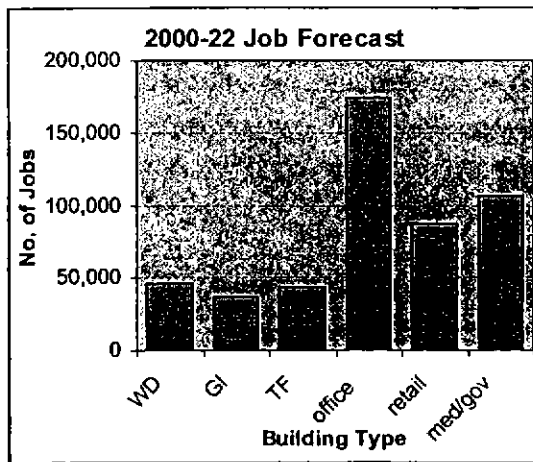
5-COUNTY FORECAST (Multnomah, Clackamas, Washington, Yamhill & Clark)

EMPLOYMENT BY REAL ESTATE TYPE: 2000-22 Regional Forecast

	2000	2005	2010	2015	2020	2022	2000-22
Warehouse/Dist.	103,861	111,891	124,470	134,094	144,087	149,557	45,697
Gen.Industrial	152,433	159,358	172,662	178,464	185,334	189,329	36,896
Tech/Flex	77,124	89,041	101,039	108,073	115,964	120,445	43,320
Office	251,182	279,978	319,275	358,900	401,616	425,205	174,023
Retail	168,110	184,760	207,030	225,610	245,260	255,775	87,665
Med. & Gov.	205,310	218,462	244,204	267,979	295,439	310,859	105,549
Total	958,020	1,043,490	1,168,680	1,273,120	1,387,700	1,451,170	493,150

Nearly half-million additional jobs are expected to arrive in the greater Portland-Vancouver metropolitan area during the next 20+ years. A small fraction (between 4 to 5 percent) is expected to locate in Yamhill county. The Yamhill forecast is deducted. The remainder (about 475,000) is expected to locate closer to the core of the Portland metropolitan area.

Chart 1:



Of the total employment growth to the Portland area, 1 in 4 jobs in the future is expected to be in manufacturing of durable or nondurable goods, warehousing operations including distribution, consolidation or bulk breakdown of products, or in the transportation of goods and services. The blue bars in the chart (left – first 3 bars) show a generalized forecast of future jobs that typically locate on industrial land. The red bars (last 3 bars) indicate commercial job growth projected in the region. These jobs represent the change in

the total number of jobs between 2000 and in 2022. It includes the job growth that could be generated from new firms that enter the region and job growth from existing firms.

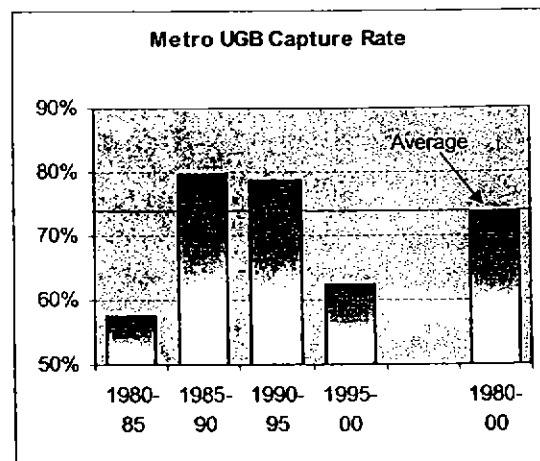
The consolidation of industry employment types into these six (6) basic building or land consuming types is the basis for delineating future industrial and commercial land need. (Note: cross-development between commercial demand and industrial supply are made later in the analysis steps.)

2. Metro UGB Employment (Job) Capture Rate.

The capture rate is measured as the proportion of job growth in a given period which locates inside the Metro UGB as compared to the four county metropolitan area. This metropolitan area includes Multnomah, Clackamas, Washington and Clark county.

The capture rate may vary over time as economic conditions change. During periods of slack demand and surplus land inventory, the Metro capture rate decreased to below 60 percent. In periods of strong economic expansion, the Metro UGB capture rate experienced a rebound approaching 80 percent. Over the duration of a 20 year historical period (after smoothing out of peaks and valleys in the region's business cycle), the Metro UGB

Chart 2.



capture rate experienced a mean average of 75 percent (see chart 2).

With a Metro UGB capture rate assumption of 75%, the amount of future job growth the Metro area must then accommodate is just over 350,000 jobs. (Assuming 25% of these jobs are users of industrial land, we estimate about 90,000 additional industrial jobs.)

3. Density Assumptions.

Table 2.

REGIONAL AVERAGE DENSITIES BY BUILDING TYPE

	WD	GI	TF	office	retail	med/gov
Sq. ft. / job	1,400	400	450	300	350	400
Floor Area Ratio	0.23	0.35	0.30	0.60	0.44	0.34

Source: Metro DRC "Density Study", RILS "Phase 2 Study", MetroScope base case scenario

The UGR applies the densities by building type (see table 2) to convert the regional employment forecast from jobs to land demand by parcel size and net acre demand.

Future employment (square foot per employee) and land (floor to area ratio – FAR) area densities for this urban growth report are based on multiple data sources and blended together from insights developed during the MetroScope base case model scenarios. The Metro employment density study provided the historical perspective for both industrial and commercial land demand. The RILS report provided insight and an outlook for how industrial densities could change in the future. And finally, the MetroScope base case run provided a more complete picture of industrial and commercial densities including a simulation of how dynamic densities could change as supply, demand and land prices vary over time.

4. Refill: Market Realities & Dynamics of Redevelopment and Infill

The urban growth report includes an estimate of the stock of redevelopment and infill land and a forecast of the demand for redevelopment and infill land in the Metro UGB. On the supply-side, we rely heavily on the MetroScope "base case" scenario to identify and estimate possible redevelopment opportunities. On the demand side, we rely on historical readings of refill and the results derived from the MetroScope "base case" scenario to adjust the future demand.

What is MetroScope?

MetroScope is two linked but separate models: the Residential Real Estate Location Model (RELM) and the Non-Residential Real Estate Location Model (N-RELM)¹². MetroScope represents a state-of-the-art urban

Table 3.

Employment Refill Rates: Estimates & Assumptions

Industrial

- ❖ History: 21.0%
- ❖ 1997 UGR: 21.0%
- ❖ 2002 UGR: 35.0%
- ❖ 2002 UGR: - 45.0%

(for vintage relocations – refill rate is negative)

Commercial

- ❖ History: 52.0%
- ❖ 1997 UGR: 52.0%
- ❖ 2002 UGR: 50.0%

¹² Metro DRC and EcoNorthwest, "MetroScope Technical Documentation", April 2001
 Metro DRC, Sonny Conder, "MetroScope Lessons Learned", May 2002

land use forecasting and policy simulation model for distributing forecasted employment and population growth. MetroScope is a statistical model that mimics the behavior of household and employment/business firm location choices. The underlying economic theory behind MetroScope is based on household utility functions and producer production functions. As a result of its theoretical completeness, we are able to discern the impact of numerous policy functions related to UGR factors.

In brief, the model utilizes a household utility location choice model to determine where households will choose available housing given ranges of household types based on their income, age, and household size. In generalized terms, a household's HIA¹³ type determines its tastes and preferences for the type (single vs. multi-family) and ownership of housing. On the supply-side, Metro's RLIS data set provides the necessary initial housing stock conditions. A sophisticated production function describes the future housing supply. A dynamic balance between housing demand and housing supply is obtained by the model through an iterative price-seeking algorithm that matches a location price that strikes a balance between household demand for housing and the housing supply that producers are willing to produce at a given price.

The decision of a household to locate in one place over another is also determined by the available employment opportunities. The proportionally greater access to more jobs, the higher the likelihood a household may choose a location. The choice in location of many households in one concentrated area will then tend to drive the location of future employers wishing to access a potential customer/retail base and a potential labor force. This is the theoretical linkage that ties the two halves of MetroScope's together.

Other factors determine employment location. They are essentially three main drivers:

1. accessibility to industry of similar types (industry clusters)
2. accessibility to other industries and employment (proxy for suppliers and other industry customers)
3. accessibility to households (retail and service end users)

Industrial Refill.

Demand Side Refill Estimates: Prior versions of the UGR had assumed an industrial refill rate of 21%. This rate was based on a 2-year historical reading between 1996 and 1998. This was the latest year to which we had good and consistent employment data. Earlier employment data were not useful due to a change in methodology for how employment estimates were geocoded.

The MetroScope base case scenario provides a simulated dynamic projection of future industrial refill rates. The analysis of industrial refill uncovered a heretofore unmeasured redevelopment and infill dynamic that we could not have quantified using existing methods. The simulation results allowed analysis and subsequent tabulation of the vintage relocation of existing firms. What this means is that as firms mature, some

¹³ HIA stands for household, income and age of head of household. Each household is headed up by a person who has these characteristics. Like households are grouped together into one of 64 categories – 4 household size types, 4 income ranges, and 4 age characteristics.

expand and must then vacate their existing location and find new and larger site to develop. Now some of these vintage relocated firms find raw vacant land as its new site, while some fraction find re-fill land to redevelop. Therefore, the negative refill rate we assign to industrial refill (-45%) represents existing firms relocating and finding another site(s) to occupy.

Ordinary refill, that is the redevelopment or infill, of existing firms or new firms finding abandoned industrial sites is measured at nearly 35%. The net result from analysis of the MetroScope base case study results is that the additional demand of siting existing or vintage firms as well as a relatively large proportion of new firms entering the region also needing employment land during the next 20 years.

Supply-Side Refill Estimates:

In the MetroScope analysis, we find that there is sufficient industrial redevelopment opportunities during the next 20 years. The supply of industrial refill includes firms capable of redeveloping abandoned industrial locations or in-filling existing establishments either through higher densities, adding another shift or adding on a new building to an existing structure.

We determine that the region's markets can adequately supply industrial refill needs. Adding together the ordinary refill opportunities with the industrial relocation, the number of acres of industrial land that are "abandoned" during the next 20 years is quite significant (if all the refill consumed new industrial land, it could absorb up to another 5,000 net acres over a 20 year period). The supply of refill industrial land includes the 35% ordinary refill plus the industrial relocation component. As we discuss in the next topic "commercial refill", a significant inventory for accommodating commercial refill demand is the availability of abandoned industrial sites. The loss of industrial land to commercial refill demand is a refill dynamic quantified from the MetroScope analysis.

Commercial Refill.

Demand Side Refill Estimates: The aggregate refill rate for commercial development is about 50% in the MetroScope base case scenario. This rate is little different from the 52% reading based on historical experience. This extraordinarily high commercial refill rate is accomplished by the ability of commercial enterprises to re-invent abandoned inner-area industrial locations into thriving commercial centers. The zoning for these areas allows a mix of industrial and commercial enterprises.

Supply-Side Refill Estimates:

In the MetroScope analysis, we find that there is sufficient redevelopment opportunities during the next 20 years to supply adequate opportunities for firms capable of redeveloping abandoned industrial and commercial locations or in-filling existing establishments either through higher densities, adding another shift or expanding or replacing an existing structure(s).

The MetroScope analysis allowed us to measure this dynamic between industrial refill supply and commercial refill demand. We have determined that the region is capable of

sustaining a very high commercial refill rate when the market for commercial development is free to redevelop abandoned and/or obsolete industrial locations. Because of the central location of many of the old-time industrial centers (e.g. Portland city central eastside, Pearl district, Northwest Portland, Highway 217 corridor, Brooklyn Yards, and Hwy 224 corridor), commercial redevelopment is very viable and may be desirable aspect to promote. Commercial developments tend to places that are centrally located in a region and have significant access to households, transportation, retail and other commercial opportunities. The redevelopment of centrally located industrial centers may be an overall desirable outcome given the notion of promoting employment opportunities, shopping and other amenities near concentrations of housing opportunities.

On the other hand, there may be areas of the region with industrial losses which should not redevelop as commercial uses and appropriate regulatory protections may be needed. The simulation results from MetroScope only suggest how the market may react. The future can change. Policies determined today by the Metro Council in conjunction with local partners and industry leaders can affect the future.

Employment Land Need Methodology.

A new approach that explicitly estimates industrial and commercial land need, by firm size / parcel size is used to forecast future land demand. Industrial employment projections are regrouped into three separate industrial uses – building types. These industrial building types include 1) warehousing and distribution facilities, 2) general industrial, and 3) tech/flex space – buildings that are flexible enough to house limited warehousing, some assembly and light manufacturing, office or technology/ research & development activity.

Commercial (or non-industrial) uses are divided into these three types: 1) office, 2) retail, and 3) medical/government buildings.

1. Regional Forecast

Employment land need is grouped by a total of six (6) building types – commercial and industrial demand. The 2000-2025 Portland-Vancouver Area Forecast is the basis for future employment land need. This regional forecast is for a five-county region (the fifth county is Yamhill). Based on past 30-year trends, the Yamhill portion is about 4 to 5 percent of the total jobs and population of the greater five-county estimate. For purposes of the UGR, Yamhill county is deducted from the regional forecast.

The regional forecast is estimated on an industry-by-industry basis (roughly two-digit SIC for manufacturing; and 1 digit SIC for nonmanufacturing sectors). Each industry sector has been uniquely assigned to a “typical” building type. Table 4 outlines which industries are grouped into each commercial or industrial building type.

**Table 4
Conversion to Employment by Building Type**

	Industrial	Standard Industrial Classifications
WD	Warehousing & Distribution	40 – 45, 47, 50 – 51 Transportation & Wholesale Trade sectors
GI	General Industrial	1 – 17, 20 – 34, 37, 39, 75, 76 Construction, Manufacturing & Repair Services
T/F	Tech/Flex	35, 36, 38, 737 Machinery, Electrical, Instruments & Computer Programming & Data Processing Services
	Commercial	
Off.	Office	46, 48 – 49, 60 – 67, 70 – 74, 77 – 89, except 737 Communications & Utilities, Finance, Insurance & Real Estate, Services
Ret.	Retail	52 – 69 Retail
Med/ Gov.	Medical & Government Institutions	80, 83, 90 – 99 Health & Social Services, Government

Source: RILS, phase 2 and Metro DRC

**Table 5.
Regional Employment Forecast – 5 counties
Employment Grouped into Building Types**

EMPLOYMENT BY REAL ESTATE TYPE: 2000-25 Regional Forecast							
	2000	2005	2010	2015	2020	2025	2000-25
Warehouse/Dist.	103,861	111,891	124,470	134,094	144,087	155,067	51,206
Gen.Industrial	152,433	159,358	172,662	178,464	185,334	192,864	40,431
Tech/Flex	77,124	89,041	101,039	108,073	115,964	125,024	47,899
office	251,182	279,978	319,275	358,900	401,616	449,505	198,323
retail	168,110	184,760	207,030	225,610	245,260	266,320	98,210
med/gov	205,310	218,462	244,204	267,979	295,439	326,720	121,410
total	958,020	1,043,490	1,168,680	1,273,120	1,387,700	1,515,500	557,480

The forecast shown is for 25 years and five counties. Table 5 illustrates the regional forecast for the five-county metropolitan area by aggregate building types. This region includes the following Oregon counties: Multnomah, Clackamas, Washington and Yamhill plus Clark county, WA. For purposes of the UGR, the forecast is adjusted to 22 ½ years, July 2000 to December 2022, as required by Metro and State mandates for a 20 year supply.¹⁴

¹⁴ The Metro UGB decision is to be made in December 2002. Twenty (20) years into the future is December 2022. However, the most recently available vacant land was flown in July 2000. Therefore, to coincide and coordinate with the 20 year land need mandates, we adjust the UGR analysis years from 2000

2. Capture Rate

Based on a 20-year average rate, we calculate a Metro share of a **75% capture rate** from the four-county regional forecast.

Metro UGB Job Forecast Highlights – 75% capture rate

- ❖ 90,000 more Industrial Jobs (25% of total)
- ❖ 265,000 more Commercial Jobs (75% of total)
- ❖ Total Employment Growth between 2000 – 22 is **355,000 jobs**
- ❖ Total change in 2022 is 50% more jobs than in 2000.
- ❖ Annual percentage rate growth in total is 1.9%

Chart 3.

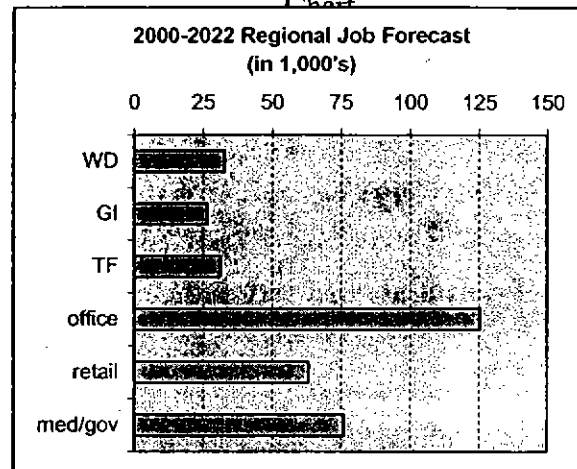


Table 6.

	Metro UGB Capture Rate
1980-85	58%
1985-90	80%
1990-95	79%
1995-00	62%
1980-00	75% average

The Metro area capture rate has varied from time to time depending on business cycles in the region and possibly other economic and demographic trends not yet fully understood. The capture rate may be impacted by available land supply as well as vagaries of economic development forces. A table nearby shows the fluctuations in the capture rate in five-year segments during the last 20 years.

3. Firm and Parcel Size Demand Assumptions

After the regional employment forecast has been re-grouped to building type from SIC industry categories, we then look to dividing this job forecast into a firm-size forecast. Unfortunately, there are no models or theoretical or economic framework that can be used to ascertain or justify the firm sizes for future industries. The best that we have is to look to the past.

There are a couple of past trends that we can assume:

1. The pattern of firm size distribution for all firms currently operating in the region
2. Or the pattern of firm size distribution of firms that have recently come into existence in; say, the last 10 years.

to 2021/2 years to reflect the base year differences. The UGB decision must be determined for 2002 to 2022.

The Regional Industrial Land Study (phase 3), using Employment Security data, determined that firm-sizes for firms that came into existence in the last 10 years demonstrated a distribution pattern weighted on the larger-end of the firm-size scale.¹⁵

Table 7.

DISTRIBUTION OF EMPLOYMENT BY FIRM SIZE & BUILDING TYPE							
jobs by employment size per SIC	WD	GI	T/F	Office	Retail	Med/ Gov	total
less than 10	22,757	25,281	5,020	49,376	20,824	14,367	137,625
10 to 49	27,854	33,179	8,182	51,930	50,293	18,004	189,442
50 to 99	17,262	20,064	5,154	36,284	24,147	11,948	114,859
100 to 149	8,892	10,125	3,825	18,458	11,773	7,452	60,525
150 to 199	4,220	7,593	1,007	12,362	6,755	5,500	37,437
200 to 499	10,667	22,996	12,395	28,640	16,566	17,059	108,323
500 to 999	7,356	8,552	8,085	16,866	3,787	10,786	55,432
1,000 to 1,999	7,554	7,092	11,000	9,517	2,714	9,984	47,861
2,000 to 2,999	2,551	2,530	8,144	2,412	0	7,386	23,023
3,000 or more	0	0	3,209	12,867	0	6,271	22,347
	109,113	137,412	66,021	238,712	136,859	108,757	796,874

Currently 800,000 jobs in the tri-county area - stratified by building type and firm size.

... and about 50,000 firms of various sizes doing business in the tri-counties.

DISTRIBUTION OF FIRMS BY SIZE & BY BUILDING TYPE							
firms by employment size per SIC	WD	GI	T/F	Office	Retail	Med/ Gov	total
less than 10	6,058	7,165	1,410	13,905	4,944	3,682	37,164
10 to 49	1,338	1,554	367	2,426	2,373	855	8,913
50 to 99	243	288	72	522	351	171	1,647
100 to 149	73	83	31	153	98	62	500
150 to 199	25	44	6	72	40	31	218
200 to 499	36	76	45	102	60	54	373
500 to 999	11	13	12	26	6	17	85
1,000 to 1,999	5	5	9	7	2	6	34
2,000 to 2,999	1	1	3	1	0	3	9
3,000 or more	0	0	1	2	0	2	5
	7,790	9,229	1,956	17,216	7,874	4,883	48,948

This UGR opted to develop its own tabulation using the same Employment Security data. A table nearby shows the distribution of current firms (year 2000). The firms were aggregated together by SIC into building types in a manner identical to the aggregation described for the regional employment forecast. Firm sizes were tabulated according to the number of employees employed by each firm. Firms that operated in more than one location were geographically relocated to subsidiary branches or locations. For example, Intel which operates at mainly 6 locations, the company's 15,000 total employees were allocated to its separate sites.¹⁶

4. Parcel Size Forecast Calculations

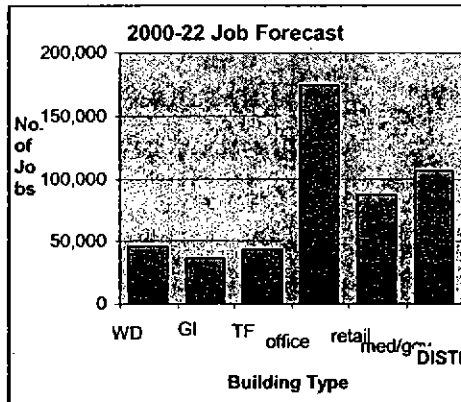
Combining the regional Metro 2000-2022 UGB employment forecast and the existing pattern of small to large size firms, we obtain a Metro UGB forecast of employment

¹⁵ Otak Inc. & EcoNorthwest, RILS, "Technical Appendix, Phase 3: Regional Industrial Land Study for the Portland-Vancouver Metropolitan Area", Appendix G, pp. 53-67, October 31, 2001

¹⁶ In many instances of large corporations, DRC staff directly inquired to the firm's human resources or public relations department for employee site counts. In other instances, private databases were consulted to identify branch locations. These databases provided a general range of employment which could be used to allocate the total employment of the firm. In a few cases, our own knowledge or public telephone directories provided added quality control over the final employment geocode.

distributed by building type and firm size. The table, nearby, shows the employment percentages derived from the year 2000 employment security data.

Chart 4.



DISTRIBUTION OF PAST EMPLOYMENT BY FIRM SIZE

	WD	GI	TF	office	retail	med/gov
Firm size by jobs						
less than 10	21%	18%	8%	21%	15%	13%
10 to 49	26%	24%	12%	22%	37%	17%
50 to 99	16%	15%	8%	15%	18%	11%
100 to 149	8%	7%	6%	8%	9%	7%
150 to 199	4%	6%	2%	5%	5%	5%
200 to 499	10%	17%	19%	12%	12%	16%
500 to 999	7%	6%	12%	7%	3%	10%
1,000 to 1,999	7%	5%	17%	4%	2%	9%
2,000 to 2,999	2%	2%	12%	1%	0%	7%
3,000 or more	0%	0%	5%	5%	0%	6%
	100%	100%	100%	100%	100%	100%

Table 8 shows the results of combining the Metro UGB employment forecast and firm-size distributions of the employment security data. This table lists the number of employees, but not the number of firms.

**Table 8.
Metro UGB Employment Forecast: 2000-2022**

FORECAST OF THE NUMBER OF EMPLOYEES BY FIRM SIZE

Firm size by jobs	WD	GI	TF	office	retail	med/gov
less than 10	6,860	4,890	2,370	25,920	9,600	10,040
10 to 49	8,400	6,410	3,870	27,260	23,190	12,580
50 to 99	5,210	3,880	2,430	19,040	11,140	8,350
100 to 149	2,680	1,960	1,810	9,690	5,430	5,210
150 to 199	1,270	1,470	480	6,490	3,120	3,840
200 to 499	3,220	4,450	5,860	15,030	7,640	11,920
500 to 999	2,220	1,650	3,820	8,850	1,750	7,540
1,000 to 1,999	2,280	1,370	5,200	5,000	1,250	6,980
2,000 to 2,999	770	490	3,850	1,270	0	5,160
3,000 or more	0	0	1,520	6,750	0	4,380
	32,910	26,570	31,210	125,300	63,120	76,000

Assuming an average firm size for each employment-size range, (e.g. 5 for "less than 10" category), we can estimate the number of firms which employ the given number of employees. The table, below, gives an estimate of the number of firms by firm-size and building type.

Table 9.
Metro UGB Firms Forecast: 2000-2022

FORECAST OF THE NUMBER OF FIRMS BY EMPLOYMENT FIRM SIZE						
Firm size by jobs	WD	GI	TF	office	retail	med/gov
less than 10	1,372	978	474	5,184	1,920	2,008
10 to 49	280	214	129	909	773	419
50 to 99	69	52	32	254	149	111
100 to 149	21	16	14	78	43	42
150 to 199	7	8	3	37	18	22
200 to 499	9	13	17	43	22	34
500 to 999	3	2	5	12	2	10
1,000 to 1,999	2	1	3	3	1	5
2,000 to 2,999	0	0	2	1	0	2
3,000 or more	0	0	0	2	0	1
	1,763	1,284	679	6,523	2,928	2,654

(BASED ON PRESENT EMPLOYMENT PATTERN)

Assuming an average regional density for each building type (see table 10), we arrive at a regional total for number of parcels demanded as given by the regional economic forecast. As noted earlier, the densities are estimates derived from the MetroScope "base case" forecast simulation scenario.

Table 10.
REGIONAL AVERAGE DENSITIES BY BUILDING TYPE

	WD	GI	TF	office	retail	med/gov
Sq. ft. / job	1,400	400	450	300	350	400
Floor Area Ratio	0.23	0.35	0.30	0.60	0.44	0.34

The densities in table 10 represent a composite of densities readings from various sources: 1) Metro DRC's 1999 Employment Density Study, 2) RILS Phase II density assumptions, 3) MetroScope density projections, and 4) anecdotal comments from real estate professionals. Actual densities recorded from sample areas and buildings today may be higher or lower than these composite rates. Instead, these rates represent professional judgement and applied projections of possible future building and land density assumptions.

The square foot per job is a gross square foot per employee (SFE) measure which may differ from other quoted sources. This difference is due to variations in what is included in the building space measured for each job. For example, the measures of square foot per employee includes areas in building(s) that are not generally leasable spacesm such as:

hallways, machine rooms, common areas (lobbies, atriums, public meeting areas/rooms), and storage areas. This method may tend to raise the SFE requirements and proves to be a more complete measure of the total size of building requirements and not just the portion of buildings that “house” workers. Despite using a gross SFE measure, the MetroScope simulation/projections indicate modestly higher densities in the future than today’s rates.¹⁷

The FAR or floor-to-area ratio is equivalent to common interpretations of this density concept. For example, if the developed portion of a tax lot for a single-story building is half, then the FAR for this site is 0.5; for a two-story structure the FAR would be twice the rate at 1.0. The FAR rate doesn’t include public streets or right of ways and so in this regard it is a *net* FAR. This net FAR does include landscaping, setbacks, on-site developed parking areas, and internal streets. Internal streets are private thoroughfares necessary to the operations of the site. Therefore this FAR number accounts for only the land absorbed by the on site development.

5. Refill & Parcel Size Calculations

A number of refill lots are also assumed at this point. Refill presumes that a fraction of “new growth” will be accommodated on existing developed land (i.e., infill – second shifts, a new add-on building to existing developed structures, greater density, improved floor-to-area ratios) or on re-developed land with structure(s) that can accommodate more employees than the previously demolished building.

Table 11.

We assume different aggregate redevelopment rates for employment based on whether the employment is categorized as industrial or commercial building type.

For commercial, we assume roughly half of the employment forecast will not need vacant commercial land – with the remaining half accommodated by refill opportunities.

- Commercial = +50%
- Industrial = +35%
- Industrial = -45% (vintage relocation)
- Refill factors are applied to employment forecast

Industrial refill is complicated by the *vintage industrial relocation* phenomenon. Based on MetroScope simulation results and confirmed by “real-world” anecdotes and experience, a fraction of existing firms make the choice of “abandoning” their existing locations in search of larger and/or more efficient new locations (or redevelopment elsewhere). As firms mature through their own life-cycle, they outgrow their existing confines. This we note as vintage industrial relocation¹⁸.

¹⁷ Moderate increases in real estate prices in the future will tend to encourage more intense use of developed spaces. The MetroScope base case scenario predicts a market price increase of 26 percent or about 1 percent increase per year.

¹⁸ Note that the vintage industrial relocation rate we calculate is not meant to read as 45% of existing firms need relocating. The rate is denominated by the number of projected employment. Thus the – 45% rate is the number of employees in existing firms effected by industrial firm relocations divided by the number of forecasted industrial jobs.

As they move out of these vintage spaces, it is freed up providing locations for both industrial and commercial refill.

As the series of tables in the next section illustrate and Table 12 show the projected demand for industrial and commercial parcels by parcel size. This table incorporates the refill rates for both commercial and industrial employment. As a result, the number of parcels demand by future commercial establishments is reduced by the refill effect. In the case of industrial, there are two refill effects: 1) the usual refill effect that reduces future industrial need, and 2) the vintage industrial relocation refill effect which effectively increases future industrial demand. The net effect of industrial refill is an overall boost in the demand for vacant industrial land.

6. Conflation Factor.

This is not so much a factor or effect, but a realization that a strict application of the SFE and FAR (density assumptions) with the lot size characteristic/pattern would lead to a forecast for far too many standalone “less than 1 acre” sites. This is not realistic and so we have aggregated the smaller units in an attempt to reflect the more likely occurrence of firms forming inside *incubator industrial parks*.

This effect, unrelated to refill, is entered into the industrial demand equation. The conflation factor is limited to the smaller lot size categories under 10 acres. The conflation effect appears common to industrial start-up firms and is the natural grouping together of “smallish industrial firms” to cluster in incubator industrial parks – an example is Tualatin City’s Tri-county Industrial Park. These firms tend to share buildings and parking lots in a manner that is more efficient than individual *standalone* 1 acre parcels. For start-up firms, the cost of leasing space is an important component of their costs of doing business.

7. Campus-style Need.

On the large-end, there are larger-scale campus style development (e.g., industrial parks, business parks, special technology incubator parks, etc.). We have not investigated this effect. This style of development – if it should persist into the future – would likely increase the demand for large lot parcels through aggregation of small- and medium-lot demand. These campus-style developments could accommodate a mix of commercial and tech/flex style users. Our analysis does not include this style of development and therefore the tables developed in the next section would likely undercount the need for large lot development¹⁹.

¹⁹ If by adding to the large lot demand by an ad hoc inclusion of large campus-style business/industrial parks, then the number and net acres demand on the small-end lot need would have to be scaled back. In a final tally making these assumptions, the overall lots size demand may show larger parcel size needs and fewer smaller size lots and may correspond to a lower overall net acre demand due to efficiency gains.

Note: the ordinary industrial refill rate is 35 percent, and it is based on the total amount of employment needing industrial space that includes new growth and vintage growth.

Metro Council Decision in December 2002

The Metro Council concurred with the Regional Forecast and the employment projections of the forecast.

Industrial Land Need Assessment.

Parcel Demand – Industrial Land Need.

Future parcel and acreage demands are derived from the Metro UGB economic/regional employment forecast. In addition, industrial densities (i.e., square foot per employee, FAR) and a tabulation of existing ranges of employer and parcel sizes determines the anticipated industrial land need. The industrial land need (demand) has been adjusted to reflect the impact industrial refill and conflation factor.

Recall, straight industrial refill reduces the demand for vacant industrial land. The straight industrial refill accounts for future industrial jobs locating themselves on land with existing development (e.g., higher density, infill, and second employment shifts) or redevelopment (i.e., demolition and construction of higher density uses).

Another type of industrial refill is in fact the opposite – vintage industrial relocation. This phenomenon consumes additional vacant land as firms mature and outgrow existing outmoded facilities/location. The tables, below, delineate by parcel size the industrial (net acre) demand. At the end of this section, we compare this table with the supply or inventory table to determine a surplus or deficit.

Table 12.

Number of Tax Lots Demand		Acres Demand (net acres)	
Net Demand adj. For Ref		Acres Demand adj. For R	
	Industrial		Industrial
under 1	3,007	under 1	1,503.6
1 to 5	743	1 to 5	2,230.4
5 to 10	240	5 to 10	1,802.5
10 to 25	114	10 to 25	2,000.2
25 to 50	20	25 to 50	740.1
50 to 100	10	50 to 100	723.9
100 plus	4	100 plus	365.2
	4,138		9,366.0
	6,346		4,874.4

A further breakdown of projected land demand, shows the industrial land demand by building type (demand columns include warehouse/distribution, general industrial, and tech/flex) in table 13.

Table 13.

NUMBER OF LOTS NEEDED BY PARCEL SIZE & BUILDING TYPE - 2000-2022

	WD	GI	TF	Total
under 1	949	1,194	864	3,007
1 to 5	493	120	131	743
5 to 10	218	10	12	240
10 to 25	92	7	15	114
25 to 50	14	1	4	20
50 to 100	6	0	4	10
100 plus	4	0	0	4
	1,776	1,332	1,030	4,138
Adjusted for Refill				

The charts, below, illustrate the different components of industrial land demand.

Chart 4.

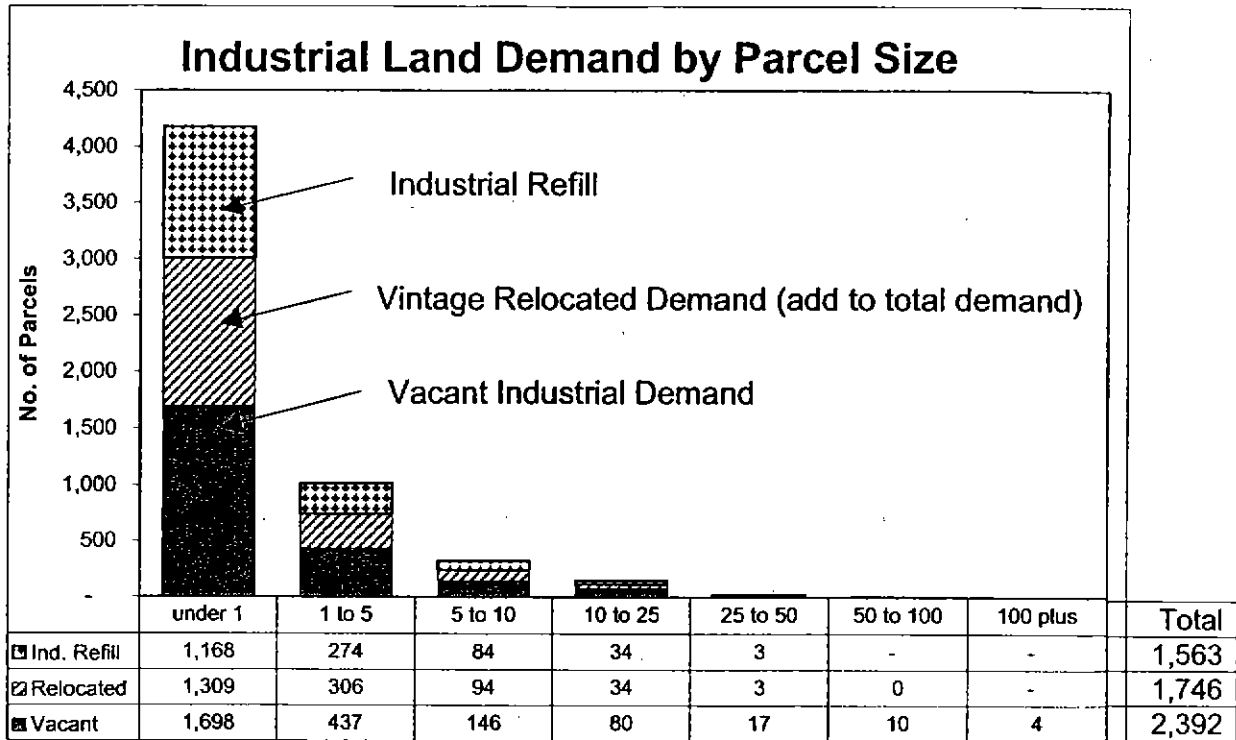
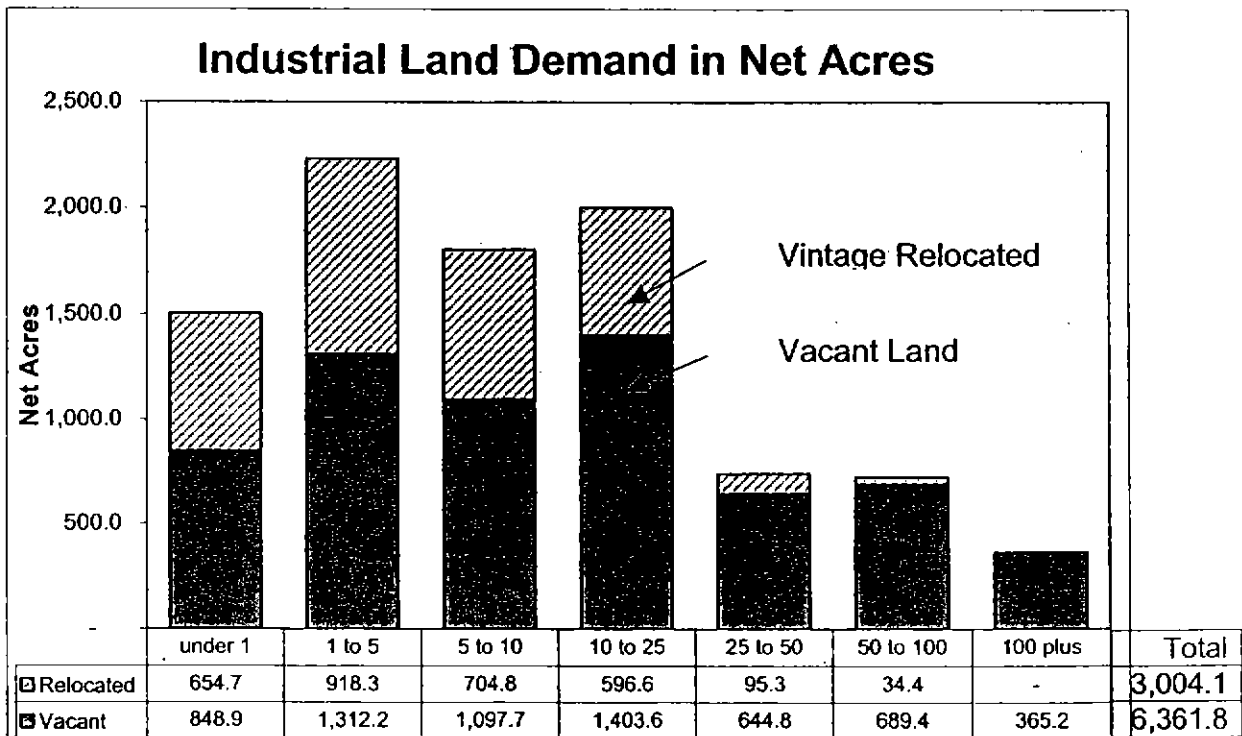


Chart 5.



The industrial refill component does not add to the demand for vacant industrial acres (as denoted in chart 5, there is no checkered bars). This is because industrial refill takes up industrial land already vacated by another firm or assumes a combination of increased densities and/or added improvements on land already designated as developed. And therefore no additional net acres are computed for the ordinary industrial refill component. On the other hand, industrial relocations (the cross-hatched bars) indicate the anticipated additional demand for vacant industrial land for firms which have outgrown their existing locations. (Note: this industrial land has been effectively abandoned and “returns” as potential inventory which becomes a part of the available inventory of redevelopment for future commercial or industrial uses.)

Regional Inventory – Regional Land Information System (RLIS) Supply.

The RLIS vacant buildable land analysis forms the core of the industrial inventory data set. Each year, an aerial photograph of the region is taken of the Metro UGB and adjacent township sections. These digitized photos are then individually analyzed and interpreted by skilled GIS analysts to identify vacant parcels and sub-parcels²⁰. Mapped building permits, streets, assessor tax lot data are used in assisting this analysis.

Environmental protection areas are subtracted from the annual vacant land data. Only Metro’s Title 3, water quality protection zones, have been deducted from vacant land. Title 3 includes the following²¹:

- ❖ Rivers and streams
- ❖ Riparian area next to waterways (50’ to 200’ buffer based on steepness of slopes)
- ❖ Wetlands + 50’ buffer
- ❖ FEMA flood plains
- ❖ 1996 Flood inundation area

Note: These listed components of Title 3 are not mutually exclusive areas. In the current year, we estimate 43,900 gross acres of vacant land of which 7,600 of these acres intersect with undeveloped portions of Title 3 (there are parts of Title 3 land area that were previously developed prior to enactment of Title 3 protections).

²⁰ Half an acre is the minimum parcel size for a partially vacant tax lot in Metro’s RLIS vacant land database. Metro’s vacant land analysis counts all tax lots which are wholly vacant according to the data and takes the added step of analyzing partially developed tax lots to identify how much if any of a tax lot is still undeveloped. If a tax lot contains a portion that is vacant and greater than ½ an acre, the undeveloped piece of the tax lot is included in the vacant land coverage. Using GIS technology and aerial photography, GIS analysts are able to visually interpret whether a tax lot is fully or partially vacant. This approach also uses administrative records (e.g., county assessors data, building permits, and tax lot zoning data) from local city and county governments as additional confirmation or data interpretation.

²¹ At this point, Metro’s Goal 5 project is not yet concluded and presumptions about possible limits or prohibition on development uses are still unknown. Therefore, this UGR does not include the impact of Goal 5. It is possible that enactment of a Metro Goal 5 policy would reduce the supply of industrial, commercial and residential land from its present level (i.e., less than 36,400 gross vacant buildable acres.)

Table 14.

Gross Vacant Land	43,900
less: Title 3 (Water Quality Protection)	7,600
Gross Vacant Buildable Acres (GVBA) - rounding	36,400
less: Fed., State, Municipal exempt land (actual count)	1,700
less: Acres of Platted Single Family Lots (actual count)	2,000
less: Acres for Places of Worship and Social Org. (per capita basis)	700
less: Major Easements (Natural Gas, Electric & Petroleum) (actual count)	600
GVBA less exempt, platted lots, church owned land, easements	31,400 (rounding)

Table 15.

GVBA by general zoning categories:
Gross Vacant Buildable Acres less: Exempt, Platted lots,
Churches and Easements

	Clack	Mult	Wash	UGB
Rural/Farm/Forest	233.6	267.2	69.0	569.8
SFR	5,247.3	6,220.0	5,017.0	16,484.3
MFR	338.8	669.6	996.3	2,004.7
Commercial	202.6	256.8	1,103.9	1,563.3
Industrial	805.7	4,864.7	3,006.9	8,677.4
Mixed Use	422.7	505.4	893.3	1,821.4
Public Facilities	38.2	8.3	159.3	205.8
	7,288.8	12,792.1	11,245.7	31,326.6

Table 15 summarizes all the vacant land in the Metro UGB which could potentially go to serving future residential, commercial or industrial uses. For purposes of the industrial needs analysis, we set aside all the other zoning categories except industrial land. The roughly 8,700 gross vacant buildable industrial acres is then “tiered” according to the approach first developed by Otak, Inc. under contract by the RILS consortium.

Supply - Industrial Land Inventory - 2000

The RILS study developed a ranking system to delineate individual industrially zoned parcels as ready-to-develop or constrained²². The RILS approach developed four (4) tiers for assigning readiness or degree of constraint for industrial parcels in the region. These tiers are:

- ❖ **Tier A** – the most desirable rating indicating immediate readiness for industrial development; having no discernable physical or market constraints
- ❖ **Tier B** – generally industrial sites that could be developed for an industrial user, except that at least one or more constraint was identified of the site. Typical

²² Although the RILS method is quite detailed and site specific, the analysis performed under the RILS approach should only be construed as a regional-level “windshield” survey. Despite analytical care in assigning the RILS industrial tiers to individual parcels, this analysis should not replace a more in-depth site specific market analysis conducted by a qualified real estate professional.

constraints include: land banking, difficult environmental restrictions to overcome, earthquake hazard, ownership (i.e. lease only), transportation improvement needed to access site, marine or air restricted to firms needing Port of Portland accessibility.

- ❖ **Tier C** – small-size industrial lots (under 5 acres) and/or assessed market value exceeding the going rate for industrial acreage; thus likely to develop as commercial despite industrial zoning.
- ❖ **Tier D** – brownfield sites or sites with redevelopable opportunities

The RILS industrial tiers have been joined to Metro’s industrial land data. Table 16 summarizes the amount of vacant industrial land by number of parcels and its corresponding net acreage.

Table 16.

Industrial Land Supply Information - 2000

Number of Vacant Buildable Industrial Tax Lots (includes partially developed lots)

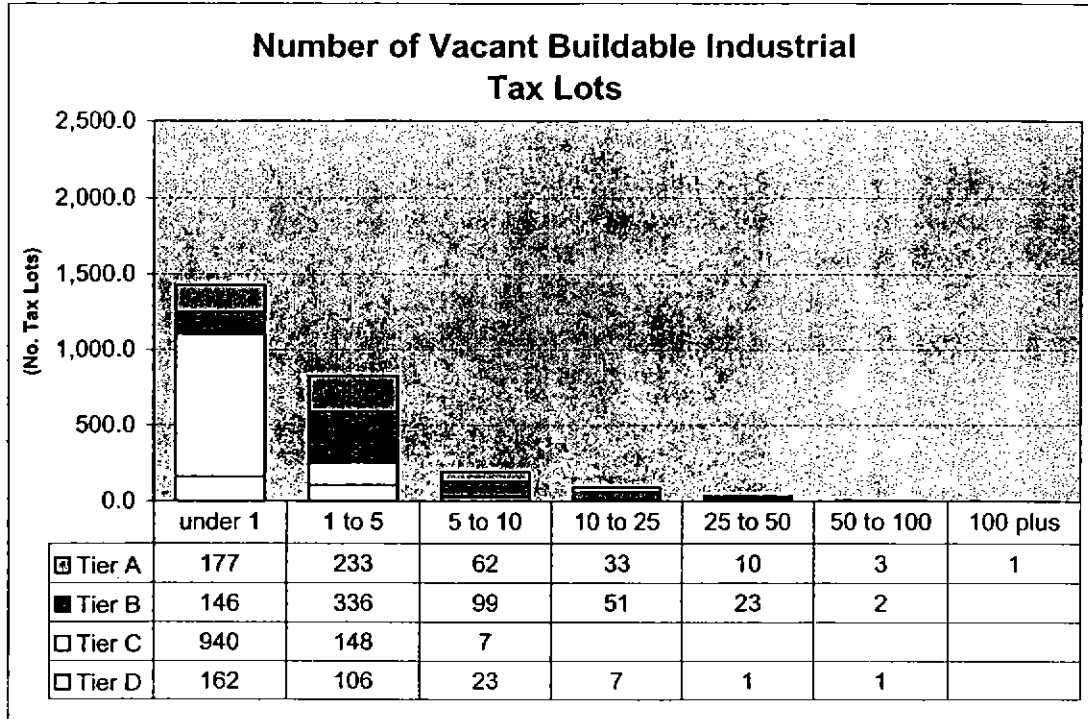
	under 1	1 to 5	5 to 10	10 to 25	25 to 50	50 to 100	100 plus	total
Tier A	177	233	62	33	10	3	1	519
Tier B	146	336	99	51	23	2		657
Tier C	940	148	7					1,095
Tier D	162	106	23	7	1	1		300
	1,425	823	191	91	34	6	1	2,571

Amount of Vacant Buildable Industrial Land (adjusted Net Acres)

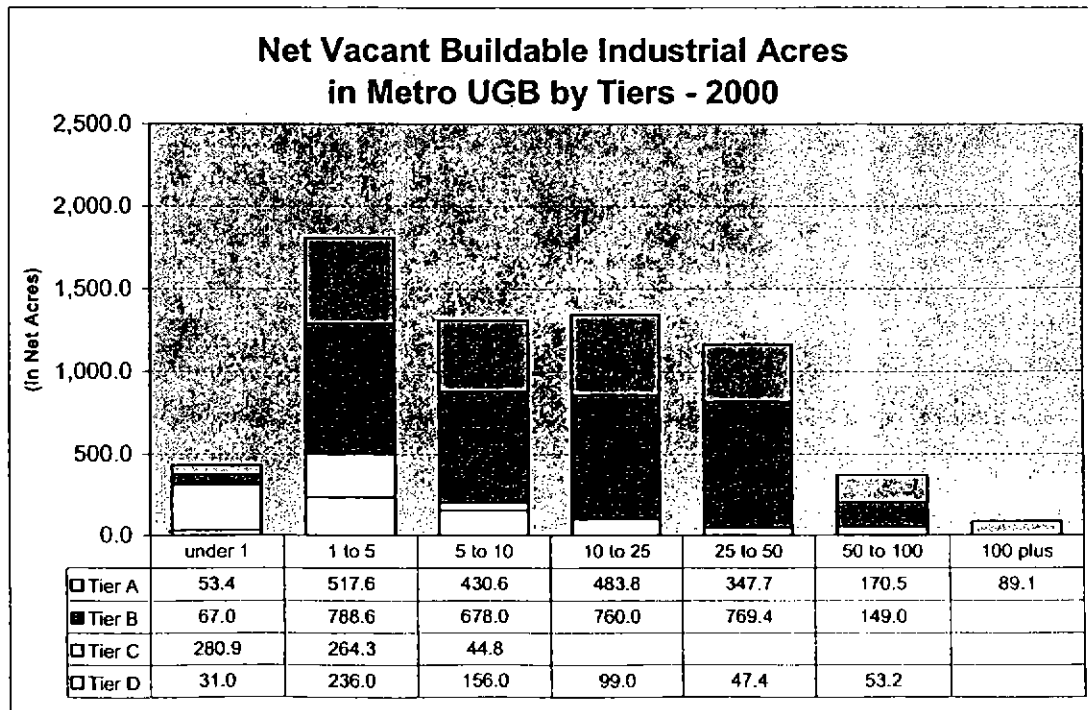
	under 1	1 to 5	5 to 10	10 to 25	25 to 50	50 to 100	100 plus	total
Tier A	53.4	517.6	430.6	483.8	347.7	170.5	89.1	2,092.7
Tier B	67.0	788.6	678.0	760.0	769.4	149.0		3,212.1
Tier C	280.9	264.3	44.8					590.0
Tier D	31.0	236.0	156.0	99.0	47.4	53.2		622.6
	432.4	1,806.5	1,309.4	1,342.8	1,164.5	372.8	89.1	6,517.5

The next two diagrams (see: charts 6 and 7) merely chart the information shown in table 16. Note that chart 6 identifies the number of tax lots (partially vacant and fully vacant). Chart 7 shows the corresponding number of acres for each type of industrial land by the size of the parcel (as measured by the lot’s gross acres). The body of the table in chart 7 and table 16 show the tabulated amount in net acre terms – after deductions for streets and infrastructure take outs.

**Chart 6.
Number of Tax Lots
Metro UGB Industrial Inventory
By RILS Tiers**



**Chart 7.
Net Acres
Metro UGB Industrial Inventory
By RILS Tiers**



Commercial Development Encroachment on Industrial Land.

The land accounting story doesn't end with RLIS & RILS... Based on MetroScope simulations and measured historical experience, the supply of industrial land is often eroded by commercial absorption. On historical standards, about 15-20% of industrial land is consumed by commercial enterprises operating in industrial zones.

On a policy and economic efficiency basis, there is good reason to allow commercial development on industrial land:

- ❖ Commercial operations and enterprises provide service and retail support opportunities to industrial firms and employees working in the area.
- ❖ An industrial development project may benefit from a fraction of commercial involvement to help offset higher construction costs.
- ❖ Some vintage industrial sites will be abandoned due to their inefficiencies and unless allowed to redevelop as commercial and/or mixed use will remain vacant or be significantly underutilized.

On the other hand, too much encroachment of commercial development into an industrial area could negatively impact remaining industries:

- ❖ Because commercial operations generally can pay a higher price for real estate, the prices of land in the surrounding area could see some price escalation over time which could lead to more departure of industrial jobs and firms in the area.
- ❖ Potential for increasing the "nuisance factor" or complaints of having conflicting types of users doing business in what was once a more homogenous industrial neighborhood, such as more traffic congestion, noise, safety hazards, etc.
- ❖ The result is "forced relocation" rather than firms that prefer to relocate.

Although there are no clear policies today with regard to encroachment and commercial redevelopment of industrial areas, this information suggests some major policy considerations which may adversely as well as positively influence future patterns of economic development. The Metro Council and policy advocates will likely want to pursue policy initiatives aimed at encouraging commercial conversion of areas centrally located within the Metro UGB and identify preservation policies aimed at discouraging conversion of industrial to commercial in areas of conflicting uses. Whatever form that these policies become, they ought to be carefully crafted to avoid imposing too rigid a set of standards as to void or restrict the functioning of market signals.

The MetroScope "base case" scenario provides a future estimate of the amount of commercial development on industrially zoned land. The middle of table 17, "commercial development on vacant industrial land" indicates the amount estimated of commercial encroachment is about 2,800 net acres over the next 20 years. The majority of industrial parcels consumed by commercial development is in the "1 to 5" acre range (40%) and "5 to 10" acre range (20%) since these are the least suitable for industrial purposes but in many cases very suitable for commercial.

**Table 17.
Metro UGB Industrial Inventory
Less Commercial Development**

(combined A through D)

Vacant Buildable Industrial Land

	under 1	1 to 5	5 to 10	10 to 25	25 to 50	50 to 100	100 plus	total
Tax Lots	1,425	823	191	91	34	6	1	2,571
Net Acres	432.4	1,806.5	1,309.4	1,342.8	1,164.5	372.8	89.1	6,517.5

Less: Commercial Development on Vacant Industrial Land

	under 1	1 to 5	5 to 10	10 to 25	25 to 50	50 to 100	100 plus	total
Tax Lots	921	469	95	34	7	2	0	1,528
Net Acres	368.2	1,123.4	566.4	468.3	198.8	111.4	0.0	2,836.4

Potentially Available Industrial Land (less commercial consumption)

	under 1	1 to 5	5 to 10	10 to 25	25 to 50	50 to 100	100 plus	total
Tax Lots	504	354	96	57	27	4	1	1,043
Net Acres	64.2	683.2	743.0	874.5	965.7	261.4	89.0	3,681.0

The two charts, following, illustrate the components that add and subtract from the supply of industrial land. Note that this inventory is dated as of July 2000 when the aerial photograph and subsequent vacant land analysis was performed. In order to conclude a 20-year need analysis, we adjust the demand projections to add another two-years to the analysis to make up for the difference in base years. The UGB decision is still determined for a 2002 to 2022 need as required by state law.

Chart 7.

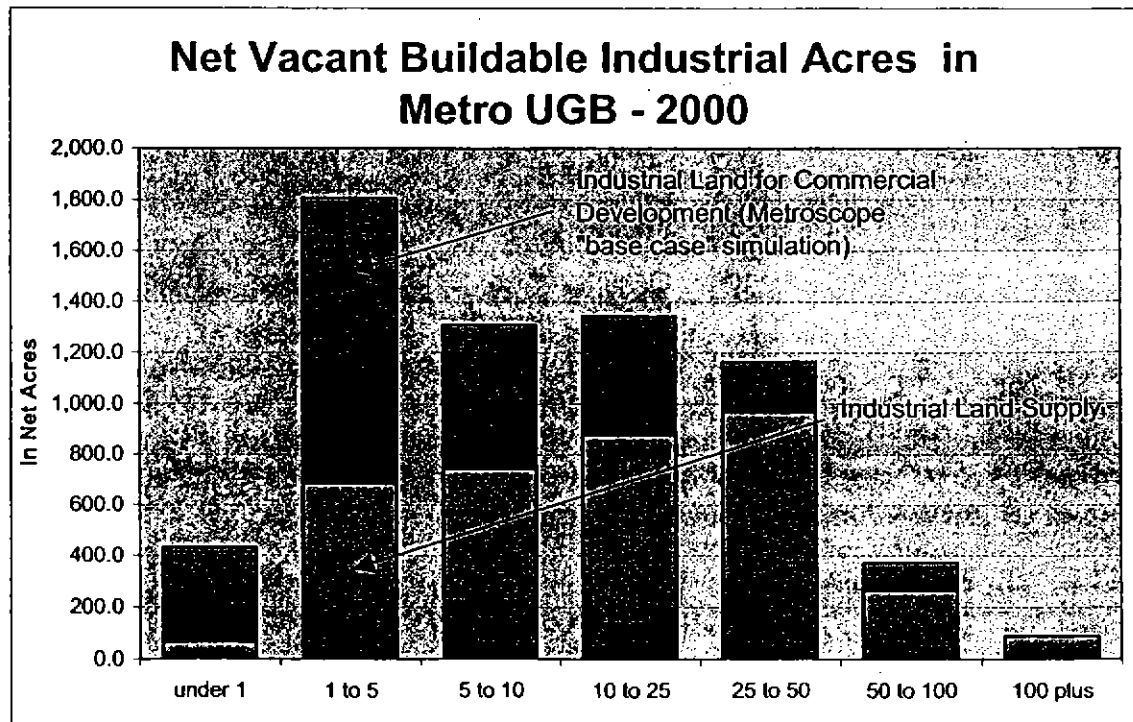
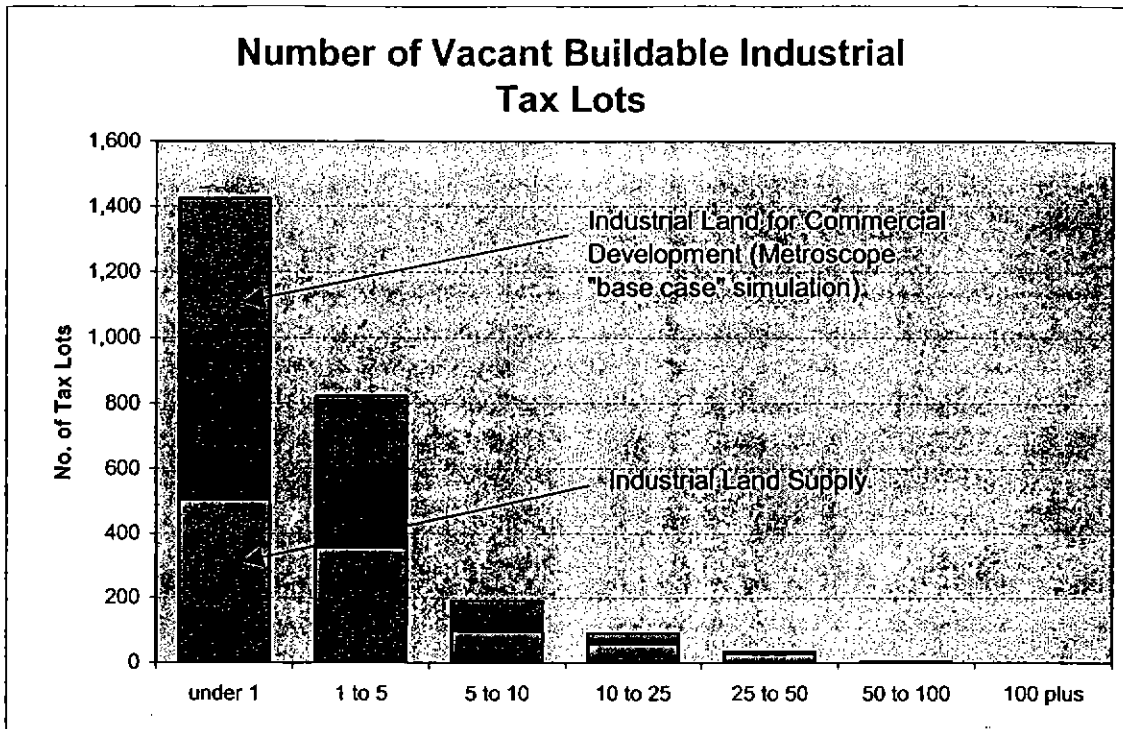


Chart 8.



Conclusion: Deficit – a shortage of large and small industrial lots with a significant overall shortfall of nearly 5,700 net acres. ←

Table 18.

Industrial Land Need (Deficit)

INDUSTRIAL by No. of Lots

	under 1	1 to 5	5 to 10	10 to 25	25 to 50	50 to 100	100 plus	TOTAL
Vac. Supply	504	354	96	57	27	4	1	1,043
Demand	3,007	743	240	114	20	10	4	4,138
vacant	1,698	437	146	80	17	10	4	2,392
relocation	1,309	306	94	34	3	0	0	1,747
net need	(2,503)	(389)	(144)	(57)	7	(6)	(3)	(3,095)

INDUSTRIAL by Net Acres

	under 1	1 to 5	5 to 10	10 to 25	25 to 50	50 to 100	100 plus	TOTAL
Vac. Supply	64.2	683.2	743.0	874.5	965.7	261.4	89.0	3,681.0
Demand	1,503.6	2,230.4	1,802.5	2,000.2	740.1	723.9	365.2	9,366.0
vacant	848.9	1,312.2	1,097.7	1,403.6	644.8	689.4	365.2	6,362
relocation	654.7	918.3	704.8	596.6	95.3	34.4	0	3,004
net need	(1,439.4)	(1,547.3)	(1,059.5)	(1,125.7)	225.6	(462.4)	(276.2)	(5,684.9)

Several significant assumptions were imposed on this industrial needs analysis:

1. How much of the non-Tier A industrial land can or should be accounted for on the supply-side? This analysis has assumed all industrial land is "fair game", when in fact because of the major costs necessary in removing the infrastructure constraints, this may make the land prohibitively inaccessible to serve future industrial need.

Shall the Tier C land which is a combination of small lots and/or over-priced industrial land be considered towards industrial need? According to the data derived from the RILS/Otak study – probably not – since the market value for Tier C land would suggest conversion to commercial development. Should the Tier C small lot industrial supply be counted against industrial demand? Probably yes, since there is a demonstrated need for small lot demand.

Tier D land includes brownfield sites and parcels with significant existing owner and development constraints. Again it will be a matter of policy to identify how much if any of the Tier D designated land should be counted against future demand.

Brownfield sites range from highly contaminated to very little on-site contamination. This wide range of contamination suggests a wide range in remedial costs which on the more expensive end may indicate a proportion of Tier D lands to be effectively prohibited from serving the projected industrial demand.

For example – If not all of the tiered industrial land is included in the supply, (e.g., assuming only 75% of Tier B, 50% Tier C, and 25% Tier D coming available to meet the next 20 year demand), then the shortage in industrial land balloons even more. This issue will require additional Metro Council findings/direction to conclude the matter.

2. The industrial data need analysis does **NOT** include an estimated demand for future industrial business park development. This is actually a fairly significant policy point. The limitations of our analysis is that we estimated individual parcel demand based on the assumption that future firms will consume land on a *stand alone* pattern, when in reality we know of industrial and business parks that provide a proportion of small-lot user needs. What this implies is that there may be a larger demand for large-lot industrial than the 9 (14 large lot demand minus 5 in the inventory as of July 2000)²³ this analysis suggests or the likely range of 6 to 24 large lots that the RILS report predicts.
3. The vision from a regional economic development strategy viewpoint, which is not explicitly assumed in the regional forecast, may provide additional policy reason to provide more than the mid-point demand for 14 or 15 large lots, as indicated by the RILS report. A regional strategy that assumes a development pattern for the last 10 years which saw the emergence of large lot industrial users (e.g. Intel, LSI, Novellus, Vestas) would tend to point in the direction of providing a greater number of industrial large lots, perhaps closer to the 24 or more as indicated by the RILS large lot scenario analysis.

²³ Table 12 summarizes the industrial large lot demand for 14 sites. Table 17 summarizes the supply of industrial lots, and in particular shows an initial supply of 7 large lots less 2 that proportionally get allocated to commercial encroachment leaving 5 large industrial lots. Note that the supply is counted for vacant land as of July 2000. As of this writing, we find that only 3 large industrial lots exist in the region: the Intel owned site near West Union Rd., the partially developed LSI location, and the abandoned Fujitsu site near Gresham.

In terms of economic development and economic sustainability strategy, it should be apparent that it is virtually impossible to know what potential economic growth a region might lose and not know that the region has foregone this potential if the supply of large lot is not sufficient. A region can adversely brand itself as hostile or not accommodating large-scale national or multi-national employers if the supply of land for this level of user if the land is not already present and available. Or if potential developers know you don't have what's demanded by the market, they won't bother to look in a region for possible opportunities.

4. A commercial development on industrial land component was accounted for in the supply and demand tabulations of industrial and commercial need. The industrial inventory was decreased at the same time the commercial inventory was increased to account for the encroachment effect of commercial absorption of industrial land. Although this phenomenon of the market has been well recognized by policy makers and the development community, this is the first effort to actually attempt to measure the encroachment effect. In fact this substitution effect is prohibited by regulations, the shortage of industrial land may not be as great, but at the same time all that has really been accomplished is moving the shortage back to commercial.
5. Although posing less of an impact on industrial development in the future, a Metro policy lead effort to increase the intensity of development in town and regional centers, this policy should have secondary impact on the need for industrial land. If the "centers policy(s)" are effective in steering commercial development into centers in contrast to other commercial strips and industrial zones, then there might be less conversion of industrial land to commercial. On the other hand, policy makers need be wary of erosion of the commercial refill rate as some of the growth drawn into centers will be from industrial refill sites instead of jobs that would have gone on vacant industrial land.
6. Another factor to consider is the treatment of commercial encroachment assumption in this technical analysis.

This industrial need conclusion assumes over 2,800 net acres of industrial vacant supply convert to commercial development. Although this may be justified by the MetroScope "base case" results, it is still a simulation and current policies could be altered to create an alternate land consumption pattern. There is evidence to strongly suggest that commercial renovation of industrial refill land is desirable. Furthermore, there is compelling evidence to suggest the desirability of allowing new commercial development on vacant industrial land. However this information is not locked-in, there remains significant policy discretion to determine geographically which places will make better use of this information in support of efficient regional urban growth goals and land use patterns.

7. Finally, the supply of large-lot industrial sites can easily turn into a "monopoly" if there are too few industrial sites available in various market areas in the region.

Suppliers of large lots can easily count how many parcels are on the market and can exert undue influence in striking a balance between supply, demand and price.

Ensuing market failure is a clear and present risk of trying to program too tightly an urban growth strategy with respect to large lots.

As table 18, above, indicates, there is a significant industrial land shortage across the whole region. The shortage, in net acres, is over 5,600 acres – on a gross acre basis (adding streets and other factors), the shortage amounts to a total of 7,000 gross acres. There is a shortage of acreage across all size ranges. We note that there is a shortfall of about 9 large lots. This is based on the technical conclusion of a demand for about 14 large lots in the region (defined to be lots greater than 50+ acres) and a supply of about 5 large lots in the UGB.

Because the analysis has a base year of 2000, the careful reader will note that several of the large lots have been absorbed between 2000 and 2002. Some of the more notable site developments include Intel's expansion of its once vacant part of its Ronler Acres and Jones Farm locations, the Novellus development in Tualatin, the Vestas announcement in the Rivergate area. There were a couple of larger sites removed from the inventory due to airport runway needs.

The Metro decision is 2002 to 2022 as dictated by Metro's periodic review process. The vacant land inventory is dated as of July 2000 – this would include the commercial and industrial supply information for this UGR. In order to sync up consistent with the supply information, the demand projections also begin at a 2000 base year – same as the supply data. The UGR analysis in effect answers the question what the need through 2022 starting from year 2000 and given a forecasted demand that begins in 2000 and a supply that begins in 2000. Between the data and today, the need for large lots has not materially diminished while the inventory for large lots has decreased to virtually zero. Policy makers will have to provide direction on how to treat this two-year gap between what our GIS databases indicate and what in reality we know has transpired during the last two years.

Metro Council Decision in December 2002

The Metro Council accepted the underlying regional employment forecast and accepted the industrial need factors (job capture rate, job refill rates, density assumptions). The Council chose to assume that all industrial land (i.e., Tiers A to D) should be counted towards meeting future land need regardless of existing constraints to their use vis-à-vis the Regional Industrial Land Study. The Metro Council acknowledged the shortage of large lot industrial tax lots.

The Council adopted new measures (amendments to Title 4) to protect commercial encroachment in Regionally Significant Industrial Areas (RSIA). RSIA locations have yet to be defined on a map. The concept is to protect and limit the development of office and retail establishments in industrially zoned land designated as regionally significant. In concept, RSIA land are industrial areas with unique industrial

attributes that can not be duplicated elsewhere in the region especially by the mere expansion of the UGB, such places might include areas adjacent to Port of Portland terminal facilities, near rail yards, or adjacent to high tech locations needing specialty gasses, electrical infrastructure, and so on.

At this point, the impact on industrial land is a tentative and indeterminate estimate because only a concept is in place. We need to identify specific locations by parcel and tax lot in order to more precisely analyze and measure the impact on industrial land need.

SEE SECTION: *Addendum*: UGR Employment Land Need

Commercial Land Need Assessment

Introduction.

Commercial land need is defined for this UGR analysis as anything that is employment-related need and not industrial. Admittedly, there is a great deal of grayness to defining what is industrial and what is commercial land need. Academically speaking, we have implicitly borrowed the classification scheme for defining industrial and commercial that the RILS report had assumed. So, anything that the RILS did not classify as industrial demand, we have gone forward by assuming everything else must then be commercial need. Furthermore, this urban growth report study has broken down commercial land need into three building type demands: office, retail, or medical/government uses.

In the real world, what is commercial and what is industrial does not fall into neat little industrial categories as has by necessity the case in this urban growth report and other similar research and analysis. However, every effort has been made to work around the nuances between industrial and commercial despite a rigid federal industrial classification code (SIC).

Parcel Demand - Commercial Land Demand.

Commercial demand projections call for the following projected land and parcel need as shown in Table 19. This demand is based on the Metro UGB Economic/Employment Forecast, commercial densities and existing range of employer and parcel sizes projections or assumptions. The commercial land need (demand) has been adjusted to reflect the impact by commercial refill as well as other supply factors including those that are tied to the industrial need equation.

Table 19.

Number of Tax Lots Demand		Acres Demand (net acres)	
Net Demand adj. For Refill		Acres Demand adj. For Refill	
	Commerical		Commerical
under 1	6,031	under 1	3,015.3
1 to 5	258	1 to 5	775.2
5 to 10	30	5 to 10	227.6
10 to 25	16	10 to 25	288.7
25 to 50	5	25 to 50	192.5
50 to 100	5	50 to 100	375.0
100 plus	-	100 plus	-
	6,346		4,874.4

A further breakdown of projected land demand, shows the commercial land demand by building type.

Table 20.

NUMBER OF LOTS NEEDED BY PARCEL SIZE & BUILDING TYPE - 2000-2022

	office	retail	med/gov	Total
under 1	3,689	1,446	896	6,031
1 to 5	86	105	68	258
5 to 10	9	7	14	30
10 to 25	4	1	11	16
25 to 50	1	0	5	5
50 to 100	2	0	3	5
100 plus	0	0	0	0
	3,791	1,558	997	6,346

Adjusted for Refill

The commercial land demand calculation is not complicated with vintage commercial relocation, despite the fact that this phenomenon also exists in the commercial world. In fact, we combine this effect with the refill rate for analytical simplicity. The commercial refill rate is a net of the relocation factor because the MetroScope simulation of the “base case” does not indicate any significance to the vintage relocation factor (as compared to the industrial sector).

The two primary components we consider for commercial land demand is as before – the net vacant land demand and a straight refill. The commercial refill rate we assume in this UGR is 50% as compared to 52% in the 1997-2017 UGR. The 50% commercial refill rate applies only to the part of the employment projection for commercial job types and corresponding commercial building types (i.e., office, retail and medical/government).

Table 21 identifies which standard industrial classifications have been grouped together to define the commercial employment and building types relationships.

Table 21.

Employment/Building Type Description	Standard Industrial Classes (SIC)
Office	46, 48, 49, 60-67, 70-73, 78,79, 81,82, 84-89
Retail	52-59
Med/Gov	80, 83, 90-99

Source: Executive Office of the President, Office of Management and Budget, “Standard Industrial Classification Manual – 1987” as compiled by Metro Data Resource Center

The two components that comprise commercial land demand are vacant commercial demand less an estimated refill amount as derived from the MetroScope "base case" scenario refill rate.

Chart 9.

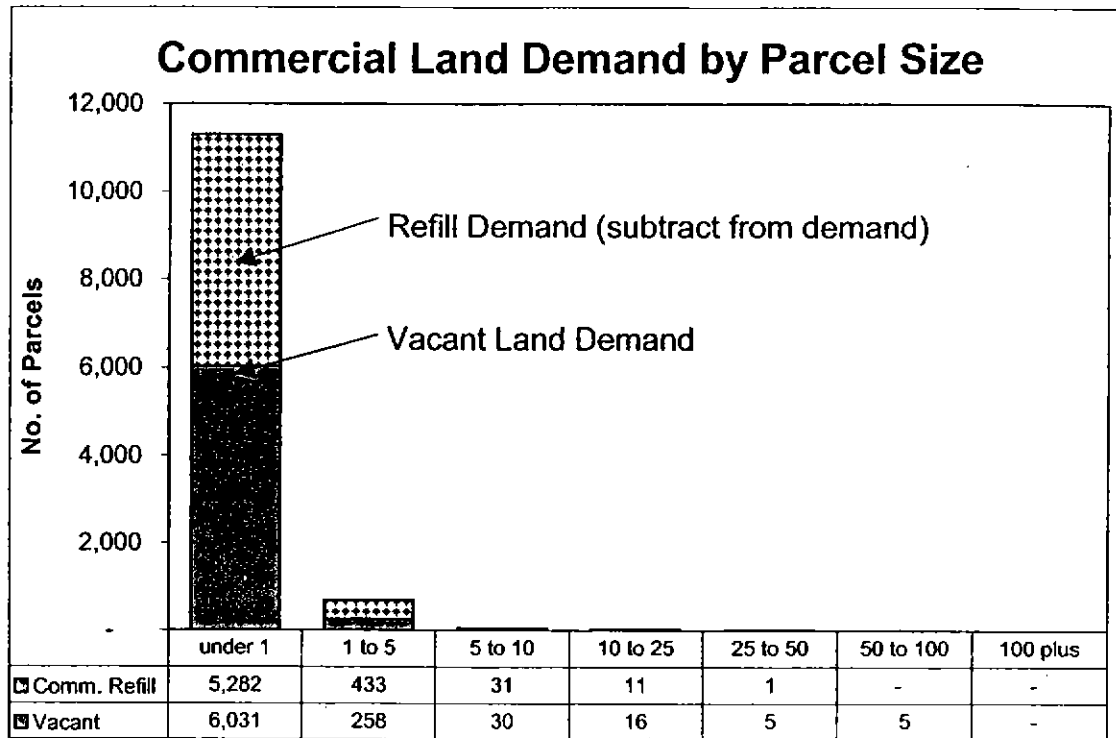
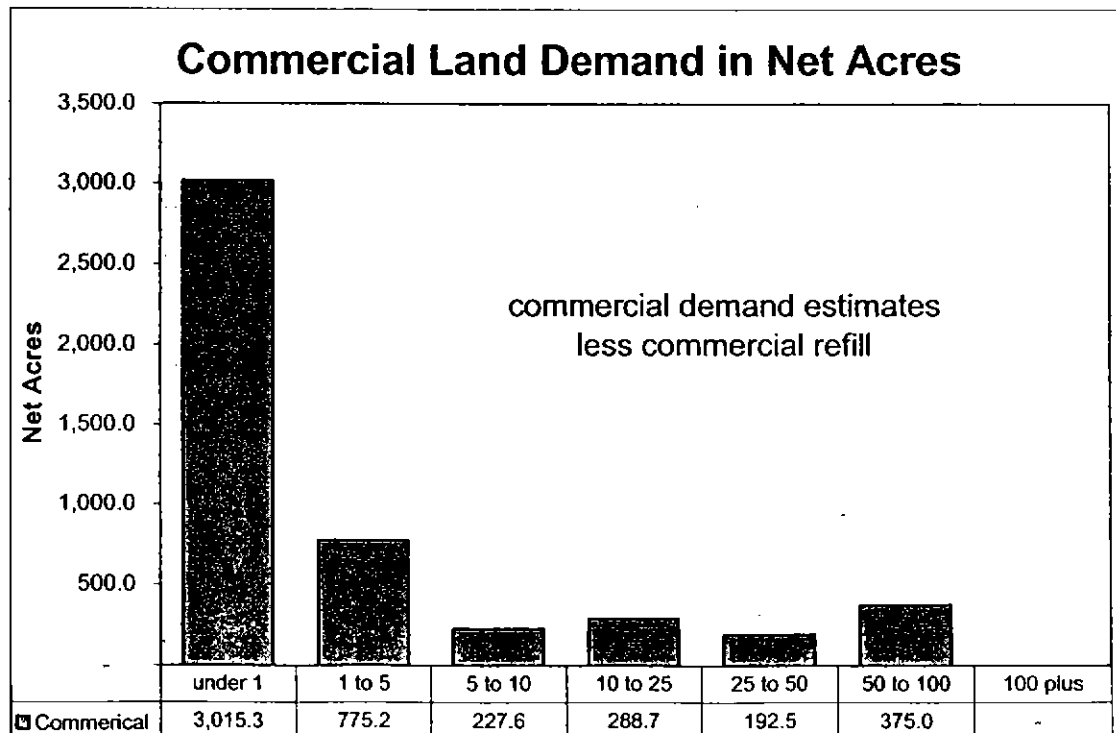


Chart 10.



The commercial refill demand component, as we learned from the MetroScope “base case” scenario is supplied by a combination of commercial refill supply and industrial refill supply. As a result, the amount of vacant acres needed for accommodating future commercial development is reduced by about half the number of acres (assuming a 50% commercial refill rate for commercial employment).

Supply - Commercial Land Inventory.

Fewer vacant acres (about 2,800 net acres) of commercial land exist in the Metro UGB than industrial zoned land (6,500 net acres). As Table 22 shows, the majority of tax lots (both fully vacant and partially vacant parcels) fall in the under 1 acre range and over half of the vacant supply (in net acres) is below the 10 acre range.

Table 22.

Commercial Vacant Land Supply Information, 2000

	Number of Parcels by Lot Size (by Acres)							TOTAL
	under 1	1 to 5	5 to 10	10 to 25	25 to 50	50 to 100	100 plus	
Clackamas	322	77	6	3				408
Multnomah	1,227	120	13	4				1,364
Washington	903	251	37	16	5	5		1,217
total	2,452	448	56	23	5	5	0	2,989

Total Acres available by Lot Size Category

	under 1	1 to 5	5 to 10	10 to 25	25 to 50	50 to 100	100 plus	
Clackamas	89.7	156.2	43.8	43.2				333.0
Multnomah	237.1	251.6	89.9	51.3				630.0
Washington	256.9	545.1	275.8	230.3	172.6	353.8		1,834.5
total	583.7	953.0	409.6	324.8	172.6	353.8	0.0	2,797.5

If one assumes the simulation results from the MetroScope “base case” scenario, and consistent with the industrial assessment in the prior section of the UGR, the supply of commercial land is augmented. Recall that 2,800 net acres of industrial land was “converted” to commercial use (i.e., commercial encroachment on vacant industrial supply). Furthermore, about half of the commercial refill demand is expected to be satisfied by the refilling of industrial land by commercial development (2,250 net acres) while 2,280 net acres is supplied by ordinary commercial refill supply (see table 17).

Therefore, the region is able to sustain a very high commercial employment refill demand by allowing conversion of the industrial refill land to go towards commercial development. Much of the region’s local industrial zoning permits commercial development. This flexibility has forestalled a shortage of commercial supply in recent years and is expected to do so in the future if reality plays out as indicated by the MetroScope “base case” scenario.

Table 23.

Commercial Land Supply Information - 2000 Vacant & Refill Land

	Number of Parcels by Lot Size							TOTAL
	under 1	1 to 5	5 to 10	10 to 25	25 to 50	50 to 100	100 plus	
on vac. Com.	2,452	448	56	23	5	5	0	2,989
on vac. Ind.	921	469	95	34	7	2	0	1,528
refill on Com.	1,970	335	52	10	9	3	0	2,379
refill on Ind.	1,309	306	94	34	3	0	0	1,747
total lots	6,652	1,558	297	101	24	10	0	8,643

Net Acres available by Lot Size Category

	under 1	1 to 5	5 to 10	10 to 25	25 to 50	50 to 100	100 plus	TOTAL
on vac. Com.	583.7	953.0	409.6	324.8	172.6	353.8	0.0	2,797.5
on vac. Ind.	368.2	1,123.4	566.4	468.3	198.8	111.4	0.0	2,836.4
refill on Com.	738.7	751.7	287.1	123.3	239.5	143.8	0.0	2,284.1
refill on Ind.	491.0	688.7	528.6	447.5	71.5	25.8	0.0	2,253.1
total acres	2,181.7	3,516.8	1,791.7	1,363.8	682.4	634.7	0.0	10,171.1

Table 23 summarizes the cross-development of industrial and commercial uses that comprise the overall portrait of the commercial inventory inside the Metro UGB. The commercial supply components comprise the following types:

- ❖ Vacant Commercial Land
- ❖ Vacant Industrial Land (i.e., poaching or encroachment)
- ❖ Redevelopment and Infill (Refill) of Commercial Land
- ❖ Redevelopment and Infill (Refill) of Industrial Land (refill of vacated vintage industrial)

Conclusion: Small Surplus 760 net acres (with the assumption of all the cross-development and/or land substitutions described in this UGR)

Table 24.

Commercial Land Need

COMMERCIAL by No. of Lots

	under 1	1 to 5	5 to 10	10 to 25	25 to 50	50 to 100	100 plus	TOTAL
Vac. Supply	3,373	917	151	57	12	7		4,517
Demand	6,031	258	30	16	5	5		6,346
vacant	11,313	692	62	27	6	5		12,105
refill	(5,282)	(433)	(31)	(11)	(1)			(5,759)
net need	(2,658)	659	121	41	7	2	0	(1,829)

COMMERCIAL by Net Acres

	under 1	1 to 5	5 to 10	10 to 25	25 to 50	50 to 100	100 plus	TOTAL
Vac. Supply	951.9	2,076.3	976.0	793.1	371.4	465.1	0.0	5,633.9
Demand	3,015.3	775.2	227.6	288.7	192.5	375.0		4,874.4
vacant	5,656.5	2,075.0	462.7	479.9	231.1	375.0		9,280
refill	(2,641.2)	(1,299.8)	(235.1)	(191.2)	(38.6)			(4,406)
net need	(2,063.4)	1,301.1	748.4	504.4	179.0	90.1	0.0	759.6

In table 24, a small surplus in commercial need is identified. This surplus only exists if the cross-development factors derived from MetroScope are assumed. Table 24 only

compares the vacant need portion (i.e., net of the refill components) to identify the future vacant land requirements for the commercial sector.

Assuming a straight tabulation of commercial inventory (i.e., leaving out the commercial encroachment piece from industrial vacant supply), we would discover a significant shortage of commercial supply during the next 20 years (2,800 net commercial supply – 4,875 demand = - 2,075 net acre deficit). Table 22 identifies an amount of 2,800 commercial net acres in the Metro UGB. Table 19 indicates almost 4,875 acres of net industrial acres demand.

However, this UGR report does **NOT** assume a straight tabulation of commercial supply for commercial demand. Instead, we have assumed a more market aware set of assumptions based on the MetroScope “base case” scenario which includes the various refill components summarized in table 23. Instead of a deficit, we have a modest surplus of about 800 net acres. (Over 20 years, this surplus is insignificant – averaging about 40 net acre surplus per year, $800 / 20 = 40$.)

The data suggests no shortage of land for commercial purposes in the future. We anticipate an apparent shortage in the “under 1 acre” range for commercial need to be easily satisfied by either the parcelization of slightly larger parcels or to be met by aggregation in multi-tenant formats such as office buildings and shopping centers.

Several key assumptions and policy outcomes can materially impact the conclusions in this UGR. These caveats are highlighted.

1. As a point of possible policy departure from the data, it should be recognized that there is a willingness by policy makers to delineate some so-called “industrial jobs” and to divert future development of these heretofore still unspecified industrial jobs into commercial or mixed use zones where in land use theory are supposedly better suited. This suggests that government policy can know better than the market. As the theory goes, with the right policies in place, future growth can be efficiently programmed as to where future types of jobs are socially more acceptable to locate. However, instead of market flexibility, we could have “silos” that impose a rigidity in the supply of land that may prove unyielding to future entrepreneurs.
2. The commercial refill rates are highly sensitive to the vintage industrial relocation and industrial refill supply. Industrial land protection regulations, such as industrial sanctuaries, could pose a threat to a high commercial refill rate by limiting commercial development or “backfilling” of obsolete industrial locations.
3. A willingness to allow some commercial encroachment was determined by the RILS report as a desirable means of allowing the market to convert some Tier B industrial land into prime industrial real estate development by using the higher value purchasing power of commercial to defray the costs of infrastructure development and brownfield remediation.

Metro Council Decision in December 2002

The Metro Council accepted the underlying regional employment forecast and accepted the commercial need factors (job capture rate, job refill rates, density assumptions).

Title 4 has direct implications on commercial land need. Formerly, we assumed a significant share (2,800 net acres) of commercial demand would be satisfied by encroachment into industrial areas. Because of an amended Title 4, we foresee much less office and retail development to occur on industrially zoned land. Commercial jobs will necessarily be displaced and likely consigned to mixed use redevelopment (i.e., regional centers, main streets and corridors) and/or newly created commercial areas in new UGB additions.

At this point, the impact on commercial land is a tentative and indeterminate estimate because only a concept is in place. We need to identify specific locations by parcel and tax lot in order to more precisely analyze and measure the impact and extent of future cross development trends on industrial supply.

SEE SECTION: *Addendum*: UGR Employment Land Need

UGR Technical Findings

Assuming MetroScope “base case” findings imposes a series of events on how the real estate market for industrial and commercial land needs are solved in a policy-neutral setting. Status quo legal definitions and administrative rules are carried out in the “base case” scenario. Within this context then, the MetroScope simulation plays out the forces of supply and demand.

Supply is determined by the RLIS (Metro’s Regional Land Information System database) vacant land inventory and local zoning parameters. The inventory of redevelopment and infill is estimated within MetroScope based on assessed value, equilibrium real estate prices, cost of production, and subsidies (if any). Demand is determined by a regional economic forecast, and employment allocations are determined by equilibrium location prices, industry clusters, number of housing units in the vicinity, and other employment opportunities. The equilibrium balance between supply and demand for each employment zone then determines various other factors including FAR’s, square foot per employee densities, refill rates, capture rates, as well as the supply quantity of vacant and refill land consumed over time.

These MetroScope findings are folded into the parcel demand approach developed in this UGR. Based on historical employment and firm-size parameters, estimates of parcel demand are obtained. (The parcel demand methodology is virtually identical to the RILS approach.) The MetroScope estimates and parcel demand projections represent point estimates for a distribution or range of possibilities. In the end, decisions are made based on what is the most likely outcome.

Additionally, results, methods and findings from the multiple phases of the Regional Industrial Land Study (RILS) have been include in this UGR analysis. In particular, Metro has incorporated the “tiered industrial land layers” developed by the RILS task force. This UGR also highlights key findings from the RILS report as it pertains to the behavior of regional industrial markets.

The UGR estimates a negligible surplus of commercial land and a significant shortfall of nearly 6,000 net acres of industrial land. In addition this UGR analysis has identified a significant shortage of large lot industrial sites and suggests further findings needed to accommodate large campus-style development for industrial and business parks. A more market aware format has been developed for this report. The conclusions are reasonable and accurate if all the assumptions and simulation results play out in the manner we have estimated as market behavior and regulatory compliance. However, legitimate technical assumptions and policy directions could increase or decrease these needs.

Addendum: UGR Employment Land Need

(Added November 2002)

On November 20th, the Metro Council Community Planning Committee (CPC) adopted new policies (Title 4 and Title 6) to protect regionally significant industrial areas within the Metro area. This policy is intended to limit certain levels and types of commercial development in industrially zoned areas that are to be designated as Regionally Significant Industrial Areas (RSIA). This policy allows only limited commercial development, development that will fortify and supply essential services to industrial users and its workforce. The goal of this policy is to preserve industrial land (especially large lot industrial land) from commercial encroachment.

The economic impact of Title 4 and Title 6 is not yet fully understood and calculated. In particular, not enough research has been completed to measure the amount of protection Titles 4 and 6 afford for industrial land. What we tentatively understand is the following:

Under past practices and policies, we estimate about 2,800 net acres of industrial land would have converted to commercial uses/development. In other words, 2,800 net acres of vacant industrial land is presumed to be converted to commercial supply. What Titles 4 and 6 are intended to do is reduce the amount of net conversion of industrial land.

Preliminary analysis suggest that about half (or 1,400 net acres) of industrial land will be protected by the new regulations. However, the now dislocated commercial jobs need to be relocated to vacant commercial zones (and mixed use zones). In this scenario, we assume that these commercial users will have to compete at commercial rents that are higher than industrial rents. As a result, the relocated commercial users will tend to opt to consume land at somewhat higher intensities thereby the amount of commercial land that gets consumed is about 900 net acres.

Assuming this scenario, the following Table describes the adjusted net need for the 20 year period.

Industrial Shortfall

Preliminary UGR finding:	5,684.9 net acres	deficit
Plus: RSIA protection effect	1,400.0 net acres	
Net Shortfall:	4,284.9 net acres	deficit

Commercial Net Need:

Preliminary UGR finding:	759.6 net acres	surplus
Less: RSIA relocated demand	900.0 net acres	
Net Shortfall:	140.4 net acres	deficit



Date: March 20, 2002

To: Andy Cotugno, Planning Director

From: Lydia Neill, Principal Regional Planner

Re: Map Atlas Release

Background

The Data Resource Center (DRC) has produced a series of maps to geographically represent the 2000 Buildable Lands inventory as well as subsets of this land that is available for residential and industrial development. The 2000 Buildable Land Inventory is based on the 2000 Vacant Land Inventory for use in the MetroScope model and the Urban Growth Report (UGR) to establish the documentation for meeting the land need.

The Metro vacant land inventory uses aerial photography and GIS tax lot base layers to identify undeveloped and partially developed tax lots. The DRC strives for a high degree of accuracy when developing this critical data set because the UGB expansion decision is ultimately based on this data. This exhaustive process is rule based and methodologically consistent year to year. The vacant land inventory has performed annually since 1990. The following criteria are applied to obtain vacant land:

- Criteria 1. Every tax lot is determined to be vacant, partially vacant or developed.
- Criteria 2. Vacant tax lots are verified to have no building, improvements or identifiable land use.
- Criteria 3. Developed lots are determined to have improvements and specific land uses (i.e. paved parking lots are classified as developed but gravel lots with trucks parked on them are not).
- Criteria 4. Lots under site development but do not contain structures are considered vacant.
- Criteria 5. If a developed tax lot has a half an acre (20,000 sq.ft.) or a greater portion of the lot that is vacant then the lot is considered partially vacant and partially developed. The vacant portion of the lot is added to the vacant land database.
- Criteria 6. Parks and Open space are treated as developed land.
- Criteria 7. During the assessment of each tax lot, no consideration is given to constrained land, suitability for building or to redevelopment potential. This is not a feasibility analysis for development purposes.

To obtain vacant buildable land a series of steps are applied to remove land that is not considered buildable. Current street right of ways, Metro Title 3 Water Quality areas, Federal/State/County/City government owned land, platted lots (less than 3/8th of an acre), major utility easements and churches/fraternal organizations are removed. The result is Vacant Buildable Acres. The results of these deductions establishes a buildable land database for regional capacity analysis of the Urban Growth Boundary (UGB) that is used in the Urban Growth Report (UGR).

The buildable land supply is then overlaid with the RLIS Standard Regional Zoning (SRZ) categories. The SRZ's are an aggregation of all zoning districts for 24 cities and 3 counties into 25 regional zoning categories. The buildable land inventory uses tax lots as the smallest level of geography for regional analysis purposes. However, displaying the data at a tax lot level is not appropriate since it would imply a level of precision that does not exist. Hence the data is presented in a more aggregate form which does not include tax lots.

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2000 Vacant Land Inventory

Existing Parks and Open Spaces Removed

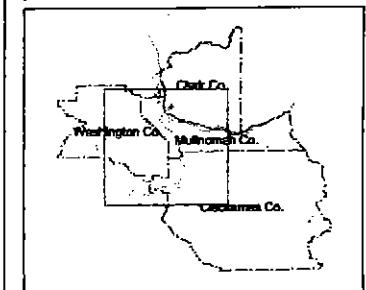
- Urban Growth Boundary
- 2000 Vacant Land Inventory
- ▨ Parks and Open Spaces

SOURCES:

TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Clatsop, Multnomah, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

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1 inch equals 3 miles

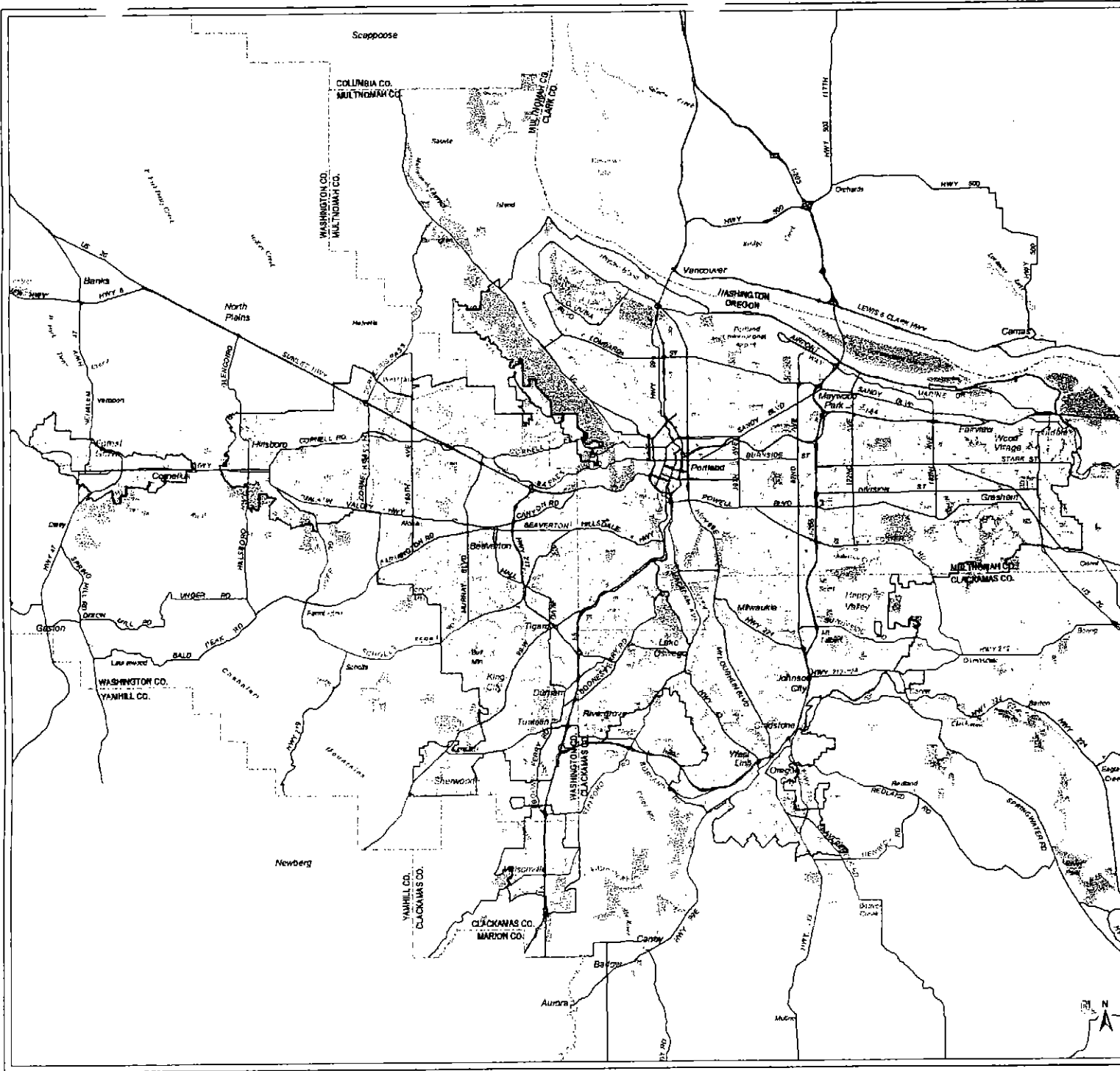


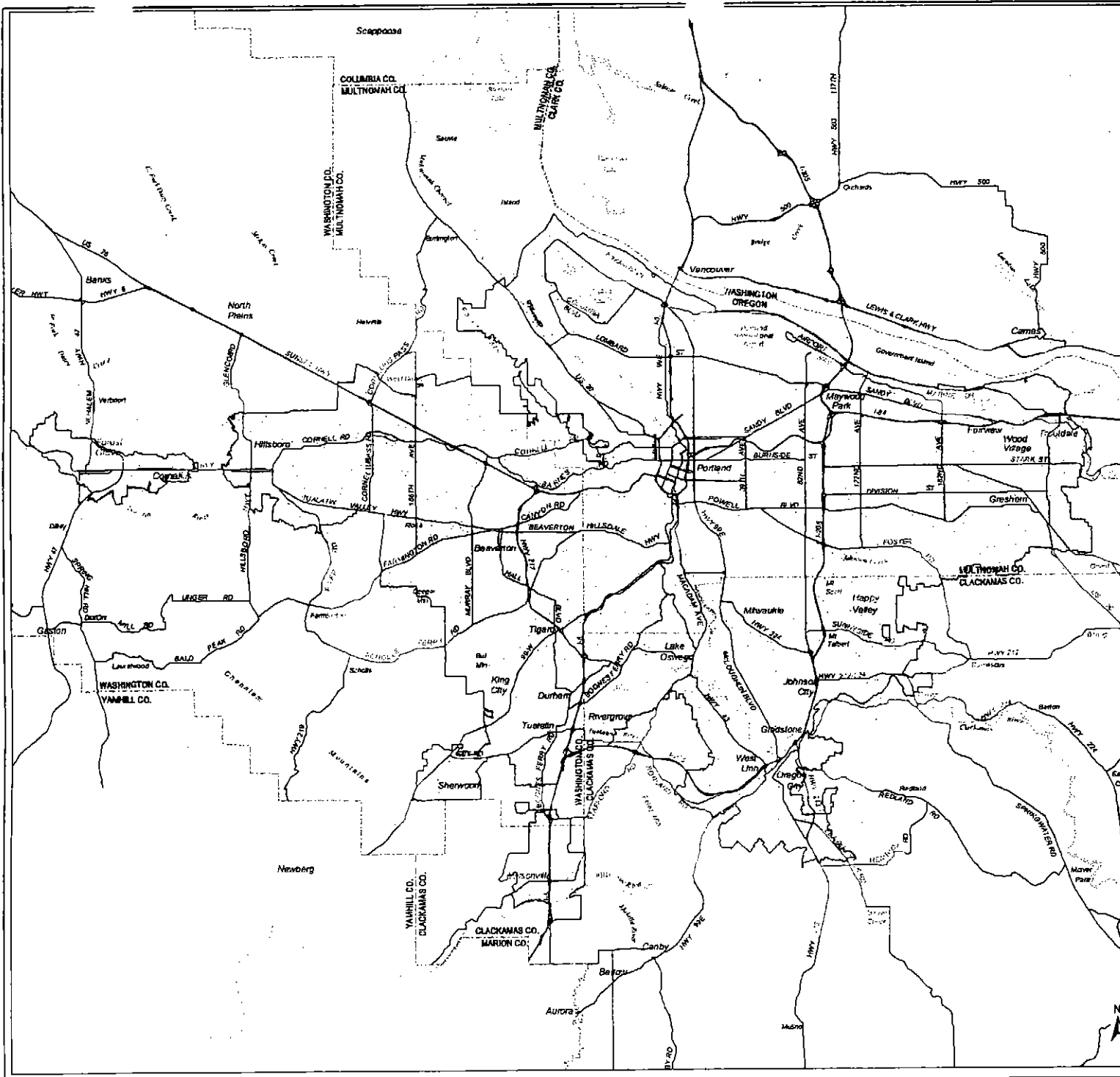
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2000 Vacant Land Inventory

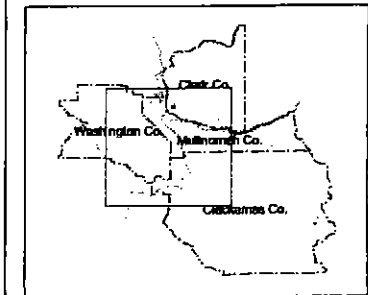
Aerial Photography
July, 2000

Urban Growth Boundary
2000 Vacant Land Inventory

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

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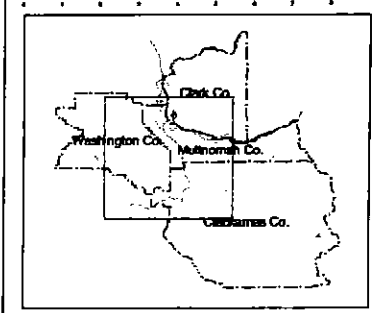
2000 Vacant Land Inventory

Platted SFR Lots
Removed

- Urban Growth Boundary
- 2000 Vacant Land Inventory
- SFR Platted Land

SOURCES:
TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.
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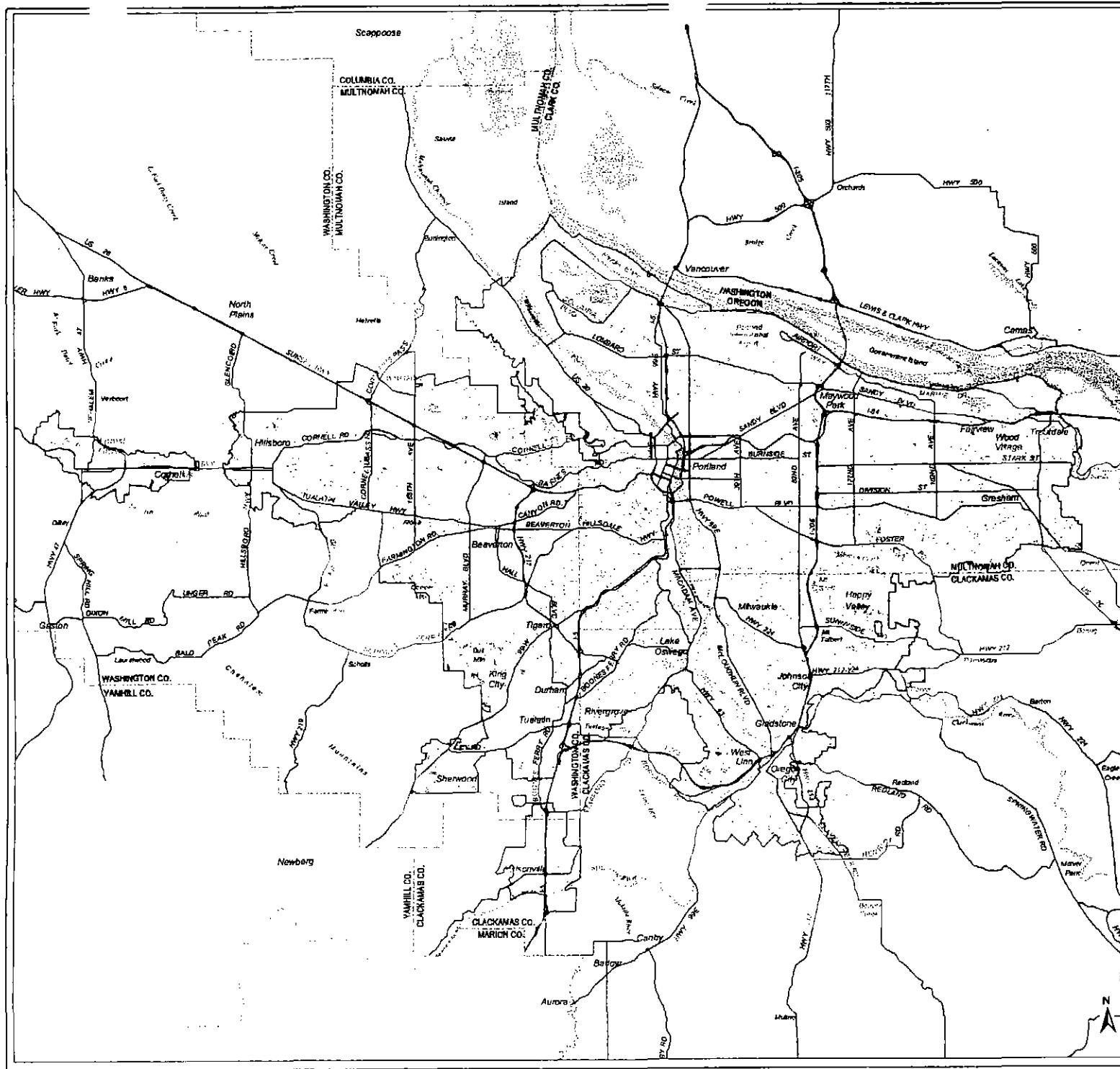
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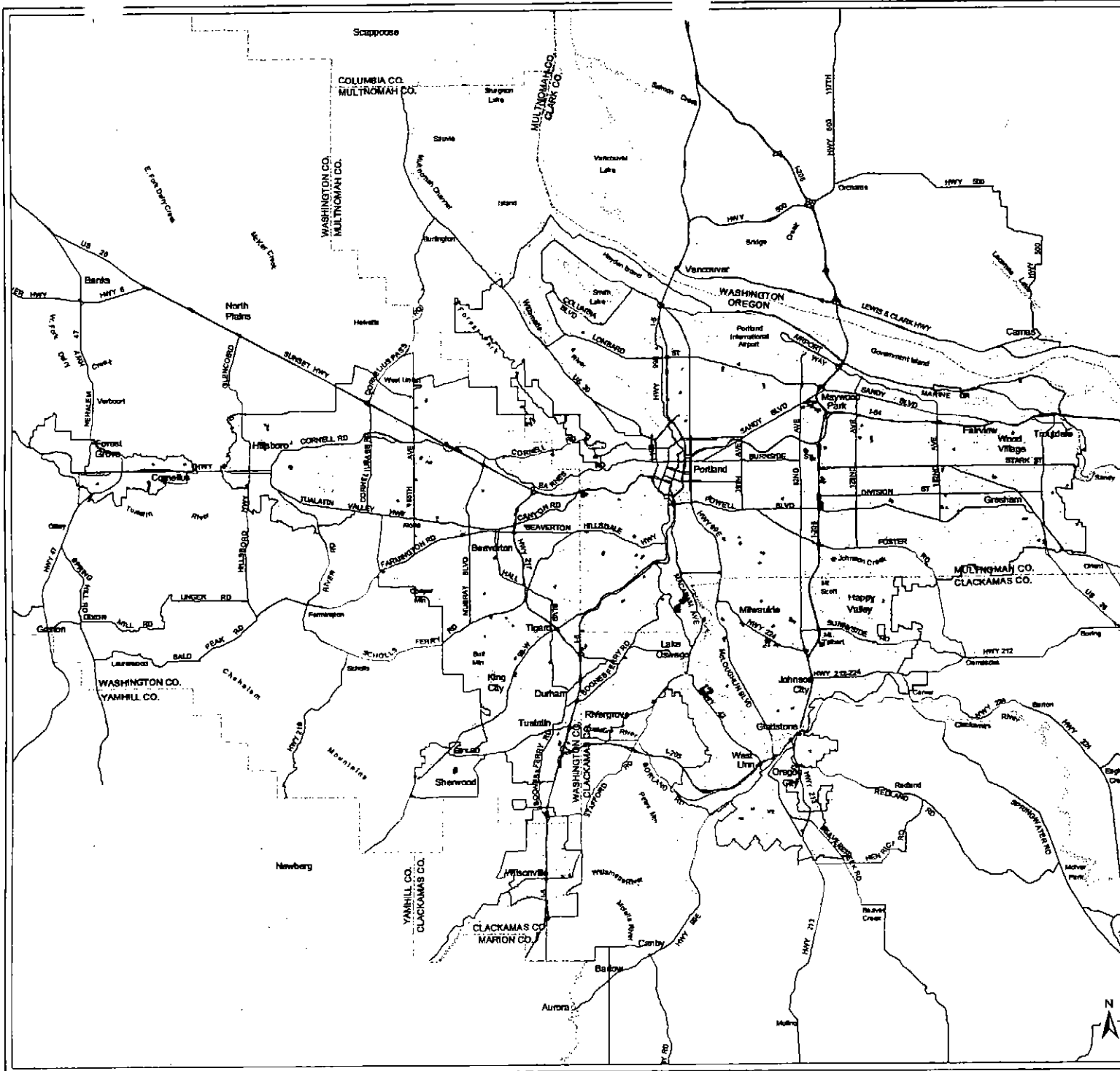


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R L I S
REGIONAL LAND INFORMATION SYSTEM

2000 Vacant Land Inventory

Land Owned by Churches and Fraternal Organizations Removed

— Urban Growth Boundary
• Church and Fraternal Organization Land
2000 Vacant Land Inventory

SOURCES:
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus one foot or better in Seaside, Hillsdale, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

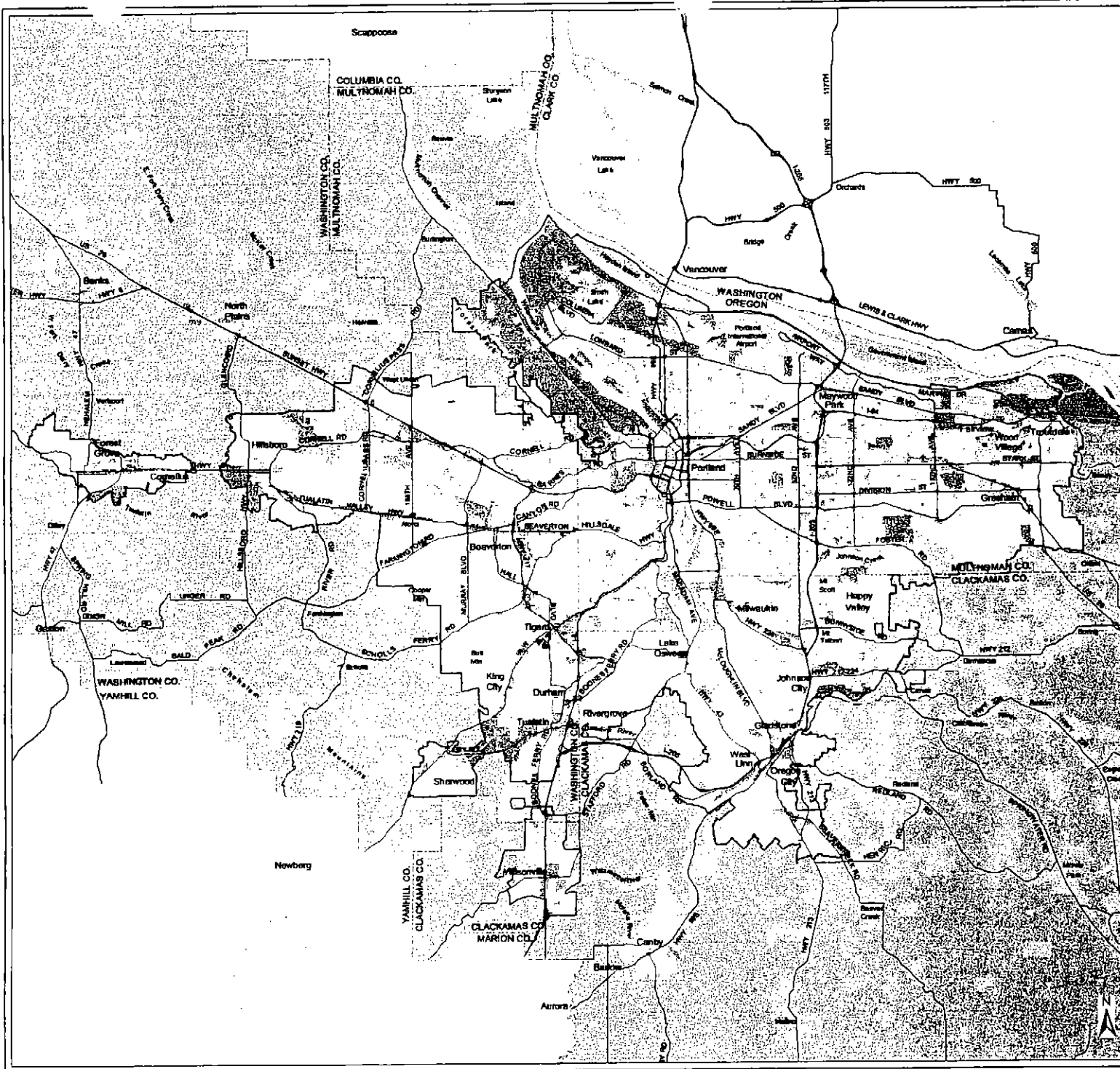
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R L I S

Standard Regional Zones

— Urban Growth Boundary

ZONE CLASS

- CC
- CS
- CR
- CRK CO
- FF
- IA
- IN
- IL
- IRU
- MR1
- MR2
- MR3
- MR4
- MUC1
- MUC2
- PF
- PDS
- RFU
- SPR1
- SPR2
- SPR3
- SPR4
- SPR5
- SPR6
- SPR7

SOURCES:

TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=250' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

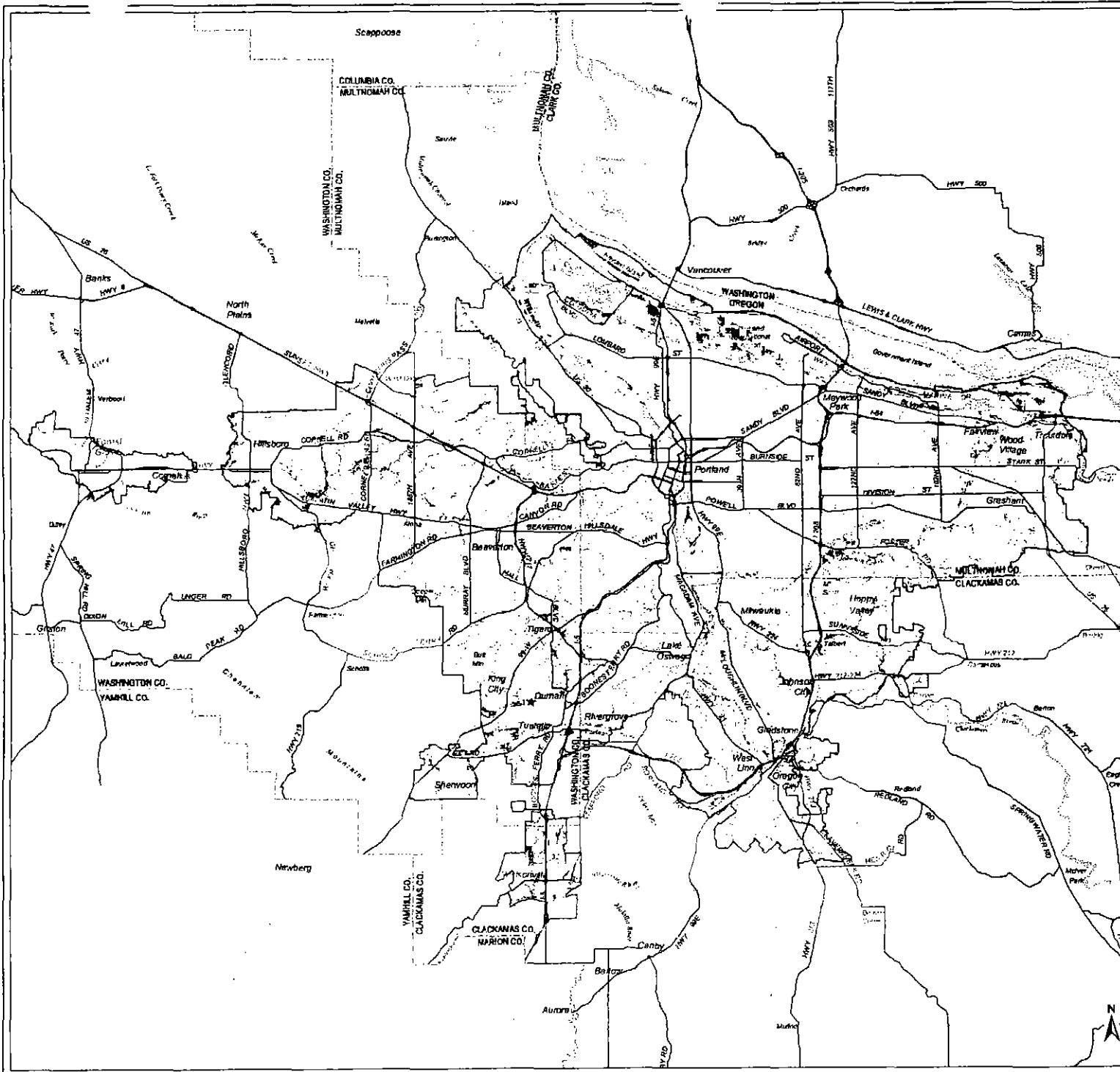
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R L S
REGIONAL LAND INFORMATION SYSTEM

2000 Vacant Land Inventory

Vacant Title 3 Land Removed

— Urban Growth Boundary
 2000 Vacant Land Inventory
 ■ Title 3 Land

SOURCES:
 TAX LOT MAP
 County Assessment and Taxation office, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Clatsop, Multnomah, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

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2000 Vacant Land Inventory

Federal, State, County, and City Government Land Removed

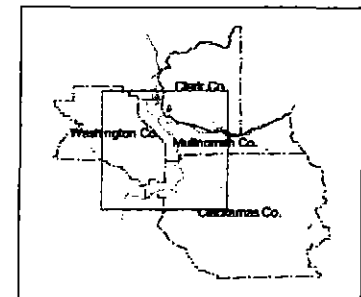
-  Urban Growth Boundary
-  Government Owned Land
-  2000 Vacant Land Inventory

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Hillsdale, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

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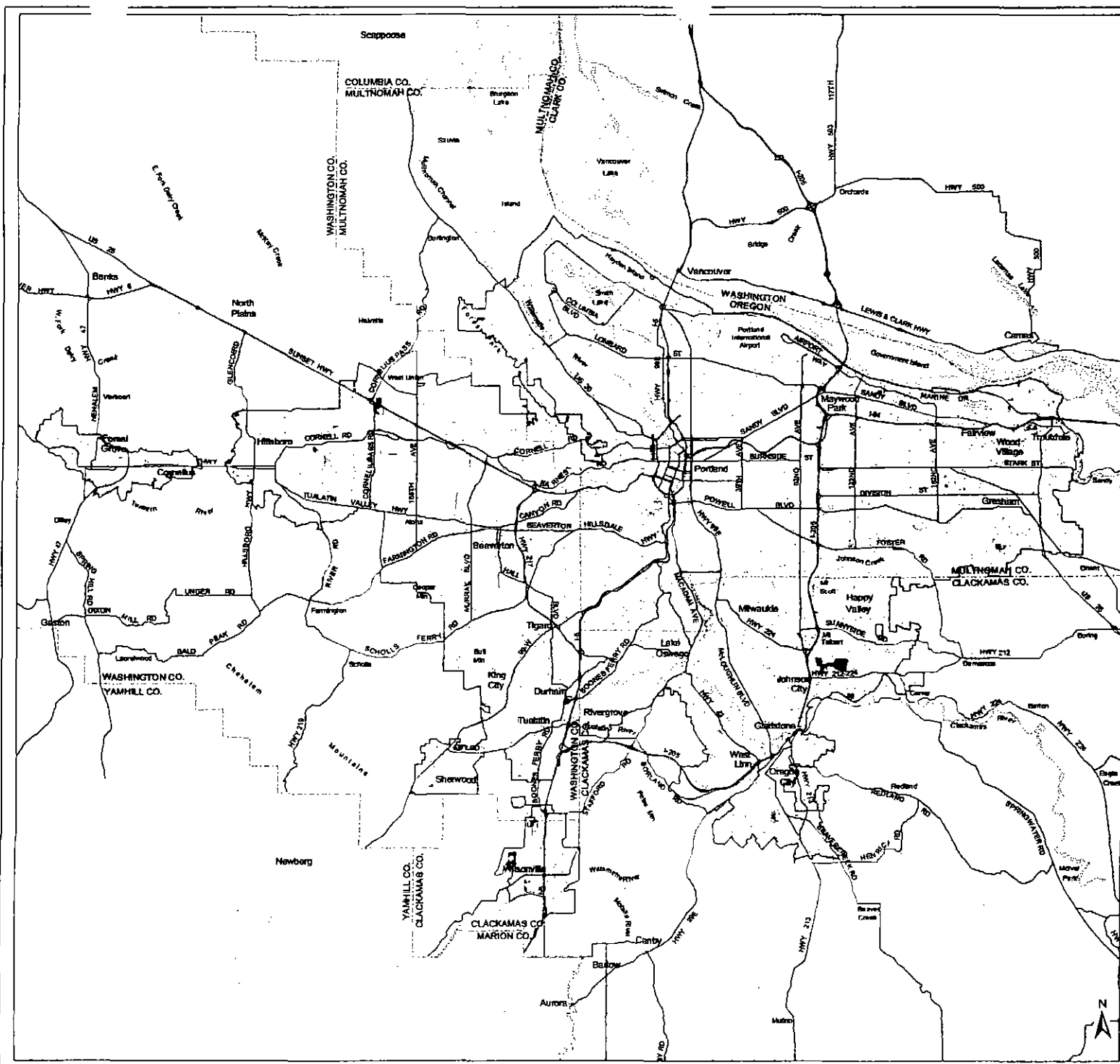
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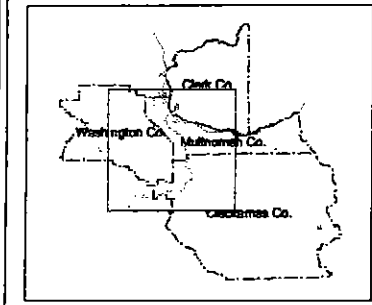
2000 Vacant Land Inventory

Major Utility Easements Removed

-  Urban Growth Boundary
-  Major Utility Easements
-  2000 Vacant Land Inventory

SOURCES:
TAX LOT MAP
 County Assessor and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.
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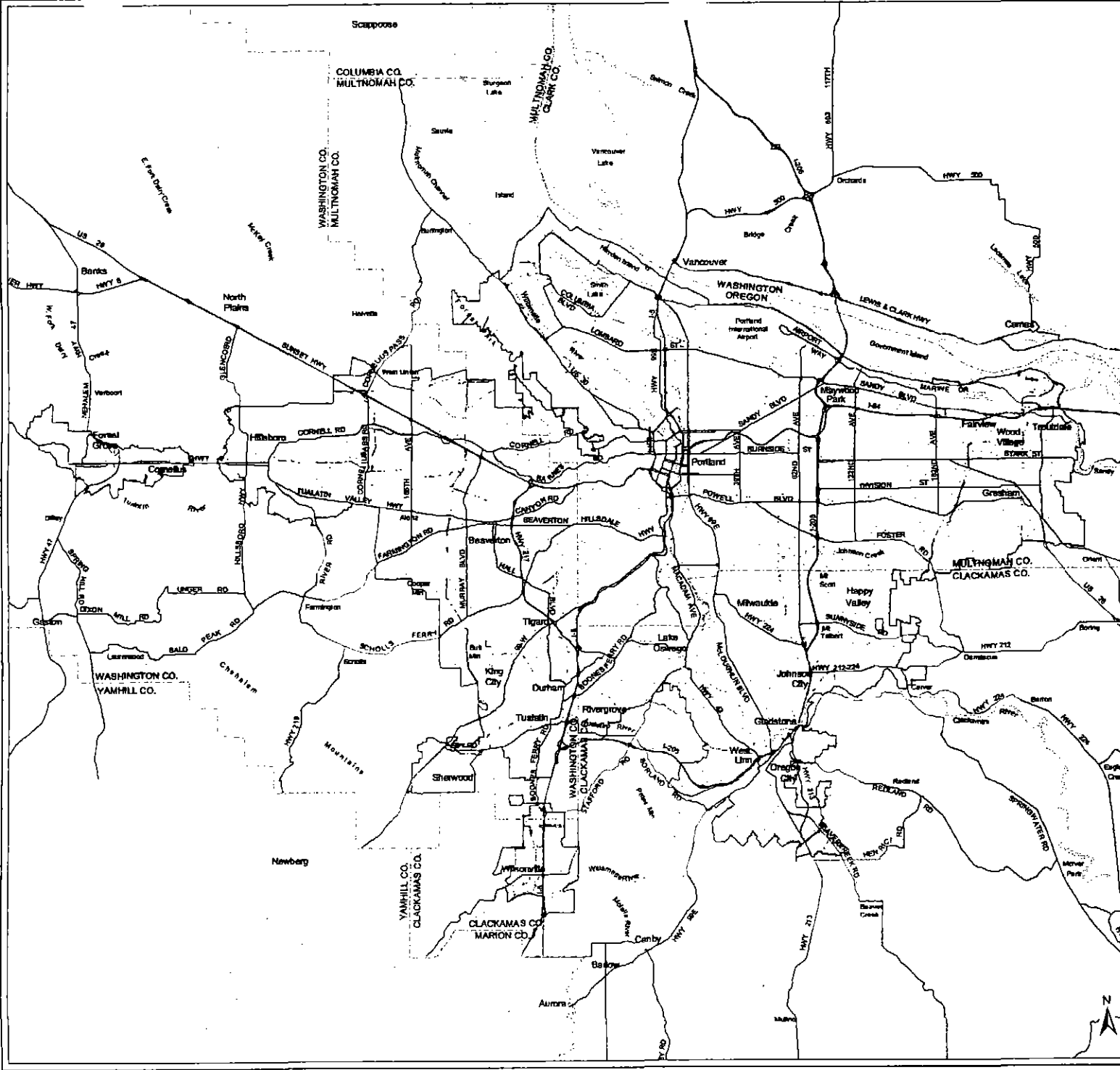
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2000 Buildable Land Inventory

- Buildable Land is the Vacant Land Inventory Minus:
- Parks
 - Government Owned Land
 - Church and Fraternal Organization Owned Land
 - Land Protected by Title 3
 - Platted Single Family Lots
 - Major Utility Easements

— Urban Growth Boundary

Standard Regional Zones

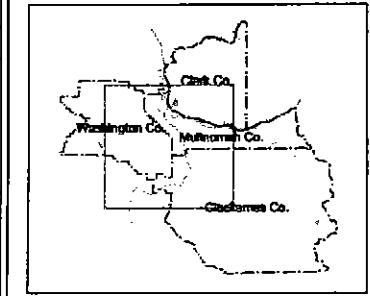
-  Commercial
-  Industrial
-  Multi-family
-  Single Family

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

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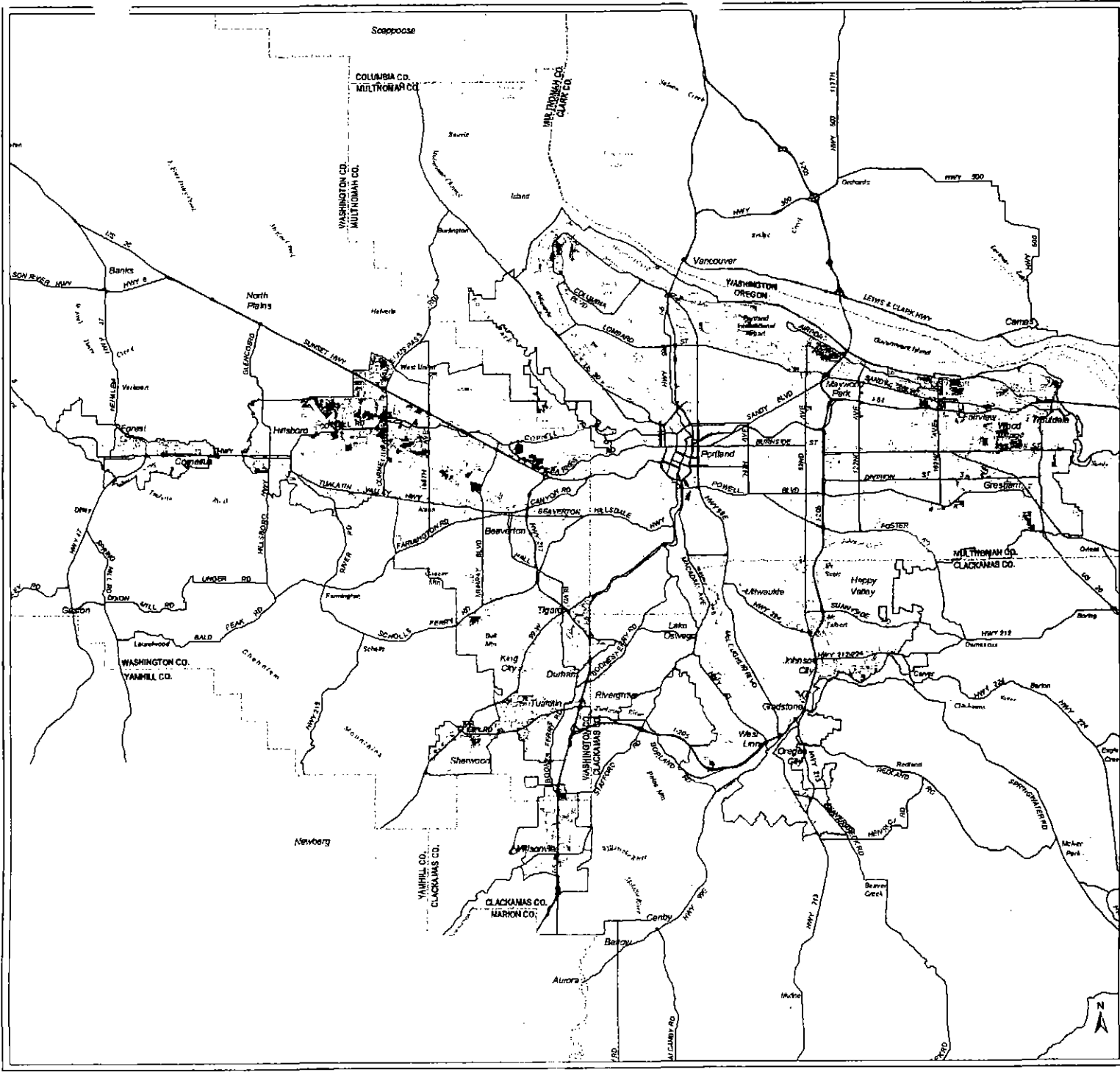
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Metro Report

Appendix A
Item 6
Ordinance 02-969 B

2002 Alternative Analysis Study

August 2002
Updated December 2002



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PEOPLE PLACES
OPEN SPACES

Metro

People places • open spaces

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METRO 2002 ALTERNATIVES ANALYSIS – JULY 2002

1 INTRODUCTION

As part of the state requirements to maintain a 20-year land supply for residential uses, Metro recently completed an assessment of approximately 75,000 acres of land around the current Urban Growth Boundary (UGB). The purpose of the Metro 2002 Alternatives Analysis is to assist the Metro Council in evaluating this land for its suitability for urbanization. The information in this analysis will help Metro determine which of the selected study areas merit further consideration as candidates for inclusion in the UGB.

The analysis focuses on four different types of lands based upon the hierarchy established in state law ORS 197.298. The hierarchy corresponds to the statutory priority for inclusion of land within the UGB. The law directs Metro to look first to "exception land" (land already partially urbanized, land with poor soils for agriculture, or reduced lot size) before considering farm or forest land. The analysis did not evaluate Class I and II agricultural soils because they are the last resort for inclusion in the UGB.

The intent of this analysis is to provide the Metro Council with a very general set of technical information. It is beyond the scope of the analysis to provide a detailed, site planning level of analysis for each of the 94 areas. Furthermore, it would be nearly impossible for a study of this scale to evaluate each possible sequence of urbanization, and the likely effects on surrounding areas under each sequence.

The structure of this report is framed by the locational factors of Statewide Goal 14. There are seven factors in Goal 14, four of which are known as locational factors. The following list shows these four factors, where in the report an analysis of each can be found, and the author of each analysis.

- *Factor 3 – Orderly and economic provision for public facilities and services.*
Sections 2.2 and 2.3 set out the methodology for analyzing the feasibility of providing the study areas with public services and transportation services. The public services include water, sewer, and stormwater. Parametrix, Inc., Metro's consultant, completed this analysis. Appendix A sections A2 and A3 contain tables and summary descriptions of the final assessment for the public services and transportation components by study areas. Appendices B and C go into more detail on the ranking of the study areas.
- *Factor 4 – Maximum efficiency of land uses within and the fringe of the existing urban area.*
Parametrix completed a land productivity assessment in two phases over two years. The methodology for this assessment is found in section 2.1 of the report. Appendix A1 contains a summary in tabular form of the dwelling unit productivity estimates of all study areas.
- *Factor 5 – Environmental, energy, economic and social consequences.*
Metro staff completed an analysis to address this factor, also known as an ESEE analysis. Section 2.4 of this report describes the purpose, process and description of the four components of Factor 5. The environmental component of the ESEE analysis was completed on an individual study area basis. The overall environmental consequence rating for each study area can be found in Appendix A, Table A-6. A summary of the environmental consequences for each study area can be found on the study area summary sheets in Section 3 of this report. The energy, economic and social components were

analyzed for groups of study areas rather than on an individual study area basis. A summary of the consequences for these can be found in Appendix A section A4.

- *Factor 6 – Retention of Agricultural Land*

Application of this factor is carried out through the hierarchy of tiers as defined in state law ORS 197.298. Based on this law plus three natural area constraints applied by Metro staff, the Metro Council adopted the Alternative Analysis Study Areas map in December 2001 (see Appendix F). While the state defines six tiers of land, Metro only studied land within the first four tiers. The four tiers, contained within five categories, are defined as follows:

- Tier 1: Exception lands contiguous to the UGB and EFU land (non-high value) completely surrounded by exception land
- Tier 1A: Exception lands not contiguous to the current UGB that will be considered if expansion on resource land that is contiguous is considered
- Tier 2: Marginal lands, a unique classification of non-resource land in Washington County that allows dwellings on EFU land
- Tier 3: Resource land that may be needed to provide public services to adjacent exception land that may be added to the UGB
- Tier 4: Resource land, majority class III & IV soils, some class I & II soils, no irrigation district

- *Factor 7 – Compatibility of the proposed urban uses with nearby agricultural activities.*

Section 2.5 of this report is an analysis of the compatibility of proposed urban development with agricultural activities nearby the study areas. Metro staff worked with the Oregon Department of Land Conservation and Development (DLCD) to develop a methodology by which to assess this factor. Table A-7 in Appendix A shows the compatibility ratings for each study area.

The report starts with an explanation of the methodology used to evaluate each study area site. Following this section is a chapter containing individual study area descriptions. These descriptions include summary tables with some basic quantitative information for each area, as well as descriptive information about each area's site characteristics, development patterns, physical attributes, zoning and environmental features. The feasibility of serving each area is also described in this section. The final section, Conclusion, is a brief description of applying the Goal 14 factors and results of the study areas' suitability for urbanization.

2 METHODOLOGY

2.1 PRODUCTIVITY ASSESSMENT

The alternative analysis was conducted in two phases over two years by a team of consultants. Pacific Rim Resources completed the Phase I analysis in August 2000. Parametrix, Inc., with assistance from ECONorthwest completed the phase II analysis in July 2002. In the Phase I analysis, land productivity assessments were generated for 28 areas, totaling approximately 25,000 acres. For Phase II, 50,000 acres of land were identified for further study, most of which had *not* been evaluated in Phase I. In summary, the addition of Phase II areas has expanded the total pool of land under consideration for urban growth boundary expansion to over 75,000 acres. This land is contained in 94 separate study areas throughout rural Clackamas, Multnomah and Washington Counties.

Prior to completing the Phase II analysis, Metro stakeholders, staff, and the consultant team considered the possibility of reevaluating some of the productivity assumptions applied in the initial Phase I study. Some changes to the Phase I assumptions for build out was desired to better reflect policy objectives. In addition, between the time that the Phase I and Phase II analyses were completed, Metro amended the regional 2040 design type designations for some of the Phase I study areas, adding a number of Corridors, and refining the boundaries of some Employment and Industrial areas. Anticipating the effect of these changes on the original productivity estimates, a new set of build out estimates was generated for all study areas using the updated assumptions described herein.¹

The following section describes the nine-step methodology used to carry out the build out assessments. Final build out numbers appear in the summary Table A-1 in Appendix A. Table 2-1 below shows a break out of the acreage that has been evaluated in Phase I and II.²

Table 2-1: Summary of Study Area Acres

Phase	Total Acres	Acres in Parcels ³
Phase I ⁴	27,667	25,820
Phase II	49,978	47,774
Total	77,645	73,594

The productivity assessments conducted for this study follow general procedures used for most buildable lands studies. Vacant areas are first identified. Areas that are unbuildable and environmentally sensitive are then removed from vacant lands. Specific categories of tax-exempt lands are also considered unbuildable, as well as high value areas that are unlikely to

¹ The Phase II build out methodology uses data from Phase II areas to generate one or two of the new productivity assumptions, most notably redevelopment. As a result of the decision to run new build out estimates for Phase I areas, as well, these new assumptions have been applied to *all* Phase I and II areas.

² Parametrix, Metro's consultant, made some modifications to the spatial data set originally generated for this study. This was primarily carried out to address places where very small study areas contained portions of very large tax lots. Details on these adjustments are provided at the beginning of Chapter 3 Study Area Descriptions.

³ "Acres in Parcels" excludes road right-of-way located outside of a tax lots, such as roads and right-of-way areas.

⁴ As noted above, approximately 35,000 acres were studied in the Phase I Analysis. A few Phase I areas, however, were evaluated again in Phase II. These areas appear in the Phase II totals above, and are considered Phase II areas for this report.

develop. The inventory of vacant land is then reduced to account for future streets and public facilities needed to accommodate urbanization.

This analysis also carries forward two basic principles used in the Phase I methodology, with slight modifications. First, some developed parcels with low improvement values will redevelop at higher densities in the future. Second, some development will occur in environmentally constrained areas, or will occur as a transfer of density from these areas onto buildable areas.

The majority of tabular data used in this analysis has been generated from Geographic Information Systems (GIS). In GIS, digital, coordinate-based spatial data layers are used to represent real world features such as tax lots, vacant and developed areas, wetlands and floodplains, and zoning areas. All of the GIS data used in this analysis are from Metro's Data Resource Center (DRC).

Of course, electronic data representing real world features are rarely perfect. Data representing features like floodplains and tax lots will have some positional inaccuracies, which, in turn, will be reflected in numbers representing them. In addition, much of the assessment information that is included in Metro's Regional Land Information System (RLIS) database comes directly from county assessment offices, where local updates may be conducted at different intervals. For a variety of reasons such as these, the study helps to point out general patterns, but is not intended to be accurate at extremely small levels of geography.

The following section walks through the set of steps behind the productivity estimates. Specific departures from the previous Phase I methodology are noted throughout the discussion.

Step 1: Determine which lands within the study areas are vacant

In this study, two separate procedures are necessary to determine vacant and developed areas. Metro's vacant lands inventory is used for most areas. For remaining areas that have not been inventoried by Metro, vacant land is estimated using an alternative procedure, described herein.

For most of the analysis area, Metro's vacant lands inventory is used. Metro DRC has been producing a vacant lands inventory almost every other year since 1990 and each year since 1996. The vacant lands inventory is based on orthorectified aerial photography covering the entire urban growth boundary and a good portion of land beyond it. Each year Metro updates the vacant lands inventory by reviewing current aerial photographs against the previous year's vacant lands data. Areas that appear to have become developed are removed from the vacant areas coverage. Building permit information is also used to help flag those areas that are no longer vacant. The most recent vacant lands inventory, and the one used in this report, is based on digital aerial photography from July of 2000.

Definition of vacant land follows specific guidelines:

Fully vacant parcels: are those with no improvement value or with no building.

Fully developed parcels: are those with an improvement value or building. Parks and open spaces, however, are defined as developed.

Partially vacant/developed parcels: are those with a developed portion of a tax lot, as well as an undeveloped portion that is larger than ½ acre. Typically, the area with a house or building(s), as well as surrounding paved areas, would be considered "developed". For

partially vacant/developed parcels, the developed portion is added to the developed lands inventory. The vacant portion is added to the vacant lands inventory.

Table 2-2 below shows a breakdown of vacant and developed lands inside and outside of Metro's vacant lands inventory for all Phase I and II study areas.

**Table 2-2: Vacant and Developed Acres (in Parcels)
Inside and Outside of Metro's Land Inventory**

Classification	Inventoried Acres	Non-Inventoried Acres	Total Acres
Vacant	46,704	0	46,704
Developed	14,134	4	14,138
Unclassified ⁵	0	12,756	12,756
Total Acres	60,839	12,760	73,598

Source: Metro RLIS. Data Processing by Parametrix.

Approximately 17 percent of all land studied in Phase I and II extends outside of the area inventoried by Metro. An alternative procedure is thus necessary to estimate vacant lands for these remaining areas. ECONorthwest assisted Parametrix in developing this approach, which is summarized briefly in this section. It is explained in greater detail in the memorandum shown in Appendix D of this report.

First, tax lots in Phase II study areas that had been inventoried by Metro were tabulated by size and land use classification to discern a pattern⁶. Generally, smaller parcels have less vacant land. In addition, parcels that are not in single family, agricultural, or rural use usually have less vacant land.

Next, the pattern is converted to an algorithm, shown in Table 2-3.⁷

**Table 2-3: Estimate of Developed Area Ratio
For Parcels Outside Metro's Land Inventory**

Land Use	Small Parcels (< 2.5 acres)	Larger Parcels (>= 2.5 acres)
Agriculture	30%	7.5%
Commercial	80%	80%
Forestry	20%	5%
Industrial	80%	80%
Multi-Family	50%	50%
Public	100%	100%
Rural Residential	60%	20%
Single Family	80%	50%
Vacant	25%	25%
Unclassified	20%	20%

Source: Metro RLIS. Data processing by Parametrix. Analysis by ECONorthwest.

⁵ Unclassified parcels are tax lots that according to the county assessor do not have a land use classification assigned.

⁶ Land use assessment classifications are a feature in Metro's RLIS database. The data are collected by Metro from local county assessment offices.

⁷ Note: Please see the memorandum from ECONorthwest, shown in Appendix D, for a discussion of this algorithm.

The developed land within these parcels is estimated as a function of the parcel's land use code and its size. Parcels outside of Metro's inventory with no improvement value, as indicated by assessment data, are first filtered out and assumed to be fully vacant before applying the developed area ratios above.

As indicated in the table above, land use classifications include a classification of "Vacant". However, it has been observed that land use codes have some inaccuracies, which is why this method assumes a limited amount of developed area within such parcels. In addition, there are some tax lots with no land use classification (*Unclassified*). These tax lots have been assigned a developed area ratio of 20 percent.

The following table shows a breakout of the final vacant and developed acres in both the areas that were inventoried, as well as the areas that were not inventoried, but estimated, using the algorithm above. Vacant areas total 56,793 acres.

Table 2-4: Total Vacant and Developed Areas

Classification	Inventoried	Non-Inventoried (Estimate)	TOTAL
Vacant Areas			
In Fully Vacant Parcels	10,156	2,913	13,069
In Partially Vacant / Developed Parcels	<u>36,549</u>	<u>7,175</u>	<u>43,724</u>
<i>Sub-Total</i>	46,705	10,088	56,793
Developed Areas			
In Partially Vacant / Developed Parcels	7,792	2,668	10,460
In Fully Developed Parcels	<u>6,341</u>	<u>0</u>	<u>6,341</u>
<i>Sub-Total</i>	14,133	2,668	16,801
TOTAL	60,838	12,756	73,594

Source: Metro RLIS. Data Processing by Parametrix.

Step 2: Remove environmentally constrained areas from vacant areas.

Another important characteristic of Metro's vacant lands data is that an area defined as vacant may not necessarily be buildable. Therefore, the next step in a buildable lands study is to subtract those areas that are environmentally constrained. The following environmentally constrained areas are removed from vacant lands.

- Title 3 Water Quality and Flood Management Areas, consisting of:
 - *Flood Hazard Areas*
FEMA floodplains and 1996 flood inundation areas.
 - *Wetlands*
From an enhanced National Wetlands Inventory and local wetlands inventories.
 - *Wetland Areas*
50 feet from the edge of wetland or up to 200 feet from the edge of wetland located adjacent to steep sloped areas (slopes > 25 percent).

- *Riparian Areas*

Variable riparian corridor between 15 feet and 200 feet depending upon the area drained by the water feature and the slope of the land adjacent to the water feature, as detailed in Title 3 of the Urban Growth Management Functional Plan.

- Slopes greater than or equal to 25 percent.

Metro maintains GIS data files representing the features described above, which have been used in this study. Data layers representing environmentally constrained areas are “clipped” out of the data layer representing vacant areas, leaving only those areas that are vacant and buildable.

The following table shows a breakdown of environmentally constrained areas in Phase I and II study areas that have been removed from the vacant lands supply.

Table 2-5: Vacant Environmentally Constrained Areas

Type of Area	Total Acres
Title 3 Areas	
Title 3 Water Resource Areas	3,865
Title 3 Slopes	1,257
Slopes (> 25%)	<u>5,816</u>
Total Constrained Acres	10,938

Source: Metro RLIS. Data processing by Parametrix.

Title 3 regulations apply only to areas within the Metro jurisdictional boundary. As much of the area under study extends beyond this boundary, Metro has constructed a supplemental data layer representing Title 3 protections for areas that might be brought into the urban growth boundary at a later date. It is expected that if and when any of these study areas are amended to the urban growth boundary, they would be annexed to the Metro jurisdictional boundary first, making Title 3 effective.

As a modification to the approach used in the Phase I Alternatives Analysis, density transfers are now assumed to occur from vacant land in Title 3 water resource areas at densities roughly similar to those permitted on adjacent buildable lands. Density transfers are not assumed to occur from steep sloped areas. More detail on these procedures appears in the following steps.

As one additional note, we have considered the possibility that this step slightly overestimates the amount of vacant, environmentally constrained land that is removed from vacant land. This is because, in areas outside of the vacant/developed lands inventory, environmentally constrained lands are assumed to be vacant, and are removed from *estimated* vacant lands, even though a small amount of these constrained areas could be developed. Further investigation revealed that these constrained areas frequently occur in tax lots classified as vacant, forest or agriculture – areas assumed to be largely vacant (Table 2-3). For this reason, the current assumption is not expected to dramatically skew the final results.

Step 3: Remove some categories of tax-exempt parcels.

Some categories of tax-exempt lands, consisting of Federal, State, County or City-owned properties, are identified from tax codes in the assessment database. Specific tax-exempt codes removed from consideration are shown in Table 2-6.

Table 2.6: Removed Tax Codes

County	Tax Exempt Codes
Clackamas	17, 19, 22, 28,
Multnomah	01, 02, 03, 04
Washington	900, 905, 910, 915

As noted earlier, Metro defines parks and open space areas as developed. Therefore, they do not need to be removed from the vacant land inventory.

Step 4: Remove future land needed for streets, parks, schools and churches/fraternal organizations.

As urbanization proceeds, some additional land will be necessary to accommodate different types of public facilities. In particular, future streets, parks and schools should be expected to absorb some of the vacant land supply. In this analysis an estimate of future land needed to accommodate these uses is applied to every vacant parcel, thereby reducing the available area on that parcel. The reduction estimates are consistent with the percentage reductions used in the 2000 analysis except for future parks which is recommended at 2.2 percent instead of 9.8 percent that was used in earlier reports. The reduction for future streets is consistent with the September 1999 Urban Growth Report update. This update changed street reductions for parcels over an acre to 18.5 percent, which is a reduction from the previously used 22 percent. This change was made based on a Metro study of subdivision development. These estimates are applied to all parcels equally, as one cannot accurately predict where such uses would occur.

- *Future Streets:* For parcels greater than one acre, 18.5 percent of the parcel areas is assumed to go towards future streets; for parcels between one acre and 3/8th of an acre, 10 percent of the parcel area is assumed to go towards future streets; for parcels less than 3/8th of an acre, the parcel is assumed to be fully serviced, and no land is removed for future streets.
- *Future Parks:* A global estimate of 2.2 percent is removed from all areas to account for future park needs.
- *Future Schools:* A global estimate of 2.9 percent is removed from all areas to account for future school land needs.
- *Future Churches/Fraternal Organizations:* A global estimate of 1.8 percent is removed from all areas to account for future land needs for churches and fraternal organizations.

The following table shows steps 2 through 4, described above.

Table 2-7: Vacant Lands Less Unbuildable Areas

Total Vacant Area	<u>56,793</u>
Less Vacant Environmentally Constrained Areas	10,938
Less Vacant Tax Exempt Areas	256
 Gross Vacant Buildable Acres	 <u>45,599</u>
Less Future Streets	8,222
Less Future Parks	1,003
Less Future Schools	1,322
Less Future Churches/Fraternal Organizations	821
 Remaining Acres	 <u>34,231</u>

Source: Metro RLIS. Data Processing by Parametrix.

Step 5: Remove vacant land on tax lots with higher value homes.

This analysis assumes that some vacant areas surrounding parcels with a high-value home (which would define them as partially vacant/developed parcels) will not be available for development.

As noted earlier in the discussion of Metro's vacant lands inventory, Metro defines both fully and partially vacant parcels. Fully vacant parcels have no improvement value or building. Partially vacant parcels, by contrast, may have a developed portion, but must have a vacant portion that is at least 1/2 acre.

The definition of partially vacant parcels reflects the possibility that a property owner may choose to partition the vacant area from the parent parcel at some time in the future. Other studies have confirmed this pattern.⁸ It is additionally recognized, however, that larger parcels with higher value homes may not be as likely to partition their vacant areas. To address this, the study sets a building value threshold for partially vacant parcels. Where the improved value of a partially vacant parcel is above a specific dollar amount, the vacant land *within* that parcel is removed from the vacant land inventory. No dwelling unit capacity is estimated for that area.

The question of how to determine the appropriate threshold has been subject to a good deal of discussion. One possible approach, presented in Table 2-8, is to examine parcels that have urbanized. The table shows a sample of approximately 12,000 developed parcels one mile *inside* of the urban growth boundary. The parcels are classified by building value and by size groupings, ranging from 0 – 10 acres.⁹ The total acreage breakout is expressed as percentages, with cluster values above 1 percent highlighted.

⁸ Please see the Residential Refill Study, Metro Growth Management Services, February 1999.

⁹ Parcels one mile inside of the UGB were selected to reflect development trends in areas that may have developed relatively recently. This table defines developed parcels as those with a building value above \$10,000. Includes land use codes associated with residential use, but not multi-family use. Cells with values above 1 percent are highlighted.

**Table 2-8: Developed Parcels One-Mile Inside of the Metro Urban Growth Boundary ¹⁰
Total Acres as a Percent of Area Evaluated**

Building Value Groups (\$'000's)	Parcel Size Classifications (Acres)						Total
	0-.25	.25 - .5	.5 - 1	1 - 2.5	2.5 - 5	5-10	
0-50	1.61%	0.97%	0.62%	0.98%	0.98%	1.20%	6.35%
50-100	10.77%	8.84%	2.55%	2.40%	1.91%	1.59%	35.07%
100-150	17.02%	4.76%	1.93%	2.62%	1.57%	1.28%	29.08%
150-200	6.47%	1.97%	1.14%	1.56%	0.83%	0.51%	12.49%
200-250	2.94%	1.68%	0.54%	0.98%	0.46%	0.45%	7.05%
250-300	1.01%	1.39%	0.38%	0.35%	0.18%	0.23%	3.54%
300-350	0.40%	0.97%	0.36%	0.33%	0.30%	0.35%	2.71%
350+	0.32%	1.46%	0.76%	0.50%	0.30%	0.37%	3.70%
Total	49.54%	20.04%	8.28%	9.63%	6.53%	5.99%	100.00%

Source Metro RLIS. Data Processing by Parametrix.

The most evident pattern is, of course, the high percentage of parcels in the smaller size classifications, as well as in the lower value ranges. Even within categories at and above the \$250,000-\$300,000 improvement value range, however, well over half of the developed land is on parcels smaller than ½ acre.

This table does not indicate the size at which vacant areas are likely to partition off of developed areas. It does suggest a “comfort zone”, in terms of size and building value, for improved parcels in areas that have urbanized.

While it is clear that higher value homes do occur on smaller parcels, one should not assume that all rural parcels with comparable improvement values will gravitate towards the same urban sizes. The act of partitioning single properties in rural areas is often more difficult from the site development standpoint, particularly without site development requirements to help maximize efficiency. As a counter argument, since this analysis assumes a 20-year timeframe, it is also reasonable to assume that *some* partitioning will occur on properties that, today, would not have activity.

While one might argue that owners of properties with building values as high as \$300,000 could comfortably partition their vacant areas, we are suggesting here (and applying in this analysis) a building value threshold of \$250,000 for partially vacant parcels. This means that vacant areas on partially vacant parcels that have an improvement value at or above \$250,000 are removed from the vacant lands inventory, and assumed to have no additional capacity for residential development.

¹⁰ Metro's vacant/developed areas coverage was not used to define “developed” parcels. Use of Metro's developed lands data would likely show even *fewer* large developed parcels. By Metro's definition, as the improved parcel increases in size, more of it is likely to be clipped out as “vacant”. For this tabulation, the use of assessment values gives a more unbiased impression of the clustering that occurs within smaller size groups.

Table 2-9: Removal of High-Value, Partially Vacant Parcels

Total Remaining Acres from Previous Step 4	34,231
Less Vacant Areas Surrounding Improved Parcels > \$250,000	4,942
Net Vacant Buildable Acres	29,289

Source Metro RLIS. Data Processing by Parametrix.

Step 6: Estimate build out on net vacant buildable acres.

Metro has defined the design types for each of the Phase I and II study areas. The residential densities applied for design types, as shown below, are based on established Metro policies.

Table 2-10: Design Types Densities

Metro 2040 Design Type Designation	Build Out Density (dwelling units per net acre)
Inner Neighborhood	9.6
Outer Neighborhood	7.3
Town Center	14.1
Corridor ¹¹	14.1 * 30%
Employment Area	-
Industrial Area	-

Source: Metro Regional Services

As a side note, tax lots in this study were assigned a Corridor designation if more than 50 percent of their total area falls within the delineated Corridor. For these parcels, 30 percent of the area is assumed to go towards residential use; the remainder goes towards non-residential use.

As noted earlier, employment build out estimates are not included in this study.

Step 7: Apply an “underbuild” factor of 20 percent.

“Underbuild” is the difference between the maximum density allowed, and the density that is likely to actually occur. The use of an underbuild factor addresses the possibility that not all development will occur at maximum densities. In addition, the underbuild factor accounts for site planning constraints and site configuration issues that may prevent a tax lot from being developed as efficiently as possible.

For this study, development is assumed to occur at densities that are 20 percent lower than the maximum permissible. Residential build out estimates are, thus, reduced by 20 percent. The total number of dwelling units on vacant land, including the underbuild factor, is 176,286.

¹¹ The assumption that 30 percent of Corridors are used for residential purposes, with the remaining 70 percent going towards non-residential uses, is based on previous Metro studies.

Step 8: Estimate dwelling units occurring in environmentally constrained areas or from possible density transfers out of riparian areas.

For fully vacant residential parcels that are partially constrained by riparian areas, the amount of land defined as a Title 3 water resource area determines the number of units that could occur through a density transfer. The area equivalent to the water resource area is first reduced by 20 percent to account for necessary access ways and/or facilities. The figure is then multiplied by the respective design type density for that area, and then reduced by an additional 20 percent to account for underbuild. Density transfers are not assumed for steep sloped areas. Tax-exempt parcels and non-residential areas are excluded from all of these estimates.

For fully vacant residential parcels that are close to fully (95 percent or more) encumbered by riparian areas or steep slopes, one unit per parcel is assumed. This addresses the likelihood that a "hardship variance" would be granted under this type of situation. The total number of dwelling units on environmentally constrained land is 4,281.

Step 9: Estimate units expected to occur through redevelopment.

As one of the final steps in the analysis, an assumption is made for the amount of land defined as developed that may redevelop at higher densities in the future. An analysis of the relative size and improvement value of study area parcels illustrates a relationship between the two that was converted into an algorithm. The algorithm, and associated tables and text, is explained in more detail in the memorandum in Appendix E.

Table 2-11 illustrates the criteria used in the final redevelopment assumption. Shaded areas represent those that are assumed to redevelop.

**Table 2-11: Redevelopment Assumptions
Based on Building Values and Parcel Sizes**

Building Value ('000's)	Parcel Sizes (acres)					
	0-.25	.25 - .5	.5 - 1	1 - 2.5	2.5 - 5	5-10
0-50						
50-100						
100-150						
150-200						
200-250						
250-300						
300-350						
350+						

Source Metro RLIS. Analysis by ECONorthwest. Reproduced with Permission.

The estimated units expected to occur through redevelopment can be summarized as follows:

- Developed areas with a building value less than \$50,000 will redevelop only if the parcel is greater than .25 acres.
- Developed areas with a building value between \$50,000 and \$100,000 will redevelop only if the parcel is greater than 2.5 acres.
- Developed areas with a building value between \$100,000 and \$150,000 will redevelop only if the parcel is greater than 5 acres.

In summary, all parcels smaller than .25 acres or with a building value greater than \$150,000 are not assumed to redevelop.

The algorithm above defines those areas that may redevelop in the future. Only developed tax lots and the developed portions of partially vacant/developed tax lots are included in the final redevelopment calculations.

Environmentally constrained areas are removed from developed areas before applying these estimates. As some "developed" areas are outside of Metro's vacant/developed lands data layer, the area of developed land that may be environmentally constrained is estimated by using the same ratio of constrained land to developed land for areas that have been inventoried by Metro (approximately 9 percent).

An estimate of land for future streets is removed from these selected redevelopable parcels, similar to the method used for vacant lands. Parcels are estimated to build out at their respective design type densities, less underbuild. An estimate of current units occurring on the parcel is also removed from the build out estimate. Since this is a rural area, one current unit per developed parcel is assumed.

Within residential design types, (Inner Neighborhood, Outer Neighborhood, and 30 percent of Corridors) no residential redevelopment is assumed to occur on parcels with a non-residential land use (Industrial, Commercial or Public Facilities). In non-residential design type areas, (Industrial Areas, Employment Areas, and 70 percent of Corridors) no residential redevelopment is assumed to occur.

The table 2-12 summarizes total dwelling unit estimates. Table A-1 in Appendix A shows acreage and build out estimates for each study area.

Table 2-12: Total Estimated Dwelling Units

Land Type	Total Estimated Dwelling Units
Vacant	176,125
Environ. Constrained	4,277
Redevelopment	13,143
TOTAL	193,545

Source: Metro RLIS

2.2 WATER, SEWER AND STORMWATER SERVICES FEASIBILITY

Pacific Rim Resources completed the Phase I analysis and Parametrix, Inc. the Phase II analysis for the feasibility of providing three types of public facilities: water, sanitary sewer and stormwater services to each study area. The approach to assessing service feasibility was refined for the Phase II study and varies slightly from the method used for the Phase I study areas. In this section the two approaches are summarized. A detailed methodology can be found in Appendix B for Phase I and Appendix C for Phase II.

Phase I Approach

The study areas have been rated as "easy", "moderately difficult" or "difficult" to serve. This approach is consistent with the *Utility Feasibility Analysis* conducted in 1996.

Metro's RLIS data was a primary source of information used in making the assessments. The consultant team also made telephone calls to each of the water, sanitary, and stormwater service providers in the vicinity of the study areas to determine their policies and capacities regarding service. Weighted numerical matrices were applied to each study area. Ratings were assigned based on the relative numerical scores of all the service areas.

The primary factors affecting the ability to provide water, sewer and stormwater services include:

- Study area size,
- Distance to connection points,
- Line and treatment plant capacity,
- Construction difficulties, and,
- Policies of the provider/constituency politics.

The size of the study area was considered to be the most important factor. Larger areas will provide more building lot potential than smaller areas. By contrast, the inclusion of smaller study areas with non-contiguous parts will significantly increase the cost of providing service within a 3-to-7-year timeframe. An exception to this occurs when a small service area is easily served by existing, nearby facilities. This was considered in the evaluation. Generally, service cost can be reduced by including larger areas, as well as by consolidating contiguous areas, which can be served by the same new interceptors and main lines.

The distance to the connection point and the adequacy of existing line and treatment plant capacity were also major considerations. Areas that can be served by treatment plants with adequate load capacity may have cost advantages over areas served by plants needing expansion. This is particularly true if the new loading will pass thresholds for new treatment-level requirements.

Typically, the internal cost (within subdivision developments) of new water, sewer or stormwater systems is borne by developers. However, some cost will be paid by rate-payers. Consequently, design/construction difficulties such as wetlands, drainage divides, rocky soils and steep/flat slopes were considered. The policies of the individual providers regarding serving new areas were also considered in this analysis. Table A-2 in Appendix A shows individual assessments for the Phase I study areas for water, sanitary sewer and stormwater serviceability.

Phase II Approach

Detailed steps of the Phase II approach can be found in Appendix C. Phase II was divided into two steps. The first part, which aims to characterize general serviceability issues for each study area, is based on telephone interviews conducted with close to 30 different representatives from cities, counties and local/regional service districts.

The second step of this study provides more concise ratings for each area as "easy", "moderate", or "difficult" to serve, and has relied on additional technical information. Some comes from the interviews and some from other sources, such as GIS data, topographic maps and local facilities plans.

The level of analysis conducted for this study aims only to provide a general comparison of serviceability. More detailed site-specific evaluations, which would involve field checking, are beyond the scope of this study. It has been necessary to rely primarily on available data, and on information that could be gathered directly from potential service providers. A log of all service provider contacts for the Phase II Analysis is provided for reference in Appendix E.

Service Provider Interviews

Parametrix contacted and interviewed nearly 30 persons from cities, counties and local/regional service districts to gather knowledge about serviceability issues for each of the study areas.

Letters were first sent to each identified provider. Following the mailing, service providers were contacted by telephone. Questions focused on the following:

- Future service area expansion plans,
- Current water production capacity and wastewater treatment capacity,
- Build-out water production capacity and wastewater treatment capacity,
- Willingness to provide projected water demand or accept projected wastewater load from the expansion areas, and
- Stormwater policies or regulations that might limit expansion ¹²
- Study area characteristics such as topography and rocky soils that could impact service.

Qualitative information collected from these discussions has been summarized, and appears in the study area descriptions in **Section 3** of this report.

Study Area Ratings

The second part of this study focuses on developing a more concise rating of each study area as “easy”, “moderately difficult”, or “difficult “ to serve.

This part of the study relied on other sources of information, such as GIS data, topographic maps, and local facilities plans, and was supplemented by the information collected from telephone interviews. The following steps outline the method for developing and assigning ratings for each study area.

Evaluation Criteria

The following evaluation criteria were first established for rating the study areas as “easy”, “moderately difficult”, or “difficult” to serve.

- Study area size
- Distance from existing lines
- Topography
- Obstacles to providing services
- Willingness of providers to serve

¹² One additional modification from the Phase I study, the stormwater assessments in the Phase II study most often rated as “easy” to serve. This is based on the fact that most service provider policies place responsibility for stormwater treatment and detention on the developer. So from the standpoint of the governing body, stormwater treatment is not difficult. Issues such as topography and environmental impacts were still part of the scoring system, which gave some areas a “moderate” rating for stormwater.

Importance Factors

Each criterion is first assigned an importance factor (or weight), between 1 and 5. This is used for weighting the criteria independent of the study areas. A higher weight indicates that the criterion is of greater importance.

The criterion 'Willingness of providers to serve', for example, has the highest weight of 5. This is because a provider's policy towards serving an area (or not serving an area) influences its likelihood of urbanizing, and may override factors such as topographic constraints and distance to service.

There are some areas with topographic constraints, for example, that have less difficult ratings because providers indicated a clear willingness to serve it. There are also some areas rated as more difficult to serve, in spite of the fact that they lack major infrastructure or environmental issues.

The criteria of 'Distance from existing lines' and 'Obstacles to providing services' were given importance factors of 3. The remaining criteria of 'Study area size' and 'Topography' were both given importance factors of 2.

Raw Scores

Next, the study areas receive a raw score for each criterion on a scale of 0 through 10, depending upon the difficulty of providing service. For each criterion, values closer to 0 equate with a greater level of difficulty in providing service.

The scorings used in this analysis are very similar to those used in the Phase I analysis. A few refinements have been added for the scores on Phase II study areas; they are noted, where present, for each criterion.

Service area size

Net vacant buildable acres were used for this score. Smaller areas are more difficult to serve, due to economies of scale. Scores based on size were assigned, with large areas of 1000 acres or more scoring highest at 10 and smaller areas of less than 100 acres scoring 0.

Distance from existing lines or connection point

In some cases, where the exact distance to a service area cannot be estimated (due to the large size of the area) the distance is estimated from the center of the study area to the border of the service provider area or respective city limits. Scores for this criterion are highest for those areas with services within ¼ mile or less from service and 0 for those areas greater than 5 miles away.

Topography

Topography has been defined as the percent of land in each study area encumbered by steep slopes (slopes above 25 percent). Not many study areas have more than 25 percent of their land encumbered by steep slopes. This is an additional criterion that was not used in the Phase I analysis.

Obstacles to providing services (Phase I - Internal System Construction Ease)

This criterion includes geology, natural resources, and other human obstacles. For this Phase II study, the same scoring system was used for water, wastewater and stormwater serviceability. In the Phase I study, the scores for wastewater and stormwater were scored differently. The Phase II analysis also has made topography a separate criterion. Appendix B and C contain detailed scoring approaches.

Willingness of providers to serve (Phase I - Provider Policy)

- 10 Clear policy to provider service
- 7 Implied desire to provide service
- 5 Policy to provide service, but possible political obstacles
- 3 Implied desire not to provide service, possible political obstacles
- 0 Explicit policy not to provide service

For this criterion, the range of possible scores has been expanded to five, instead of the three that were used for the Phase I analysis (0, 5, 10).

Final Scores

After raw scores have been generated for each criterion, they are multiplied by the importance factor to determine a weighted assessment, as shown below, in Table 2-13.

Table 2-13: Final Scores For Serviceability (Example)

Criteria	Importance Factor	Raw Score 1-10	Weighted Assessment
Study Area Size	2	6	12
Distance	3	6	12
Topography	2	9	18
Obstacles	3	1	3
Willingness to Serve	5	8	40
Total			85

The total scores are then summarized for each type of service for each study area, and comparatively given the following ratings:

- Easy
- Moderate
- Difficult

Total scores may range from 0 to 150. For this study, final scores between 0 and 70 are considered "difficult"; 71 and 120 are "moderately difficult"; and 120 to 150 are considered "easy" to serve.

Appendix A, Tables A-2 and A-3 show composite scores for all three services (water, sanitary sewer, and stormwater) for Phase I and Phase II respectively. Raw scores for the individual services for Phase I are located in Appendix B. Raw scores for the individual services for Phase II are located in Appendix C.

2.3 TRANSPORTATION SERVICES FEASIBILITY

Pacific Rim Resources completed the transportation services feasibility analysis for Phase I. Parametrix, Inc. completed the analysis for Phase II.

Phase I Study Areas

The evaluation of transportation service feasibility for the Phase I study considered three measures:

- Relative intensity of trip activity,
- Connectivity, and
- Serviceability.

A composite score gives guidance to how readily and cost effectively each study area can be served by urban transportation. Primary modes of travel including auto, bike, pedestrian and transit were considered.

Travel Activity

The two-hour peak period vehicle trip generation was determined based on the housing supply estimate provided for each alternative area. The Metro travel demand model regional average trip generation for housing was used to calculate future travel activity (0.62 trips per household in a single peak hour). In addition, the equivalent number of arterial lanes was estimated based on the peak direction of travel (two-third inbound), and the nominal capacity for an arterial facility (750 vehicles per lane per hour).

The off-site trip generation was ranked on a scale of 1 (low) to 3 (high) based on the total trip generation for all candidate sites. In addition, the equivalent number of inbound arterial lanes was indicated.

Connectivity

The location of the study area was reviewed as to its proximity to higher-level transportation facilities identified in the Metro transportation system plans. A qualitative evaluation was made as to the potential for extending the existing system to service the study area or group of study areas.

A rating on a scale of 1 (excellent) to 3 (poor) was assigned to each study area. A poor score indicates that transit, pedestrian, and bicycle regional corridors and facilities are remote from the site. An excellent score indicates that the Regional Transportation Plan (RTP) already provides these services immediately adjacent to these areas or it includes the extension of services as growth occurs.

Potential Auto System Serviceability

The potential off-site impacts on the regional transportation system were assessed at a preliminary level by considering the above two factors and reviewing current travel demand forecast for 2020 without the study areas. The latest EMME/2 data (available in 2000) included Round 4 projects identified within the Regional Transportation Plan. These plots were used to identify in a general sense the available system capacity near the study areas. The volume-to-capacity plot was used in assessing regional auto travel.

A rating on a scale of 1 (low) to 3 (high) was assigned to each area to indicate the magnitude of additional system improvements. In some cases there are significant constraints to providing

the required services and these cases were identified in the next chapter. Table A-4 in Appendix A shows individual study area assessments for transportation serviceability.

Phase II Study Areas

The transportation methodology used in this analysis is similar to that used in the Phase I study. For Phase II, the evaluation of transportation service focused on four criteria:

- Potential trip generation,
- Impact to the existing transportation system,
- Availability of transportation facilities, and
- Environmental factors such as steep slopes and sensitive lands.

Criteria were first assigned a relative rating of 1 to 3. Each criterion was then assigned a qualitative weight, also ranging from 1 to 3. Impact to the existing system was assigned the greatest weight (3), followed by environmental factors and availability of transportation facilities (2), while potential trip generation was assigned the lowest weight of 1. The resulting composite scores (determined by multiplying rating times weight) ranged from 9 (best) to 22 (worst) out of the possible range of 8 to 24. These composite scores are intended to indicate the relative ability to serve potential future transportation demand resulting from buildout of each of the study areas.

The following sections outline the process used to develop transportation ratings for each criterion used to evaluate the study areas. In each component of the transportation assessment, a score of '1' corresponds to easiest to serve, a score of '2' means moderate, and a '3' indicates the study area would be difficult to serve in comparison to the others.

Potential Off-Site Trip Generation

Future two-hour peak period travel demand was calculated using the buildout estimates for Inner Neighborhoods, Outer Neighborhoods and Corridors that were generated for the productivity study. Trip generation rates were then developed and applied based on the Metro regional travel demand forecasting model and standard transportation references. For residential uses, a two-hour peak trip generation rate of 1.201 trips/household was used. The small portion of industrial acreage was assigned a peak period rate of 5.7 trips/acre, a midpoint between the rates for heavy and light industrial use.

Potential Impact to the Committed Transportation System

This criterion provides an initial look at how developing the study area could affect the regional transportation system, by considering potential trip generation in light of projected future traffic conditions on the committed regional network.

Arterial lane capacity needed to serve each study area's travel demand was estimated based on trip generation. Arterial lane capacity is meant to provide a proxy measure of off-site impacts and the capacity that would be necessary to serve that impact. Arterial capacity demand was calculated assuming a planning level capacity of 900 vehicles per hour per lane (1,800 vehicles per lane over the two-hour peak period)¹³. Residential development was assumed to generate

¹³ The Phase II analysis assumes a higher hourly capacity for arterial roadways, 900 vehicles per hour per lane (vpl) as compared to 750 vpl in the Phase I analysis. This increase is based on the assumption that new roadways will

2/3 of peak period travel in the peak direction, while industrial traffic was assigned a 50/50 directional split. A 50/50 split for industrial traffic is a conservative assumption in that it reflects multiple shifts in the four study areas that include industrial acreage. A rating of '1' was assigned to study areas generating an arterial capacity demand of 0.5 lanes or less, while a rating of '2' corresponds to demand of 0.6 lanes to 2.0 lanes. A rating of '3' was assigned to study areas with potential trip generation equivalent to more than 2.0 arterial lanes.

Potential off-site impacts on the transportation system were assessed using the above information together with Metro's latest horizon year travel demand volume-to-capacity plots that incorporate RTP network improvements. Each study area was ranked from '1' (projected capacity available on adjacent regional network facilities, or low level of additional capacity need generated by the study area) to '3' (no projected capacity available, and high level of additional capacity needed to serve the study area). A study area was assigned a rating of '2' if it was judged to generate a high traffic volume but had available capacity, or vice-versa.

For this part of the assessment, "adjacent facility" applies to the city or county arterial, state highway or freeway that most directly connects the study area to the regional transportation system. Capacity availability was determined based on the volume-to-capacity (v/c) plots from the regional model. The volume-to-capacity ratio indicates the degree to which the traffic volume on a given roadway consumes the roadway's capacity, or its ability to accommodate traffic. A v/c ratio of 0.00 means there is no traffic on the roadway, while a v/c ratio of 1.00 means the traffic volume is equivalent to the facility's theoretical maximum capacity. If the adjacent facility serving a study area had a plotted v/c ratio greater than 1.00, it was assigned a '3' or most difficult; a v/c of 0.80 to 1.00 was assigned a '2' rating, and a v/c ratio less than 0.80 was assigned a '1' rating.

Availability of Transportation Facilities ¹⁴

Each study area's proximity to higher-level transportation facilities included in Metro's regional transportation plans was reviewed. The analysis assumes improvements for each transportation mode as shown in the current RTP. Each type of travel (vehicle, bicycle, pedestrian, transit) was assigned a qualitative ranking ranging from '1' (facilities available and readily accessible) to '3' (few or no facilities in the area, or facilities would be difficult to reach). Non-auto travel was more likely to receive a '3' rating because, while roadways serve many of the study areas, most are not served by sidewalks, bike lanes or transit service.

Rankings for each type of travel were combined using a subjective weighting factor for each mode. Based on the outlying location of most of the study areas, the greatest weight was assigned to the auto ranking, (0.5), followed by transit (0.25), bicycle (0.15) and pedestrian travel (0.1).

Environmental Factors

Environmental factors potentially affecting future transportation facilities were given a qualitative rating ranging from '1' to '3' corresponding to the degree of difficulty the environmental factor

be built to standards and serve all modes of travel, whereas many of the existing roadways in the outlying metropolitan area lack sidewalks and bicycle lanes or shoulders.

¹⁴ In the Phase I Analysis, this criterion was called "connectivity". This new criterion is similar to the former one, though it generally addresses the number of connections, rather than whether connections are there at all.

could create. A rating of '3' was assigned to study areas that were estimated to have ¼ or more of the area comprised of wetlands, steep slopes or other environmentally sensitive Title 3 areas. A moderate rating of '2' was assigned to study areas appearing to have a smaller portion that could be affected by environmental factors, and a '1' was assigned to areas that did not appear to have any noticeable environmental constraints. The rating of environmental factors was determined using a preliminary review of topographic, environmental and wetlands maps and does not represent any level of environmental assessment.

Criteria Weight (Relative Importance)

The Phase II analysis assigned weighted factors to each of the criteria ranging from 1 to 3 based on the degree of control an individual study area would have on the factor and the degree of impact the factor would have on the broader region.¹⁵ Weighting factors were selected based on the rationale that a potential developer would control the density, land use mix, internal employment, and resulting external trip generation. Therefore trip generation was assigned the least significant weight.

Availability of transportation facilities to serve the site and environmental factors were assigned the mid-range weight of '2.' These concerns could be addressed through techniques like clustering development, incorporating context-sensitive design, or building transportation facilities to connect to the study area. Impacts on the existing (i.e. committed) transportation system were assigned the greatest weight, as they would involve larger scale improvements and would tend to be the most difficult for an individual study area to address. As a result it would be a greater difficulty to overcome. The final relative scores are assigned qualitative overall ratings of "easy", "moderate" or "difficult" to serve

Each of the study areas was evaluated for potential transportation service and assigned a rating, as shown in the Table A-5 in Appendix A. Lower scores indicate the area would face fewer constraints to transportation service, and be relatively less expensive to serve. Higher scores indicate increasing constraints, greater impacts to the existing system, and higher costs of providing transportation services to serve the study area.

2.4 ESEE ANALYSIS

Environmental, Social, Energy and Economic Consequences of adding land to the existing Metro Urban Growth Boundary

Metro Code Section 3.01.020 *Legislative Amendment Criteria* includes four (4) factors that address locational factors 3, 4, 5 and 7 of Statewide Planning Goal 14. Factor 5 requires an analysis of the environmental, social, energy and economic (ESEE) consequences of urbanization of land that is under consideration for inclusion into the UGB. Metro staff completed the ESEE analysis for both Phase I and II study areas.

Purpose of the ESEE Analysis

The purpose of this analysis is to assess the long-term environmental, social, energy and economic consequences that would result from urbanization of land considered for inclusion within the UGB and to guide the selection of lands from among those considered. The analysis

¹⁵ The approach of using weights is a slight modification from the Phase I analysis, which made no distinction as to the relative importance of individual criteria.

must find that urbanization may occur in a manner consistent with any special protection of resources or hazards, as identified in a local comprehensive plan and implemented by land use regulations. Any complimentary and adverse economic impacts must also be identified. Evaluation of these factors, on balance, must demonstrate that the lands being considered are no worse than other areas under consideration for urbanization. Each of the ESEE factors must be evaluated for each study area or groups of study areas under consideration. Fifty-eight (58) of the 94 study areas included in this report were evaluated in the ESEE analysis for the 2000 Alternatives Site Study. The ESEE analysis previously completed for the 58 study areas was used as a starting point for this current ESEE analysis.

Evaluation of ESEE Factors

Statewide Planning Goal 2: Land Use Planning, Part II Exceptions, suggests that when considering the conversion of land from rural to urban uses that the evaluation be based on the "Positive/Negative Effects" of the impacts of urbanization on the study areas and the "Advantages/Disadvantages" of a particular site versus another site. Individual and groupings of study areas are described in detail to account for individual differences between study areas.

ESEE Analysis Process

The environmental factor of the ESEE analysis was completed on an individual study area basis as the elements of this factor are easily quantified (stream length, acreage of wetlands, floodplain size) and there are specific regulatory programs in place to ensure that urbanization will occur in a manner consistent with the regulatory programs. Each of the environmental elements described below was evaluated to determine an overall environmental consequence rating that considered the individual element ratings equally. The overall environmental consequence rating for each study area can be found in Appendix A, Table A-6. A summary of the environmental consequences for each study area can be found on the study area summary sheets in **Section 3**.

The energy, social and economic factors of the ESEE analysis were analyzed for groups of study areas rather than on an individual study area basis. This was done to better understand and evaluate the components of these three factors, as they are not easily quantified, do not lend themselves to small area analysis, and their consequences extend beyond the boundary of an individual study area. A summary of the energy, social and economic consequences for groups of study areas can be found in Appendix A, Section A-4.

Outlined below are general descriptions of the elements of each of the ESEE analysis factors and the expected consequences to each factor (Environmental, Social, Energy & Economic) as a result of urbanization.

General Description of Factors

Environmental

Urbanization may impact natural resources through the degradation of water quality and wildlife habitat, the loss of floodplain functions and through increased instability of steep slopes. One way to maintain water quality is to protect the vegetated corridors adjacent to streams and wetlands. Urbanization can affect the function of these areas through either direct removal of vegetation or by increasing nearby impervious surface through the development of structures, parking areas, roadways, and driveways. This increase in impervious surface generates

additional stormwater run-off that in turn increases natural stream flows, which can impact the water quality of streams by washing sediments and impurities from impervious surfaces into the natural waterways. Additional stream flow may also prevent ground water infiltration and recharge as well as scour streambeds due to the increased volume and velocity of the flow. Increased stream flows and associated transport of sediments and impurities reduce the ability of the vegetated corridor to provide important functions, such as stream bank stability, migration corridors for wildlife and regulation of water temperature.

A properly functioning floodplain allows for the storage and conveyance of natural floodwaters, thereby reducing the risk of flooding and preventing or reducing risk to human life and property. Floodplains impacted by urbanization through the placement of structures will have less storage and conveyance capacity for flood events, thereby increasing the likelihood of downstream flooding and health, welfare and safety issues.

Metro's current Title 3 program as defined in the Urban Growth Management Functional Plan (Functional Plan) provides performance standards to protect and improve water quality and reduce the risk of flooding. Any land brought into the UGB is subject to the requirements of Title 3 through the concept planning requirements of Title 11 of the Functional Plan. Section 3.07.1120G of Title 11 requires that the Title 3 performance standards for water quality and flood management be in place prior to urbanization.

Metro is in the process of developing a regional fish and wildlife habitat protection plan in order to balance habitat protection with the needs of a growing urban area and meet the mandates of Statewide Planning Goal 5: Natural Resources, Scenic and Historic Areas, and Open Spaces. In December 2001, Metro established criteria to define and identify regionally significant fish habitat and created a draft map of regionally significant fish habitat areas. Metro is currently completing a Goal 5 ESEE analysis that assesses the tradeoffs of protecting or not protecting these regionally significant fish and wildlife habitats. The final protection plan will include habitat protection programs that range from incentives and education to acquisition and regulation. Once the Metro Goal 5 Fish and Wildlife Habitat Protection Plan is adopted and acknowledged by the Land Conservation and Development Commission the plan will apply to land that is brought into the UGB through the concept planning requirements of Title 11 or pursuant to section 3.07.810 of Title 8 of the Functional Plan.

Urbanization of steep slopes requires earthwork to create a buildable area to place a structure that can result in slopes becoming unstable. One step in the methodology for determining the dwelling unit productivity removed all areas of steep slopes (>25%) from the buildable land inventory, therefore, no dwelling units were assumed for steep sloped areas. It is expected that the Metro Goal 5 Fish and Wildlife Habitat Protection Plan will have an upland component that may provide additional protection measures.

Clackamas, Multnomah and Washington counties currently enforce natural resource protection measures through the development review process as regulated in their respective zoning and development review codes. In addition, the Clackamas County Comprehensive Plan identifies principal river and stream conservation areas to ensure adequate protection of river and stream corridors. Multnomah County is in the process of completing the West of Sandy River Plan for the unincorporated area between the City of Gresham and the Sandy River. The plan, which is currently in *draft* stage, contains a natural resource inventory of significant Goal 5 resources and impact areas. The County's West Hills Rural Plan also identifies areas that are of significant environmental concern in northwest Multnomah County. Washington County's Rural/Natural Resource Plan identifies fish and wildlife habitat areas and significant natural areas in the rural

area outside the UGB. The presence of significant natural resource areas identified or inventoried in the above referenced documents is noted on the appropriate study area summary sheet.

Inclusion of land into the UGB does not necessarily affect inventoried natural resources. The protection standards currently in place as implemented by county land use and development codes will remain in affect. As part of the required planning of new urban areas, as directed by Title 11 of the Functional Plan, an analysis of Goal 5 resources must be completed. This could be done by either utilizing an adopted Metro Goal 5 Fish and Wildlife Habitat Protection Plan or by completing a Goal 5 ESEE analysis on the Goal 5 resources to determine whether to allow, limit or prohibit conflicting uses.

Social

The social consequences of urbanization relate to changes to the built environment, the natural landscape, demographics and an influx of population, which can impact those living both inside and outside the UGB. As the character of an area changes from rural to urban the natural landscape is impacted by a denser built environment. Through the required planning of new urban areas, as directed by Title 11 of the Functional Plan, an efficient and compact urban form can be created that will provide additional social, commercial, recreational and educational opportunities to serve both current and new residents of the area and nearby established residential communities inside the UGB. Mixed-use areas that are part of a planned complete community have the greatest potential to provide social gathering places and community centers, or become the focus point for a neighborhood. The closer proximity to services, jobs and recreational opportunities due to an efficient and compact urban form will result in shorter trips by residents and provide opportunities for other modes of transportation such as transit, bicycling and walking.

The Environmental Building News, Vol. 11 No. 4, references a number of national studies that indicate there are numerous health impacts attributed to development of communities that are dependent on the automobile. These impacts range from air pollution and related illnesses to automobile accidents and a sedentary lifestyle, all based on increased vehicle miles traveled and commuting time. However, urbanization utilizing a compact urban form can help alleviate some of these health impacts and contribute in a positive nature to the overall health of the community by providing transportation options, nearby services, and opportunities for exercise that can reduce the time spent in an automobile.

As noted, urbanization will affect the rural character of the area, which is a negative social impact for those residents who desire such a lifestyle and rural environment. Residents within the UGB may also be negatively affected by the loss of nearby rural landscapes, the loss of the perception of easy access to open spaces and the perceived loss of protection of natural resources. Those individuals currently engaged in farming nearby land may feel pressure from encroaching urbanization to curtail farming activities or develop their property.

Affordable Housing

Throughout the 1990s the demand for housing in the Portland metropolitan region was strong due in large part to a strong economy that provided an increase in jobs and population. The region functions as one housing market as people may live in one area, work in another and shop in yet another part of the region. In many areas there are few affordable housing options for the people who work there, resulting in long commute distances and times, while increasing

congestion and pollution. This also leads people to purchase or rent more expensive homes than they can afford. The social factors of having an affordable home – shelter, safety and security – are fundamental to the livability of the region. The availability of a range of affordable homes throughout the region helps provide the stability needed to develop and maintain complete communities. A population that has access to housing choices near employment and services will spend less time traveling and may quite possibly be more aware of and involved in their immediate community. Title 11 of the Functional Plan requires that areas brought into the UGB provide an average of 10 dwelling units per net residential acre. The intent of this requirement is, in part, to foster the development of a range of housing types including smaller less expensive houses on small lots, in an effort to provide affordable housing options throughout the region.

Archeological Sites

State and federal laws prohibit the disturbance of Native American burial sites. Approximately six percent of the state has been formally surveyed for the presence of Native American artifacts, most often having to do with federally funded projects. As long as state and federal laws are observed during the planning and development processes there would not be any social consequences realized. Based on known settlement patterns and the level of disturbance that has already occurred due to farming and rural development, it is unlikely that any significant archeological resources remain.

Historic Sites

The study areas may contain historic resources that have been listed as a historic resource of statewide significance or on the National Register of Historic Places. Non-surveyed historic resources are best addressed through the local jurisdiction's Goal 5 survey, inventory and protection ordinances. As an area urbanizes the local government assuming governance will be responsible for the protection of all historic resources.

Clackamas County has identified a number of historic properties that are designated as historic landmarks in the rural portion of the county. Multnomah County's *draft* West of Sandy River Plan has identified a number of properties that could be designated as historic resources. Multnomah County's West Hills Rural Area Plan also identifies historic resources through a Heritage Preservation sub-district. Washington County has identified historic resources in the rural area as part of the county's Rural/Natural Resource Plan. The presence of historic resources identified or inventoried in any of the above referenced documents is noted on the appropriate study area summary sheet.

Aggregate Resources

The vast majority of mining sites in Oregon are aggregate mines. Aggregate is the main ingredient in concrete and asphalt pavement and is used as a base on which roads and buildings are placed. Other important uses include gravel roads, dams, landscaping, drainage control, landfills, sanding icy roads, and railroad ballast. Total annual aggregate production in Oregon is approximately 52,000,000 cubic yards.

Due to the generally finite nature of these resources and the limited supply of aggregate mines located in the region, its value is expected to increase. Because of high transportation costs it is most economical for the construction industry to use resources that are closest to the region. The relationship between the value of the aggregate resource, the importance to the construction industry and the costs involved with extraction and transportation makes it important to preserve these uses. Furthermore, aggregate resource extraction uses are

temporary in nature due to the limited supply of the resource within a mining site. Once a site is no longer economically viable it can be reclaimed for a number of uses including recreational, open space or general development.

Aggregate resource sites in the study areas were identified utilizing the State of Oregon Department of Geology and Mineral Industries (DOGAMI) Special Paper 3 "Rock Material Resources of Clackamas, Columbia, Multnomah and Washington Counties, Oregon". In addition, Washington County identifies mineral and aggregate resources in the rural area through the use of two district overlays contained in the Rural/Natural Resource Plan. The District A overlay designation applies only to sites upon which extraction, processing, and stockpiling activities are currently undertaken and to sites which may be utilized for such activities in the future. The District B overlay designation applies to land within 1000 feet of District A with the intent to regulate the establishment of new noise sensitive uses to help reduce conflicting land uses. Clackamas County has inventoried significant mineral and aggregate resource sites, based on the DOGAMI report in their comprehensive plan. Multnomah County's West Hills Rural Area Plan also includes a special district for protected aggregate and mineral sites. The presence of mineral and aggregate resource sites identified or inventoried in any of the above referenced documents is noted on the appropriate study area summary sheet.

Energy

Statewide Planning Goal 13: Energy Conservation, states that "Priority consideration in land use planning should be given to methods of analysis and implementation measures that will assure achievement of maximum efficiency in energy utilization". Energy impacts are related to additional consumption of fossil fuels to heat and cool buildings and power motor vehicles. As an area urbanizes the number of buildings requiring energy increases, resulting in a rise in natural gas, electricity and heating oil use.

The addition of residential dwelling units and non-residential uses in a new urban area also increases the number of vehicles in that area. Increased vehicle miles traveled (VMT) increases gasoline consumption and emissions output associated with internal combustion engines. The total increase in vehicular trips is based on the productivity of the individual study areas in terms of the number of dwelling units or the amount of employment that the area is expected to create through urbanization. Although an increase in energy consumption is inevitable, the urbanization of some study areas may improve transportation connectivity and efficiency for areas inside of the existing UGB. Furthermore, maintaining a compact urban form, providing both service and employment opportunities, and increasing density along high capacity transportation corridors will result in smaller increases in energy consumption than disjointed unplanned large lot development. Urbanizing areas close to the UGB rather than allowing leapfrog development of areas farther away will result in a decrease of fossil fuel consumption and costs and the negative consequences of pollution from using automobiles. Overall reductions in VMT and out of direction travel can be expected from expanding into areas close to the current UGB rather than areas farther out.

ORS 660-23-190(1) states that energy sources may include naturally occurring locations, accumulations, or deposits of one or more of the following resources used for the generation of energy: natural gas, surface water (i.e., dam sites), geothermal, solar and wind areas. Energy sources applied for or approved through the Oregon Energy Facility Siting Council (EFSC) or the Federal Energy Regulatory Commission (FERC) are deemed to be significant energy sources that could be impacted by urbanization of the surrounding area. Protection of energy

sources means to adopt plan and land use regulations that limit new conflicting uses within the impact area of the site and authorize future development or use of the energy source of the site. There are no known sources of energy in the study areas as defined in the ORS 660-23-109(1), although some of the areas contain easements for electric power, petroleum and natural gas transmission facilities.

Economic

The land in the study areas is currently in rural uses that include large lot residential, farm and forest, and limited commercial and industrial uses. Permitted commercial uses are generally confined to wholesale and retail sales of farm and forest products and other incidental uses including convenience stores or service based businesses under prescribed conditions. Industrial uses are mainly related to resource based industries such as sand and gravel, mineral extraction, logging, and equipment storage.

Urbanization allows for a concentration of residential, commercial and office uses that benefit from economies of scale. As land is brought into the UGB the range of uses and development options increases with market forces determining the highest and best use of the land. As land values increase activities that are land intensive such as agriculture, forestry and equipment storage may become less economical. The resulting diversified urban economy will serve both the current and new residents that will locate there as well as the nearby established residential communities inside the UGB.

The addition of public facilities and infrastructure increases the value of rural residential land by providing the opportunity to divide property into smaller lots for higher density residential use or by converting rural residential uses to either commercial or industrial uses. These development options would not be available without inclusion in the UGB and the subsequent urban services that are provided.

Although there is economic value in converting land from rural to urban uses as noted above, there also is a cost associated with protecting natural resources in terms of lost development productivity and/or replacement or mitigation of development impacts on natural resources. The cost of lost development productivity from the protection of natural resources must be balanced with the immeasurable value of lost open spaces and the degradation of wildlife habitat. An article published by the Oregon Business Council in *A New Vision for Salmon*, November 1996, states: "The restoration and management of habitat must follow two principles; 1) it is most cost effective to protect habitat rather than restore it, and 2) restoration activities should assist the stream's natural healing process". Therefore it appears that there is economic value in the protection of existing fish and wildlife habitat due to the costs of mitigation and restoration. Based on this information it seems to be cost effective to concentrate development in areas where impacts to natural resources can be minimized and to avoid impacts that would require restoration and mitigation.

The Oregon Department of Agriculture reported that in 2001, five of the top six agriculture producing counties were in urban Oregon. Clackamas and Washington counties ranked second (\$318 million) and fifth (\$218 million), respectively, in gross farm and ranch sales. The document *An Action Plan for Keeping Agriculture Viable in the Portland Area* (dated 1997) by the Agri-Business Council of Oregon indicated that farms located in the Portland metropolitan area tend to specialize in higher value crops cultivated on smaller parcels and tend to have a higher income per acre yield than the rest of the State. The average size of a farm in the metropolitan area is 59 acres and high value crops include nursery and greenhouse products,

fruits, vegetables and nuts. The study concluded "... a certain critical mass of farming, in contiguous blocks of land or operations, is essential to achieve economies of scale through bulk purchases, distribution and control of service costs. To protect the agricultural economy it is important to maintain farm uses in sufficient concentrations so that these economies of scale are maintained."

Oregon's 1999 nursery sales, at \$584 million, is the highest nursery value ever estimated, and is ten percent higher than 1998 and eighty-five percent more than 1990. 1999 was the ninth consecutive year of record sales, the biggest increase on record, and the seventh consecutive year the nursery and greenhouse industry claimed the top ranking sales spot for all Oregon agricultural commodities. Clackamas, Washington and Multnomah counties claimed the first, third and fifth spot, respectively, for combined total sales of \$287.9 million. The urbanization of land currently in nursery stock production could have a significant effect on the regional economy, especially when the related industries of shipping, storage and employment are taken into consideration.

It appears that the positive economic benefits of the agriculture and nursery industries are not exclusively limited to large parcels as might be expected, but includes small parcels that are producing high value crops. This is especially the case when there is a critical mass of similar operations that allows the farmer/grower to share equipment, supplies and employees. Urbanizing small parcels that are part of this larger mass of agricultural activity could have detrimental effects on the needed economies of scale for the industry to be successful.

As mentioned previously, the analysis of the energy, social and economic factors consider the consequences of adding particular land to the UGB by groups of study areas. The study areas were grouped together based on common traits such as size, distance from current UGB, location as related to other study areas, and existing development pattern. See Appendix A Section A4 for a breakdown of the groups of study areas.

2.5 AGRICULTURAL COMPATIBILITY ANALYSIS

Metro Code Section 3.01.020 *Legislative Amendment Criteria* includes four (4) factors that address locational factors 3, 4, 5 and 7 of Statewide Planning Goal 14. Factor 7 requires an analysis of the compatibility of proposed urban development with nearby agricultural activities on land that is under consideration for inclusion into the UGB. Metro staff completed the agricultural compatibility analysis for both Phase I and Phase II study areas.

The purpose of the agricultural analysis is to satisfy the requirements of Goal 14 Factor 7: Compatibility with Nearby Agricultural Activities. The methodology used to conduct the analysis was developed through conversations between Metro Staff and the DLCD. The basic methodology for this agricultural compatibility analysis is based on the analysis that accompanied legislative amendments to the Urban Growth Boundary (UGB) in 1998 and the 2000 Alternatives Site Study. One difference from the 2000 study is that this analysis does not include the number of acres of high-value farmland in each study area as the high-value farmland component is reflected in the determination of the priority of lands to be studied as directed by Oregon Revised Statutes (ORS) 197.298

Agricultural activity occurring inside the UGB was excluded from this study based on previous conversations Metro staff had with Jim Sitzman of DLCD. It was determined that current impacts of urban development on agricultural land located in the UGB far exceed any potential impacts on this land by urban development occurring outside the UGB. Furthermore, Metro

was directed to look beyond the study area borders to document if adjacent land was composed of uninterrupted Exclusive Farm Use (EFU)-zoned land, or EFU land heavily fragmented by rural residential uses on exception land. It was felt that the impacts of new urban development on agricultural production would be most severe if the areas to be urbanized were surrounded by a large and healthy network of actively farmed resource land. An effort was made to identify and categorize all agricultural activity occurring within a one-half mile distance from each study area.

Data Sources

Zoning

Zoning data was obtained from regularly updated county records from Metro’s RLIS. Counties designate land as resource land, EFU or forest, or exception land through the comprehensive planning process, which must be acknowledged by DLCD. Counties must go through an exception process to remove resource land from protected status. Metro is required to utilize this local zoning that has been acknowledged by the State when completing an agricultural compatibility analysis.

The zoning within each county that qualifies as resource land and exception land is somewhat different. The exception land and resource land zone designations shown in Table 2-16 were used for the agricultural compatibility analysis.

Table 2-14: County Zone Designations for Agricultural Analysis

County	Resource Land Designation	Exception Land Designation
Clackamas	EFU Exclusive Farm Use AGF Agriculture/Forest District TBR Timber District	RA1 Rural Residential RA2 Rural Residential RRFF5 Rural Residential/Farm Forest 5 Acre FF10 Farm Forest 10 Acre RC Rural Commercial RTC Rural Tourist Commercial
Multnomah	EFU Exclusive Farm Use MUF Multiple Use Forest CFU-1, CFU-2, CFU-3, CFU-4 and CFU-5 Commercial Forest Use districts	RR Rural Residential RC Rural Center MUA20 Multiple Use Agriculture
Washington	EFU Exclusive Farm Use AF20 Agriculture/Forest 20 Acre EFC Exclusive Forest and Conservation	RR5 Rural Residential 5 Acre AF5 Agriculture & Forest District 5 Acre AF10 Agriculture & Forest District 10 Acre RC Rural Commercial RI Rural Industrial

The State of Oregon has allowed the City of Portland to designate as exception land a small area of land within their city limits but outside the UGB. This land is located within Area 94 and is zoned as Residential Farm/Forest (RF) by the City of Portland.

Crop Type

Crop types located within the study areas and within a one-half mile distance of the study areas were interpreted from computerized aerial photographs taken in the year 2001. In some cases aerial photographs from 2000 or 1998 were used if the study areas extended beyond the range of the 2001 photos, which are Metro's most current aerial photos. Aerial photos are generally taken in June or July; thus many crops may be young and difficult to identify at this time of year. Guidance for crop identification was previously received from the United States Department of Agriculture (USDA) Farm Service Agency of Clackamas/Multnomah County. Crops were grouped into general categories of nursery stock, orchards, row crops (corn, vineyards, cane berries, etc.), vegetables and field crops (grasses and grains). Although selected field checking did occur, Metro staff recognizes that this work may not precisely identify all crops being cultivated.

Compatibility Factors

Metro staff received assistance from Washington County and Multnomah/Clackamas County offices of the USDA Farm Service Agency to identify the most significant challenges to compatibility that exist between the urban use of land and nearby farming activity. Compatibility considerations include:

- Urbanization may affect land values and encourage speculation and land banking that inhibits the ability of farmers and agricultural suppliers to acquire parcels of land needed for agricultural production.
- Increased traffic resulting from urbanization may impede the movement of farm equipment and hinder the transport of agricultural goods to market.
- Urbanization may result in the isolation of certain agricultural areas from the greater farming community. This may hinder normal practices of sharing equipment and knowledge among farmers.
- Safety and liability issues associated with increased residential populations in close proximity to active farming (i.e., vandalism and accidental injury on and around farm equipment).
- Conflicts due to dust, noise, odor and chemical spray resulting from urban development being located in close proximity to active farming.
- An increase in impervious surface generates additional stormwater run-off that can impact the water quality of streams, prevent ground water infiltration and re-charge, and scour streambeds that nearby agricultural activities are dependent upon.

The agricultural practices used in the production of the identified crop categories vary somewhat in the levels of pesticide use, noise produced, etc., which may conflict with urban development in close proximity. For example, a cane berry (row crop) operation may contribute less to the creation of dust and generate fewer complaints than the vacuuming of an orchard or the normal cultivation of a field crop that requires tilling of soil, planting and flailing. However, cane berries require large, specialized equipment that may be impacted more by increased traffic on local roads than other crops. It is also difficult to compare the amount of noise made by machinery needed to produce field crops with the noise associated with other agricultural operations such as that made by fans in an indoor nursery or greenhouse. For this reason, the intensity of the agricultural uses occurring within the surrounding areas and the degree to which active farming of these crops may be hindered by nearby urban development was not ranked. Metro staff simply noted when the potential for such conflicts existed. The base assumption was that areas that support intensive and uninterrupted agricultural uses would be most impacted by the proximity of new urban development.

Finally, the presence of buffers in the form of natural and man-made features such as rivers, steep slopes, highways and golf courses may serve to limit impacts of urbanization on agricultural practices were identified.

Each of the compatibility factors and the presence or not of natural and man-made buffers were evaluated for each study area to determine an overall agricultural compatibility rating for each study area. The starting point for the analysis was whether or not any agricultural activities were occurring on adjacent land. A study area that had no adjacent agricultural activity to approximately 30 percent of the adjacent land involved in agricultural activity received a high compatibility rating. Areas with approximately 30-60 percent of the adjacent land involved in agricultural activity received a moderate compatibility rating and those areas above 60 percent received a low compatibility rating. The size or extent of the adjacent agricultural activity, the number of streams that flowed from the study area through active farming areas and local traffic patterns were additional factors in consideration of the rating. Table A-7 in Appendix A shows the compatibility ratings for each factor for each study area.

2.6 OVERALL ASSESSMENT

The purpose of assigning an overall urbanization suitability assessment for the study areas is to compare the individual areas relative to each other. This comparison helps in determining which areas are more suitable for urbanization.

The individual ratings that were determined for each component of the Goal 14 Factors (public services feasibility, ESEE analysis, and Agricultural Analysis) were given a numerical score. For the public services feasibility a rating of 'easy' was given a 3, 'moderate' a 2, and 'difficult' a 1. Likewise, for the ESEE and agricultural analysis a 'low consequence' score was given a 3, 'medium' a 2 and 'high' a 1. The numerical scores were then tallied to determine an overall score for the study area. Based on the distribution of the overall scores the following breakout was determined:

- study areas that totaled 13 points or less were determined to be least suitable for urbanization
- study areas that totaled 14 – 16 points were determined to be more suitable for urbanization
- study areas that totaled 17 points or more were determined to be most suitable for urbanization

3 STUDY AREA DESCRIPTIONS

A number of technical adjustments were made to the study area spatial data sets in order for the Phase I and Phase II study areas to mesh together into one cohesive report. Below is a list of the adjustments that were completed, followed by the individual study area descriptions. Four of the Phase II study areas originally contained portions of tax lots that are larger than the total acreage of the study area. Adjustments to the spatial data file of study areas was completed to ensure that the tax lot and buildable lands information pertain only *to the portions of the tax lots inside of the study area boundaries*. Adjustments to these study areas are as follows:

Study Area 61-2:

Study Area Acres: 5.25 acres
Parcel Containing Study Area: 20.05 acres
Area Removed (difference): 15.05 acres

Study Area 73:

Study Area Acres: 4.49 acres
Parcel Containing Study Area: 138.8 acres
Area Removed (difference): 134.31 acres

Study Area 74:

Study Area Acres: 500.85 acres
Parcel(s) Containing Study Area: 644.81 acres
Area Removed (difference): 143.96 acres

Study Area 76-2:

Study Area Acres: 3.9 acres
Parcel Containing Study Area: 19.3 acres
Area Removed (difference): 15.4 acres

Other Modifications Made to Original Study Area Coverage from DRC:

Study Area 19 – Split into two parts, Phase I and Phase II.
Study Area 32 – Sliver overlapping with 31 (Phase I Area) dropped.
Study Area 39 – A cluster inside of the UGB (Lake Oswego) dropped.
Study Area 55 – Right of way area dropped.
Study Area 57 – Split into Sections a, b, and c.
Study Area 61 – Northern portion renamed as 61-1 and dropped from Phase II, as already studied in Phase I. Southern smaller portion renamed as 61-2.
Study Area 69 - Split into two parts. Northern portion renamed 69-1. This area was dropped from Phase II, as already studied in Phase I. Southern, smaller section renamed as 69-2.

Study Area 73 – Section overlapping urban growth area (UGB) dropped.

Study Area 75 – Two parcels dropped. One 1N333DA00401, about 50,000 square feet. Half is inside the urban growth boundary; the other half is completely environmentally constrained. 1N333DA00405 about one acre, completely inside UGB.

Study Area 76 – Split into two parts. Northern portion renamed 76-1, dropped from Phase II, as already studied in Phase I. Southern, smaller section renamed as 76-2.

Study Area 78 – Split into two parts. Northern portion renamed 78-1, dropped from Phase II, as already studied in Phase I. Southern, smaller section renamed as 78-2.

Study Area 79 – Dropped southern portion from Phase II, as already studied in Phase I. Renamed northern piece as 78-2.

Study Area 92 – Dropped sliver.

Study Area 94 – Selected northern portion only for Phase II. Renamed as 94-II. Remaining portion studied in Phase I.

Study Area 1		Gross Vacant Buildable Acres 4	
Total Acres ¹⁶	11	Dwelling Unit Capacity	18
Total Developed Acres	0.6	Employment Acres ¹⁷	-
Total Constrained Acres	7.0	Resource Land Acres	-
Title 3 Acres	6.4	Percent Tree Canopy Cover	60%
Upland Steep Slope Acres	0.6		

General Site Description: Study Area 1 consists of two non-contiguous land tracts. Both are situated just east of the Troutdale city limits and west of the Sandy River, in Multnomah County. The northern piece, directly adjacent to and west of the Sandy River, is approximately seven acres. Southeast Sandy Dell Road serves it. The other tract, southwest of the first, is approximately four acres. Southeast Stark serves it, just south of SE 35th. The study areas are very near a residential subdivision, and are approximately two miles south of the interchange between I-85 and 257th, the general vicinity of the Troutdale town center. This area has been designated as Inner Neighborhood. These areas are not contiguous to other study areas. While the study area is about 11 acres, only about 4 acres are vacant and buildable.

Parcelization, Building Values, Development Patterns: There are four total tax lots in this study area. The northern tract contains two tax lots, and the southern tract, two. There is only one building in this study area, in the southwestern tract, which is valued at above \$250,000. This area contains no farms, crops or nurseries. There are no mining uses, commercial or industrial uses in this area. This area is primarily residential and rural in character.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): Neither power lines nor easements run through this study area. Available information does not indicate that this area is within an airport fly zone.

Public Services Feasibility: Troutdale appears willing to accept the study area within its service area, if necessary. The area's relatively small size may make it difficult to serve with maximum efficiency. This area is contained within a single drainage basin.

- **Water:** This study area will generally be difficult to serve, and infrastructure improvements will be needed.
- **Sewer:** This study area would be moderately difficult to serve. While the infrastructure system is in acceptable condition to develop the area, minimal improvements within the UGB are anticipated. In addition, the area's size is a factor in making it more difficult.
- **Stormwater:** This study area would also be moderately difficult to serve. The infrastructure for the storm system is generally in an acceptable condition to develop the area, but minimal improvements within the UGB are anticipated. The area's size is also a contributing factor.

¹⁶ For all these study area descriptions, "Total Acres" includes land in streets and right-of-way.

¹⁷ For all these study area descriptions, "Employment: land includes the employment portion (70 percent of land in designated Corridors).

Agricultural Analysis

Zoning: This study area is composed of two exception land sub-areas, the northern area adjacent to the Sandy River is zoned RR and the southern area is zoned MUA20 by Multnomah County. To the north and partially to the east of the northern area is resource land zoned CFU. The remainder of this sub-area is adjacent to the UGB. To the north and west of the southern area is the UGB. To the east is resource land zoned CFU and to the south is resource land zoned EFU. The resource land located between the two sub-areas is zoned CFU. The large expanse of resource land to the east and south of the Sandy River is zoned EFU.

Current Agricultural Activity: There is no agricultural activity occurring in this study area, as the study area is composed of rural residences on forested parcels and vacant forested parcels. To the south is a large area that is in row crop production. To the east is an area of row and field crops intermixed with forested areas.

Compatibility: Urbanization of these two small areas may result in minimal increases in traffic on SE Stark Street, however, this increase in traffic would not affect the movement of equipment or agricultural products. Urbanization of this area would not bring new development directly adjacent to actively farmed areas therefore, issues related to vandalism, safety, liability and odor, dust, noise and spray associated with farming would not be a concern. The Sandy River provides a natural buffer for any new development from the agricultural practices to the east and south. Urbanization would result in an increase in impervious surfaces that may diminish water quality and increase the flow of surface water but these consequences will not affect nearby agricultural activities or have an impact on the peak flows of the Sandy River. Therefore, urbanization of these two small isolated areas would have minimal impacts on the large tracts of resource-zoned land that extend to the east and south of the Sandy River.

Environmental Social Energy Economic Analysis

General Character of Area

Two sub-areas of two parcels apiece make up this study area. The northern parcels are characterized as forested with slopes greater than 25 percent and have no improvements. The southern parcels are generally flat, open, with improvements on one lot.

Environmental

The northern parcels border the Sandy River for approximately 1,100 feet. The majority of this sub-area is in the floodplain and most of the remaining land contains steep slopes. An unnamed tributary to the Sandy River flows along the western edge of the southern sub-area for approximately 600 feet. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis. Multnomah County's *draft* West of Sandy River Plan identifies a portion of the northern study sub-area as being part of the riparian and wildlife habitat of the Sandy River in its inventory of significant Goal 5 resources and impact areas. Metro's *draft* Goal 5 Fish and Wildlife Habitat Inventory identifies 69 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area 2		Gross Vacant Buildable Acres		318
Total Acres	616	Dwelling Unit Capacity		1,626
Total Developed Acres	217	Employment Acres		-
Total Constrained Acres	95	Resource Land Acres		-
Title 3 Acres	79	Percent Tree Canopy Cover		30%
Upland Steep Slope Acres	16			

General Site Description: Study Area 2 is located east of the Gresham city limits and the UGB. Approximately 25 percent of the perimeter of this subarea is adjacent to the existing urbanized area. This study area is oblong and "L" shaped, oriented along a northwestern-southeastern axis. It lies within Multnomah County. The northwestern tip of the study area sits immediately south of an approximately 85-acre area of unincorporated Multnomah County, near the Troutdale city limits. The northwestern portion of the study area is approximately 1.5 miles from Gresham's downtown, while the southeastern portion is approximately 3 miles from it. Southeast Chase Road serves the area at the north; SE Stebin Road serves it at the south. On the eastern end, the area is served by SE 302nd Avenue. The majority of this study area has been designated as Inner Neighborhood; a small part of the study area is within a designated Corridor. The entire study area is about 616 acres, while the vacant buildable portions of the study area comprise about 293 acres.

Parcelization, Building Values, Development Patterns: This study area, consisting of about 616 acres, contains about 150 tax lots. Larger tax lots in the northwestern portion consist mainly of agricultural uses, with a few rural residential uses. Southward, towards the center of this study area is the Arrow Creek subdivision with 13 approximately one-acre tax lots. This subdivision sits immediately east of the UGB and the Gresham City limits. Smaller tax lots with residential uses and some agricultural and commercial uses are located in the southeastern portion of the study area. Businesses include nurseries, construction and engineering services. The Sam Barlow High School is also in the southern section of the study area.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There are no power lines or public easements running through this area. Available data does not indicate that this area is within significant range of an airport flight zone.

Public Services Feasibility: Gresham appears willing to accept the study area within its service area if necessary.

- **Water:** This area would be relatively easy to serve because the infrastructure system is in acceptable condition to accommodate new development. Some improvements and extensions of lines, both inside and outside the existing UGB, will be necessary.
- **Sewer:** This area would be moderately difficult to serve. Infrastructure improvements will be needed to prevent existing facilities from being overburdened.
- **Stormwater:** This area would be easy to serve because the infrastructure is already in acceptable condition to develop the area. Some improvements and extensions of lines will be necessary, both inside and outside the UGB.

Agricultural Analysis

Zoning: This area is composed of exception land that is zoned RR and MUA20 by Multnomah County. To the north and west is the UGB. To the east and south is resource land zoned EFU. The resource land to the south is in Study Area 3.

Current Agricultural Activity: There are some small-scale grass fields and row crop operations taking place inside this exception area but the majority of the area is dedicated to large-lot rural residential uses that follow the stream corridors. The resource lands directly to the east and north of this study area support large-scale row crop, nursery and field crops. The resource areas to the south mostly support nurseries as well as some field crops and orchards. One of the large, forested portions of this area is publicly owned open space.

Compatibility: A significant increase in traffic on SE Lusted Road may result from the urbanization of this area. This increased traffic could impede the normal movement of farm equipment and supplies and affect the transport of agricultural goods. Urbanization of this area would bring development directly adjacent to actively farmed land to the east and south. Issues relating to safety, liability and vandalism, and complaints due to noise, odor, and the use of pesticides and fertilizers may occur in these areas. If this study area were to urbanize in conjunction with Study Area 6, a virtual island of resource land (Study Area 3) would be created to the north of SE Dodge Park Boulevard and south of SE Lusted Road between this area and the exception land in Study Area 6. The near isolation of Study Area 3 would exacerbate the issues related to safety, liability, and complaints due to noise and the use of pesticides and fertilizers. It would also disconnect this resource area from the greater network of resource land to the east. A tributary of Beaver Creek passes through this area and onto surrounding resource land. Development of this area would increase impervious surfaces and potentially affect water quality and increase flooding downstream which could affect the agricultural activities taking place. Furthermore, urbanization of this area may affect the value of adjacent active farmland to the east and south by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Urbanization of this study area would result in a high potential for negatively affecting nearby agricultural activities.

Environmental Social Energy Economic Analysis

General Character of the Area

This study area is a peninsular shaped area of exception land that extends out SE Lusted Road to the east and is surrounded by resource land zoned EFU on three sides. It is rural residential in nature, mostly gently sloped, with small portions of slopes over 25 percent that are forested and associated with stream corridors.

Environmental

Beaver Creek flows north through the top portion of the study area for approximately one-mile. There is a 3.4-acre wetland and an area of floodplain that varies in width from 30-150 feet located on the east side and a significant amount of steep slopes on the west side of this stretch of Beaver Creek. An unnamed tributary of Beaver Creek flows north through the western edge of the lower portion for approximately two miles. This stream also has a significant area of steep slopes along the western side of the stream. South Fork Beaver Creek and Middle Fork Beaver Creek flow through the eastern edge of the lower portion for approximately three-quarters of a mile and one quarter mile respectively. South Fork Beaver Creek also has some significant areas of steep slopes on both sides of the stream corridor. Metro owns a 38-acre

open space tract along Beaver Creek adjacent to SE Troutdale Road in the central portion of the study area. Multnomah County's *draft* West of Sandy River Plan has identified Beaver Creek and two tributaries as riparian corridors with significant areas of riparian and wildlife habitat in the its inventory of significant Goal 5 resources and impact areas. There also is an area of uplands along Beaver Creek in the northern portion of the study area that is identified in the plan. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 47 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Other Identified Resources

The county's *draft* West of Sandy River Plan also identifies two home sites and a farm structure as historic resources located at 30515 SE Pipeline Road, 29345 SE Lusted Road and 29639 SE Lusted Road in Gresham, respectively.

Study Area	3	Gross Vacant Buildable Acres	287
Total Acres	355	Dwelling Unit Capacity	1,550
Total Developed Acres	39	Employment Acres	0
Total Constrained Acres	13	Resource Land Acres	344
Title 3 Acres	13	Percent Tree Canopy Cover	5%
Upland Steep Slope Acres	0		

General Site Description: Study Area 3 is a smaller, W-shaped area that is adjacent to the western end of the UGB and Gresham's boundary in unincorporated Multnomah County. The only street boundary for the study area is Powell Valley Road in the southern end of the area. Otherwise the area is defined by surrounding property lines. The area is in Multnomah County and Metro's jurisdictional boundary. Southeast Chase Road and SE 302nd Avenue serve it. It is mostly flat. The area has been designated entirely as Inner Neighborhood. There are 287 acres of vacant and buildable land out of 355 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: Out of 41 total parcels in the study area, 30 parcels have recorded improvement values. The median improvement value is \$17,860. The median parcel size is 7.2 acres. Nine parcels are smaller than one acre, and 22 parcels that exceed five acres. This area is largely in agricultural use. Assessment records indicate that there have been no permits issued for single-family dwellings since 1990.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): The available data does not suggest that there are power lines or public easements running through the study area. There is no evidence of high air traffic noise over this area.

Public Services Feasibility: This study area falls within several jurisdictions for public services, and the following conditions apply:

- **Water:** The Lusted Water District appears willing to accept the study area within its service area. Any additional service requirements would require upgrades to transmission lines, storage, and possible negotiation with Portland for additional water rights. The area is rated as moderately difficult to serve.
- **Sewer:** Clackamas County Water Environment Services would be the sewer service provider for the area. It is approximately five miles outside of current service boundaries, and would require extensive additional infrastructure, pipelines and pump stations. The area is rated as moderately difficult to serve.
- **Stormwater:** Clackamas County Water Environment Services would be the service provider responsible for stormwater management in the area. The area would be considered easy to serve, as stormwater would be required to be treated on site and discharged to local basin drainage. This area is rated as easy to serve.

Agricultural Analysis

Zoning: This area is composed entirely of resource land and is zoned EFU by Multnomah County. To the north is exception land in Study Area 2 and to the east is resource land zoned EFU. To the south is exception land in Study Area 6 and to the west is the UGB.

Current Agricultural Activity: This agricultural area includes field crop, row crop and nursery production. A large expanse of resource land extends to the east that includes field crop and

nursery production. To the south are nursery operations on large lots and some field crop areas that are intermixed with rural residences and small-scale farming operations.

Compatibility: Urbanization of this area may result in an increase in traffic on SE Orient Drive, SE Dodge Park Boulevard, SE 302nd Avenue and SE Lusted Road, but due to the number of travel options impact to the movement of farm equipment or goods should be minimal. Urbanization of this area would bring development directly adjacent to a small area of actively farmed land to the east and also some to the south. Issues relating to safety, liability and vandalism, and complaints due to noise, odor, and the use of pesticides and fertilizers may occur in these areas. Kelly Creek and a tributary of Beaver Creek flow through this area. Urbanization of the area would result in increased impervious surfaces that may diminish water quality and increase downstream flooding in these streams. Kelly Creek passes through the study area prior to flowing into the UGB therefore these consequences would not affect agricultural activities. As Beaver Creek leaves this study area it flows through an area of limited farming activity, which results in limited impact to farming activities. Urbanization of this area may affect the value of a small amount of adjacent active farmland to the east by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production.

Environmental Social Energy Economic Analysis

General Character of Area

This area is rural with few residences. It is gently to moderately sloped with little forest cover except along the creeks. The entire study area is zoned for resource use, in this case EFU. Much of the land is dedicated to nursery stock.

Environmental

Kelly Creek flows in a northwest direction through the southern portion of the area. The headwaters of this creek are within one-half mile. A tributary of Beaver Creek passes through the northwest portion of the site. The total length of the stream corridors is approximately 1.25 miles. The creek corridors are forested. Multnomah County's *draft* West of Sandy River Plan has identified Kelly Creek North and part of a tributary to Beaver Creek located in the western portion of the area as riparian corridors in its inventory of significant Goal 5 resources and impact areas. Metro's *draft* Goal 5 Fish and Wildlife Habitat Inventory identifies 28 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Other Identified Resources

There are three home sites identified as historic resources by Multnomah County in the *draft* West of Sandy River Plan located at 30532 SE Lusted Road, 6308 SE 302nd Avenue and 29429 SE Powell Valley Road in Gresham.

Study Area	4	Gross Vacant Buildable Acres	226
Total Acres	363	Dwelling Unit Capacity	1,039
Total Developed Acres	101	Employment Acres	0
Total Constrained Acres	10	Resource Land Acres	-
Title 3 Acres	10	Percent Tree Canopy Cover	31%
Upland Steep Slope Acres	0		

General Site Description: Study Area 4 is a strip-like area on a small hill that is oriented diagonally NW-SE. It is situated south and west of the Sandy River, and is served by SE Dodge Park Boulevard and SE Lusted Road. Forested areas on the sides of the hill define the area's boundaries. The eastern boundary of the area marks the beginning of a large expanse of forested area. The northern end of the area is located within unincorporated Multnomah County, while most of the area is in unincorporated Clackamas County. It is outside of Metro's jurisdictional boundary. The area is designated as an Outer Neighborhood. Approximately 226 acres are vacant and buildable out of 363 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: Of the 139 total parcels, the area has 111 parcels with recorded improvement values. The median parcel improvement value is \$102,940. Forty-two parcels are smaller than one acre and 20 parcels exceed five acres. The area is in farm and forest use. Nine permits have been issued for single-family dwellings since 1990.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): The area does not show evidence of power lines or other public easements being present. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This study area falls within several jurisdictions for public services, and the following conditions apply:

- **Water:** At this time, the area is within the service area of the Pleasant Home Water District, and approximately one mile from the nearest connection point. The water district is currently at capacity. Pleasant Home Water District is willing to serve the study area, but would need additional pumping stations, transmission lines, and storage facilities. The area is rated as moderately difficult to serve.
- **Sewer:** The study area would need a pump station and force mains. The majority of the study area is in Clackamas County; so Sandy would be likely need to provide service for this area to be urbanized. The City has noted in interviews, however, that a portion of necessary service areas would cross the "Green Corridor/Rural Reserve" area set aside in 1998 by Metro, Clackamas County and Sandy. In addition, service provision would be difficult due to the presence of steep bluff along the west side of the study area. This bluff indicates the possibility of bedrock in the area. Trenching along the bluffs would be difficult. The area is rated as difficult to serve.
- **Stormwater:** Clackamas County Water Environmental Services states that all stormwater will be required to be treated for quality/quantity before leaving a site. No difficulty is anticipated. The area is rated as easy to serve.

Agricultural Analysis

Zoning: This area is composed entirely of exception land and is zoned RRFF5 by Clackamas County and as RR by Multnomah County. Resource land surrounds the study area on three sides and is zoned both EFU and TBR.

Current Agricultural Activity: There is a very small amount of field crop agricultural activity occurring within this study area. Between the furthest tip of the study area and the Sandy River is a nursery, and there are some large expanses of row and field crops to the south of the area. North of the study area is forested resource land along the Sandy River. This stretch of the Sand River is designated as wild, scenic or recreational through the National Wild & Scenic Rivers System.

Compatibility: An increase in traffic on SE Lusted Road would be expected, which may impede the normal movement of farm equipment and supplies and affect the transport of agricultural goods. Urbanization of this long thin stretch of exception land would have an impact on the adjacent agricultural practices to the south mainly in the form of an increase in issues relating to safety, liability, and complaints due to noise and the use of pesticides and fertilizers. The Sandy River provides a natural barrier to the resource lands further east, however as noted above there is a large number of publicly owned parcels of land in this area that could be impacted by urbanization of this area. Three small streams pass through this study area prior to flowing through forested areas and draining into the Sandy River. Urbanization of the area would result in increased impervious surfaces that may diminish water quality and increase downstream flooding in these streams, however the small increase in flow would not affect peak flows in the Sandy River or active agricultural areas. Urbanization of this area may affect the value of adjacent resource land to the south by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production.

Environmental Social Energy Economic Analysis

General Character of Area

Area 4 is a long narrow area running southeast/northwest and bisected by Lusted Road. It is rural residential in character and mostly gently sloped with steep slopes along its eastern and western boundaries. These steep boundaries are heavily forested. There are patches of forest cover scattered throughout the area.

Environmental

Two tributaries of the Sandy River divide Area 4 into thirds. The Sandy River parallels the eastern boundary, varying from 400 feet to 2,000 feet away. The total length of river tributaries in the study area is approximately 1.3 miles. There are areas of steep slopes along both the east and west boundaries of the area. The Blue Hole Tract land that Metro purchased along the east side of the Sandy River is approximately 400 feet east of the study area. Urbanization of this area may also inhibit the ability of this natural area to provide species habitat and other ecological functions. Multnomah County's *draft* West of Sandy River Plan has identified a very small segment of riparian and wildlife habitat in the northern portion of the study area along the county line its inventory of significant Goal 5 resources and impact areas. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 32 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis and may also inhibit the ability of the natural area to provide species habitat and other ecological functions.

Social Energy Economic
See Appendix A.

Study Area	5	Gross Vacant Buildable Acres	1,214
Total Acres	1,789	Dwelling Unit Capacity	4,898
Total Developed Acres	287	Employment Acres	161
Total Constrained Acres	108	Resource Land Acres	48
Title 3 Acres	107	Percent Tree Canopy Cover	9%
Upland Steep Slope Acres	0.5		

General Site Description: Study Area 5 is a rectangular area southwest of Gresham in unincorporated Multnomah County. It is bounded on the west by Clark Road, on the North by SE Lusted Road, on the east by steep contours, and to the south by SE Bluff Road. The area is bisected by Metro's jurisdictional boundary. The major arterials that serve this area are SE Dodge Park Boulevard, SE Bluff Road, and SE 327th Avenue. This area includes 1,463 acres that are designated as Outer Neighborhood. There are 229 acres are designated as Corridor. There are 1,214 acres vacant and buildable out of 1,789 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: There are 465 parcels in this study area, of which approximately 369 have recorded improvement values. The median improvement value is \$70,920. The median parcel size is 1.9 acres. There are 160 parcels less than one acre, and 90 parcels exceed five acres. There appears to be a significant amount of agriculturally productive land in the study area. A total of 14 permits for single-family dwellings have been issued since 1990. Most of that development has occurred along SE Dodge Park Boulevard between SE Pleasant Home Road and SE Altman Road.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of significantly high air traffic noise over the area. County assessor's data does not suggest that there are power lines or other public easements in the study area.

Public Services Feasibility: If this area were developed for residential purposes, it would be relatively isolated from the existing service areas of Gresham. It would not represent a logical extension of the urban area, because of the topography. Therefore, it would be difficult and expensive to provide services.

- **Water:** Pleasant Home Water District is currently providing service to the area. Development would not require more transmission lines, but the main transmission line would have to be enlarged. All study area development would need added pumping stations, transmission lines and storage facilities. The area could be served. However, it would be relatively expensive to extend service to the area because of the varying topography. Several reservoirs and pump stations would be required. The area is rated as moderately difficult to serve.
- **Sewer:** Beaver Creek and its associated stream corridor tributaries will have to be protected. The provision of service in this area, if constructed in a traditional manner, would disturb Beaver Creek and its tributaries. Typically, sewers are constructed to take advantage of gravity. In this area, the only way to do this on a consistent basis would be to construct the service interceptors in the creek bottoms. This would likely not be possible, due to environmental impacts. Therefore, pump stations and pressure lines will be necessary. The likely service provider would be Sandy, however the City would oppose development in this area, as service would cross the "Green Corridor/Rural Reserve" area set aside in 1998 by Metro, Clackamas County and Sandy. The area is rated as difficult to serve.

- **Stormwater:** Clackamas County Water Environmental Services states that all stormwater will be required to be treated for quality/quantity before leaving a site. No difficulty is anticipated. The area is rated as easy to serve.

Agricultural Analysis

Zoning: This area is composed almost entirely of exception land and is zoned as RRFF5 by Clackamas County and as MUA20 by Multnomah County. There is a small amount of resource land that is surrounded by exception land that is zoned EFU. There are large areas of resource land to the north and south of the study area that is zoned EFU. To the west is exception land and resource land zoned EFU in Study Area 6.

Current Agricultural Activity: The exception land within this area is overwhelmingly utilized as nursery land including parcels of all sizes, with a number of small lots combined to make larger expanses of nursery fields. The resource land to the north and the south of the area supports nursery stock, with some very large individual nursery operations stretching across substantial expanses of land. Directly to the southeast is Study Area 4 that contains minimal amounts of agricultural activity. Directly to the west is Study Area 6 that contains some nursery operations but on a smaller scale.

Compatibility: Urbanization of this area, especially in combination with urbanization of Study Area 9 to the south would have a great impact on through traffic in the resource land that separates the two study areas. This increase in traffic congestion would impede the normal movement of farm equipment and supplies and affect the transport of agricultural goods to market. Urbanization of any part of the exception land in the study area would impact the nursery operations that remain due to issues relating to safety, liability, and complaints due to noise and the use of pesticides and fertilizers as well as traffic congestion along SE Dodge Park Boulevard. Urbanization of the entire study area would also impact the nursery operations adjacent to the north and south on resource land. A number of streams flow in this area including Johnson Creek, South Fork Beaver Creek, Middle Fork Beaver Creek and Beaver Creek. Urbanization of the area would result in increased impervious surfaces that may diminish water quality and increase downstream flooding in these streams. All three Beaver Creeks flow through active farming areas that could be negatively affected by the increased flows. Urbanization may affect the stream flow of Johnson Creek, which could have serious effects on land downstream, as Johnson Creek already experiences high stream flows and flooding. Furthermore, urbanizing this area may encourage land banking and speculation in the active farmland areas to the south and north. Urbanization of this study area would result in a high potential for negatively affecting nearby agricultural activities.

Environmental Social Energy Economic Analysis

General Character of Area

Area 5 is gently sloped, especially through its middle section. The northern and southern sections, which have portions of two creek systems passing through, contain slightly steeper slopes. There are a few scattered forested patches within the area, with more concentrated cover along the Johnson Creek corridor to the south. Much of this land is dedicated to nursery operations.

Environmental

Johnson Creek and several small tributaries flow through the southern portion of Area 5. Beaver Creek and two tributaries originate within this study area and flow to the northwest. The

Sandy River flows within 200 feet of a northeast portion of the area. The total length of stream tributaries in the area is approximately 6.75 miles. There are eleven wetlands in this study area; four are located across the top half and seven are dispersed along the southern edge. In total, there are approximately 19.25 acres of wetland in this area. A small portion of a larger floodplain extends into the southwest corner of the area for approximately one-half mile. The Diack tract land that Metro purchased along the Sandy River is approximately 1,000 feet from the northeast corner of the study area. The relatively small Hessel Reservoir is just north of Johnson Creek near the southern boundary of the study area. The Sester Reservoir is approximately 1,500 feet from the northern boundary of the area. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 29 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Other Identified Resources

Multnomah County's draft West of Sandy River Plan identifies home sites as historic resources located at the following addresses: 31310 and 31604 SE Bluff Road, Gresham, 33304, 34116 and 34630 SE Lusted Road, Gresham and 34116 SE Carpenter Lane, Gresham. The West of Sandy River Plan also identifies the historic Pleasant Home Methodist Church at 31632 SE Bluff Road, Gresham as a historic resource.

Study Area 6		Gross Vacant Buildable Acres 853	
Total Acres	1,398	Dwelling Unit Capacity	4,034
Total Developed Acres	464	Employment Acres	913
Total Constrained Acres	109	Resource Land Acres	279
Title 3 Acres	103	Percent Tree Canopy Cover	10%
Upland Steep Slope Acres	6		

General Site Description: Study Area 6 lies just south of the Gresham city limits. While most of the area is within Multnomah County, about 83 acres are in Clackamas County. The study area is within the Metro jurisdictional boundary, except for one parcel at the eastern end. Highway 26 borders the study area on the west. Southeast Clark Road aligns most of the eastern boundary, and SE Wheeler Road aligns most of the southern boundary. The center of this study area is approximately four miles southeast of Gresham's downtown. This study area contains Industrial, Inner Neighborhood and Corridor designations. The entire study area is about 1,506 acres, while the vacant buildable portions of the study area comprise about 940 acres (residential and non-residential). Study Area 6 is adjacent to and directly east of Study Area 12.

Parcelization, Building Values, Development Patterns: This study area contains about 480 tax lots. The majority of them have improvements of some type, though fewer than 10 have improvements valued above \$250,000. About 15 percent of the tax lots in this study area are smaller than one acre. A great deal of land in Study Area 6 is in farm use, particularly for nursery stock. Non-residential uses include nurseries, stables, construction, auto parts, feed stores as well as general store and a café. There is no evidence of mining or aggregate activities within this area.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): Available data does not suggest that there are power lines or other public easements running through this area. There is also no evidence of significantly high air traffic noise over this area.

Public Services Feasibility: Gresham showed a desire, or already has plans, to serve the area with water, and appears willing to accept the study area within its service area for sewer and storm, if necessary. This area is of a size that could allow for more efficient service provision. The area is also divided by multiple drainage basins, which may be a consideration for providing services.

- **Water:** This study area would be relatively easy to serve because the infrastructure system is in acceptable condition to accommodate new development. Minimal improvements within the UGB should be expected.
- **Sewer:** This study area would be moderately difficult to serve. Infrastructure improvements will be needed to prevent existing facilities from being overburdened.
- **Stormwater:** This area would be relatively easy to serve. While the infrastructure is in acceptable condition to develop the area, some improvements and extensions of lines are to be expected, both inside and outside the UGB.

Agricultural Analysis

Zoning: The majority of this area is exception land and is zoned as MUA20 and RC by Multnomah County. A portion of this area is within Clackamas County and is zoned RRFF5. There is 139 acres of resource land in the study area that Multnomah County has zoned as EFU. The EFU land within this area is surrounded on all sides by exception land and is considered high value farmland.

Current Agricultural Activity: The resource land within the study area supports nursery operations that are completely surrounded by rural residences on large lots and small-scale farming operations. There are some nursery operations occurring on the exception lands within the area and some properties also appear to be growing field crops. The resource land areas directly to the north supports mostly nurseries, with some field crops and orchards. Directly to the east is Study Area 5, which is overwhelmingly being utilized as nursery land including parcels of all sizes, with a number of small lots combined to make larger expanses of nursery fields. The resource land to the south supports nurseries, field crops and rural residential uses. Directly to the west is Study Area 12 which is mostly in residential use however, there are field crops and small amounts of pastureland¹⁸ on the larger residential lots and scattered row crop production.

Compatibility: A significant increase in traffic on SE Orient Drive, Highway 26 and SE Telford Road may result from the urbanization of this area. This increased traffic could impede the normal movement of farm equipment and affect the transport of agricultural goods produced to the south and east of this area. Similar to the situation in Study Area 2, if this area was to urbanize in conjunction with Study Area 2 a virtual island of resource land to the north of this area would be created. The agricultural viability of this pocket of resource land could suffer considerably from being nearly surrounded by urban development. The near isolation of this resource area would exacerbate issues relating to safety, liability, vandalism, and complaints due to noise and the use of pesticides and fertilizers. The resource lands within the study area would be severely impacted if the land that surrounds them were to urbanize. In addition, resource areas directly to the south and southwest (Study Area 7) of this area could be impacted by their close proximity to urban development. However, the Study Area 7 resource land areas are divided and surrounded by a patchwork of exception land so the impact may not be as great. Johnson Creek passes through Study Area 6 prior to crossing the small resource land parcels in Study Area 7 and flowing to the UGB. Urbanization of Study Area 6 would result in increased impervious surfaces that may diminish water quality and increase downstream flooding in this stream. The small active farming area in Study Area 7 could be negatively affected by the increased flow, but the major impact maybe further downstream as Johnson Creek already experiences high stream flows and flooding. Urbanization of this area may affect the value of adjacent land, especially the pocket of resource land to the south, by encouraging land banking and speculation and inhibit the ability of farmers to acquire parcels of land needed for agricultural production.

¹⁸ Pastureland is land that is covered in forage suitable for grazing such as clover and alfalfa.

Environmental Social Energy Economic Analysis

General Character of the Area

The area is characterized as generally flat and open with forested areas associated with stream corridors. A majority of the open areas support agricultural activities dominated by nursery operations. There are also a number of large lot residential uses.

Environmental

Johnson Creek flows west through the center of the area for approximately 1.9 miles. Two tributaries of Johnson Creek flow north from the lower portion of the area and a third flows south from the eastern edge, totaling 1.25 miles of stream corridor. A fourth tributary flows west through the area for approximately 2.2 miles. There are floodplains associated with the entire length of the main stem of Johnson Creek that vary in width from 150-350 feet. Four small wetlands associated with stream corridors that total 1.6 acres are located in the study area. There are about 12 very small-dispersed locations of slopes over 25 percent in the southeastern portion of the area. These steep sloped areas are generally located along a stream corridor. Multnomah County's *draft* West of Sandy River Plan has identified those portions of Johnson Creek and a tributary that are in the county as riparian corridors in the county's inventory of significant Goal 5 resources and impact areas. There also are a few large areas of riparian and wildlife habitat associated with both streams. A segment of Kelly Creek North is also identified as a riparian corridor and a minor area of upland located near the county line and SE Stone Road are also in the plan. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 31 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Other Identified Resources

Multnomah County's *draft* West of Sandy River Plan also identifies a home site as a historic resource at 29740 SE Rook Road, Gresham.

Study Area 7		Gross Vacant Buildable Acres	
Total Acres	140	Dwelling Unit Capacity	80
Total Developed Acres	18	Employment Acres	75
Total Constrained Acres	12	Resource Land Acres	140
Title 3 Acres	12	Percent Tree Canopy Cover	1%
Upland Steep Slope Acres	—		

General Site Description: Study Area 7 is located west of SE 282nd Avenue in the vicinity of SE Stone Road and is surrounded by Study Areas 6, 10 and 12. The area north of SE Stone Road is in Multnomah County and the area south of SE Stone Road is in Clackamas County. The entire area is within the Metro jurisdictional boundary. This study area is approximately 3 miles from the Gresham Regional Center and contains a Corridor along SE 282nd Avenue and is designated as Inner Neighborhood and Industrial land.

Parcelization, Building Values, Development Patterns: This study area contains 16 parcels, nine of which have improvements. There are no parcels with improvement values above \$250,000. Nine of the parcels are over five acres in size. Agricultural activity is the dominant use.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): Data available does not indicate that there are power lines or public easements running through this site. There is also no evidence of significantly high traffic noise over this site.

Public Services Feasibility: The City of Gresham has plans to serve the area with water, sewer and storm services. The area's small size would be an impediment to providing services efficiently. However, the City believes it can provide these services in an efficient manner if a large amount of adjacent land is also included in the UGB.

- **Water:** This study area would be relatively easy to serve because the infrastructure system is in acceptable condition to accommodate new development. Minimal improvements within the UGB should be expected
- **Sewer:** This study area would be moderately difficult to serve, as infrastructure improvements will be needed to prevent existing facilities from being overburdened.
- **Stormwater:** This study area would be relatively easy to serve. While the infrastructure is in acceptable condition some improvements and extensions of the lines are to be expected.

Agricultural Analysis

Zoning: This area is entirely resource land that is completely surrounded by exception land in Study Areas 6, 10 and 12. The area is bisected by the Clackamas/Multnomah County line and is zoned EFU in both counties.

Current Agricultural Activity: This entire area of resource land is dedicated to nursery operations. The pocket of resource lands to the southeast mainly supports nursery operations. Directly east and north is Study Area 6 which supports nursery operations that are completely surrounded by rural residences on large lots and some small-scale farming operations that

appear to be growing field crops. The closest pocket of resource land in Study Area 10 to the southwest is zoned TBR and consists mainly of forested areas with rural residences.

Compatibility: Any increase in traffic resulting from urbanization would be negligible due to the access point at SE Stone Road to Highway 26 that is directly adjacent to this small study area. Urbanization of this pocket of resource land would have a small affect on the agricultural practices that are occurring on adjacent exception lands and the surrounded pocket of resource land to the northeast. Issues relating to safety, vandalism, liability, and complaints generated from noise and the use of pesticides and fertilizers may be exacerbated by the proximity of new development to these adjacent farming operations. Johnson Creek flows through this area prior to heading north towards the UGB. Any diminished water quality and potential for downstream flooding in this stream due to urbanization will be more of an issue inside the UGB. The encouragement of land banking and speculation may also occur, especially on adjacent exception land that is currently farmed.

Environmental Social Energy Economic Analysis

General Character of Area

Area 7 is a gently sloped area with few residences. The entire study area is zoned EFU. Most of the land is dedicated to nursery operations. In addition to the tree cover along Johnson Creek, there is one small patch of forest cover on the northwest side of the study area.

Environmental

Johnson Creek bisects the site running east to west for approximately one-fourth of a mile. The floodplain of Johnson Creek extends this entire length and is 185-300 feet in width. Multnomah County's *draft* West of Sandy River Plan identifies that portion of Johnson Creek that is in the county as a riparian corridor in its inventory of significant Goal 5 resources and impact areas. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 21 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area	8	Gross Vacant Buildable Acres	548
Total Acres	782	Dwelling Unit Capacity	2,343
Total Developed Acres	185	Employment Acres	0
Total Constrained Acres	19	Resource Land Acres	0
Title 3 Acres	19	Percent Tree Canopy Cover	21%
Upland Steep Slope Acres	0		

General Site Description: Study Area 8 is a curve-shaped area that touches the northern boundary of Sandy in unincorporated Clackamas County. The area is outside of the UGB and Metro's jurisdictional boundary. This area is partially bounded by 352nd Avenue on the western side, and some downward slopes on the east side. Southeast Hauglum Road, 352nd Avenue and Bluff Road provide access to this area. It is designated as an Outer Neighborhood. Approximately 548 of the area's 782 acres are vacant and buildable.

Parcelization, Building Values, Development Patterns, Vacant Land: The study area contains 256 tax lots, 215 of which have recorded improvement values. The median improvement value for the study area is \$81,545. There are 81 parcels less than one acre in size, and 54 parcels are greater than five acres. There have been 11 single-family homes developed in the study area since 1990. The median parcel size is 2.01 acres. There appears to be a large amount of agricultural use in this location.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements. The study area is sufficiently far from any airport that it is unlikely that there is loud noise from air traffic overhead.

Public Services Feasibility: This study area falls within several jurisdictions for public services, and the following conditions apply:

- **Water:** This area could be served by either Pleasant Home Water District or Boring Water District, and both are willing to provide service. The source of water on this study area is from wells, and there is no infrastructure in place at this time. Transmission lines would have to be extended, and the main transmission line would have to be enlarged. All area development scenarios would need added pumping stations, transmission lines and storage facilities. Boring Water District is considering annexing this area into their district, and anticipates no difficulty with bedrock in excavation. The area is rated as moderately difficult to serve.
- **Sewer:** Sandy is the closest sewer provider. They are unwilling to serve the study area, stating that the area is within the "Green Corridor/Rural Reserve" area set aside by Metro, Clackamas County and Sandy in 1998. Clackamas County can serve the study area, but would require multiple lift stations and approximately 20 miles of trunk line. The area is rated as difficult to serve.
- **Stormwater:** Clackamas County Water Environmental Services states that all stormwater will be required to be treated for quality/quantity before leaving a site. No difficulty is anticipated. The area is rated as easy to serve.

Agricultural Analysis

Zoning: The area is entirely exception land and is zoned RFFF5 by Clackamas County. To the north and south is resource land zoned EFU. To the east is resource land zoned TBR. To the west is exception land in Study Area 9.

Current Agricultural Activity: A large portion of this exception area is devoted to nursery operations with some field crop production. The majority of the large parcels along the main roads of Bluff Road, SE 362nd Avenue and SE Hauglum Road are in agriculture, however there also are a number of smaller parcels in crop production. The majority of the resource land to the east supports the nursery industry however the resource land further east along the Sandy River is timber. The large expanse of resource land to the north is in nursery production and the resource land to the south is in nursery stock and field crops. Directly west is Study Area 9, which includes a number of nursery operations.

Compatibility: Any increase in traffic on SE Hauglum Road, Bluff Road, 352nd Avenue, and SE 362nd Avenue, which provide major north-south and east-west transportation connections may impede the normal movement of farm equipment and affect the transport of agricultural goods produced to the north, south and east. Urbanization of this area would have a negative impact on all the agricultural activity that is occurring around the area. Safety, vandalism, and liability issues, as well as complaints generated from noise and the use of pesticides and fertilizers may be exacerbated by the proximity of new development to these farming operations. A few small stretches of tributaries to Doane Creek and Dolan Creek originate in this study area. Urbanization of this area would result in increased impervious surfaces that may diminish water quality and increase downstream flooding in these streams negatively affecting the nursery operations occurring in Study Area 9. Finally, urbanization of this area may also affect the value of adjacent farmland, especially the large tracts to the south and east along the main roadways, by encouraging land banking, speculation and inhibiting the ability to acquire parcels of land needed for agricultural production.

Environmental Social Energy Economic Analysis

General Character of Area

Area 8 is a gently sloped area with several rural residences. There are some steep slopes along the southeastern edge of the study area. Much of the land is dedicated to nursery operations. There are several large patches of forested land, mostly in the western half of the area.

Environmental

Portions of Doane Creek and Dolan Creek tributaries originate in the western portion of the study area. The headwaters of a Sandy River tributary originate in the central northern portion of the area. In total, there are approximately 1.3 miles of tributaries in this area. There are five wetlands located in the top two-thirds of the area measuring approximately 5.3 acres in total. There are some steep slopes along the southeastern edge of the study area. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 21 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area	9	Gross Vacant Buildable Acres	1,153
Total Acres	1,963	Dwelling Unit Capacity	4,943
Total Developed Acres	514	Employment Acres	83
Total Constrained Acres	190	Resource Land Acres	0
Title 3 Acres	168	Percent Tree Canopy Cover	12%
Upland Steep Slope Acres	22		

General Site Description: Study Area 9 is in unincorporated Clackamas County southwest of Gresham. It is outside the UGB and Metro's jurisdictional boundary. It is a rectangular area that is intersected diagonally by SE Orient Drive. The southern extent of the area is partially defined by Highway 212 and the eastern boundary is defined by 352nd Avenue. The study area contains an interchange for Highway 26 and is also served by Highway 212. This study area contains 1,728 acres that are designated as Outer Neighborhood. It also includes 118 acres that are designated as Corridor. Riparian areas run through the western end of the study area, as well as through the east. Approximately 1,153 of the 1,963 acres are vacant and buildable.

Parcelization, Building Values, Development Patterns, Vacant Land: Of the 537 parcels, 493 parcels have recorded improvement values. The median improvement value in the area is \$115,520. There are 167 parcels less than one acre in size, and 116 parcels that are greater than five acres. The area contains a large amount of agricultural use, as well as associated residential uses. There have been 19 single-family dwelling permits issued since 1990.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This study area falls within several jurisdictions for provision of public services, and the following conditions apply:

- **Water:** Either the Pleasant Home Water District or the Boring Water District could serve this area, and both are willing to provide service. There is no infrastructure in place at this time. Transmission lines would have to be extended, and the main transmission line would have to be enlarged. All area development scenarios would need added pumping stations, transmission lines and storage facilities. The Boring Water District is considering annexing this area into their district, and anticipates neither gravity problems nor difficulty in bedrock excavation. The area is rated as easy to serve.
- **Sewer:** Sandy is the closest sewer provider. They are unwilling to serve the study area, stating that the area is within the "Green Corridor/Rural Reserve" area set aside by Metro, Clackamas County and Sandy in 1998. Clackamas County can serve the study area, but doing so would require multiple lift stations and approximately 20 miles of trunk line. The area is rated as difficult to serve.
- **Stormwater:** Clackamas County Water Environmental Services states that all stormwater will be required to be treated for quality/quantity before leaving a site. No difficulty is anticipated. The area is rated as easy to serve.

Agricultural Analysis

Zoning: The area is entirely exception land and is zoned RRFF5 by Clackamas County. To the north and south is resource land zoned EFU. To the east is exception land in Study Area 8 and to the west is exception land in Study Area 10.

Current Agricultural Activity: Nursery operations occur throughout the study area however, there is a greater concentration of them in the eastern portion, east of SE Orient Drive. It is apparent that size of parcel is not a limiting factor as a number of smaller parcels (5-10 acres) contain a residence with the remainder of the parcel devoted to nursery crops. The resource land to the south between the study area and the community of Kelso contains large-scale nursery operations. The two relatively isolated pockets of resource land north and south of SE Haley Road contain nursery operations. The resource land located between Study Areas 5 and 9 between SE Orient Drive and 352nd also contains large-scale nursery operations. To the east is Study Area 8 that contains a number of nursery operations. Adjacent to the west is exception land in Study Area 10 that is mostly dedicated to rural residences around the community of Boring.

Compatibility: Any increase in traffic on SE Brooks Road, SE Revenue Road, SE Compton Road, SE Orient Drive, SE 312th and 352nd Avenues, which provide some major north-south and east-west transportation connections may impede the normal movement of farm equipment and affect the transport of agricultural goods produced to the south and east. Urbanization of this area would have a negative impact on the agricultural activity that is occurring around the area, especially the large-scale nursery operations that are located directly adjacent to the area. Safety, vandalism, and liability issues as well as complaints generated from noise and the use of pesticides and fertilizers may be exacerbated by the proximity of new development to these farming operations. Doane and Dolan Creeks and some of their tributaries pass through this area prior to joining and forming North Fork Deep Creek, which flows through resource land on its way to the Clackamas River. Urbanization of this area would result in increased impervious surfaces that may diminish water quality and increase downstream flooding however, there would be no affect to agricultural activities as the North Fork Deep Creek flows south in a canyon. Finally, urbanization of this area may also affect the value of adjacent farmland, especially the large tracts to the north and south along the main roadways, by encouraging land banking, speculation and inhibiting the ability to acquire parcels of land needed for agricultural production.

Environmental Social Energy Economic Analysis

General Character of Area

Area 9 is characterized by gentle to moderate slopes with two small steeped-sloped areas - one along Deep Creek and one in the northwest corner adjacent to a small butte. There are many rural residences along with small farming operations. Several small patches of forest are scattered throughout the area. Highway 26 runs on a northwest/southeast diagonal through the western portion of the area.

Environmental

This area contains portions of three creek systems. Doane Creek runs east to west along the northern half of the area; Dolan Creek runs through the middle and southern portion of the area; and a small section of the North Fork of Deep Creek is found in the southwestern tip of the area. Stream segments in the study area add up to a total of approximately nine miles. A total of 17 wetlands measuring approximately 67.25 acres are dispersed along the stream system in the

study area. There are two small steeped-sloped areas - one along Deep Creek and one in the northwest corner adjacent to a small butte. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 33 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area 10		Gross Vacant Buildable Acres	3,830
Total Acres	8,102	Dwelling Unit Capacity	18,692
Total Developed Acres	2,773	Employment Acres	559
Total Constrained Acres	1,252	Resource Land Acres	849
Title 3 Acres	388	Percent Tree Canopy Cover	30%
Upland Steep Slope Acres	864		

General Site Description: Study Area 10 is an M-shaped area situated south of Gresham, southeast of Portland and east of Happy Valley in unincorporated Clackamas County. It is not physically contiguous to the UGB, as Study Areas 12 and 13 are immediately to the north, and Study Areas 14 and 17 are to the immediate west. The majority of this area, with the exception of a small portion in the southern end, is within Metro's jurisdictional boundary. The boundaries of this study area are partially defined by SE Borges Road at the north, SE 282nd Avenue at the east, and SE Foster Road at the west. The major arterials that serve the area are SE Foster Road, SE Tillstrom Road, SE Sunnyside Road, SE 222nd Avenue, SE 232nd Avenue, SE 242nd Avenue, and Highway 212. This area contains a several clusters with steep slopes, primarily along its eastern and western sides. There are 3,830 acres that are vacant and buildable out of total of 8,102 acres. The area has sections that are designated Inner Neighborhood, Town Center, Industrial and Employment. This area almost completely surrounds Study Area 11.

Parcelization, Building Values, Development Patterns, Vacant Land: Out of 3,401 parcels, the study area has 2,798 parcels that have recorded improvement values. The median improvement value in the study area is \$108,300. The median parcel size in the study is roughly one acre. There are 342 parcels that are greater than five acres, and 1,516 parcels less than one acre. Since 1990, 80 permits for single-family residences have been issued in the study area, some of which are tightly clustered in the area's southeast corner by the Boring Golf Course. The mix of residential and agricultural uses appears roughly even, and these uses are well interspersed.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): The Springwater Corridor runs north-south through the eastern side of this study area, connecting with the Boring Golf Course. There is no evidence of significantly high air traffic noise over this area.

Public Services Feasibility: This study area falls within several jurisdictions for public services, and the following conditions apply:

- **Water:** Either the Boring Water District or the Sunrise Water Authority could serve this area. Most of the infrastructure is in place, however transmission trunk lines would need to be upsized, and new contracts would need to be negotiated with Clackamas River Water District or Portland for more water. Overall, more infrastructure, including trunk lines and storage, would need to be added. Portions of this area are already being served by the Boring Water District, which is considering annexing to the west of current boundaries to enlarge their service area. The area is rated as moderately difficult to serve.
- **Sewer:** The service provider for this area would be Clackamas County Water Environment Services. The study area includes several separate drainages. The east side of this study area that might involve service into the canyon walls would present a challenge. Lift stations would be necessary to bring service up to the valley floor. Approximately 12 miles of trunk line (including lift stations and force main) would have to be installed to connect the service area to the Tri-Cities Plant.

The Tri-Cities plant capacity would have to be increased to serve the area. The area is rated as moderately difficult to serve.

- **Stormwater:** Clackamas County Water Environmental Services states that all stormwater will be required to be treated for quality/quantity before leaving a site. No difficulty is anticipated. This area is rated as easy to serve.

Agricultural Analysis

Zoning: This area in Clackamas County is a mixture of exception land and resource land, some of which is completely surrounded by exception land. There are five pockets of resource land that are zoned either EFU (869 acres) or TBR (533 acres). The central business areas of Damascus and Boring are zoned RC and RI with the remaining exception land devoted to residential use zoned RA1, RA2 and RRFF5. To the north is a mixture of exception land and resource land zoned EFU, TBR and AGF. To the east is exception land in Study Areas 6 and 9 and resource land zoned EFU. To the south is resource land zoned EFU, TBR and AGF. To the west is exception land in Study Areas 14 and 17.

Current Agricultural Activity: Agricultural activities within the study area consist mostly of scattered nursery and field crop production throughout the entire study area. Located in the center of the study area is a large expanse of nursery operations that extend north to Study Area 12 and south to Study Area 11. The area also contains large portions of resource land in timber. Study Area 11, which is essentially surrounded, by this study area, contains a mixture of agricultural activities including nursery, row crop, field crop, and pasturelands. The majority of the resource land to the south of Damascus stretching to the Clackamas River is in timber. To the south of Highway 212 and west of Noyer Creek is a substantial pocket of nursery operations. There is a large area of nursery operations further east that extends to SE Kelso Road, south of Boring and Study Area 9. Study Areas 13, 14 & 17 border this area to the west/northwest and contain a scattering of nursery operations.

Compatibility: Urbanization of this area would have a great impact on the transportation system of this large area, which may affect the normal movement of farm equipment and the transport of agricultural goods produced to the south and east. Urbanization of the large nursery area that extends out from this study area to Study Areas 11 and 12 would isolate these other areas, possibly encouraging land banking, speculation and inhibiting the ability to acquire parcels of land needed for agricultural production. The proximity of new development to these farming operations may exacerbate issues regarding safety, vandalism, and liability, as well as complaints generated from noise and the use of pesticides and fertilizers. The nursery areas to the south/southeast would be less affected by urbanization of this area due to the steep slopes along SE Bartell Road and SE 262nd Avenue that provide a natural buffer for these agriculture lands. Urbanization of the numerous scattered pockets of nursery and field crops would have little affect on other agricultural activity as most of these areas are currently surrounded by rural subdivisions. Numerous creeks including Richardson, Noyer, Rock, and tributaries of Johnson Creek and Kelly Creek flow through this area. Urbanization of this area would result in increased impervious surfaces that may diminish water quality and increase the potential for downstream flooding. Most of these streams flow in the bottom of canyons in the adjacent resource land areas so the threat of flooding will be minimal. However, the tributaries of Johnson and Kelly Creeks do flow through some relatively flat resource land areas where a negative impact on agricultural activities may occur.

Environmental Social Energy Economic Analysis

General Character of Area

This large study area can be divided into three sub-areas for the purpose of this analysis. The eastern portion extends from the Multnomah/Clackamas county line on the north to the Highway 212 corridor and Deep Creek area on the south, and from 282nd Avenue on the east to Sunshine Valley Road/250th Place on the west. It is characterized by two buttes with steep slopes in the north and by more moderate sloped land to the east and south. There are, however, steep slopes along a section of the North Fork of Deep Creek. The Springwater Corridor Trail runs north/south through this sub-area. There are several rural residences scattered throughout this section. Forest covers a significant portion of this section, especially in association with the two buttes.

The middle portion of Area 10 extends from Borges Road on the north to Hoffmeister Road on the south, and from Sunshine Valley Road/250th Place on the east to about 222nd Drive on the west. It is characterized by more gentle slopes than the eastern or western sections of Area 10. There are several rural residences, including a few rural subdivisions. Many small agricultural operations are spread across this valley section. A few forested areas are scattered throughout this section.

The western portion of Area 10 extends from a line extending west from Borges Road on the north to approximately Highway 224 on the south, and from 222nd Drive on the east to Foster Road on the west. It is characterized in the north by moderate to steep slopes due to buttes; and by more gentle-sloped land to the south. There are several residences in the northern section, especially to the east and south of the buttes. The southern half of the section includes the community of Damascus, where there are several hundred residences and some commercial businesses. Much of the northern section is forested, mostly associated with the buttes; the southern section has some forested areas associated with Richardson Creek and the steeper areas in the vicinity of Highway 224 and 232nd Drive.

Environmental

Area 10 contains portions of four creek systems. In the northern and northeastern part of the area, two branch tributaries of Johnson Creek flow northward. In the northwestern part of the study area, a branch of Rock Creek flows toward the west. The southwestern area contains a portion of the Richardson Creek system. The southern and southeastern sections of the study area contain portions of Noyer Creek and the North Fork of Deep Creek. In total the stream segments in this study area measure approximately 29.5 miles. There are 26 wetlands distributed throughout the area measuring approximately 16.5 acres in total. There are buttes containing steep slopes in the eastern and western portions of the area. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 43 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis

There are approximately 300 acres of land along the Clackamas River near the confluence of Noyer and Deep Creeks that has been purchased by Metro. This purchase is intended to provide flood storage and protect fish and wildlife habitat, scenic and recreational values and water quality. While not directly in Area 10, these naturally significant properties are directly downstream of potential impacts from urbanization of the study area. Urbanization of this area may, therefore, inhibit the ability of this natural area to provide species habitat and other ecological functions.

Social Energy Economic
See Appendix A.

Study Area	11	Gross Vacant Buildable Acres	649
Total Acres	777	Dwelling Unit Capacity	399
Total Developed Acres	48	Employment Acres	195
Total Constrained Acres	62	Resource Land Acres	777
Title 3 Acres	38	Percent Tree Canopy Cover	21%
Upland Steep Slope Acres	24		

General Site Description: Study Area 11 is a U-shaped area that is almost completely contained within Study Area 10. This area is located within unincorporated Clackamas County, and is completely within Metro's jurisdictional boundary. It is served by SE 222nd Avenue, SE 242nd Avenue and Highway 212. The area contains some moderately sloped portions towards the western and eastern edges and is designated as Inner Neighborhood and Employment. This area contains 649 acres that are buildable and vacant out of 777 total acres. This area is completely surrounded by Study Area 10.

Parcelization, Building Values, Development Patterns, Vacant Land: Out of 61 total parcels, there are 39 improved parcels. The median improvement value is \$131,326. Parcels in this area are generally larger than in Area 10. The median parcel size is 9.5 acres. There are three parcels that are smaller than one acre and 45 parcels are larger than five acres. There are a mix of forest, farm and residential within the study area. Records do not indicate that residential building permits have been issued in this area since 1990.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There does not appear to be a significantly high level of noises caused by air traffic over the study area.

Public Services Feasibility: This study area falls within several jurisdictions for public services. It should also be noted that, as this area is almost completely surrounded by Area 10, Area 10 would most likely have to come into the UGB in order for Study Area 11 to be brought in based on service provisions.

- **Water:** Either the Boring Water District or the Sunrise Water Authority could serve this area. Although most of the infrastructure is in place, the transmission trunk lines would need to be upsized, and new contracts would need to be negotiated with Clackamas River Water District or Portland for more water. Overall, more infrastructure, including trunk lines and storage, would need to be added. Portions of this area are already being served by the Boring Water District, which is considering annexing to the west of current boundaries to enlarge their service area. This area is rated as moderately difficult to serve.
- **Sewer:** All sewage flows would have to be conveyed to the Tri-Cities plant. Clackamas County Water Environmental Service is willing to provide service. No difficulty is anticipated in installation of services. The study area is not served at this time, and would require approximately 15 miles of trunk lines. The Tri-Cities plant would need to be expanded to serve demand. Costs of infrastructure and plant expansion are expected to be covered by development fees. The study area is rated as moderately difficult to serve.
- **Stormwater:** Clackamas County Water Environmental Services states that all stormwater will be required to be treated for quality/quantity before leaving a site. No difficulty is anticipated. This area is rated easy to serve.

Agricultural Analysis

Zoning: The area is entirely resource land and is zoned EFU by Clackamas County. This resource land area is surrounded by exception land in Study Area 10, except for a small location along Highway 212 where resource land extends south to the community of Barton.

Current Agricultural Activity: The agricultural activities in this study area include nursery, row crop, field crop, pasture and forested areas. There are a small number of rural residences located in this group of resource lands. Generally the exception land area surrounding in all directions consist of rural subdivisions intermixed with field and nursery crops on the larger parcels. To the south of Highway 212 is a substantial pocket of nursery operations, west of Noyer Creek.

Compatibility: Urbanization of this area would result in an increase in traffic on SE Bohna Park Road, SE Tillstrom Road, Highway 212, SE 322nd and SE 342nd Avenues. An increase in traffic on these roads, which provide some major north-south and east-west transportation connections may impede the normal movement of farm equipment and affect the transport of agricultural goods produced to the south and north. The current agricultural activities within the study area provide expanses of agricultural land that, when combined with the agricultural activities on the adjacent exception land results in some fairly large blocks of agricultural activities. Urbanization of this study area would have an impact on the agricultural activities that occur on the adjacent exception lands, as these agricultural activities would then be more isolated and completely surrounded by development. Safety, vandalism, and liability issues, as well as complaints generated from noise and the use of pesticides and fertilizers may be exacerbated by the proximity of new development to these farming operations. Richardson Creek and Noyer Creek pass through this area prior to flowing south on resource land. Urbanization of this area would result in increased impervious surfaces that may diminish water quality and increase the potential for downstream flooding however, these streams flow in the bottom of canyons in the adjacent resource land areas so the threat of flooding will be minimal. Urbanization of this study area may also affect the value of adjacent land that is being farmed, especially if it is exception land, by encouraging land banking, speculation and inhibiting the ability to acquire parcels of land needed for agricultural production.

Environmental Social Energy Economic Analysis

General Character of Area

Area 11, a horseshoe shaped area, is characterized by moderate to steep slopes in the western one quarter (to 222nd Drive on the east), gentle slopes in the middle section (between 222nd and 242nd drives), and moderate slopes in the far eastern section. The entire study area is zoned for resource use, in this case EFU. There are agricultural operations on the upper western tip of the area; the lower western section contains a portion of a small, steeped-sloped butte and large lot single family residences. There is forest cover associated with the butte. The middle section of the area contains agricultural operations on each side of a forested section of land. The eastern section of Area 11 contains several agricultural fields.

Environmental

Richardson Creek flows through the western portion of Area 11, and Noyer Creek flows through the southwestern portion of the area. In total, the creek segments measure approximately 2.25 miles. There are four wetland areas in the study area; one located in the center, and three in the eastern portion. They measure approximately 12.75 acres in total. There are two small areas of steep slopes, one in the very western portion and one in the very eastern portion of the

study area. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 39 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area 12		Gross Vacant Buildable Acres 1,148	
Total Acres	2,038	Dwelling Unit Capacity	4,793
Total Developed Acres	624	Employment Acres	175
Total Constrained Acres	323	Resource Land Acres	829
Title 3 Acres	165	Percent Tree Canopy Cover	30%
Upland Steep Slope Acres	157		

General Site Description: Study Area 12 sits south of Gresham and a small pocket of unincorporated Multnomah County. Approximately 900 acres of this area rests in Multnomah County, while the remaining portion sits to the south in Clackamas County. This area sits entirely within the Metro jurisdictional boundary. The western edge of the area is SE 222nd Drive. The southern edge consists of the axis along SE Borges Road, meeting with SE Rugg Road towards the southeast. This boundary turns back south along SE Telford Road, and meets Highway 26, the eastern boundary of the study area. The center of this study area is approximately three miles from the center of Gresham's Town Center. The area contains a mixture of Industrial and Inner Neighborhood designations. The entire study area contains about 2,038 acres, while the vacant buildable portions of the study area comprise about 1,148 acres (residential and non-residential).

Parcelization, Building Values, Development Patterns: This study area contains about 400 tax lots. About three-fourths of them have improvements. Fewer than 15 have improvements valued at above \$250,000. About 15 percent of the tax lots in this study area are smaller than one acre in size; 80 percent of all tax lots in this study area are smaller than five acres in size. There is a subdivision of approximately 55 one-acre tax lots in the central southern portion of the study area. Agricultural uses are scattered, but include field crops and nursery stock. Non-residential land uses include nurseries, animal hospitals, construction and remodeling businesses, machine repair, a golf course and religious services.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There does not appear to be power lines or public easements running through this area. Available data does not indicate that there is significantly high air traffic noise over this area.

Public Services Feasibility: Gresham showed a desire or already has plans to serve the area with water, and appears willing to accept the study area within its sewer and storm service areas, if necessary. The area is contained by multiple drainage basins, which may be a consideration in providing services.

- **Water:** This area would be relatively easy to serve because the infrastructure system is in acceptable condition to accommodate new development. Some improvements and extensions of lines inside and outside the existing UGB are to be expected to prevent overburdening existing facilities.
- **Sewer:** This study area would be moderately difficult to serve because infrastructure improvements are needed to develop the area.
- **Stormwater:** This study area would be easy to serve. While the infrastructure is in acceptable condition to develop the area, some improvements and extensions of lines may be needed, both inside and outside the UGB.

Agricultural Analysis

Zoning: This area is mostly exception land but does include 808 acres of resource land and is located in both Multnomah and Clackamas Counties. Multnomah County zoning includes MUA20 and resource zoned EFU. Clackamas County zoning includes RRFF5, EFU and TBR. The resource land within Study Area 12 is surrounded by exception land when viewed together with the resource land in adjacent study areas. To the north is the UGB. To the east is exception land and resource land zoned EFU in Study Area 6 and resource land zoned EFU in Study Area 7. To the south and west is exception land and resource land zoned EFU, AGF and TBR in Study Areas 10 and 13.

Current Agricultural Activity: Agricultural production on the resource land within Study Area 12 is dedicated mostly to nurseries and row crops. The Persimmon Golf Club is also located on resource land. The resource area directly to the south of the western portion of this area supports nurseries, field crops, and orchards. The resource lands directly to the south of the eastern portion of this study area is forested and mostly unfarmed. A large block of resource land is located to the west in Study Areas 10 and 13 that includes forested and unfarmed areas in the north with the remainder dedicated to pasture and several nurseries and row crops. There also are nurseries within the non-resource portions of Study Area 12 and some properties also are growing field crops.

Compatibility: A significant increase in traffic on SE 242nd Avenue, SE 252nd Avenue, SE Kane Road, SE Hogan Road, SE Orient Drive, US 26 and SE Telford Road may result from the urbanization of this area. This increased traffic could impede the normal movement of farm equipment and supplies and affect the transport of agricultural goods produced in and around this area to market. Urbanization of this area would bring development directly adjacent to the resource land to the south and west and may affect the agricultural viability of these areas. Although some of this resource land is unfarmed other areas are dedicated to nurseries and the production of row crops. Issues relating to safety, vandalism, and liability as well as complaints generated from noise and the use of pesticides and fertilizers may be exacerbated by the proximity of new development to these farming operations. The sections of resource land within Study Area 12 that support nursery operations and row crops may be severely impacted should the land that surrounds them urbanize. The resource land that is home to the golf course would not be greatly impacted by urbanization. Tributaries of Johnson Creek flow north joining the main stem near SE Telford Road. Johnson Creek flows north towards the UGB adjacent to SE Telford Road in a ravine. Therefore, any increased flows due to urbanization will not negatively affect agricultural activities. Urbanization of this area may affect the value of adjacent active farmland to the south and west by encouraging land banking and speculation and inhibit the ability of farmers and agricultural suppliers to acquire parcels of land needed for agricultural production.

Environmental Social Energy Economic Analysis

General Character of the Area

Rural residences with dense tree cover associated with steep slopes and open land in the relatively flat areas that are in agricultural production characterizes this study area. The Persimmons Golf Course is in the north-central portion of the study area.

Environmental

Johnson Creek flows north along the eastern edge of the area for approximately 1.7 miles. There are floodplains along the entire length of Johnson Creek that vary in width from 125-500

feet however; the most common width is about 200 feet. There are three sets of tributaries that flow through the area. Two tributaries from the east total approximately a half-mile of stream corridor. Three main tributaries from the south total approximately 6.1 miles of stream corridor. Three tributaries from the west total approximately two miles of stream corridor. There are three isolated wetlands in the north portion of the study area that total approximately 1.1 acres. Four additional wetlands totaling 8.7 acres are located adjacent to steam corridors in the southern portion of the area. There is one very large area of steep slopes over 25 percent along the western edge, just south of Persimmons Country Club. There are a few other minor locations of steep slopes near stream corridors that are scattered about the area. The Springwater Corridor runs adjacent to Johnson Creek along the eastern edge of the area. Johnson Creek and all four tributaries that are located in Multnomah County are identified as riparian corridors in the county's inventory of significant Goal 5 resources and impact areas in the *draft* West of Sandy River Plan. There are large areas of riparian and wildlife habitat between SE Hogan Road and SE 247th Avenue and there is a small upland area near SE 252nd Avenue and US Highway 26 also identified in the plan. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 46 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resource areas as outlined in the introduction of the ESEE analysis.

Social Energy Economic

See Appendix A.

Other Identified Resources

Clackamas County has identified a historic house at 9460 SE 242nd Avenue, Gresham.

Study Area 13		Gross Vacant Buildable Acres 812	
Total Acres	1,576	Dwelling Unit Capacity	3,065
Total Developed Acres	418	Employment Acres	185
Total Constrained Acres	325	Resource Land Acres	992
Title 3 Acres	55	Percent Tree Canopy Cover	40%
Upland Steep Slope Acres	271		

General Site Description: Study Area 13 is approximately 1,576 acres. It is situated immediately south of the Gresham City limits and the Pleasant Valley Area. Southeast Foster Road, which defines the edge of Study Area 14, borders it on the west. The southern boundary consists of parcel lines running along the approximate axis of SE Borges Road. The eastern boundary is SE 222nd Drive, and the boundary of Study Area 12. The center of this study area is approximately four miles south of Gresham's downtown center. Approximately 210 acres of the northern section of this study area is in Multnomah County; the rest is in Clackamas County. This area has been designated as Inner Neighborhood and Industrial. The total study area is approximately 1,576 acres, while the vacant buildable portions of the study area comprise approximately 812 acres.

Parcelization, Building Values, Development Patterns: This study area contains about 300 tax lots. About two-thirds of them have improvement values, though only about five have improvement values above \$250,000. About 15 percent of the tax lots in this study area are smaller than one acre in size, and about 70 percent of all the tax lots are smaller than five acres. Some agricultural activities appear to be occurring in the eastern and western portions of the area, consisting mainly of field crops. Non-residential land uses include stables, construction, repair and remodeling, excavating and lodging. Mining and aggregate uses do not occur in this study area.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): Available data does not suggest the existence of power lines or other public easements running through this area. There is no evidence of significantly high air traffic noise over this area.

Public Services Feasibility: The study area falls within several jurisdictions for public services. The area's relatively large size may allow for more efficient servicing. However, the area also contains multiple drainage basins, which may be a consideration in providing services. The following conditions apply:

- **Water:** The Sunrise Water Authority appear willing to accept the area within its service area if necessary. This study area would be moderately difficult to serve. Infrastructure improvements are needed to develop the area, otherwise, existing facilities may suffer from new development.
- **Sewer:** Clackamas County Water Environment Services appears willing to accept the study area within its service area if necessary. This study area would be moderately difficult to serve due to the existence of steep slopes, which could increase construction difficulty and create some operational problems. Infrastructure improvements will be needed to prevent overburdening existing facilities in the vicinity.

- **Stormwater:** Clackamas County Water Environment Services appears willing to accept the study area within its service area if necessary. This area would be easy to serve for storm sewers, though some limited improvements and extensions of lines are to be expected, both inside and outside the UGB.

Agricultural Analysis

Zoning: This area includes exception land and resource land, a small portion of which is in Multnomah County and zoned as CFU (219 acres). Clackamas County has zoned the remainder of the study area's resource land as TBR or AGF (662 acres) and EFU (116 acres) and the exception land as RRFF5. The 116 acres of EFU land is contiguous to a 106-acre section of EFU land in Study Area 14. To the north is the UGB. To the east is exception land and resource land zoned EFU and TBR in Study Area 12. To the south is exception land and resource land zoned EFU, AGF and TBR in Study Area 10. To the west is exception land and a small pocket of resource land zoned EFU in Study Area 14.

Current Agricultural Activity: The largest portion of resource land within Study Area 13 is surrounded on all sides by exception land when combined with the resource land to the south and east in Study Areas 10 and 12. The majority of this land is forested with a minor amount of nursery and field crops. A number of these forested parcels are publicly owned open space. The EFU land on the western edge of the study area contains rural residences with some forest and pastures. The directly adjacent EFU land in Study Area 14 contains nursery and field crops. To the east is Study Area 12 that contains adjacent resource land that is forested with some nursery land to the south. The resource land directly to the south in Study Area 10 is mostly forested with large expanses of nursery land further south. There are a number of nursery operations on exception land in Study Areas 10 and 12.

Compatibility: Urbanization of this area may result in a significant increase in traffic on SE Tillstrom, SE Borges Road, and SE 222nd Drive, which could impede the normal movement of farm equipment and supplies and affect the transport of agricultural goods produced on the agriculture lands to the south. Issues relating to safety, vandalism, and liability, as well as complaints due to noise, odor, and the use of pesticides and fertilizers would be exacerbated by the proximity of new development to these farming operations. Urbanization may also have a great impact on the resource land within the area that is forested that currently provides a natural barrier between existing farm practices and rural residential subdivisions. Three streams flow through this area, Kelley Creek to the north to Johnson Creek while Rock Creek and a tributary flow south to the Clackamas River. Urbanization of this area would result in an increase in impervious surface that may diminish water quality and increase the potential for flooding on Rock Creek through downstream agriculture areas. Urbanization would also bring development near the EFU land to the southeast, which may affect the value of these agriculture lands by encouraging land banking and speculation and inhibiting the ability of farmers to acquire parcels of land needed for agricultural production.

Environmental Social Energy Economic Analysis

General Character of the Area

This area is characterized by large areas of steep sloped-forested land generally located in the center and south of the study area. A number of streams flow through the area in ravines formed by the steep slopes.

Environmental

Kelly Creek and two small tributaries flow west through the top portion of the area for approximately 1.7 miles. Rock Creek and a tributary flow through the lower portion of the area for one-half and 1.5 miles, respectively. There are three small isolated wetlands totaling 1.1 acres dispersed in the study area. There is a very large area of steep slopes located in the central portion of the study area. Metro owns 23 open space parcels totaling approximately 207 acres in this area of steep slopes. There are two other significant locales of steep slopes, one in the northern section and one in the southern section; both associated with stream corridors. Kelly Creek is identified as a riparian corridor in Multnomah County's inventory of significant Goal 5 resources and impact areas in the *draft West of Sandy River Plan*. There is a large area of riparian and wildlife habitat south of this stream segment and upland areas north of the stream also identified in the plan. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 57 percent of the study area land in the proposed inventory. Urbanization of this area may impact these streams and steep slope areas as outlined in the introduction to the ESEE analysis and also may inhibit the ability of these natural areas to provide species habitat and other ecological functions.

Social Energy Economic

See Appendix A.

Study Area 14		Gross Vacant Buildable Acres 775	
Total Acres	1,275	Dwelling Unit Capacity	2,898
Total Developed Acres	453	Employment Acres	187
Total Constrained Acres	83	Resource Land Acres	107
Title 3 Acres	76	Percent Tree Canopy Cover	10%
Upland Steep Slope Acres	7		

General Site Description: Study Area 14 is located immediately south of the Pleasant Valley area. This area is fully within Clackamas County and the Metro jurisdictional boundary. The study area is oblong, and oriented in a north-south direction. The area is defined on the west by Study Area 15, on the east by SE Foster Road and on the south by Sunnyside Road. The center of this study area is approximately four miles, straight-line distance, from the intersection of I-205 and Sunnyside Road, the general vicinity of the Clackamas Regional Center. This study area contains land designated as Town Center and Inner Neighborhood, Employment and Industrial. The total study area is about 1,275 acres. It contains approximately 775 acres that are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains about 400 tax lots. Approximately 75 percent of them have improvements, though fewer than 15 have improvement values above \$250,000. About one third of the tax lots in this study area are smaller than one acre in size. These smaller tax lots are scattered throughout the study area. Approximately 85 percent of the tax lots in this study area are smaller than five acres in size. A golf course with a subdivision surrounding it sits in the central western portion of the study area. Agricultural uses are evident, mainly in the northern and southern sections of this site. They consist mainly of nursery stock and field crops. Non-residential land uses include landscaping, construction, paving, greenhouse sales, masonry, concrete, religious and non-profit and financial services.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): Available data does not indicate any power lines or other public easements running through this site. There is also no evidence of significantly high air traffic near this site.

Public Services Feasibility: The study area falls within several jurisdictions for public services. The area is of reasonable size to accept new services efficiently, and is contained within one drainage basin.

- **Water:** The Sunrise Water Authority showed a desire or already has plans to serve the area. This area would be easy to serve because the infrastructure system is in acceptable condition to accommodate new development. Minimal improvements within the UGB are likely to be necessary.
- **Sewer:** Clackamas County Water Environment Services seemed willing to accept the study area within its service area if necessary. This study area would be easy to serve, although some infrastructure improvements will be necessary to prevent overburdening the existing system.
- **Stormwater:** Clackamas County Water Environment Services seemed willing to accept the study area within its service area if necessary. This area would be easy to serve. Although the infrastructure is in acceptable condition to develop the area,

some improvements and extensions of lines are to be expected, both inside and outside the UGB.

Agricultural Analysis

Zoning: The majority of this study area in Clackamas County is exception land zoned RRF5 and FF10, with a small portion of resource land (106 acres) zoned EFU. This resource land is contiguous to resource land in Study Area 13, creating an island of 223 acres of EFU land when viewed together is completely surrounded by exception land. To the north is the UGB. To the east is exception land and resource land zoned EFU, AGF and TBR. To the south is exception land in Study Area 17. To the west is the UGB and exception land in Study Area 15.

Current Agricultural Activity: There is a small amount of field and nursery crops located on exception land within the study area. The EFU zoned land supports nursery operations. Directly east in Study Areas 13 and 10 are scattered field crops and forestland on both exception land and resource land. Directly to the south is Study Area 17 that contains a small amount of row crop, nursery and pasture operations. Directly west is the UGB in the south and Study Area 15 in the north, which contains a small amount of field and row crops.

Compatibility: A significant increase in traffic on SE Foster Road, SE 172nd Avenue and SE Sunnyside Road may result from the urbanization of this area, which could impede the normal movement of farm equipment and the transport of agricultural goods produced to the south and east. However, the outlying areas that would most be affected by these traffic impacts are for the most part rural residential or unfarmed. The closest EFU lands to this area are relatively small, surrounded by exception land and are not part of a larger network of EFU land. Issues relating to safety and liability, and complaints due to noise, odor, and the use of pesticides and fertilizers would be relatively minimal based on the small amount of agricultural activities taking place around Study Area 14. Rock Creek and its tributaries run through this area as it flows south to the Clackamas River along the edge of the UGB. As Rock Creek flows just west of the resource land in Study Area 18 it is contained in a gorge. Urbanization of this study area would result in increased impervious surfaces that may diminish water quality and increase the potential for flooding downstream. Since Rock Creek is located in a gorge, urbanization of this area would not appreciably affect any downstream resource lands. Since this area and the surrounding areas contain only small amounts of agricultural activity, urbanization of this area would have little affect on adjacent agricultural activities.

Environmental Social Energy Economic Analysis

General Character of the Area

This study area is characterized as a moderately sloped stretch of land between steep sloped areas to the east and west. The area is mostly open with agricultural uses intermixed with rural residences throughout the study area. A portion of a golf course is located on the west side of the area.

Environmental

Rock Creek flows into the center portion of the study area from the east and then flows south for approximately 1.5 miles. Four tributaries combine together to join Rock Creek in the center of the study area. These four streams total 2.7 miles of stream corridor. Six tributaries join Rock Creek in the southern portion of the study area. These six streams total 2.4 miles of stream corridor. Five wetlands all associated with stream corridors are spread throughout the area and total 4.8 acres. There are a few very minor locations of steep slopes, mostly in the southern

portion of the study area. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 38 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resources as outlined in the introduction to the ESEE analysis.

Social Energy Economic
See Appendix A.

Study Area 15		Gross Vacant Buildable Acres 551	
Total Acres	930	Dwelling Unit Capacity	2,607
Total Developed Acres	315	Employment Acres	11
Total Constrained Acres	73	Resource Land Acres	-
Title 3 Acres	36	Percent Tree Canopy Cover	40%
Upland Steep Slope Acres	37		

General Site Description: Study Area 15 rests just south of the Clackamas/Multnomah County line and is approximately 930 acres. The study area abuts intermittent parts of Portland, Happy Valley and unincorporated Clackamas County. The area is accessible via SE Vrandenburg Road from the north, SE Monner Road from the southwest, and SE Hagen Road from the southeast. It is completely within the Metro jurisdictional boundary. Approximately 75 percent of the perimeter of this study area borders the existing UGB. It is about 3.5 miles, straight-line distance from the Clackamas Regional Center area. The majority of this study area has been designated as Inner Neighborhood. Study Area 15 abuts Study Area 14, immediately to the East. About 551 of the 930 acres in this study area are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains about 200 tax lots. About 120 have improvements. Fewer than 15 have improvement values over \$250,000. Almost 50 percent of these tax lots are smaller than one acre in size. Smaller tax lots are situated mainly along the southern edge and within the northwestern section of the study area. About 80 percent of all tax lots in this study area are smaller than five acres. Farming uses do not appear in large amounts within this study area. Non-residential land uses in this study area include construction and business services. There is no evidence of mining and aggregate activities within this study area.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): Available data does not suggest the existence of power lines or other public easements running through the area.

Public Services Feasibility: The study area falls within several jurisdictions for public services. The area's relatively large size may allow it to be services more efficiently, though the area contains multiple drainage basins, which may also be a consideration for new development.

- **Water:** The Sunrise Water Authority showed a desire or already have plans to serve the area. It would be moderately difficult to serve. Infrastructure improvements are needed to develop the area and to prevent overburdening the existing system.
- **Sewer:** Clackamas County Water Environment Services appears willing to accept the study area within its service area if necessary. The area would be moderately difficult to serve. Some infrastructure improvements will be needed to prevent overburdening the existing system, though a more detailed study will be needed to determine the specific improvements necessary.
- **Stormwater:** Clackamas County Water Environment Services appears willing to accept the study area within its service area if necessary. The area would be moderately difficult to serve. Although the infrastructure is in acceptable condition to develop the area, some improvements and extensions of lines are to be expected, both inside and outside the UGB.

Agricultural Analysis

Zoning: This area is entirely exception land and is zoned by Clackamas County as RRFF5 and FF10. To the north, west and south is the UGB. To the east is exception land and resource land zoned EFU in Study Area 14.

Current Agricultural Activity: There is a small amount of field and row crops in the south portion of the study area. Directly east in Study Area 14 is a small nursery operation on exception land.

Compatibility: Urbanization of this area may result in an increase in traffic on SE 172nd Avenue. This increase in traffic would have little affect on the normal movement of farm equipment, supplies and the transport of agricultural goods produced on land to the southeast. The area contains three tributaries to Rock Creek, which flows in a gorge south to the Clackamas River along the edge of the UGB, just west of the resource land in Study Area 18. Urbanization of this study area would result in increased impervious surfaces that may diminish water quality and increase the potential for flooding downstream. Since Rock Creek is located in a gorge, increased stream flows due to urbanization of this area would not appreciably affect any downstream resource lands. Since this area is surrounded on three sides by the UGB and by exception land on the fourth side that only contains a small nursery operation, urbanization of this area would have little affect on adjacent agricultural activities.

Environmental Social Energy Economic Analysis

General Character of the Area

This entire area is characterized by heavily forested land with moderate to steep slopes, as a result of a large central butte, which is part of the Boring Lava Domes morphology. The main use is rural residential, many on large lots, with minor locations of agricultural activities generally in the southern part of the area. Most of the smaller residential lots are also located in the southern portion. The flat top portion of the large centrally located butte defines the center of the study area. There are a number of stream corridors in both the north and south portions of the area that drain steep slopes.

Environmental

Mitchell Creek flows west through the very top portion of the study area for approximately a quarter mile. A tributary to Mitchell Creek flows in a northerly direction in this section of the area for approximately a quarter mile. A tributary of Rock Creek flows east through the center of the area for just over a third of a mile and four other tributaries of Rock Creek flow in a southeasterly direction in the southern portion of the area for a combined stream corridor length of 1.6 miles. A sixth tributary of Rock Creek flows along the southern edge of the are for 0.9 miles. There is a half-acre wetland along Mitchell Creek. There is a significant area of steep slopes on the western edge of the area and other smaller scattered steep slope areas along stream corridors. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 62 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area 16		Gross Vacant Buildable Acres 38	
Total Acres	79	Dwelling Unit Capacity	118
Total Developed Acres	19	Employment Acres	-
Total Constrained Acres	12	Resource Land Acres	-
Title 3 Acres	-	Percent Tree Canopy Cover	40%
Upland Steep Slope Acres	12		

General Site Description: Study Area 16 is approximately 79 acres. It is generally rectangular in shape. It is an "island" completely surrounded by the Metro UGB. The northern boundary of this area is the Happy Valley city limits. Unincorporated Clackamas County borders the other three sides. It is completely within the Metro jurisdictional boundary. The area is accessible from the north via SE Eastborne Lane, and from the east via SE Aldrich Road. The area is also accessible from the south via SE 142nd, which connects from Sunnyside Road. The area is approximately two miles, straight-line distance, from the intersection of I-205 and SE Sunnyside Road, the Clackamas Regional Center area. This study area has been designated as Inner Neighborhood. It is not adjacent to other study areas. Approximately 38 of the 79 acres in this study area are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains 23 tax lots. The majority of these tax lots have improvements; 10 have improvement values above \$250,000. Two tax lots are less than one acre. Most of the tax lots in this study area are smaller than five acres. Land uses are mainly rural and residential. There are no apparent non-residential land uses in this study area.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): Available data does not suggest the existence of power lines or other public easements running through this area.

Public Services Feasibility: The study area falls within several jurisdictions for public services, through it is contained within one drainage basin. The following conditions apply:

- **Water:** The Sunrise Water Authority showed a desire or already has plans to serve the area. This study area would be relatively easy to serve. The infrastructure system is in acceptable condition to develop the area, though some minimal improvements within the UGB may be necessary.
- **Sewer:** Clackamas County Water Environment Services showed a desire or already has plans to serve the study area. It would be relatively easy to serve. The infrastructure system is in acceptable condition to develop the area. However, minimal improvements within the UGB are still anticipated.
- **Stormwater:** Clackamas County Water Environment Services also showed a desire or already has plans to serve the study area. This area would be moderately difficult to serve for storm services. While the infrastructure is in acceptable condition to develop the area, some improvements and extensions of lines are to be expected, both inside and outside the UGB.

Agricultural Analysis

Zoning: This area is an island of exception land located south of Happy Valley and is surrounded on all sides by the UGB. Clackamas County has zoned this area as RRFF5 and FF10.

Current Agricultural Activity: The predominant use in this area is rural residential. All open areas that are not associated with homes (large yards) are unfarmed. Most of these unfarmed areas are densely forested.

Compatibility: Urbanization of this area would appear to have little or no impact on surrounding agricultural lands, as this area is surrounded by urban land. In fact, there is land within the UGB to the east of this site that is closer to any agricultural land than this potential urban area.

Environmental Social Energy Economic Analysis

General Character of the Area

This island of rural residential land surrounded by urban land is divided into two distinct sections. Large heavily forested lots from 3-15 acres with steep slopes characterize the southern portion. Smaller parcels ranging from 0.5-3 acres characterize the northern portion along SE Aldridge Road and are much flatter and less forested. There are no agricultural activities or streams flowing through the area.

Environmental

There are steep slopes located in the southern portion of the area that could be impacted by urbanization as outlined in the introduction to the ESEE analysis. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 41 percent of the study area land in the proposed inventory.

Social Energy Economic

See Appendix A.

Study Area 17		Gross Vacant Buildable Acres		305
Total Acres	597	Dwelling Unit Capacity		432
Total Developed Acres	218	Employment Acres		168
Total Constrained Acres	32	Resource Land Acres		0
Title 3 Acres	31	Percent Tree Canopy Cover		10%
Upland Steep Slope Acres	1			

General Site Description: Study Area 17 is located immediately east of Study Area 18, with SE Sunnyside Road defining its northern boundary and SE Highway 212 the southern boundary. The western edge is defined by Study Area 18 and unincorporated Clackamas County inside the UGB. The eastern edge is SE 187th Avenue. This area is completely within Clackamas County and the Metro jurisdictional boundary. There is a small pocket of rural commercial land at the intersection of SE Sunnyside Road, SE Foster Road and Highway 212, less than one mile to the east. This study area is approximately 4 miles from the intersection of I-205 and SE Sunnyside Road, the general vicinity of the Clackamas Regional Center. This area contains Inner Neighborhood, Industrial and Employment designations. The total study area is about 597 acres, with 305 acres that are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains 327 tax lots. The majority of these tax lots have improvements, though only 17 have improvement values above \$250,000. This study area contains a few subdivisions where the majority of the tax lots are less than one acre in size. Over 90 percent of all the tax lots in this study area are smaller than five acres in size. Agricultural activities are centered on pockets in the north and south of the area.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): Data available does not indicate that there are power lines or public easements running through this site. There is also no evidence of significantly high traffic noise over this site.

Public Services Feasibility: The study area falls within several jurisdictions for public services. The area's size would not be an impediment to providing services efficiently, however the area does contain multiple drainage basins, which may be a consideration.

- **Water:** The Sunrise Water District already has plans to serve the area. This study area would be easy to serve because the infrastructure system is in acceptable condition to accommodate new development. Some improvements and extensions of lines inside and outside the existing UGB are to be expected to alleviate the impacts of new development on the existing system.
- **Sewer:** Clackamas County Water Environment Services seemed willing to accept the study area within its service area if necessary. The area would be easy to serve. The infrastructure system is in acceptable condition to develop the area, though some improvements within the UGB may be needed.
- **Stormwater:** Clackamas County Water Environment Services seemed willing to accept the study area within its service area if necessary. The area would also be easy to serve for storm services. The infrastructure system is generally in an acceptable condition to develop the area, but minimal improvements within the UGB are anticipated.

Agricultural Analysis

Zoning: This area is entirely exception land and is zoned by Clackamas County as RRFF5. To the north is exception land in Study Area 14. To the east is exception land and resource land zoned TBR and EFU in Study Area 10. To the south are exception land in Study Area 19 and the UGB. To the west is resource land zoned EFU in Study Area 18.

Current Agricultural Activity: Agricultural activity within the study area includes nursery operations in the south along Highway 212 and in the north adjacent to SE 172nd Avenue. Directly to the north is the exception land of Study Area 14 that is predominantly rural residential but supports some nursery and field crops. To the east is exception land currently in rural residential use leading to the community of Damascus. To the south is exception land in Study Area 19 that contains no agricultural activity. The resource land to the southeast outside of the study area boundaries is in timber. Directly west is Study Area 18 that is entirely EFU land and supports field crops and a dairy operation.

Compatibility: Urbanization of this area would be expected to significantly increase the traffic on Highway 212, SE Sunnyside Road and SE 172nd Avenue, which could impede the normal movement of farm equipment and affect the transport of agricultural goods produced in and around this area to market. These impacts might be felt most by the adjacent EFU land that supports the dairy operation and nursery operations within the study area. Issues relating to safety and liability, and complaints due to noise, odor, and the use of pesticides and fertilizers might be exacerbated by the proximity of new development to the farming practices would most likely affect the adjacent dairy operation the most. In addition urbanization of this area may affect the value of this adjacent resource land by encouraging land banking and speculation. Three tributaries to Rock Creek flow through this study area. As Rock Creek flows just west of the resource land in Study Area 18 it is contained in a gorge. Urbanization of this study area would result in increased impervious surfaces that may diminish water quality and increase the potential for flooding downstream. Since Rock Creek is located in a gorge, urbanization of this area would not appreciably affect any downstream resource lands.

Environmental Social Energy Economic Analysis

General Character of the Area

The area is characterized as generally flat and open with a few very small areas of forested steep slopes associated with stream corridors. The majority of the area is in a rural residential use on both large and small lots. There are two main pockets of agricultural activity, one in the north and one in the south, along with some agricultural activity associated with large residential lots. Several streams flow through the study area.

Environmental

Rock Creek flows south along the western edge of the area for a brief 500 feet. Two tributaries of Rock Creek flow in a westerly direction through the northern portion of the area for a total stream corridor length of just over three-quarters of a mile. Three tributaries of Rock Creek flow through the center of the area for a total stream corridor length of 1.7 miles. There is a three-quarter acre wetland associated with the main tributary in this location. A final tributary flows through the lower portion of the area for three-quarters of a mile. There are a few very small locations of steep slopes that are associated with streams. There are two private open spaces associated with residential developments located in the northern portion of the study area. One open space is a 50-acre tract near one of the tributaries to Rock Creek and the second is a 5.5-

acre tract not associated with a stream corridor. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 35 percent of the study area land in the proposed inventory. Urbanization of this area may impact these streams, wetlands and steep slope areas as outlined in the introduction to the ESEE analysis and also may inhibit the ability of these natural areas to provide species habitat and other ecological functions.

Social Energy Economic

See Appendix A

Other Identified Resources

Clackamas County has identified a historic farm parcel at 14933 SE 172nd Avenue, Clackamas.

Study Area 18		Gross Vacant Buildable Acres		193
Total Acres	276	Dwelling Unit Capacity		0
Total Developed Acres	33	Employment Acres		144
Total Constrained Acres	50	Resource Land Acres		276
Title 3 Acres	30	Percent Tree Canopy Cover		25%
Upland Steep Slope Acres	20			

General Site Description: Study Area 18 is located to the southeast of Happy Valley. SE Highway 212 defines its southern boundary. The western edge is defined by the UGB along SE 152nd Avenue. SE 162nd Avenue runs north south through the middle of the study area. This area is completely within Clackamas County and the Metro jurisdictional boundary. The study area is near an industrial pocket within unincorporated Clackamas County, inside the UGB. There is also a small pocket of rural commercial land at the intersection of SE Sunnyside Road, SE Foster Road and Highway 212, less than two miles to the east. This area is approximately 3.5 miles from the intersection of I-205 and SE Sunnyside Road, the general vicinity of the Clackamas Regional Center. This study area has an Employment designation. The total study area is 276 acres, with 144 acres that are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains 29 tax lots, three-quarters of which have improvements and only 5 tax lots have improvement values above \$250,000. This study area contains no subdivisions, and only six of the tax lots in this study area are less than one acre in size. Six of the tax lots in this study area are greater than five acres in size. Agriculture is the dominant use in the study area.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): Data available does not indicate that there are power lines or public easements running through this site. There is also no evidence of significantly high traffic noise over this site.

Public Services Feasibility: The study area falls within several jurisdictions for public services. The area's size would not be an impediment to providing services efficiently, however the area does contain multiple drainage basins, which may be a consideration.

- **Water:** Sunrise Water District already has plans to serve the area. In broader terms, this study area would be easy to serve because the infrastructure system is in acceptable condition to accommodate new development. Some improvements and extensions of lines inside and outside the existing UGB are to be expected to alleviate the impacts of new development on the existing system.
- **Sewer:** Clackamas County Water Environment Services seemed willing to accept the study area within its service area if necessary. The area would be easy to serve. The infrastructure system is in acceptable condition to develop the area, though some improvements within the UGB may be needed.
- **Stormwater:** Clackamas County Water Environment Services seemed willing to accept the study area within its service area if necessary. The area would also be easy to serve for storm services. The infrastructure system is generally in an acceptable condition to develop the area, but minimal improvements within the UGB are anticipated.

Agricultural Analysis

Zoning: This area is entirely resource land that is zoned by Clackamas County as EFU and is surrounded by the UGB and exception land in Study Area 17.

Current Agricultural Activity: This study area of EFU land supports field crops and a dairy operation. To the north, west and south is the UGB. To the east is Study Area 17 that contains two separate nursery operations, one in the north and one in the south.

Compatibility: Urbanization of this small area of resource land would be expected to minimally increase traffic on Highway 212 and possibly 162nd Drive. This slight increase in traffic may affect the transport of agricultural goods produced to the north and east of the area however it shouldn't impede the normal movement of farm equipment as both roads at this point are in the UGB. Issues relating to safety and liability, and complaints due to noise, odor, and the use of pesticides and fertilizers might be exacerbated by the proximity of new development to the nursery practices to the east. In addition urbanization of this area may affect the value of these adjacent nursery lands by encouraging land banking and speculation. Urbanization of this study area would have little affect on adjacent agricultural activities due to the limited amount of agricultural activity in the area.

Environmental Social Energy Economic Analysis

General Character of the Area

Two distinct areas characterize the study area; forested steep slopes associated with Rock Creek and generally flat open areas devoted to agricultural activities and rural residential uses. Most of the residential uses are on large lots and contain some related agricultural activity.

Environmental

Rock Creek flows south in a gorge along the western edge of the area for just under a mile. There is a small tributary located in the central portion that is 677 feet in length. In the northern portion there are two tributaries that have a combined stream corridor length of a quarter mile. This area also has a small 4,000 square foot wetland. Steep slopes extend over most of the entire length of Rock Creek and there is a second area of steep slopes near the longer tributary in the north. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 38 percent of the study area land in the proposed inventory. Urbanization of this area may impact these two natural resources as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area 19-1		Gross Vacant Buildable Acres 427	
Total Acres	1,042	Dwelling Unit Capacity	2,248
Total Developed Acres	369	Employment Acres	54
Total Constrained Acres	258	Resource Land Acres	-
Title 3 Acres	167	Percent Tree Canopy Cover	20%
Upland Steep Slope Acres	91		

General Site Description: Study Area 19-1 sits immediately south of Study Areas 17 and 18. It is defined on the north by Highway 212, on the west by the UGB and urban unincorporated Clackamas County, on the south by the Clackamas River, and on the east by its parcel boundaries. This study area sits entirely within Clackamas County. It is bisected by the Metro jurisdictional boundary, with most of it sitting outside (south of) of the Metro jurisdictional boundary. Approximately 20 percent of the perimeter of this study area runs along the existing urbanized area to the west. The center of this study area is approximately 4.5 miles, straight-line distance, from the intersection of I-205 and Highway 212, the general location of Johnson City. This study area contains Corridor, Employment, Industrial and Inner Neighborhood designations. Approximately 432 of the 1,042 acres in this study area are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains approximately 375 tax lots. About 300 have improvements. Less than five, have improvement values above \$250,000. About 150 tax lots are smaller than one acre in size, and 90 percent of the tax lots in this study area are smaller than five acres in size. Smaller tax lots are situated mainly in the northeastern and southwestern portions of the study area. Non-residential land uses include masonry, retail, food service, lodging, gallery, antiques, repair, landscaping, construction, and trucking.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): Data does not indicate any power lines or other public easements running through this area. In addition, there is no evidence of significantly high air traffic noise over this area.

Public Services Feasibility: The study area falls within several jurisdictions for public services. The area's size will not preclude efficient urbanization, though the area contains multiple drainage basins, which may be a consideration.

- **Water:** The Damascus/Mt. Scott Water District appears willing to accept the area within its service area if necessary. In broader terms, this study area would be easy to serve. Some infrastructure improvements will be required to prevent new development from overburdening the existing system.
- **Sewer:** Clackamas County Water Environment Services appears willing to accept the study area within its service area if necessary. Generally, the area would be easy to serve, in spite of the existence of wetlands, which could possibly require mitigation or avoidance. Steep slopes are also located within this study area. This could increase the construction difficulty and could create some operational problems. While the infrastructure system is in adequate condition to serve new development, some improvements within the UGB may be necessary to prevent overburdening the existing system.

- **Storm:** Clackamas County Water Environment Services appears willing to accept the study area. This area would generally, be easy to serve, even though the area's wetlands and steep slopes may pose the same issues discussed above. Generally, the infrastructure system is generally in an acceptable condition to develop the area, and minimal improvements within the UGB are anticipated.

Agricultural Analysis (19-1 + 19-2)

Zoning: This area is entirely exception land and is zoned by Clackamas County as RRFF5 and FF10, with small areas of RI, and RC zoning in the Carver area. This study area extends south across the Clackamas River to include property north of S Hatten Road.

Current Agricultural Activity: This area is mostly rural residential with scattered minor field crop locations. To the west are the UGB and the Clackamas River, which provides a buffer between this area and resource land that contains pasture and nursery stock. To the north is Study Area 17 that includes some nursery operations on the on the north side of Highway 212. To the east is a large expanse of resource land that supports a few nursery operations directly adjacent to Study Area 17, with the majority of the remaining resource land being forested and sparsely populated with rural residential dwellings.

Compatibility: A significant increase in traffic on Highway 224 and S Clackamas River Road may result from the urbanization of this area. Since the majority of the resource land to the southeast is in timber the affect would most likely be minimal on the normal movement of farm equipment and the transport of agricultural goods. Issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development would be minimal, as there is only a few agricultural areas that would be directly adjacent to new development. The Clackamas River will act as a buffer between new urban development and the nursery operations on the resource land to the west. Clear Creek connects with the Clackamas River in the southern part of this study area. Urbanization of this portion of the study area would increase impervious surface that could diminish water quality of the stream. Due to the size of the Clackamas River at this location the chance of downstream flooding due to this increase in impervious surface would be small after standard stormwater detention requirements are implemented. Urbanization of this area may affect the value of a small amount of adjacent active farmland by encouraging land banking and speculation. Urbanization of this study area would have little affect on adjacent agricultural activities due to the limited amount of agricultural activity in the area.

Environmental Social Energy Economic Analysis (19-1 + 19-2)

General Character of the Area

Four separate areas characterize the study area; forested steep slopes near the town of Carver, the town of Carver itself, moderately sloped open areas in the north near Highway 224 with rural residences, and a moderately sloped forested and open area south of the Clackamas River that includes commercial and residential development. There also are a number of streams that drain to the Clackamas River.

Environmental

The northern portion of the study area borders the Clackamas River for 1.8 miles and the southern portion for 0.84 miles. Clear Creek flows north to the Clackamas River through the southern portion of the study area for three-quarters of a mile. The southern portion also contains a tributary to Clear Creek that flows for 377 feet. Richardson Creek flows south to the

Clackamas River through the southeast corner of the study area for a length of 917 feet. A tributary to Clear Creek flows south through the northeast corner of the area for a half-mile. Two unnamed streams also drain to the Clackamas for one-quarter and two-thirds of a mile, respectively. The top portion of the study area also contains a quarter-mile tributary to Rock Creek. Both sides of the Clackamas River contain floodplain that stretches the entire riverfront and varies in width up to a maximum of 1,300 feet. There is floodplain along Clear Creek that varies in width from 120-775 feet. Richardson Creek also has floodplain that is fairly uniform in width at approximately 380 feet. All three of these floodplain areas are also identified as wetlands. An 88-acre area of steep slopes is present just north of the town of Carver with other significant steep sloped areas near Rock and Clear Creeks. There is approximately four acres of a much larger Metro owned open space along Richardson Creek. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 55 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis and inhibit the ability of the open space tract to provide species habitat and other ecological functions.

The Town of Carver has experienced problems with septic tank leaching that has resulted in water quality concerns. Representatives from the Clackamas Water District have confirmed these concerns and are interested in providing sanitary sewer service to alleviate some of these water quality problems. Maintaining water quality is especially important in this area because downstream are drinking water intakes for the cities of Oregon City and West Linn.

Social Energy Economic

See Appendix A.

Other Identified Resources

The Carver School Community Center is located at 16077 SE Highway 224, Carver. The Baker Cabin Historical society owns a historic structure at 18005 S Gronlund Road, Oregon City. A historic house is located at 14999 S Springwater Road, Oregon City. A sand and gravel pit is located at 16051 SE Highway 224, Clackamas.

Study Area	19-2	Gross Vacant Buildable Acres	5
Total Acres	14	Dwelling Unit Capacity	30
Total Developed Acres	4	Employment Acres	0
Total Constrained Acres	4	Resource Land Acres	0
Title 3 Acres	0	Percent Tree Canopy Cover	80%
Upland Steep Slope Acres	4		

General Site Description: Study Area 19-2 is a narrow, curved area approximately two miles south of Pleasant Valley and four miles east of Oregon City in unincorporated Clackamas County. This area represents a small addition to Area 19-1, which was evaluated in the Phase I analysis. It is adjacent to Metro's jurisdictional boundary and one-half mile south of the UGB. Its northern boundary is partially defined by the Clackamas River. It is bounded by, and has access from, S Gronlund Road and S Hatten Road. The area contains some steep slopes in the northern and western edges. It is completely designated as Inner Neighborhood. Out of the 14 total acres, 5 acres are vacant and buildable.

Parcelization, Building Values, Development Patterns, Vacant Land: The median parcel size is roughly one-quarter acre. There are nine parcels that are less than one acre in size, and no parcels greater than five acres. The median improvement value is \$53,592. The area is forested. There has been no recorded development since 1990.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements. The area is sufficiently far from an airport to assume that there is not significantly high noise generated by overhead air traffic.

Public Services Feasibility: This study area falls within several jurisdictions for public services, and the following conditions apply:

- **Water:** Clackamas River Water would be the service provider for this study area and is willing to provide service. There is currently no water service in this area; all water is provided by wells. This area is also marked by high rock content, which may make the installation of lines somewhat more difficult. Service would include a bridge crossing at Baker Bridge. Service to the area would require trunk lines, reservoirs, and pump stations. This area is rated as moderately difficult to serve.
- **Sewer:** Clackamas County Water Environment Services would be the service provider for the study area. The service provider indicates that residents in this area would like service. A pump station and .75-mile of additional trunk line would be needed to serve this area. Problems with rock in the area have been discovered with other excavations. The area is almost entirely within the Clackamas River floodplain. This area is rated as moderately difficult to serve.
- **Stormwater:** Stormwater will be required to be treated, either with detention, water quality facilities or both. As this will be on a per-development basis, Clackamas County Water Environment Services does not consider stormwater services difficult. Due to other environmental factors, this area is rated as moderately difficult.

Agricultural Analysis

See Study Area 19-1.

Study Area	20	Gross Vacant Buildable Acres	167
Total Acres	433	Dwelling Unit Capacity	776
Total Developed Acres	161	Employment Acres	0
Total Constrained Acres	93	Resource Land Acres	0
Title 3 Acres	18	Percent Tree Canopy Cover	49%
Upland Steep Slope Acres	74		

General Site Description: Study Area 20 is an hourglass-shaped section of land in Clackamas County, roughly 2.5 miles east of Oregon City and two miles south of Happy Valley. It is outside of Metro's jurisdictional boundary and the UGB. South Hatten Road defines the area's northern boundary, and S Gronlund Road defines most of its eastern edge. South Gronlund Road and S Hatten Road provide access to the area. The southern part of the area has steep slopes. The area is designated as Inner Neighborhood. Of the 433 total acres, there are 167 vacant and buildable acres.

Parcelization, Building Values, Development Patterns, Vacant Land: Of the 13 total parcels, 8 parcels have recorded improvement values. The median improvement value is \$53,592. The median parcel size is approximately one-quarter acre. There are nine parcels less than one acre in size, and no parcels greater than five acres. The land has mostly urban uses, although there is a small forested area in the midsection. There have been seven permits issued for single-family dwellings since 1990.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the area. There is no evidence of significant noise caused by air traffic over the study area.

Public Services Feasibility: This area is within the Clackamas River Water District, which collects system development charges at this time.

- **Water:** This area is hilly, and would require infrastructure, including lift stations and reservoirs. The current service in the area is for rural fire capacity only. There is a six-inch main on S Hattan. All mains in this area would need to be upsized, which would pose a challenge, due to the presence of some rock in the area. This area is rated as moderately difficult to serve.
- **Sewer:** Serving this area would require sewage to go north toward the Clackamas River, then be pumped to the Tri-Cities plant. There will be possible rock excavation problems in the area, according to Clackamas County Water Environment Services. Development would require lift station(s) and approximately eight miles of trunk line, including some force mains. This area is rated as moderately difficult to serve.
- **Stormwater:** Stormwater will be required to be treated, either with detention, water quality facilities, or both. As this will be on a per-development basis, Clackamas County Water Environment Services considers stormwater services to be easy to provide. This area is rated easy to serve.

Agricultural Analysis

Zoning: This area is entirely exception land and is zoned by Clackamas County as RRFF5. To the north is exception land in Study Area 19 and resource land zoned TBR in Study Area 22. To the south and east is resource land zoned EFU and to the west is resource land zoned TBR.

Current Agricultural Activity: There are no agricultural activities occurring in this study beyond small gardens and tree farms associated with adjacent residences. Directly to the east is a large expanse of field crops, the majority of which are on the far side of Clear Creek. To the south and southeast is an area of field crops and pasture. To the west is a strip of resource land that is in timber with rural residences, between this area and Study Area 21. To the north is a small section of Study Area 19 that is developed with rural residences and some nursery land further to the northwest.

Compatibility: Urbanization of this area would result in an increase in traffic on S Hatten Road in both directions, north on to S Clackamas River Road and south on to S Redland Road. This increase in traffic may affect the normal movement of farm equipment and the transport of agricultural goods from the resource lands to the southeast. Since most of the resource land directly adjacent to this area is in timber or rural residential uses, issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development would be minimal. A few small streams flow through the study area connecting with Clear Creek to the east. Urbanization of the study area would increase impervious surfaces that could diminish water quality and promote downstream flooding of Clear Creek as it flows through nearby resource land. Urbanization of this area may affect the value of adjacent resource land by encouraging land banking and speculation.

Environmental Social Energy Economic Analysis

General Character of Area

The northern half of Area 20 is characterized by moderate slopes, except for a strip in the northeastern corner where the slopes are more gentle. The western and southern portions of this section contain moderate to heavy forest cover. There are several rural residences scattered throughout this northern section. The narrow southern portion of the study area has moderate to steep slopes, except for the rural residential neighborhood on Clear Acres Drive west of Hatten Road. Approximately one-half of the southern portion is forest covered. Residential uses are concentrated along Clear Acres Drive.

Environmental

Several tributaries of Clear Creek flow from west to east through Area 20 and measure approximately 1.5 miles in total. Three wetlands measuring approximately one-half acre in total are located at the midpoint of the study area bisecting it into north and south. There are a number of areas of steep slopes in the middle and southern portions of the study area. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 59 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area	21	Gross Vacant Buildable Acres	938
Total Acres	1,800	Dwelling Unit Capacity	4,059
Total Developed Acres	583	Employment Acres	49
Total Constrained Acres	174	Resource Land Acres	0
Title 3 Acres	54	Percent Tree Canopy Cover	30%
Upland Steep Slope Acres	120		

General Site Description: Study Area 21 is a T-shaped section of unincorporated Clackamas County. It is proximate to Study Area 20, located two miles south of Happy Valley and two miles east of Oregon City. It is fully outside the Metro jurisdictional boundary and the UGB. The area is bisected into eastern and western parts by Bradley Road and northern and southern parts by S Holcomb Boulevard. South Redland Road defines the area's southern boundary. South Holcomb Boulevard, S Forsythe Road, S Redland Road and S Bradley Road provide access to the area. The northern section of the study area is hilly. This area is mostly designated as Outer Neighborhood and also contains a small area designated as Corridor. Out of 1,800 total acres, there are 938 vacant and buildable acres.

Parcelization, Building Values, Development Patterns, Vacant Land: Out of 809 total parcels, there are 664 parcels with recorded improvement values. The median improvement value is \$88,837. The area has some urban, agricultural and forest uses. There have been 37 permits issued for new residential development since 1990, most of which are located in the northern end and the southeastern corner of the study area.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This area is within the Clackamas River Water District, which collects system development charges at this time.

- **Water:** This area is hilly, and would require expensive infrastructure, including lift stations and reservoirs. There is a six-inch main on S Bradley, but the mains and reservoir would need to be upsized to provide service. The area is rated as moderately difficult to serve.
- **Sewer:** The majority of this hilly study area drains south and west toward Abernathy Creek. Flows could be collected at the confluence of Abernathy Creek and the Clackamas River, and then moved north to the Tri-Cities plant. Two major collectors would be needed, one on Potter Creek and one on Holcomb Creek before the Abernathy Creek collector. No pump stations may be needed, but approximately seven miles of trunk line would have to be installed to connect with the collector along the Clackamas River just north of Oregon City. There is no service in the area at this time. Steep terrain along Holcomb and Potter Creeks would pose challenges to trunk line installation. Clackamas County Water Environment Services states that installation would be somewhat difficult due to the large amount of rock in the area. This area has been rated as moderately difficult to serve.
- **Stormwater:** Stormwater will be required to be treated, either with detention, water quality facilities or both. As this will be on a per-development basis, Clackamas County Water Environment Services considers stormwater services to be easy to provide. This area is rated easy to serve.

Agricultural Analysis

Zoning: This area is entirely exception land and is zoned by Clackamas County as RRFF5, RA2, RA1 and RC. To the north is a small strip of resource land zoned TBR in Study Area 22. Directly to the east is TBR zoned resource land and to the west is resource land in Study Area 22 zoned as TBR, AGF and EFU. To the south is exception land in Study Area 27.

Current Agricultural Activity: There is a very minimal amount of agriculture activity taking place within the study area, limited to some pasture and nursery operations in the southern portion. To the north is resource land in Study Area 22 that is mostly in timber, with nursery uses north of S Clackamas River Drive. To the east is resource land in timber with rural residential development and some scattered field crops and tree farms. To the south is Study Area 27, which contains scattered areas of field and row crops, orchards and pastureland intermixed with forested parcels and rural residences. To the west is Study Area 22, which is entirely resource land that includes areas in timber, pasture, field crops and nursery operations. Most of the nursery operations are along S Forsythe Road in the north with scattered forestland being the major resource land use, especially in the south.

Compatibility: Urbanization of this area would result in an increase in traffic on S Forsythe Road, S Holcomb Boulevard, S Redland Road and S Bradley Road. This increase in traffic may affect the normal movement of farm equipment and the transport of agricultural goods from the resource lands to the southeast and from the nursery operations within Study Area 22 along S Forsythe Road. However, the majority of the resource land surrounding this study area is in timber and urbanization may have less of an impact on the movement of agricultural goods. Since most of the resource land directly adjacent to this area is in timber or rural residential uses, issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development would be minimal. A number of streams flow through the study area including Holcomb Creek and Potter Creek as well as tributaries of Clear Creek. Urbanization of the study area would increase impervious surfaces that could diminish water quality and promote downstream flooding of these creeks as they flow through nearby resource land however, most of this land is in timber so there would be minimal affect on agricultural activity. Urbanization of this study area would have little affect on adjacent agricultural activities due to the limited amount of agricultural activity in the area.

Environmental Social Energy Economic Analysis

General Character of Area

The northern half of Study Area 21, from the northern boundary to Holcomb Road, is characterized mostly by moderate slopes; there are, however, areas of steep slopes associated with the small hills that run through the middle of the northern section. Approximately one-quarter of this section is forest covered. There are several rural residences scattered throughout this northern section. Moderate slopes characterize the southern half of the study area, from Holcomb to Redland Road, with some gentle slopes in the southeast portion; there are some steep slopes along the creeks in the western and southwestern portions of this section. Approximately one-third of this section is forest covered. The southern half of Study Area 21 has somewhat fewer rural residences than the northern half.

Environmental

Area 21 serves as the headwater area for Holcomb and Potter Creeks as well as for tributaries of Clear Creek and the Clackamas River. There are a total of approximately 5.5 stream miles in the study area. There are wetlands along Potter Creek. There are seven wetlands totaling

approximately two acres located in the study area. There are scattered areas of steep slopes in the northern and southern portions of the study area, mostly along stream corridors. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 37 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area	22	Gross Vacant Buildable Acres	1,444
Total Acres	2,180	Dwelling Unit Capacity	5,719
Total Developed Acres	159	Employment Acres	1
Total Constrained Acres	558	Resource Land Acres	2,137
Title 3 Acres	159	Percent Tree Canopy Cover	46%
Upland Steep Slope Acres	400		

General Site Description: Study Area 22 is an irregular shaped area located between Study Areas 21, 23 and 24. It touches the eastern-most part of Oregon City in the central portion of the area. Its northern boundary is partially defined by the Clackamas River. There are several Title 3 designated streams originating and passing through the study area that drain into the Clackamas River. Steep slopes are present along the northern and southern edges of this study area, as well as across the center. South Clackamas River Drive, S Forsythe Road and S Holcomb Boulevard provide access to the site. This area is mostly designated as Outer Neighborhood and also contains a small area designated as Corridor. Approximately 1,444 acres are vacant and buildable out of 2,180 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: Out of 222 total parcels, there are 152 parcels with recorded improvement values. The median improvement value is \$120,242. The median parcel size is approximately 4.6 acres. There are 105 parcels larger than five acres in size, and 55 parcels less than one acre. This area's land appears to be in agricultural, urban, and forest use. It has had nine residential developments since 1990.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study areas. The available data does not suggest that the area has high levels of noise generated by overhead air traffic.

Public Services Feasibility: This area is within the Clackamas River Water District, which collects system development charges at this time.

- **Water:** A 16-inch main in S Forsyth Road and a 12-inch main in S Holcomb Boulevard currently serve this area. There is the possibility that service may need to be split into two reservoirs. Boulders are occasionally found in excavation. This area is rated as moderately difficult to serve.
- **Sewer:** The Clackamas River, as well as an east-west ridge, separates this study area from the UGB to the north. The northern two-thirds of the area drain to the north, and sewage can be collected and piped approximately four miles to the Tri-Cities treatment plant. Any additional flows to the Tri-Cities plant would require plant upgrade. The south side of the study area drains to the south. Service to this area would require either a pump station and force main to add the flows to the north side development, or a gravity sewer down Holcomb Creek to Abernathy Creek, then to the Tri-Cities plant. This gravity trunk line would require approximately three miles of pipe. Installation may pose difficulties due to the presence of rock in the area. This area is rated as moderately difficult to serve.
- **Stormwater:** Stormwater will be required to be treated, either with detention, water quality facilities, or both. As this will be on a per-development basis, Clackamas County Water Environment Services considers stormwater services to be easy to provide. This area is rated easy to serve.

Agricultural Analysis

Zoning: This area is entirely resource land and is zoned TBR, AGF and EFU by Clackamas County. The study area is almost completely surrounded by exception land in Study Areas 20, 21, 23 and 24.

Current Agricultural Activity: The resource land within this study area includes uses in timber, pasture, field crops and nursery operations. Most of the nursery operations are along Forsythe Road with scattered forestland being the major resource land use, especially in the south. To the east is Study Area 21, which contains a minimal amount of agricultural activity, generally limited to some pasture and nursery operations in the southern portion of the area. To the south are Study Areas 26 and 27 that contain some field crops, pastures, small nurseries and timberland. To the east is Study Area 23 in the north and Study Area 24 in the south. Study Area 23 supports some nursery operations, field crops, pasture and orchards. Study Area 24 contains some minor areas of pasture and field crops.

Compatibility: Urbanization of this area of resource land would result in an increase in traffic on S Forsythe Road, S Holcomb Boulevard, S Redland Road and S Clackamas River Road. This increase in traffic may affect the transport of agricultural goods from the resource lands to the southeast, out along S Springwater Road, S Fischers Mill Road and S Redland Road. Since this study area is the main location of resource land in the immediate area, urbanization would have a minimal impact on issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development. Holcomb Creek, Potter Creek and other tributaries to the Clackamas River flow through the area, but do not flow through very much farmland. Urbanization of the study area would increase impervious surfaces that could diminish water quality and promote downstream flooding of these creeks as they flow to the Clackamas, but these consequences would not affect significant agricultural activities.

Environmental Social Energy Economic Analysis

General Character of Area

All of Area 22 is zoned for resource use. The northern half of Area 22, from the northern boundary to Forsythe Road, is characterized by a variety of slopes, from gentle to moderate in the center portion to steep along the northern boundary and creek areas. Over 50 percent of this half of Area 22 is forest covered, which is concentrated along the riparian areas of the creeks and Clackamas River, and along the steep hillside that running east/west. There are few residences, mostly associated with farming operations.

Moderate to steep slopes in the north, gentle slopes in the central portion and moderate to steep slopes in the south characterizes the southern half of Area 22, from Forsythe Road to Redland Road on the south. Approximately 40 percent of this area is forest covered, which is concentrated along the steeper-sloped areas in the northern section and the creek riparian areas in the southern section. There are very few rural residences in this section.

Environmental

The Clackamas River forms Area 22's northern boundary for approximately 1.4 miles. A floodplain runs along the northern edge of the study area for approximately 1.75 miles. Johnson Creek, three tributaries of the Clackamas River and a tributary of Clear Creek are within the northern half of this study area. Holcomb and Potter Creeks flow east to west through the southern half of Area 22. In total, there are approximately 7.75 miles of stream corridor located

in the study area. Four wetlands totaling approximately eight acres are located in the area. There are moderate areas of steep slopes scattered throughout the area mainly along stream corridors. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 55 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area	23	Gross Vacant Buildable Acres	488
Total Acres	944	Dwelling Unit Capacity	2,751
Total Developed Acres	196	Employment Acres	0
Total Constrained Acres	248	Resource Land Acres	55
Title 3 Acres	160	Percent Tree Canopy Cover	36%
Upland Steep Slope Acres	88		

General Site Description: Study Area 23 is a round area in unincorporated Clackamas County. The Clackamas River defines its northern and western extents. The area's northern and western sides share a boundary with Metro's jurisdictional boundary and the UGB. Forsythe Road and Clackamas River Drive provide access to the area. The area has some steep slopes that drop into the Clackamas River on its western end. This area is designated as an Inner Neighborhood. It has 488 acres of vacant and buildable land out of 944 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: Out of 252 total parcels, there are 181 improved parcels. The median improvement value is \$100,548. The median parcel size is 2.2 acres. There are 58 parcels less than one acre in size, and 56 parcels are greater than five acres. There are forest, urban and agricultural uses in the study area. Two residential developments have occurred since 1990.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This area is within the Clackamas River Water District, which collects system development charges at this time.

- **Water:** Clackamas River Water District is willing to provide service to this study area. Several mains are available (a six-inch main at S Forsyth Road and an eight-inch main at S Highland Road). There are no rock problems. This area is rated easy to serve.
- **Sewer:** This area would drain north toward the Clackamas River. Clackamas County Water Environment Services states that a pump station would be necessary. Flows would travel south approximately two miles to the Tri-Cities treatment plant, and a river crossing would be necessary. The Tri-Cities plant capacity would have to be upgraded to provide additional service. There may be difficulties with installation due to the presence of rock in this area. This area is rated moderately difficult to serve.
- **Stormwater:** Stormwater will be required to be treated, either with detention, water quality facilities, or both. As this will be on a per-development basis, Clackamas County Water Environment Services considers stormwater services to be easy to provide. This area is rated easy to serve.

Agricultural Analysis

Zoning: This area is mostly exception land but does include 55 acres of resource land that is zoned by Clackamas County as RRFF5 and FU10 respectively. The UGB is to the north and south and west. To the east is resource land zoned EFU in Study Area 22.

Current Agricultural Activity: There are a number of larger lots in this area that are cultivating field crops, orchards and pastureland. The 55 acres of resource land in the south of the study area adjacent to the UGB supports a nursery. To the east is the northern portion of Study Area 22 that contains a substantial amount of nursery land as well as field crops and timber. To the south is a small sliver of resource land that contains rural residential uses and the UGB. To the west and north is the UGB except for a small amount of resource land across the Clackamas River that supports row crops.

Compatibility: Urbanization of this area would result in an increase in traffic on S Forsythe Road, and S. Clackamas River Road. This increase in traffic may affect the transport of agricultural goods from the nursery operations in Study Area 22 to the east, adjacent to these two roads. Urbanization of this area would bring new development directly adjacent to agricultural activities, which would impact issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development. The agricultural activities to the north across the Clackamas River are more impacted by the existing adjacent urban development than by future urban development of this area due to the Clackamas River acting as a buffer. Johnson Creek flows through the area and then passes through resource land. Urbanization of the study area would increase impervious surfaces that could diminish water quality and promote downstream flooding of Johnson Creek as it passes through the nursery operations located on resource land in Study Area 22. Urbanization may affect the value of adjacent agricultural land to the east by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production.

Environmental Social Energy Economic Analysis

General Character of the Area

The area is characterized by steep forested slopes along S Clackamas River Drive and along the stream corridors in the central and eastern portion of the area. The remainder of the area is more moderately sloped and contains agricultural activities as well as rural residences and some forested areas.

Environmental

The Clackamas River borders the study area along the western and northern sides, providing 2.5 miles of river edge. Edna Creek flows for 1.4 miles prior to draining into the Clackamas River on the western side of the study area. Johnson Creek flows for a mile prior to draining into the Clackamas River on the northern edge of the study area. A quarter mile tributary of Johnson Creek also is in the study area as are two unnamed tributaries of the Clackamas River that total about two-thirds of a mile of stream corridor. Floodplains associated with the Clackamas River encompass almost all of the land between S Clackamas River Road and the river for the entire 2.5-mile length. The floodplain varies in width from 100-1,000 feet. There are large areas of steep slopes along S Clackamas River Drive and along Edna Creek. Johnson Creek has smaller areas of steep slopes scattered along its corridor. The southwest corner of the area contains three publicly owned open space parcels totaling approximately 15 acres that are linked to the steep slopes near the Clackamas River. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 54 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis and inhibit the open space tracts from providing species habitat and other ecological functions.

Social Energy Economic

See Appendix A.

Other Identified Resources

Clackamas County has identified three historic houses located at 13841, 14343 and 15040 S Clackamas River Drive, Oregon City.

Study Area	24	Gross Vacant Buildable Acres	549
Total Acres	985	Dwelling Unit Capacity	3,078
Total Developed Acres	197	Employment Acres	32
Total Constrained Acres	215	Resource Land Acres	2
Title 3 Acres	99	Percent Tree Canopy Cover	51%
Upland Steep Slope Acres	116		

General Site Description: Study Area 24 is an oval-like area in unincorporated Clackamas County. Its northwestern boundary is defined by the UGB. A portion of the area is within Metro's jurisdictional boundaries, although most of it is not. The area's northwestern most extent meets Oregon City's boundary. Redland Road defines the area's southern boundary, and Holcomb Road defines a portion of its northern boundary. South Holcomb Road and S Redland Road provide access to the site. The area is mostly flat. This area is mostly designated as Inner Neighborhood and also contains a small area designated as Corridor. It contains 549 acres of vacant and buildable land out of 985 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: Out of 252 total parcels, there are 181 parcels with improvement values. The median improvement value is \$100,548. There are urban and forest uses within the area. Since 1990, four permits have been issued for single-family homes.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This area is within the Clackamas River Water District, which collects system development charges at this time.

- **Water:** Service is available on S Holcomb Road (12-inch main), S Redland Road (one 8-inch and one 12-inch main) and S Neibur Road. This study area would be served by Redland pressure zone and by a 797-foot pressure zone (Hunter Heights). While excavation encounters rocks intermittently, Clackamas River Water district is willing to serve this area. This area is rated moderately difficult to serve.
- **Sewer:** Clackamas County Water Environment Services has reported that this area would not be difficult to serve. Additional service would still require upgrade of the Tri-Cities plant. The topography slopes to the south toward Abernathy Creek. There is a 48-inch collector at the corner of Highway 213 and Abernathy Road, approximately two miles from the study area. Steep slopes and the possibility of rocky soils would pose some challenges with installation. This area is rated as moderately difficult to serve.
- **Stormwater:** Stormwater will be required to be treated, either with detention, water quality facilities, or both. As this will be on a per-development basis, Clackamas County Water Environment Services considers stormwater services to be easy to provide. This area is rated easy to serve.

Agricultural Analysis

Zoning: This area is entirely exception land and is zoned by Clackamas County as RRFF5. The area is surrounded by the UGB to the west, exception land in Study Area 26 to the south and resource land zoned TBR, AGF and EFU in Study Area 22 on the east and north.

Current Agricultural Activity: There are a few scattered areas of pasture and one central location of field crops in this study area. To the north and east is resource land in Study Area 22 that contains a mixture of field crops, pasture land and forested areas. The majority of this resource land directly adjacent to this area is forested. To the south is Study Area 26 that is mostly in rural residences but also contains some forested resource land with minor areas of row crops, pastures and small nurseries. To the west is the UGB.

Compatibility: A significant increase in traffic on S Holcomb Boulevard and S Redland Road may result from the urbanization of this area. This increased traffic could affect the transport of agricultural goods produced from the resource lands to the further southeast along S. Redland Road and S Fischers Mill Road. However, these impacts would most likely be fairly minimal since the majority of the adjacent resource-zoned land is for timber use. Urbanization of area would bring development directly adjacent to resource land areas in Study Area 22 that are mostly forested. Therefore impacts related to safety and liability, and complaints due to noise, odor, and the use of pesticides and fertilizers would be minimal. Potter Creek and Holcumb Creek flow through this area prior to joining Abernethy Creek on the way to the Willamette River. Urbanization of this area would result in increased impervious surface area that may diminish water quality downstream and promote downstream flooding, but these consequences would not affect any agricultural activities. Urbanization of this area may affect the value of some adjacent resource land that is in pasture or field crops by encouraging land banking and speculation that may inhibit the ability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area would have a small affect on adjacent agricultural activity.

Environmental Social Energy Economic Analysis

General Character of the Area

Two distinct areas characterize the study area; forested steep slopes associated with Holcumb Creek and Potter Creek in the south and the generally flat open northern portion with small lot rural residential uses. The majority of the residences in the south are on large lots. There is very little agricultural activity in the study area.

Environmental

Holcumb Creek flows in a northeast-southwest direction through the center of the area for 1.6 miles joining Abernethy Creek just west of the area boundary. Three tributaries to Holcumb Creek add 1.4 miles of stream corridor. Potter Creek and a tributary flow west through the southeast portion of the area prior to joining Holcumb Creek. These two stream segments are two-thirds of a mile in length. There are large areas of steep slopes associated with all of the stream corridors. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 56 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resources as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area 25		Gross Vacant Buildable Acres 217	
Total Acres	666	Dwelling Unit Capacity	1,364
Total Developed Acres	271	Employment Acres	-
Total Constrained Acres	181	Resource Land Acres	446
Title 3 Acres	114	Percent Tree Canopy Cover	10%
Upland Steep Slope Acres	67		

General Site Description: Study Area 25 is situated east of Oregon City's downtown area. It is oblong, and oriented in a north-south direction. Approximately 75 percent of this study area is boarded by the existing urbanized area/UGB. This area is within Clackamas County and is also within the Metro jurisdictional boundary. It is generally defined at the north by S Redland Road and at the south by selected parcel lines. To the east is Study Area 26. Highway 213 runs directly through the study area in a north-south direction. South Holly Lane also runs through the study area, east of Highway 213. This study area has been designated as Inner Neighborhood. Approximately 217 of the 666 acres in this study area are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains about 150 tax lots. About two-thirds of them have improvements. Only two tax lots have improvement values above \$250,000. Almost half of the tax lots in this study area are less than one acre in size, and about 80 percent of the tax lots in this study area are smaller than five acres in size. Smaller parcels and subdivisions sit mainly in the northern and eastern portions of the site. Agricultural uses are not prevalent in this study area. Non-residential land uses in this study area include construction, contracting, and excavation services. There is no evidence of mining or aggregate activities occurring within this site.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There are no power lines or other public easements running through this area. There is also no evidence of significantly high air traffic noise over this area.

Public Services Feasibility: The study area falls within several jurisdictions for public services. The area's small size may make it more difficult to accommodating services with maximum efficiency. It is contained within a single drainage basin.

- **Water:** Oregon City showed a desire or already has plans to serve the area. This study area would be easy to serve, however, it contains a fair amount of land with steep slopes, which could increase the difficulty of delivering water services. The current infrastructure system can accommodate new development, though some improvements and extensions of lines inside and outside the existing UGB will be needed to prevent overburdening the existing system.
- **Sewer:** Clackamas County Water Environment Services appears willing to accept the study area within its service area, if necessary. The area would be moderately difficult to serve. As noted above, steep slopes could increase the construction difficulty and create operational problems. Infrastructure improvements may also be needed to prevent overburdening the existing system.
- **Stormwater:** Clackamas County Water Environment Services appears willing to accept the study area within its service area, if necessary. The area would be moderately difficult to serve. Steep slopes within the study area present the same

issues addressed above. Some improvements and extensions of lines will be necessary, both inside and outside the UGB.

Agricultural Analysis

Zoning: This area contains both exception land and resource land zoned by Clackamas County as RRFF5 and TBR respectively. The area is surrounded by the UGB on three sides and exception land in Study Area 26 on the fourth side.

Current Agricultural Activity: There are very scattered and minor areas of field crops and pastures in this area. All of the resource-designated land is forested. Directly to the east is exception land in Study Area 26 that contains rural residences. To the south, west and north is the UGB.

Compatibility: Urbanization of this area may increase traffic on this Highway 213, which passes through the center of the study area, but would not appear to impact any agricultural practices further east than they are already impacted by the current level of traffic of this highway. Increased traffic might also occur on Redland Road, which serves the larger agricultural community to the east. Any new development would not be directly adjacent to large agricultural areas, thereby reducing any impacts related to safety and liability, and complaints due to noise, odor, and the use of pesticides and fertilizers. Newell Creek runs lengthwise through the forested resource land portion of this study area. Urbanization of the study area would increase impervious surfaces that could diminish water quality and promote downstream flooding of Newell Creek, but these consequences would not affect any agricultural activities. Overall, urbanization of this area would not have an affect on agricultural activity.

Environmental Social Energy Economic Analysis

General Character of Area

The western half of the study area is very heavily wooded and steeply sloped, with limited residential development. The eastern half of the study area is moderately sloped and contains some flat areas with development concentrated off of S Holly Lane. Highway 213 bisects the area in a north-south direction.

Environmental

Newell Creek flows north through the center of the area for two miles prior to joining Abernethy Creek at the northern edge of the area. There are five tributaries to Newell Creek that total 1.4 miles of stream corridor. The lower half-mile of Newell Creek has an associated floodplain that is approximately 50 feet in width. There is floodplain along the northern edge of the study area that is associated with Abernethy Creek, which flows adjacent to this border. This floodplain is approximately two-thirds of a mile in length and varies in width from 200-400 feet. Close to half of the study area contains steep slopes that are generally associated with the stream corridors. Metro has acquired 12 open space parcels totaling approximately 86 acres along Newell Creek within the study area and also owns five parcels totaling approximately 85 acres adjacent to the south of the study area within Oregon City. Adjacent to the north is a 1.5-acre open space owned by Clackamas County along Abernethy Creek. Oregon City owns a 15-acre adjacent open space to the south along Newell Creek. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 65 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis and may inhibit the ability of these natural sites to provide species habitat and other ecological functions.

Social Energy Economic
See Appendix A.

Study Area	26	Gross Vacant Buildable Acres	1,029
Total Acres	1,885	Dwelling Unit Capacity	6,141
Total Developed Acres	455	Employment Acres	35
Total Constrained Acres	362	Resource Land Acres	294
Title 3 Acres	218	Percent Tree Canopy Cover	40%
Upland Steep Slope Acres	144		

General Site Description: Study Area 26 is an inverted U-shaped area that runs north and south. The area is in unincorporated Clackamas County. A portion of land in the western section of the area is within Metro's jurisdictional boundary, although most of it is outside. Most of the area's western and southern boundaries are defined by the UGB and Metro's jurisdictional boundary. South Redland Road defines the area's northern boundary. South Maplelane Road, S Holly Lane and S Redland Road provide access to the area. This study area is mostly flat. This area is mostly designated as Inner Neighborhood and also contains a small area designated as Corridor. Of 1,885 total acres, the area has 1,029 acres of vacant and buildable land.

Parcelization, Building Values, Development Patterns, Vacant Land: Of 465 total lots, there are 372 lots with recorded improvements. The median improvement value for parcels in the area is \$82,826. The median parcel size is 1.6 acres. This area contains 169 parcels smaller than one acre, and 113 parcels larger than five acres. The area has a fairly even mix of urban, forest, and agricultural uses. There have been 12 permits issued for single-family residential developments since 1990.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There appear to be large power line easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This area is within the Clackamas River Water District, which collects system development charges at this time.

- **Water:** This study area would require upsizing of mains. Boulders are prevalent in the area. Improvements are currently in process on S Maplelane Road (replacing 6-inch main with 12-inch main), and S Waldow Road (replacing 4-inch main with 8-inch main). Due to the proximity of connection points and provider willingness, this area has been rated as easy to serve.
- **Sewer:** This study area would drain to the north to Abernathy Creek. From there, sewage would flow to the 48-inch collector at the corner of Highway 213 and Abernathy Road. Approximately six miles of trunk line would need to be constructed. Any additional service would require upgrade of the Tri-Cities plant. Steep terrain and rocks may provide some difficulties with installation. This area is rated difficult to serve.
- **Stormwater:** Stormwater will be required to be treated, either with detention, water quality facilities, or both. As this will be on a per-development basis, Clackamas County Water Environment Services considers stormwater services to be easy to provide. This area is rated easy to serve.

Agricultural Analysis

Zoning: This area is mostly exception land but does include 294 acres of resource land and is zoned by Clackamas County as RRFF5 and TBR respectively. Either the UGB or exception land in Study Areas 24 and 25 surrounds the area on three sides and a mixture of exception and resource land zoned TBR and AGF in Study Area 27 defines the fourth edge.

Current Agricultural Activity: Agricultural production in this study area is limited to scattered areas of field crops, row crops, and pastures. The largest area of resource land is mostly forested and the Oregon City Golf Course is located on resource land in the southern portion of the study area. To the north is Study Area 24 that contains a small area of field crops just north of Redland Road. To the east is Study Area 27 that includes both exception and resource land that supports scattered areas of field crops, orchards, row crops and timberland. To the south and west is the UGB. A portion of this area also borders Study Area 25 that contains no agricultural activities.

Compatibility: Urbanization of this area would significantly increase traffic on S Redland Road, S Maplelane Road, and S Thayer Road. This increased traffic could affect the transport of agricultural goods produced on the resource lands further southeast along S. Redland Road and S Fischers Mill Road. Since most of the nearby resource lands are timber-zoned and forested the impact would be much less than if these resource areas were in agricultural production. Since most of the nearby resource land is in timber, issues relating to safety, vandalism and liability, and complaints due to noise, odor, and the use of pesticides and fertilizers resulting from new development adjacent to agricultural activities would be minimal. Thimble and Abernethy Creeks and associated tributaries flow through the area. Urbanization of this area would increase impervious surfaces that might diminish water quality downstream and increase the potential for flooding. Some of these streams flow through adjacent resource land areas that are zoned for timber uses or have minimal farming activities, and thus would not affect agricultural activities. Urbanization of this area may affect the value of adjacent resource land in Study Area 27 by encouraging land banking and speculation that results in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area would have a small affect on adjacent agricultural activity.

Environmental Social Energy Economic Analysis

General Character of Area

The northern half of the study area contains a number of steep slopes associated stream corridors. Most of the area is forested with large lot residential development along S Holly Lane. The southern portion is moderately sloped, more open with some agricultural activities and residential development on smaller lots.

Environmental

Thimble Creek flows north for a mile through the southeastern portion of the area prior to joining Abernethy Creek just outside the study area. There are three tributaries to Thimble Creek that flow through the southern portion for 1.95 miles. Abernethy Creek crosses the central eastern edge of the area and continues in a northwesterly direction through the top portion of the area for 3.3 miles. This segment of Abernethy Creek includes five-acre BullFrog Reservoir. Four tributaries join Abernethy Creek in this area totaling approximately two miles of stream corridor. Holcumb Creek briefly runs in the area for 700 feet prior to joining Abernethy Creek. The floodplain of Abernethy Creek stretches for 1.75 miles from the northwest corner of the area to BullFrog Reservoir and has a width that varies from 200-600 feet. A second area of floodplain

along Abernethy Creek stretches a third of a mile north from where the stream enters the study area and varies in width from 200-300 feet. There are six scattered wetlands that total 3.2 acres in size. There are extensive areas of steep slopes associated with all of the stream corridors and a few other locations of steep slopes in the central-top portion of the area. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 50 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resources as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area	27	Gross Vacant Buildable Acres	1,726
Total Acres	2,973	Dwelling Unit Capacity	7,385
Total Developed Acres	612	Employment Acres	105
Total Constrained Acres	579	Resource Land Acres	438
Title 3 Acres	233	Percent Tree Canopy Cover	46%
Upland Steep Slope Acres	348		

General Site Description: Site Area 27 is a mostly-rectangular area in unincorporated Clackamas County. It is outside Metro's jurisdictional boundary. The study area is approximately 1.5 miles west of Oregon City, and is not contiguous to the UGB, as Study Area 26 lies immediately to the west. South Redland Road defines much of the area's northern boundary. South Henrici Road defines much of the area's eastern boundary. The area is served by S Henrici Road, S Ferguson Road, S Maplelane Road and S Thayer Road. It is a hilly area, with over 300 feet of elevation change. The area is designated as Outer Neighborhood and also contains an area designated as Corridor. The area has 1,726 acres of vacant and buildable land out of 2,973 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: There are 642 parcels recorded as having improvements out of 816 total parcels. The median parcel improvement value is \$95,924. The median parcel size is approximately two acres. There are 199 parcels that are less than one acre, and 139 parcels that are larger than five acres. Forest, farm and urban uses are well interspersed throughout the study area. There have been 50 permits issued for single-family residential developments since 1990.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the site.

Public Services Feasibility: This area is within the Clackamas River Water District, which collects system development charges at this time.

- **Water:** This area is hilly, and would require extensive infrastructure, including lift stations and reservoirs. There are currently six-inch mains on S Walker Road, S Thayer Road, S Beckman Road and S Grasle Road. To provide service to this study area, the current treatment plant would either need to be improved or possibly rebuilt. Infrastructure needs and the rocky terrain on the west side of the study area will present some challenges to service in this area. This area has been rated moderately difficult to serve.
- **Sewer:** The majority of this area drains toward Abernathy Creek, which cuts across the study area in a generally southeast to northwest direction. There is no service in the area at this time. Approximately six miles of trunk line would have to be constructed to meet the 48-inch interceptor at the corner of Abernathy Road and Highway 213. The area is steep and rocky, which will make installation more difficult. No pump stations are anticipated. This area is rated difficult to serve.
- **Stormwater:** Stormwater will be required to be treated, either with detention, water quality facilities, or both. As this will be on a per-development basis, Clackamas County Water Environment Services considers stormwater services to be easy to provide. This area is rated easy to serve.

Agricultural Analysis

Zoning: This area in Clackamas County contains exception land zoned RRFF5, FF10, RA1, RA2, and RC and resource land zoned TBR and AGF. To the east is resource land zoned EFU and TBR. To the north and south is exception land in Study Areas 21, 28 and 29. To the west is exception land and a small amount of resource land in Study Area 26.

Current Agricultural Activity: There are a number of scattered locations of agricultural activity in this large study area including field and row crops, orchards and pastureland. These activities occur on both designated resource and exception land. Most of the area in the north near S Redland Road is occupied by rural residences. A large area of the designated resource land is forested. To the north are Study Areas 21 and 22 that contain some pasture and field crops but mostly forested land. To the east is a large expanse of resource land that contains significant areas of field crops, orchards and nursery land. To the south are Study Areas 28 and 29 that contain areas of scattered field crops, row crops and also several orchards and nurseries. To the west is Study Area 26 with scattered areas of field crops, row crops, and pastures.

Compatibility: Urbanization of this area would significantly increase traffic on S Redland Road, S Maplelane Road, S Ferguson Road, S Thayer Road and S Henrici Road. This increased traffic could affect the transport of agricultural goods produced on the resource lands further east along S. Redland Road and S Fischers Mill Road. Urbanization of this area would bring new development directly adjacent to agricultural activities, which would exacerbate issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development. This could occur mainly with the agricultural activities to the east. Abernathy Creek and a number of its tributaries flow through this area. Urbanization of this area would result in increased impervious surface area that may diminish water quality and promote downstream flooding, but these consequences would not affect any agricultural activities. Urbanization of this area may also affect the value of adjacent resource land to the east by encouraging land banking and speculation that results in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area may have a negative affect on adjacent agricultural activities to the east.

Environmental Social Energy Economic Analysis

General Character of Area

Area 27 is characterized by gentle to moderate slopes between the fingers of the steeper slopes associated with Abernathy Creek and its tributaries. Approximately 40 percent of this study area is forest covered, with most of it concentrated along the riparian areas of the creek and steep-sloped areas. There are scattered rural residences throughout the study area, with a higher concentration in the north along Redland, Beckman and Grasle Roads as well as within a neighborhood defined by Elida, Glisan and Norman Roads.

Environmental

Area 27 is bisected by Abernathy Creek, which has several tributaries that are within the central and southern portion of this study area. In total, the stream segments in this study area measure approximately 11.75 miles. Abernathy Creek ultimately flows into BullFrog Reservoir, which is about two-thirds mile from the northwest corner of the study area. A floodplain associated with Abernathy Creek extends across the area at an angle from the western edge to the southeastern corner for approximately 3.5 miles. Two wetlands are located in the study

area, one in the western portion and the other toward the center of the area measuring approximately one acre in total size. There are large areas of steep slopes associated with all the stream corridors. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 27 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area	28	Gross Vacant Buildable Acres	771
Total Acres	1,532	Dwelling Unit Capacity	4,277
Total Developed Acres	623	Employment Acres	115
Total Constrained Acres	97	Resource Land Acres	
Title 3 Acres	63	Percent Tree Canopy Cover	25%
Upland Steep Slope Acres	34		

General Site Description: Study Area 28 is a rectangular area situated immediately south of Oregon City in unincorporated Clackamas County. A small portion of the area is within the Metro jurisdictional boundary. Its boundaries are partially defined by S Beaver Creek Road in the west, S Wilson Road in the south, S Athens Road in the east and S Rachel Court in the north. South Mollala Avenue, S Wilson Road and S Henrici Road serve the area. It is somewhat hilly. Clackamas County owns a large tract of land in the area's southwest corner. This area is designated as Inner Neighborhood with a small area designated as Corridor. There are 771 vacant and buildable acres of land out of 1,532 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: Out of 774 total parcels, there are 648 parcels with recorded improvement values. The median parcel improvement value is \$66,990. The median parcel size is approximately 0.6 acres. There are 494 parcels less than one acre in size and 58 parcels greater than five acres. The area has mostly urban and agricultural uses. There have been nine residential developments since 1990, which occurred in the northeastern corner of the study area.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This area is within the Clackamas River Water District, which collects system development charges at this time. There may be constraints on the City being able to provide services.

- **Water:** Although this area is considered easy to serve with mains at S Henrici Road (12-inch), S Beaver Creek Road (8-inch), Highway 213 (6-inch) and Leland (8-inch), the reservoir at Beaver Creek, with a current capacity of 744 million gallons, would require improvement. This area is rated moderately difficult to serve.
- **Sewer:** This study area is divided into two drainages that divide approximately along S Henrici Road. There is no service at this time. That part of the area north of S Henrici Road would drain north of the Abernathy Creek watershed, then to Oregon City. The area south of Henrici Road would require pump stations to be served. Approximately three miles of additional trunk line would have to be constructed. Floodplains and wetlands north of the study area would restrict installation somewhat. Additional flows would require upgrade of the Tri-Cities plant. This area is rated moderately difficult to serve.
- **Stormwater:** Stormwater will be required to be treated, either with detention, water quality facilities, or both. As this will be on a per-development basis, Clackamas County Water Environment Services considers stormwater services to be easy to provide. This area is rated easy to serve.

Agricultural Analysis

Zoning: This area is entirely exception land and is zoned by Clackamas County RRFF5, FF10 and RA2. To the north are the UGB and a mixture of exception land and resource land in Study Areas 26 and 27. To the east are exception lands in Study Area 29 and a small pocket of resource land that is connected to a much greater expanse of resource land that extends for several miles. To the south is exception land in Study Area 30. To the west is resource land that extends to and includes Study Area 31.

Current Agricultural Activities: There are pastures and scattered field crops and row crops in several portions of this area. There are also nursery operations in the southern portion of this area. To the north is the UGB, as well as the lower portion of Study Area 27 that is mainly forested with rural residences. To the east is a pocket of resource land that contains field crops and Study Area 29 stretching further east. To the southeast is a great expanse of exception land that does support some field crop and nursery operations but is mostly forested or tree farms. To the south is Study Area 30 that contains a significant amount of scattered agricultural activity including pastureland and field and row crops. To the west is resource land that is split between forested areas in the north and orchards, nurseries and row crops in the south.

Compatibility: Urbanization of this area would result in increased traffic on Highway 213/ S Mollala Avenue and Beavercreek Road. Since much of this area is essentially subdivided and would not be likely to develop further, the total increase in traffic would be less than other study areas of similar size. However, any increase in traffic would exacerbate existing traffic concerns and negatively affect the farming operations to the south and east. Urbanization would bring development directly adjacent to a small amount of active farming parcels; thus issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development would be minimal. Beaver Creek flows through the western portion of the study area, continuing on through a large area of resource land that is mostly forested but does contain some field crops. Urbanization of this area would result in increased impervious surface area that may diminish water quality and promote downstream flooding, possibly affecting these agricultural activities. Urbanization of this area may also affect the value of adjacent resource land to the east by encouraging land banking and speculation that results in the inability of farmers to acquire parcels of land needed for agricultural production. The new golf course on the west side of Highway 213 serves as an area of separation between potential new development in this area and the agricultural activities to the west. Overall, urbanization of this area may have a negative affect on adjacent agricultural activities to the east and south.

Environmental Social Energy Economic Analysis

General Character of Area

The majority of the area is moderately sloped with a few steep-sloped forested areas associated with stream corridors. There are a few heavily parceled residential areas in the north and a number of larger rural residential uses spread throughout. Agricultural activities are scattered through the center on the largest parcels.

Environmental

Beaver Creek flows through the southwest corner of the study area for approximately 1-mile. Four tributaries of Beaver Creek are also located in the portion of the area and total 1.7 miles of stream corridor. Thimble Creek flows through the northeast corner of the area for a half-mile. There are scattered locations of steep slopes mainly associated with these two stream

corridors. The area contains three wetlands, 4.9 acres, 0.55 acres and 0.87 acres in size. The wetlands are located in the lower portion of the study area and the largest wetland is centered along Beaver Creek. There is a 23-acre private open space associated with a residential development in the southwest portion of the area. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 35 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis and may inhibit the ability of the natural site to provide species habitat and other ecological functions.

Social Energy Economic

See Appendix A.

Other Identified Resources

Clackamas County has identified two historic houses, one at 155644 S Old Acres Lane and the second at 15440 S Henrici Road in Oregon City and a historic farmstead located at 20750 S Beavercreek Road.

Study Area	29	Gross Vacant Buildable Acres	990
Total Acres	1,584	Dwelling Unit Capacity	4,351
Total Developed Acres	221	Employment Acres	0
Total Constrained Acres	385	Resource Land Acres	0
Title 3 Acres	116	Percent Tree Canopy Cover	29%
Upland Steep Slope Acres	269		

General Site Description: This is a donut-shaped study area in unincorporated Clackamas County. This study area lies immediately east of Study Area 28, which separates this area from the UGB (and Oregon City) by approximately one and one-half miles. This area contains the Mopano Reservoir, also known as Beaver Lake. South Bogynski Road defines most of the northern edge of the study area, and S Redlands Road, the easternmost edge. The remaining boundaries are defined by properties within it. South Henrici Road, S Lyons Road and S Sprague Road provide access to the area. This area is very hilly, gaining 600 feet in three-quarters. The western half of this study area is marked by heavily sloped terrain. This area is designated as an Outer Neighborhood. There are 990 acres of vacant and buildable land out of 1,584 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: There are 190 parcels that have recorded improvement values out of 354 total parcels. The median reported improvement value is \$107,868. The median parcel size is 2.9 acres. There are 64 parcels less than one acre in size, and 77 parcels are greater than five acres. There have been 36 recent residential developments in this area.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This area is within the Clackamas River Water District, which collects system development charges at this time.

- **Water:** There is currently service to this study area from the Redland pressure zone on the east, and a 592-foot 12-inch line on S Henrici Road to S Bogynski Road. There are not many rock problems in this area. Additional service will probably require the upgrade of current trunk lines and increase of reservoir capacity. This area is rated moderately difficult to serve.
- **Sewer:** A ridge that runs from northwest to southeast divides the eastern portion of this study area. Sewage draining on the east side of the ridge would be collected at S Redland Road. It would then be pumped back to the west by way of a lift station and force main, or pumped to the north along Redland Road toward Oregon City. Sewage draining on the west side of the ridge could be collected and piped along the Abernathy Creek drainage. Approximately six miles of trunk line would have to be constructed to the 54-inch interceptor at Abernathy Creek and S Redland Road. The study area would also need at least one lift station on the east side. Clackamas County anticipates rock in the area, which would make trenching more difficult. There are floodplains and wetlands in the western portion of the study area, and floodplain impacts along the possible service route from the study area to the Tri-Cities plant. Any development would require upgrade of the Tri-Cities plant. The study area is rated difficult to serve.

- **Stormwater:** Stormwater will be required to be treated, either with detention, water quality facilities, or both. As this will be on a per-development basis, Clackamas County Water Environment Services considers stormwater services to be easy to provide. This area is rated easy to serve.

Agricultural Analysis

Zoning: This area is entirely exception land and is zoned RRFF5 by Clackamas County. The study area also surrounds a pocket of resource land that is zoned TBR. To the north and south is resource land zoned TBR. To the east is resource land zoned EFU.

Current Agricultural Activities: There are scattered locations of field crop, row crop and pasture land in the eastern portion of the area. The northeast corner supports some orchard operations while much of the southwest corner is forested. To the north is resource land that is a mixture of forest, field crops, pasture and orchards. To the east is resource land that contains a mixture of agricultural activities including field and row crops, nursery, and orchard operations. To the south is resource land that is mostly forested but does contain areas of field and row crops. To the west is a small pocket of resource land that supports field crops and Study Area 28 that also has some field crop and nursery operations nearby.

Compatibility: Urbanization of this area would result in increased traffic on S Henrici Road and S Redland Road. Increased traffic on S Redland Road could affect the transport of agricultural goods produced on the resource lands further east along S Redland Road and S Fischers Mill Road. Urbanization would bring development directly adjacent to some significant areas of active farming parcels on the east end of the study area; thus issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development may occur. A tributary of Abernethy Creek flows through the area and also through some active farming locations. Urbanization of this area would result in increased impervious surface area that may diminish water quality and promote downstream flooding, possibly affecting these agricultural activities. Urbanization of this area may also affect the value of adjacent resource land to the east by encouraging land banking and speculation that results in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area may have a negative affect on adjacent agricultural activities to the east and to a lesser extent to the south.

Environmental Social Energy Economic Analysis

General Character of Area

The western portion of Area 29, from western boundary to Sprague Road on the east, is characterized mostly by moderate slopes with about one-fourth of the land containing steep slopes. The 60-acre Mompano Reservoir runs north/south through the center of this section. Approximately two-thirds of this western section is forest covered, which is concentrated within the creek riparian areas and on the steeper-sloped areas. The few residential uses in this section are located in the northwest corner along Henrici Road.

The eastern portion of Area 29, from Sprague Road to the eastern boundary, is characterized by more gentle to moderate slopes than the western portion. Approximately one-quarter of this section is forest covered. There are some rural residential uses scattered throughout this section.

Included in the center of the area is a 115-acre piece of land that is zoned for timber. The western one-third of this resource land has steep slopes with the remainder moderately to gently sloped. Approximately 40 percent of the resource area is forest covered, with a few residential uses.

Environmental

Abernathy Creek and two tributaries run mostly through the western portion of the area and two short lengths of tributaries are located in the northeast and southeast corners of the study area. In total there are approximately 4.3 miles of stream corridor. The 60-acre Mompano Reservoir runs north/south through the center of this section. Abernathy Creek flows into and out of this reservoir. Seven wetlands are located in the study area, four on the westside and three in the eastside. When totaled, the wetlands measure approximately 64 acres. Approximately one-fourth of the land in the western half of the study area contains steep slopes, generally along the stream corridors. There also are smaller scattered areas of steep slopes in the eastern half of the study area. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 30 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area	30	Gross Vacant Buildable Acres	1,400
Total Acres	2,306	Dwelling Unit Capacity	5,963
Total Developed Acres	671	Employment Acres	-
Total Constrained Acres	128	Resource Land Acres	0
Title 3 Acres	127	Percent Tree Canopy Cover	14%
Upland Steep Slope Acres	0.8		

General Site Description: Study Area 30 is situated within unincorporated Clackamas County. It is immediately south of Study Area 28, which separates it from the UGB, and Oregon City by approximately one mile. It is also outside of Metro's jurisdictional boundary. S Ferguson Road, S Yeoman Road and S Beaver Creek Road define the area's eastern boundary. South Carus Road defines the area's southernmost boundary. The area has some slight elevation change, but does not appear to contain many slopes above 25 percent. It is designated as Outer Neighborhood with a small area designated as Corridor. There are 1,400 vacant and buildable acres out of 2,306 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: Out of 1,022 total parcels, the site has 920 parcels with recorded improvement. The median parcel improvement value is \$75,327. The median parcel size is 0.7 acre. There are 598 parcels that are less than one acre large, and 105 parcels that are greater than five acres. Most of the land in this area appears to be in agricultural use, with a smaller amount of land in urban use. Since 1990, 26 residential development permits have been issued.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This area is within the Clackamas River Water District, which collects system development charges at this time.

- **Water:** This study area is considered easy to serve by Clackamas River Water. There is a 12-inch main on S Ferguson Road running to S Leland Road. There are 8-inch mains on S Leland and S Beaver Creek Road, which should be upsized. Homes south of S Leland are currently served by wells. This area is rated as easy to serve.
- **Sewer:** The area is not served at this time. The majority of this area would be served in the Beaver Creek Drainage, which flows in a generally south-north direction through the study area. Flows into the Fishers Corner area on the west side of the study area would likely have to be collected and pumped to the east to meet with the Beaver Creek drainage. Approximately one mile of trunk line would have to be constructed from the northwest corner of the study area to an existing 15-inch interceptor on Highway 213 at the south end of Oregon City. This interceptor is at capacity, and would have to be enlarged for a distance of approximately three miles. Development of the area would require an upgrade to the Tri-Cities plant. Construction of trunk and service lines will also have to address the presence of rock in this area. The area is rated moderately difficult to serve.
- **Stormwater:** Stormwater will be required to be treated, either with detention, water quality facilities, or both. As this will be on a per-development basis, Clackamas County Water Environment Services considers stormwater services to be easy to provide. This area is rated easy to serve.

Agricultural Analysis

Zoning: This area is entirely exception land and is zoned by Clackamas County as RRRF5, FF10, RA2 and RC. To the north is exception land in Study Area 28. To the east is resource land zoned as TBR and EFU. To the south and west is resource land zoned EFU.

Current Agricultural Activity: There is a large amount of agricultural activity spread throughout the study area except for the extreme west section adjacent to Highway 213. Activities occurring include pasture, field and row crops and some nursery operations. Interspersed are areas of forest cover. To the north is Study Area 28 that contains some large areas of field and row crops adjacent to this area. Directly to the east, south and west is resource land that is actively farmed with large expanses of field and row crops as well as some tree farms located to the southwest. Extending out beyond these agriculture uses is mostly forest cover.

Compatibility: Urbanization of this area would result in increased traffic on S Leland Road, Highway 213 and S Beaver Creek Road. Increased traffic on these roads could affect the transport of agricultural goods produced on the resource lands further south and east along the same roads. Urbanization would bring development directly adjacent to a large amount of active farming parcels; thus issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development may occur in a number of areas. Beaver Creek and a number of tributaries flow directly through the middle of this area. Urbanization of this area would result in increased impervious surface area that may diminish water quality and promote downstream flooding, possibly affecting agricultural activities further downstream. Urbanization of this area may also affect the value of adjacent resource land by encouraging land banking and speculation that results in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area has a high potential for negatively affecting adjacent agricultural activities.

Environmental Social Energy Economic Analysis

General Character of Area

Area 30 is characterized by gentle slopes, except for a very small area just inside the northern boundary along Beaver Creek. The only forest cover is confined to the Beaver Creek riparian area and some scattered upland patches. There are several hundred residential uses, mostly concentrated in the Highway 213/Leland Road area and the area defined by Wilson Road on the north and Leland/Beaver Creek Roads on the south.

Environmental

Beaver Creek and several of its tributaries flow throughout the middle and eastern parts of this study area. In total, the stream corridor length is approximately 9.5 miles. There are 13 wetlands dispersed in the eastern two-thirds of the study area measuring a total of approximately 19.75 acres. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 25 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area	31	Gross Vacant Buildable Acres	983
Total Acres	1,322	Dwelling Unit Capacity	5,756
Total Developed Acres	71	Employment Acres	0
Total Constrained Acres	253	Resource Land Acres	793
Title 3 Acres	131	Percent Tree Canopy Cover	43%
Upland Steep Slope Acres	122		

General Site Description: Study Area 31 is situated within unincorporated Clackamas County, adjacent to the southwest corner of Oregon City. It is immediately east of Area 32, and approximately one mile east of the Willamette River. The UGB defines the northern edge of this study area. South Leland Road defines the area's eastern boundary. The majority of this study area is outside of the Metro jurisdictional boundary. South Central Point Road runs through the center of this area, providing access from the north and south. South Leland Road provides additional access from the southeast. This study area is interspersed by a number of narrow, steep ridges. It is designated completely as Inner Neighborhood. There are 983 vacant and buildable acres out of 1,322 total acres in this area.

Parcelization, Building Values, Development Patterns, Vacant Land: Approximately half of the area's 121 parcels have recorded improvement values. The median improvement value is \$97,089. The median parcel size is 4.1 acres. There are 19 parcels less than one acre in size, and 53 parcels are greater than five acres. The land in this area is utilized almost exclusively as farm and forest. Since 1990, two permits for residential development have been issued.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This area is within the Clackamas River Water District, which collects system development charges at this time.

- **Water:** This study area is not served at this time, although service is being provided adjacent to the area, in Oregon City. The area is hilly, and would require a good deal of new infrastructure, including lift stations and reservoirs. This area is rated as moderately difficult to serve.
- **Sewer:** Beaver Creek cuts through this study area in a generally east-west direction. Sewage in this area would drain to Beaver Creek, and then west to the Willamette River. At that point, a pump station would be needed to convey flows approximately five miles to the Tri-Cities treatment plant. Approximately three miles of trunk line would be needed to connect the area with the new pump station. Installation of trunk lines would pose challenges due to steep canyons and rocky terrain. Additional flows from the study area would require an upgrade of the Tri-Cities plant. The area is rated difficult to serve.
- **Stormwater:** Stormwater will be required to be treated, either with detention, water quality facilities, or both. As this will be on a per-development basis, Clackamas County Water Environment Services considers stormwater services to be easy to provide. This area is rated easy to serve.

Agricultural Analysis

Zoning: This area is entirely resource land that is zoned by Clackamas County as TBR, AGF and EFU. To the north is the UGB. To the east is resource land zoned TBR. To the south is resource land zoned EFU and to the west is exception land in Study Area 32.

Current Agricultural Activity: There is a mixture of forest and field crops throughout this study area with the majority of the field crops in the southern portion near S Criteser Road. Many of the forested areas are adjacent to streams on steep slopes. To the north is the UGB. To the east and south is resource land that contains a mixture of forested and field crop locations, with most of the farming activities to the south. Again, much of the forested areas are associated with slopes and streams. To the west are a number of small field and row crop activities within the exception land of Study Area 32.

Compatibility: Urbanization of this resource land area would result in increased traffic on S Leland Road, and S Central Point Road. Increased traffic on these roads could affect the transport of agricultural goods produced on the resource lands further south and east along the same roads. Urbanization would bring development directly adjacent to active farming parcels; thus issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development may occur in a number of areas. Cahill Creek and Beaver Creek join together in the southern portion of this area. Urbanization of this area would result in increased impervious surface area that may diminish water quality and promote downstream flooding. Beaver Creek however, flows in the bottom of a canyon in areas that are forested and therefore agricultural activities further downstream would not be affected. Urbanization of this area may also affect the value of adjacent resource land to the east and south by encouraging land banking and speculation that results in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area has a high potential for negatively affecting adjacent agricultural activities.

Environmental Social Energy Economic Analysis

General Character of Area

Area 31 is characterized by moderate to steep slopes along Beaver Creek and its tributaries with some gentle slopes between the north/south tributary fingers and south of the creek. Approximately one-third of the area is forest covered, mostly located along the creek riparian areas and steeper slopes. Because this land is zoned for resource use, mostly timber and EFU, there are few residential uses. There are some farming operations, mostly in the southern portion of the area.

Environmental

Beaver Creek flows east/west through the southern portion of Area 31. Two of its larger tributaries flow north/south into the creek, dividing the study area into thirds. In total, there are approximately six miles of stream corridor located in the study area. There are six wetlands, two in the western portion of the study area and four in the eastern portion. When totaled, they measure approximately six acres. There are numerous linear areas of steep slopes along the stream corridors. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 57 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic
See Appendix A.

Study Area 32		Gross Vacant Buildable Acres 528	
Total Acres	696	Dwelling Unit Capacity	2,242
Total Developed Acres	138	Employment Acres	35
Total Constrained Acres	32	Resource Land Acres	-
Title 3 Acres	19	Percent Tree Canopy Cover	20%
Upland Steep Slope Acres	13		

General Site Description: Study Area 32 sits south of the southwestern edge of Oregon City. A portion of its western edge is defined by Highway 99E. Most of the perimeter of this site is not contiguous to the existing UGB. It is in Clackamas County, and is bisected by the Metro jurisdictional boundary, which runs east-west. The area is most readily accessible via Southend Road. To the immediate west of this study area is Coalca Landing and the Willamette River. This area has been designated entirely as Inner Neighborhood and Employment. It is about 3.5 miles, straight-line distance, from downtown Oregon City, and about the same distance from the fork of Highway 213 and S Mollala Avenue. About 528 of the 696 acres in this study area are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains about 170 tax lots. The majority of them have improvements, though fewer than 10 have improvement values above \$250,000. About 15 percent of the tax lots in this study area are smaller than one acre. About 75 percent of all the tax lots in this study area are smaller than five acres in size. Agricultural uses are evident in smaller patches throughout this area, consisting mainly of nursery stock and field crops. Non-residential land uses in this study area include construction, mechanical and marketing. There is no evidence of mining or aggregate activities in this study area.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): This study area is bisected by a power line that runs east-west, through the northern half of the area. There is no evidence of other public easements in this study area. Data available does not suggest that there is significantly high air traffic noise over this area.

Public Services Feasibility: The study area falls within several jurisdictions for public services. While assessments indicate the area can be served, its smaller size may make it more difficult to provide services efficiently. In addition, this area contains multiple drainage basins, which may be a consideration in providing services. The following conditions apply:

- **Water:** Oregon City showed a desire or already has plans to serve the area. In broader terms, this study area would be easy to serve. The infrastructure system is in acceptable condition to develop the area. Minimal improvements within the UGB should be expected.
- **Sewer:** Clackamas County Water Environment Services appears willing to accept the study area within its service area if necessary. This study area would be moderately difficult to serve. While the infrastructure system is in acceptable condition to develop the area, some improvements and extensions of lines, inside and outside the existing UGB, will be necessary to serve new development.
- **Stormwater:** Clackamas County Water Environment Services appears willing to accept the study area within its service area, if necessary. This study area would be

moderately difficult to serve. Infrastructure improvements will be necessary to prevent new development from overburdening the existing system.

Agricultural Analysis

Zoning: This area is entirely exception land and is zoned by Clackamas County as RFFF5 and FF10. To the north is the UGB and resource land in Study Area 33 zoned TBR. To the east is resource land zoned TBR and EFU in Study Area 31. To the south is a small area of exception land in Study Area 33 resource land farther out that is zoned EFU. To the west is exception land and resource land zoned TBR in Study Area 33.

Current Agricultural Activity: There are scattered areas of field crops near the border with Study Area 31 and a couple of areas of row crops in the very north portion of the study area. To the north is forested resource land and the UGB. To the east is a mixture of forest and field crops in Study Area 31. To the south in the vicinity of S New Era Road is a mixture of nursery and field crops along with forested areas. To the west are forest areas in Study Area 33.

Compatibility: A significant increase in traffic on S South End Road and Highway 99E may result from the urbanization of this area. This increased traffic could impede the normal movement of agricultural goods produced to the south of this area near S New Era Road and S Central Point Road. Urbanization would bring development directly adjacent to active farming parcels to the east and south. However, since most of these areas are intermixed with forested parcels issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development would be minimal. Urbanization of this area would create a virtual island of timber resource land to the east adjacent to the Willamette River. The fact that this area is zoned for timber use and not intense agricultural uses results in no impact to agricultural activity. Urbanization of this area may affect the value of adjacent resource land in Study Area 31 by encouraging land banking and speculation. However much of this nearby resource land is forested and therefore the affect on agriculture would be less than if it were all in agricultural production. Overall, urbanization of this area would have a small impact on adjacent agricultural activity.

Environmental Social Energy Economic Analysis

General Character of the Area

The area is characterized as rural residential, mostly on large moderately sloped open lots with a few forested areas associated with stream corridors. There are various agricultural activities scattered throughout the area.

Environmental

An unnamed tributary to the Willamette River flows through the top portion of the area for one-third mile. Two small tributaries to Beaver Creek flow through central lower portion of the area, totaling one mile of stream corridor. There are three small wetlands along the larger tributary to Beaver Creek that total 1.3 acres in size. A fourth 1.2-acre wetland is located in the southeast corner of the area. There are minor areas of steep slopes scattered throughout the area and adjacent to the west is Canemah Bluff. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 37 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resources as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Other Identified Resources

Clackamas County has identified a historic farmstead is located at 20122 S South End Road, Oregon City.

Study Area	33	Gross Vacant Buildable Acres	401
Total Acres	786	Dwelling Unit Capacity	1,558
Total Developed Acres	77	Employment Acres	0
Total Constrained Acres	205	Resource Land Acres	464
Title 3 Acres	38	Percent Tree Canopy Cover	66%
Upland Steep Slope Acres	167		

General Site Description: Area 33, which is situated immediately east of and adjacent to the Willamette River, has a long, narrow configuration. This area can be characterized in two separate parts. The northern portion runs along the Willamette River, and is situated directly across from West Linn. This portion is inside of Metro's jurisdictional boundary. The southern section is outside of Metro's jurisdictional boundary. It winds eastward, enclosing the southern portion of Study Area 32. Highway 99E defines the boundaries of both sections and provides access to them. The area is designated entirely as Outer Neighborhood. There are 401 acres of vacant and buildable land out of 786 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: There are 71 parcels with recorded improvement values out of 111 total parcels. The median parcel improvement value is \$120,599. The median parcel size is approximately two acres. Thirty-two parcels are less than one acre in size, and 34 parcels that are greater than 5 acres. Land in the northern section is mostly forested, while the southern section is predominately urbanized. Since 1990, five permits for single-family dwellings have been issued.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This area is within the Clackamas River Water District, which collects system development charges at this time.

- **Water:** Bedrock presents considerable barriers to excavation in this area. South End Road has an 8" main that connects to a 12" main at the study area boundary. The upper two-thirds of the study area have no service. This section would require force mains, pump stations, and reservoirs. This area is rated difficult to serve.
- **Sewer:** This area is bounded on the west by the Willamette River, and consists mainly of high rocky bluffs. Sewer drainage would be west towards the river, and would require numerous collection points and pump stations. The total length of force main transmission would be about five miles from the south end of the study area to the Tri-Cities treatment plant. Development flows from the study area would require upgrade of the Tri-Cities plant. Installation of trunk lines, force mains, and pump stations would be difficult due to steep bluffs and rocky terrain. Installation of mains along the Willamette River would be also difficult due to floodplains and wetlands. This area is rated difficult to serve.
- **Stormwater:** Stormwater will be required to be treated, either with detention, water quality facilities, or both. As this will be on a per-development basis, Clackamas County Water Environment Services does not consider stormwater services to be difficult to provide. Due to other environmental features, this area is rated moderately difficult to serve.

Agricultural Analysis

Zoning: This area includes both exception lands zoned RRFF5 and FF10 and resource land zoned TBR (464 acres) by Clackamas County. To the north is the UGB. To the east is the UGB and exception land in Study Area 32. To the south is resource land zoned EFU. To the west is the Willamette River.

Current Agricultural Activity: No agricultural activity takes place in this study area. To the east are some scattered field crops in Study Area 32. To the south in the area of S New Era Road is a mixture of nursery and field crops along with forested areas. There is no agricultural activity to the west or north.

Compatibility: Urbanization of this resource area would have a minimal affect on traffic congestion due to the large amount of area that is restricted by steep slopes. Urbanization would not bring development directly adjacent to active farming areas therefore, there would be no issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development. Urbanization of this area would not affect the value of any adjacent agricultural land. Overall, urbanization of this are would not affect agricultural land.

Environmental Social Energy Economic Analysis

General Character of Area

Area 33 is a long, narrow piece of land along the Willamette River that is mostly comprised of moderate to steep slopes. The area is about 90 percent forest covered. There are few residences in the study area with the greatest concentration in the far southern tip in the vicinity of Highway 99 and South End Road. There are also a few farming operations in this southern area.

Environmental

The Willamette River forms the western edge of the study area for approximately four miles. A creek with associated wetland runs through a small central portion of the area. Beaver Creek forms the southern boundary of the study area, and one of its tributaries flows south through the southern portion of the area. In total there are approximately 1.5 miles of stream corridor in the study area. Two wetlands totaling approximately 1.5 acres are located in the southern half of the study area. An area of steep slopes extends almost the entire four-mile length of the western edge of the area, and is known as Canemah Bluff. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis. The Metro Open Space program purchased three tracks, totaling 60 acres, along the Canemah Bluff section of the Willamette River. These sites are noteworthy for a diversity of habitats including basalt outcroppings, oak/madrone forest, good plant communities and wetlands. Urbanization of this area may also inhibit the ability of this natural area to provide species habitat and other ecological functions. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 70 percent of the study area land in the proposed inventory. Urbanization of this area may also inhibit the ability of this natural area to provide species habitat and other ecological functions.

Social Energy Economic

See Appendix A.

Study Area	34	Gross Vacant Buildable Acres	134
Total Acres	514	Dwelling Unit Capacity	452
Total Developed Acres	243	Employment Acres	0
Total Constrained Acres	124	Resource Land Acres	454
Title 3 Acres	32	Percent Tree Canopy Cover	24%
Upland Steep Slope Acres	92		

General Site Description: Study Area 34 is a wedge shaped area located at the confluence of the Tualatin River and Willamette River. Study Area 35 is situated immediately to the north of this study area, which is defined by Pete's Mountain Road. West Linn is directly across the Tualatin River, to the northeast. The area has some steep downward slopes running along the eastern portion, dropping into the Willamette River as well as along the northern edge, along Pete's Mountain Road. The area is entirely within Metro's jurisdictional boundary. It is designated entirely as Outer Neighborhood. There are 134 vacant and buildable acres out of 514 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: Of the 45 total parcels, 22 parcels have recorded improvement values. The median improvement value is \$267,730. The median parcel size is 6.3 acres. There are seven parcels less than one acre in size, and 29 parcels exceed 5 acres. National Golf Operations Partnership owns a large portion of this area, which is mostly urbanized. The remainder of the area is in agricultural use. Since 1990, three permits for residential development have been issued.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This area is within West Linn's service area. There may be constraints on the City being able to provide services.

- **Water:** There are currently no services in this area. Existing water storage is inadequate to support addition of the study area. Service to the area would require increased plant capacity; pump stations, and transmission lines. Rocky soils and steep topography between the north boundary of the service area and West Linn would pose some challenges to installation of service. This area is rated difficult to serve.
- **Sewer:** Development of this area would require at least two pump stations and approximately 2 miles of force main to convey flows to a 12-inch collector near I-205 in West Linn. To serve the added flows, the collector would have to be enlarged for about two miles to the Tri-Cities treatment plant. Development of the study area would require upgrades to the Tri-Cities plant. Installation of service in the area would be difficult due to rocky soils. In addition, the force main route between the north boundary of the service area and West Linn collector is down a very steep and rocky bluff, and across Tualatin River floodplains. West Linn states that a number of force mains and pump stations would be required to serve the area. This area is rated difficult to serve.
- **Stormwater:** Stormwater will be required to be treated, either with detention, water quality facilities, or both. As this will be on a per-development basis, Clackamas County Water Environment Services does not consider stormwater services to be

difficult to provide. Due to other environmental features, this area is rated as moderately difficult.

Agricultural Analysis

Zoning: This area of resource land is zoned TBR and AGF by Clackamas County. To the north is a small strip of exception land in Study Area 35 and the UGB. To the east is the Willamette River. To the south and west is resource lands zoned TBR and AGF.

Current Agricultural Activities: There are no operating agricultural activities in this study area. A large portion of this area is the Oregon Golf Club, which extends further south of the study area. The remaining resource areas are either forested or in rural residences. There are no agricultural activities on the exception land to the north or to the east. To the south and west are pockets of field and row crops along Petes Mountain Road and SW Mountain Road. Much of this resource land area is forested.

Compatibility: Due to the limited amount of urbanizable land in this study area and the small amount of agricultural activity occurring in the area, any increase in traffic on Petes Mountain Road would result in a minimal impact on the movement of agricultural products or equipment. Urbanization of this area would not result in new development directly adjacent to active farming areas therefore, there would be no issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development. Urbanization of this area would not affect the value of adjacent resource land. Overall, urbanization of this area would have a minimal impact on agricultural activity.

Environmental Social Energy Economic Analysis

General Character of Area

Area 34 is zoned for resource use, which includes TBR and agriculture/forest district (AGF). It is characterized by moderate slopes with steep slopes located adjacent to the Willamette River and along the northeastern boundary. Approximately 20 percent of the study area is forest covered, mostly associated with the steep sloped areas. There are few residences in the area, mostly concentrated in the northeast corner. There is a relatively large agricultural operation in the southwest corner of the area. Approximately 40 percent of the area is a golf course.

Environmental

A very short portion (700 feet) of the Tualatin River forms the northeast corner boundary of Study Area 34. The Willamette River forms the eastern boundary of the area for approximately one-mile. The floodplain associated with the Willamette River extends for about a third of a mile in the northeast corner of the area. A large area of steep slopes also runs along the Willamette River, continuing in a westerly direction along the top of the study area. There is a wetland located in the eastern portion of the study area measuring approximately 4.5 acres. Metro's draft Goal 5 Fish and Wildlife Inventory identifies 31 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis. The Metro Open Space program purchased about 30 acres along the Willamette River within the study area. These properties are part of a 439-acre area of the Willamette Narrows acquisition, the remainder of which is immediately south of the study area. The importance of these purchases is their views along the river, unusual and diverse vegetation and varied topography. Urbanization of this study area would not likely impact the values of these 30 acres because of their steep slopes and golf course buffer.

Social Energy Economic
See Appendix A.

Study Area 35		Gross Vacant Buildable Acres 375	
Total Acres	965	Dwelling Unit Capacity	1,409
Total Developed Acres	258	Employment Acres	-
Total Constrained Acres	349	Resource Land Acres	-
Title 3 Acres	155	Percent Tree Canopy Cover	30%
Upland Steep Slope Acres	194		

General Site Description: the Tualatin River defines Study Area 35 to the east. West Linn also defines the southeastern edge. At the northern tip is the intersection of I-205 and SW Borland Road. Along the southern edge is SW Schaeffer Road. This study area is within Clackamas County and is inside of the Metro jurisdictional boundary. Southwest Borland Road runs through the upper piece of the study area in a northwesterly-southeasterly direction. The center of this study area is approximately 1.5 miles from the main street along Willamette Falls Drive. This study area has been designated entirely as Inner Neighborhood and contains some Corridor area. About 375 of the 965 acres in this study area are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains about 250 tax lots, the majority of which have improvements. About 50 have improvement values above \$250,000. Approximately one-third of the tax lots in this study area are smaller than one acre in size. There are limited agricultural uses in this area, which appear to consist of grasses, and tree stock. Non-residential land uses in this study area include nursery, construction, glass repair/replacement, trucking, religious, financial services. There is no evidence of mining or aggregate activities within this area.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): Available data does not suggest the existence of power lines or public easements through this area. There is also no evidence of significantly high air traffic noise over this area.

Public Services Feasibility: West Linn did not indicate a desire to serve the study area.

- **Water:** This study area would be moderately difficult to serve. Infrastructure improvements will be needed to help alleviate the impacts of new development.
- **Sewer:** This study area would be moderately difficult to serve. Steep slopes are located within the study area, which could increase the construction difficulty and could create some operational problems. Infrastructure improvements will also be needed to service this area.
- **Stormwater:** This area would be easy to serve. Some improvements and extensions of lines will be necessary, both inside and outside of the UGB.

Agricultural Analysis

Zoning: This area is entirely exception land and is zoned by Clackamas County as RRFF5 and FF10. To the north are Study Areas 38 and 42 that are mostly exception land but also include some resource land zoned EFU. To the east is the UGB. To the south is resource land within and outside of Study Area 34 that is mostly zoned AGF. To the west is Study Area 36 that includes resource land zoned TBR and exception land.

Current Agricultural Activity: There are a few pockets of agricultural activities located near the Tualatin River in the central and northern portions of the study area however, much of the land directly adjacent to the Tualatin River is developed with single family homes. These farm activities are mostly field crop with isolated nursery, tree farm and orchard uses. To the north is mostly rural residential with a scattering of field and pasture uses. There is no agricultural activity to the east or to the south in Study Area 34. To the southwest are a few locations that support field crops but much of the area is forested. To the west are a few locations of pastureland on exception land however, the resource land is forested.

Compatibility: A significant increase in traffic on SW Borland Road and lower SW Schaeffer Road may result from the urbanization of this area. This increased traffic on lower SW Schaeffer Road could impede the normal movement of agricultural goods produced to the south of this area near SW Petes Mountain Road and SW Mountain Road. Urbanization would bring development directly adjacent to a few active farming parcels to the west. However, since most of these areas are intermixed with forested parcels issues related to safety, liability and complaints that might arise from the dust and spray associated with active farming near new development would be minimal. In addition, these farming areas are near I-205, which may override any issue related to noise from new urban development. The Tualatin River would act as a buffer between new development and the few isolated farming activities to the north. There are a number of streams that flow through the area to the Tualatin River. Urbanization of this area would result in increased impervious surface area that may diminish water quality and promote downstream flooding, but these consequences would not affect any agricultural activities. Overall, urbanization of this area would have a minimal impact on agricultural activity.

Environmental Social Energy Economic Analysis

General Character of the Area

Three distinct sections characterize the study area. The northern portion is gently to moderately sloped and is mostly rural residential with some agricultural activities. Residences line the Tualatin River and a portion of the west side is forested. The central portion of the area is generally flat with agricultural activities as the main use. The southern portion contains large areas of steep forested slopes with larger three- to five-acre rural residences.

Environmental

The Tualatin River flows south along the eastern edge of the study area for approximately four miles. Four small-unnamed streams flow east across the area to the Tualatin River and total 1.17 miles of stream corridor. A fifth stream, Fields Creek and a tributary also flow east across the area to the Tualatin River and total about 1.5 miles of stream corridor. The floodplain of the Tualatin River extends the entire length of the eastern edge and varies in width from 200 - 1,300 feet. The largest part of the floodplain occurs in the central portion of the study area with the typical width being approximately 200 feet. Over half of the lower portion of the study area, south of Fields Creek, contains steep slopes. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 49 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resources as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Other Identified Resources

Clackamas County has identified a historic house is located at 1165 SW Borland Road, West Linn.

Study Area	36	Gross Vacant Buildable Acres	684
Total Acres	1,187	Dwelling Unit Capacity	1,655
Total Developed Acres	150	Employment Acres	37
Total Constrained Acres	286	Resource Land Acres	390
Title 3 Acres	42	Percent Tree Canopy Cover	37%
Upland Steep Slope Acres	244		

General Site Description: Study Area 36 is located in unincorporated Clackamas County, approximately one-quarter mile southwest of the Tualatin River. This area is separated from the UGB on all sides by Study Area 35 to the east, Study Areas 37 – 42 to the north, and Study Area 43 to the west. The area is completely within Metro’s jurisdictional boundary, which defines the area’s southern border. The area’s northern boundary is defined by I-205, which the area can access via the SW Stafford Road interchange. Southwest Schaeffer Road also serves the study area. There is a fair expanse of land with steep slopes that run along the eastern edge of the study area. This area is designated as Outer Neighborhood with a small area designated as Corridor. There are 684 acres of vacant and buildable land out of 1,187 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: There are 153 parcels with recorded improvement values out of 215 total parcels. The median improvement value is \$256,230. The median parcel size is 4.3 acres. There are 38 parcels smaller than 1 acre, and 79 parcels exceed 5 acres. Urban and forest uses are evenly mixed within this area. Since 1990, nine residential development permits have been issued.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This area is within West Linn’s service area. There may be constraints on the City being able to provide services.

- **Water:** There are currently no services in the study owned or operated by West Linn. Existing water storage is inadequate to support addition of the study area. Service to the area would require increased plant capacity; pump stations, transmission lines and reservoirs. Service would also require a crossing of the Tualatin River. This area is rated difficult to serve.
- **Sewer:** The majority of his study area slopes steeply in a northeast direction towards the Tualatin River. The southwest portion slopes southwest toward Newland Creek. Installation of collection and trunk lines would be difficult on the steep and rocky terrain. A pump station and force main would be required to bring flows from the southwest portion over Pete’s Mountain to the West Linn service area. A I-205 and Tualatin River crossing would be necessary to convey flows to the Tri-Cities plant. This would include impacts to the Tualatin River floodplain. Development flows from the area would require an upgrade of the Tri-Cities plant. West Linn has noted that to serve the area, a large number of pump stations and force mains would be necessary. The closest collector is a 10-inch trunk line near the intersection of Goethel Road and I-205. That collector, and the pump station that serves it, would probably have to be enlarged. This area is rated difficult to serve.
- **Stormwater:** Stormwater will be required to be treated, either with detention, water quality facilities, or both. As this will be on a per-development basis, Clackamas

County Water Environment Services considers stormwater services to be easy to provide. This area is rated easy to serve.

Agricultural Analysis

Zoning: This area includes both exception land zoned RRF5 and resource land zoned TBR (342 acres) and AGF (48 acres) by Clackamas County. To the north is exception land and resource land in Study Areas 38, 41 and 42. To the east is exception land in Study Area 35. To the south is resource land zoned AGF and TBR. To the west is a strip of resource land zoned EFU between this study area and Study Area 44.

Current Agricultural Activity: The small amount of agricultural activity occurring within this study area is made up of scattered areas of pasture and field crops. The majority of the study area is rural residential. There is no agricultural activity to the north. To the east are a few pockets of agricultural activities composed mostly of field crops with isolated nursery, tree farm and orchard uses. Directly to the south are a few large parcels that support field crops with forested lands further south. Directly to the southwest is a fairly large area of field and row crops. To the northwest are rural residences with minor pockets of field crops.

Compatibility: A significant increase in traffic on SW Borland Road, SW Schaeffer Road, and SW Stafford Road may result from the urbanization of this area. This increased traffic on SW Schaeffer Road and SW Stafford Road could impede the normal movement of agricultural goods produced to the south of this area near SW Mountain Road and to the west near Newland Road. Urbanization would bring development directly adjacent to active farming parcels to the south and west therefore, issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development may occur. There are a number of streams that flow through the area to the Tualatin River. Urbanization of this area would result in increased impervious surface area that may diminish water quality and promote downstream flooding, but these consequences would not affect any agricultural activities. Urbanization of this area may affect the value of adjacent agricultural land to the south and west by encouraging land banking and speculation. Overall, urbanization of this area would may have an impact on agricultural activity to the south and west.

Environmental Social Energy Economic Analysis

General Character of Area

Mostly moderate slopes characterize area 36 with approximately 20 percent of the area covered with steep slopes. The steep slopes are primarily found along the eastern boundary; some are associated with the tributaries of the Tualatin River. Approximately one-third of the area is forest covered, which is found mostly along the steep-sloped areas. Residential uses are scattered throughout this area, except along the creeks and steeper slopes.

Environmental

There are four tributaries of the Tualatin River that flow southwest to northeast within Area 36. In total, they measure approximately 3.5 miles. A wetland located in the lower portion of the study area measures approximately 1.75 acres. Steep slopes are primarily found along the eastern boundary with some other areas associated with the tributaries of the Tualatin River. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 42 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area 37		Gross Vacant Buildable Acres 265	
Total Acres	373	Dwelling Unit Capacity	1,166
Total Developed Acres	40	Employment Acres	-
Total Constrained Acres	65	Resource Land Acres	-
Title 3 Acres	18		
Upland Steep Slope Acres	47	Percent Tree Canopy Cover	20%

General Site Description: Study Area 37 sits immediately east of West Linn. The western boundary of this study area is SW Wisteria Road. This road also delineates the eastern edge of Study Area 38. This area is accessible via SW Parker Road from the east and SW Wisteria Road from the north and west. This study area is within Clackamas County, and is inside of the Metro jurisdictional boundary. This study area is designated as Inner Neighborhood. Approximately 265 of the 373 acres in this study area are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains about 50 tax lots. Approximately 30 have improvements, though fewer than 10 have improvement values above \$250,000. There are very few tax lots smaller than one acre. About one-half of the tax lots in this study area are smaller than five acres in size. Agricultural uses, including grasses, field crops, and tree or nursery stock, are evident primarily in the northern sections of the area. Non-residential land uses consist of construction. Mining and aggregate uses are not evident within this area.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): Available data does not suggest the existence of power lines or public easements through this area. There is also no evidence of significantly high air traffic noise over this area.

Public Services Feasibility: West Linn showed a desire, or already has plans to serve the study area. The area is moderately small, and is contained within one drainage basin.

- **Water:** This study area would be moderately difficult to serve. Infrastructure improvements are needed to prevent new development from overburdening the existing system.
- **Sewer:** This area would be difficult to serve. Steep slopes could increase construction difficulty and could create some operational problems. Infrastructure improvements will also be needed to help alleviate the impacts of new development in this area.
- **Stormwater:** This area would be difficult to serve. The study area contains a significant amount of land with steep slopes, which could increase construction difficulties and pose operational problems. Infrastructure improvements will also be needed.

Agricultural Analysis

Zoning: This area is entirely exception land and is zoned by Clackamas County as RRFF5. The UGB is to the north, east and south. To the west is exception land located in Study Area 38.

Current Agricultural Activity: There is one 38-acre parcel that supports pastureland in this study area. There are also some large rural residential lots that also contain pastureland. There is no agricultural activity to the north, east and south. To the west are a few large rural residential lots that also contain pastureland.

Compatibility:

Urbanization of this area might increase the traffic on SW Rosemont Road and SW Wisteria Road. This increased traffic would not affect the normal movement of farm equipment or the transport of agricultural goods. Urbanization of this area would not result in new development directly adjacent to active farming areas therefore, there would be no issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development. Urbanization of this area would not affect the value of any adjacent agricultural land. Overall, urbanization of this area would not have an impact on agricultural activity.

Environmental Social Energy Economic Analysis

General Character of the Area

The area is characterized by rural residential development on large forested and open parcels with some steep slopes in the southern portion of the area. There are a number of vacant forested parcels that appear to be ready for development. The center of the area contains one large parcel that is still actively farmed. There are a number of high value rural residential uses located in the northern portion of the site, some with related agricultural uses.

Environmental

There are scattered areas of steep slopes along the western border and one large area in the lower section of the study area. The lower section also contains numerous small locales of steep sloped land. Urbanization of this area may impact these natural resources as outlined in the introduction to the ESEE analysis. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 58 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resources as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area 38		Gross Vacant Buildable Acres 822	
Total Acres	1,500	Dwelling Unit Capacity	3,704
Total Developed Acres	489	Employment Acres	-
Total Constrained Acres	202	Resource Land Acres	245
Title 3 Acres	142	Percent Tree Canopy Cover	30%
Upland Steep Slope Acres	60		

General Site Description: Study Area 38 is situated south of Study Areas 39 and 40, near SW Stafford Road and SW Rosemont Road. To the west is Study Area 41. To the east are Study Area 37 and the City of West Linn. To the south is the Tualatin River and Study Area 35. This area is accessible via SW Sweetbriar Road from the north and SW Grapevine Road from the south. The I-205 freeway bisects the southern portion of this site. This site is in Clackamas County, and is inside of the Metro jurisdictional boundary. The study area contains a designated Corridor along SW Rosemont Road. The remaining land is designated as Inner Neighborhood. About 822 of the 1,500 total acres are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains about 350 tax lots. Approximately 50 have improvement values above \$250,000. About 20 percent of the tax lots in this study area are smaller than one acre in size, and 80 percent of all tax lots are smaller than five acres. Agricultural uses appear limited in this area, and may consist of nursery stock and tree farms. Non-residential land uses include landscaping, construction, trucking, cabinet making, financial services, engineering, and software.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There do not appear to be any power lines or public easements running through this area. There is no evidence of significantly high air traffic noise over this area.

Public Services Feasibility: West Linn appears willing to accept the area within its service area, if necessary. This area is of an acceptable size to serve with some degree of efficiency. The area contains multiple drainage basins, however, which may be a consideration in providing services.

- **Water:** This study area would be easy to serve, though some infrastructure improvements are needed to accommodate new development.
- **Sewer:** This study area would be moderately difficult to serve. A large portion of the area is relatively flat, which could make it difficult to drain sewage from the area. Sewer depth will have to be increased, and additional pump stations may be needed.
- **Stormwater:** This study area would be easy to serve. The area's relatively flat topography, noted above, may make it difficult to drain storm water. Storm sewer depth may have to be increased, and more pump stations may be required. While most necessary infrastructure is in place, some improvements and line extensions may be required.

Agricultural Analysis

Zoning: This area contains both exception land and resource land and is zoned by Clackamas County as RRF5 and EFU (245 acres) respectively. To the north are resource lands in Study

Areas 39 and 40. To the east is the UGB and exception land in Study Area 37. To the south across the Tualatin River is exception land in Study Area 35. To the west is exception land and resource land in Study Areas 41 and 42.

Current Agricultural Activity: There are a number of very scattered agricultural uses intermixed with rural residences in this study area. The agriculture uses include field crop, pasture and orchards. The majority of the resource land is forested. To the north is a large area devoted to field crop and pastureland. To the east, south and west are the dispersed agriculture activities in Study Areas 37, 35 and 41.

Compatibility: Urbanization of this area may increase traffic on SW Sweetbriar Road, SW Rosemont Road and SW Johnson Road. This increased traffic could possibly impede some normal movement of farm equipment and affect the transport of agricultural goods produced in the area to the north. However, due to the direct connection to I-205 via SW Stafford Road this affect may be minimal. Urbanization would bring development directly adjacent to active farming parcels to the north therefore, issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development may occur. Wilson Creek flows south through this area to the Tualatin River. Urbanization of this area would result in increased impervious surfaces and may diminish water quality and increase flooding downstream but these consequences would not affect any agricultural activities. Urbanization of this area may affect the value of adjacent agricultural land to the north by encouraging land banking and speculation, resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area may have an impact on agricultural activity to the north.

Environmental Social Energy Economic Analysis

General Character of the Area

Three distinct sections characterize the study area. The northern portion is gently to moderately sloped and is mostly rural residential on both open and forested parcels with some agricultural activities. The central portion is mostly forested with larger 3-10 acre parcels with rural residences and contains scattered areas of steep slopes. The majority of the steep slopes are along stream corridors. The southern portion, south of I-205 is basically flat with a mix of forested and open parcels with residences. The Tualatin River forms the southwest edge of the study area and is lined with residences on forested parcels.

Environmental

The Tualatin River flows along the south edge of the study area for 1.7 miles. Wilson Creek flows south through the western portion of the study area for a mile prior to draining into the Tualatin River. Two tributaries of Wilson Creek also flow through the area for 1.2 miles. Three other tributaries of the Tualatin River flow through the area for approximately 3.7 stream corridor miles. There are four small wetlands located in the lower corner near the Tualatin River that total 1.76 acres. There is floodplain along the Tualatin River south of I-205 that varies in width from 100-700 feet. There are five small public open spaces located near I-205 that total 4.4 acres. The State of Oregon owns four of the open spaces and Clackamas County owns the fifth. There is a large 165-acre privately owned open space located in the center of the study area. There are numerous linear extensions of steep slopes located along all of the stream corridors including the Tualatin River. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 62 percent of the study area land in the potential inventory. Urbanization of the area may impact these natural resources as outlined in the introduction to the ESEE analysis and

may inhibit the ability of these natural sites to provide species habitat and other ecological functions.

Social Energy Economic

See Appendix A.

Other Identified Resources

Clackamas County has identified a historic house at 990 SW Long Farm Road, West Linn.

Study Area	39	Gross Vacant Buildable Acres	353
Total Acres	526	Dwelling Unit Capacity	1,695
Total Developed Acres	110	Employment Acres	12
Total Constrained Acres	3	Resource Land Acres	507
Title 3 Acres	0	Percent Tree Canopy Cover	12%
Upland Steep Slope Acres	3		

General Site Description: Study Area 39 is in unincorporated Clackamas County flanked by Lake Oswego to the north and West Linn to the southeast. The area is within Metro's jurisdictional boundary. The UGB defines the area's northern, eastern and western boundaries. Southwest Rosemont Road defines the area's southern boundary. Southwest Stafford Road and SW Rosemont Road provide access to the area. The area is rolling, with some slight increases in slopes towards the eastern side. It has been designated as Inner Neighborhood, with some area designated as Corridor. There are 353 vacant and buildable acres out of 526 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: The area has 35 parcels with recorded improvement values out of 70 total parcels. The median parcel improvement value for this area is \$226,940. The median parcel size is 3.3 acres. There are 12 parcels less than 1 acre in size, and 29 parcels exceed 5 acres. The land in this area is mostly in residential or agricultural use. Permit records indicate that two single-family dwelling development permits have been issued since 1990. Approximately 100 acres of this study area have recently been purchased by Lake Oswego for open space.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: If urbanized, the probable service providers for this area would be either Lake Oswego or West Linn. West Linn has implied a willingness to serve, however Lake Oswego is strongly opposed to serving this area.

- **Water:** Existing water storage, treatment, and transmission is inadequate to support addition of the study area to this service area. Service to the area would require increased plant capacity; pump stations and transmission lines. This area is rated difficult to serve, partially to its size, but also due to its distance from the nearest service point as well as willingness on the part of possible providers to serve it.
- **Sewer:** Flows from this area would run south along the Wilson Creek drainage to the Tualatin River. From there, a pump station and approximately 2 miles of force main would be required to convey flows to the existing 10-inch trunk line at Goethel Road and I-205. At this point, a force main conveys flows to the Tri-Cities plant. The existing trunk line and pump station would have to be enlarged to convey additional flows. Service to the area would require upgrade of the Tri-Cities plant. This area is rated as moderately difficult to serve.
- **Stormwater:** Stormwater will be required to be treated, either with detention, water quality facilities, or both. As this will be on a per-development basis, Clackamas County Water Environment Services considers stormwater services to be easy to provide. This area is rated easy to serve.

Agricultural Analysis

Zoning: This area contains both exception land and resource land and is zoned by Clackamas County as RRFF5 and EFU (507 acres) respectively. To the north, east and west is the UGB. To the south is resource land zoned EFU in Study Area 40.

Current Agricultural Activity: The majority of this area is devoted to field crop production with some areas of row crops as well. Lake Oswego's Luscher Farm Park occupies almost the entire western edge of the area. There is no agricultural activity to the north, east and west. Directly south is Study Area 40 that contains a large amount of field crop and pastureland.

Compatibility: Urbanization of this area may increase traffic on SW Bergis Road and SW Rosemont Road. This increased traffic could possibly impede some normal movement of farm equipment and affect the transport of agricultural goods produced in the area to the south. However, due to the direct connection to I-205 via SW Stafford this affect may be lessened. Urbanization would bring development directly adjacent to active farming parcels to the south therefore, issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development may occur. Wilson Creek flows south through this area to the Tualatin River. Urbanization of this area would result in increased impervious surfaces and may diminish water quality and increase flooding downstream that could affect agricultural activities to the south. Urbanization of this area may affect the value of adjacent farmland to the south by encouraging land banking and speculation, resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area may have an impact on agricultural activity to the south.

Environmental Social Energy Economic Analysis

General Character of Area

Area 39 consists of mostly moderate slopes with some gentle sloping land in the western portion. There is very little forest cover, which is scattered in small isolated patches. There are some scattered residences throughout the area. Approximately 30 percent of the land is in agricultural use.

Environmental

Tributaries of Pecan and Wilson Creeks flow south and east through portions of Area 39. The stream corridor measures in total approximately 1.5 miles in length. There are two wetlands in the upper reaches of two Wilson Creek tributaries, and one located northwest of them. In total the three wetlands in the study area are approximately 2.25 acres. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 29 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area	40	Gross Vacant Buildable Acres	279
Total Acres	313	Dwelling Unit Capacity	1,329
Total Developed Acres	21	Employment Acres	-
Total Constrained Acres	6	Resource Land Acres	305
Title 3 Acres	0	Percent Tree Canopy Cover	16%
Upland Steep Slope Acres	6		

General Site Description: Study Area 40 is directly south of Study Area 39, in unincorporated Clackamas County. This area is completely within Metro's jurisdictional boundary. The northern edge of this area is defined by SW Rosemont Road, with Area 39 to the north of that. Southwest Johnson Road partially defines the area's southern boundary. Both SW Rosemont and SW Stafford Roads provide access to the area. This area is rolling, with a slight increase in slopes around the southern portions. It is designated as Inner Neighborhood with a small area designated as Corridor. The area has 279 vacant and buildable acres out of 313 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: There are 16 parcels with recorded improvement values out of 29 total parcels. The median improvement value is \$271,424. The median parcel size is 6.2 acres. There are 3 parcels smaller than 1 acre, and 17 parcels exceed 5 acres. The area is almost exclusively in single family or agricultural use. Permit records indicate that one development permit for a single-family use has been issued since 1990.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: If urbanized, the probable service providers for this area would be either Lake Oswego or West Linn.

- **Water:** Existing water storage is inadequate to support additional services to this area. Service to the area would require increased plant capacity; pump stations, and transmission lines. This area is rated difficult to serve.
- **Sewer:** Flows from this area would be divided into two drainages, one to the Wilson Creek drainage, and the other to an unnamed drainage that outfalls to the Tualatin River at the Shipley Bridge. West Linn would be the likely service provider, and has implied a willingness to serve. Approximately one mile of trunk line would be necessary to convey the flows to a collection site on the Tualatin River; from there a pump station and approximately three miles of force main would be needed to convey the flows to the 10-inch trunk line at the intersection of Goethel Road and I-205. The 10-inch trunk line and the existing pump station that conveys flows to the Tri-Cities treatment plant would have to be upsized to handle additional flows from the study area. Service for development in the study area would require upgrade of the Tri-cities plant. This area is rated moderately difficult to serve.
- **Stormwater:** Stormwater will be required to be treated, either with detention, water quality facilities, or both. As this will be on a per-development basis, Clackamas County Water Environment Services considers stormwater services to be easy to provide. This area is rated easy to serve.

Agricultural Analysis

Zoning: This area is entirely resource land and is zoned by Clackamas County as EFU. To the north and east is resource land zoned EFU in Study Area 39. To the south is exception land and resource land (EFU) in Study Area 38. To the west is exception land in Study Area 41.

Current Agricultural Activity: This study area is almost entirely devoted to field crop and pastureland uses. To the north and east is a large area of field crop production. To the south are dispersed areas of field crop and pastureland intermixed with rural residences and forested areas. To the west are a few locations of field crop production.

Compatibility: Urbanization of this area may increase traffic on SW Stafford Road and SW Rosemont Road. This increased traffic could possibly impede some normal movement of farm equipment and affect the transport of agricultural goods produced in the area to the north. However, due to the direct connection to I-205 via SW Stafford this affect may be lessened. Urbanization would bring development directly adjacent to active farming parcels to the north therefore, issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development may occur. Wilson Creek flows south through this area to the Tualatin River. Urbanization of this area would result in increased impervious surfaces and may diminish water quality and increase flooding downstream but these consequences would not affect any agricultural activities. Urbanization of this area may affect the value of adjacent farmland to the north by encouraging land banking and speculation, resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area may have an impact on agricultural activity to the north.

Environmental Social Energy Economic Analysis

General Character of Area

This area consists of moderately sloped land. Few patches of forest cover occur primarily along the Wilson Creek system. There are very few residences in this study area. Approximately 30 percent of the area is in agricultural use.

Environmental

Wilson Creek and three tributaries flow south through the central portion of the area. A portion of Pecan Creek is located in the northwest corner and an unnamed tributary to the Tualatin River is located in the southwest portion of the study area. The stream corridors measure in total approximately two miles in length. There are very minor areas of steep slopes along Wilson Creek and its tributaries. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 47 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area 41		Gross Vacant Buildable Acres 307	
Total Acres	558	Dwelling Unit Capacity	1,329
Total Developed Acres	144	Employment Acres	-
Total Constrained Acres	120	Resource Land Acres	134
Title 3 Acres	79	Percent Tree Canopy Cover	30%
Upland Steep Slope Acres	42		

General Site Description: Study Area 41 is defined to the north and west by Lake Oswego. To the north and east is unincorporated Clackamas County. To the south is the Tualatin River and Study Area 42. The eastern edge of this area is defined by SW Johnson Road, which also marks the western edge of Study Area 38. This area is in Clackamas County, and is inside the Metro jurisdictional boundary. It is accessible from SW Stafford Road, which joins SW Childs Road and SW Mossy Brae Road. The center of this study area is approximately 2.5 miles from the intersection of I-5 and SW Nyberg Street, Tualatin's main commercial area. Southwest Stafford Road, running through this site, has been defined as a Corridor. The remainder of this study area has been designated as Inner Neighborhood. Approximately 307 of the 558 total acres are vacant and buildable.

Parcelization, Building Values, Development Patterns: There are approximately 290 tax lots in this study area. About two-thirds have improvements, though fewer than 15 have improvement values above \$250,000. About two-thirds of the tax lots are less than one acre in size. These tax lots are generally clustered in the center of the site. Over 90 percent of all the tax lots in this study area are less than five acres in size. Agricultural uses are not apparent through most of the study area, except for a larger portion of land towards the southern section of the area, which may contain field crops. Non-residential land uses include landscaping, construction, logging, signs, ceramics, carpet, financial services and medical services. There is no evidence of mining or aggregate activities in this study area.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There do not appear to be any power lines or public easements running through this area. There is no evidence of significantly high air traffic noise over this area.

Public Services Feasibility: Lake Oswego appears willing to accept the study area within its service area, if necessary. The area contains multiple drainage basins, which may be a consideration in providing services.

- **Water:** In broader terms, this study area would be easy to serve. The infrastructure system is in acceptable condition to develop the area. Minimal improvements within the UGB should be expected.
- **Sewer:** This area would be difficult to serve. Infrastructure improvements will be needed to alleviate the possible burden of new development on the existing system.
- **Storm:** This study area would be moderately difficult to serve. The infrastructure system is generally in an acceptable condition to develop the area, though some additional improvements within the UGB are likely to be necessary.

Agricultural Analysis

Zoning: This area contains both exception land and resource land and is zoned by Clackamas County as RRFF5 and EFU (134 acres) respectively. To the north is the UGB. To the east is resource land zoned EFU in Study Area 40 and resource land zoned EFU and exception land in Study Area 38. To the south is exception land in Study Areas 35, and 42 and exception land and resource land zoned TBR in Study Area 36.

Current Agricultural Activity: There are a couple of larger parcels devoted to pasture and field crops otherwise the majority of this area is in residential development, with a few large rural residential lots that also contain pastureland. To the northeast is an extensive area of field crop and pastureland in Study Areas 39 and 40. To the southeast are a number of very scattered agricultural uses intermixed with rural residences in Study Area 38. To the south across the Tualatin River is a fair amount of field crop and nursery operations in Study Area 42. There is no agricultural activity to the west.

Compatibility: Urbanization of this area would increase traffic on SW Stafford Road and SW Childs Road. This increased traffic on SW Stafford Road could possibly impede some normal movement of farm equipment and affect the transport of agricultural goods produced to the northeast and to the south. However, much of the area is already committed to rural residential uses and the traffic impacts that would be expected to accompany the urbanization of this area may be lessened. Urbanization would bring development directly adjacent to active farming parcels to the northeast therefore, issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development may occur in this area. The Tualatin River acts as a natural barrier for the agricultural uses to the south and would reduce complaints due to farming activities near new development. Pecan Creek flows through the study area south to the Tualatin River. Urbanization of this area would result in increased impervious surfaces and may diminish water quality and increase flooding downstream but these consequences would not affect any agricultural activities. Urbanization of this area may affect the value of adjacent agricultural land to the northeast by encouraging land banking and speculation, which may inhibit the ability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area may have an impact on agricultural activity to the northeast.

Environmental Social Energy Economic Analysis

General Character of the Area

The area is characterized by large open and forested parcels in the north and south with a more intense development pattern in the middle centered on SW Stafford Road between the Tualatin River and SW Johnson Road. There are locales of steep slopes in the northwest portion of the area and along some stream corridors. The Tualatin River provides the southern edge of the study area. There is a small amount of agricultural activity, mainly concentrated in the northeast and southern sections.

Environmental

The Tualatin River flows along the southern edge of the study area for two miles. Pecan Creek flows south through the central portion of the area for 0.92 miles, draining into the Tualatin River. Three tributaries to Pecan Creek cross the northern portion of the area for approximately three-quarters of a mile. Wilson Creek flows through the southern portion to the Tualatin River for a short quarter mile segment. Four unnamed tributaries to the Tualatin River also cross the area for a total stream corridor length of 1.12 miles. Floodplain associated with the entire length

of the Tualatin River extends from 130-500 feet into the area, with the majority of the floodplain near the 130-foot width. Floodplain that is approximately 100 feet wide also extends up Pecan Creek and Wilson Creek for 550 and 825 feet, respectively. Lake Oswego owns a 14.8-acre Sunny Slope Open Space near SW Hilltop Road. There is a large 54-acre area of steep slopes in the western portion of the study area, which also includes the Sunny Slope Open Space. There are other significant areas of steep slopes along Pecan Creek and the nearby unnamed tributary to the south. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 63 percent of the study area land in the potential inventory. . Urbanization of the area may impact these natural resources as outlined in the introduction to the ESEE analysis and may inhibit the ability of these natural sites to provide species habitat and other ecological functions.

Social Energy Economic

See Appendix A.

Other Identified Resources

Clackamas County has identified a historic house is located at 18451 SW Stafford Road, Lake Oswego.

Study Area 42		Gross Vacant Buildable Acres 309	
Total Acres	654	Dwelling Unit Capacity	172
Total Developed Acres	266	Employment Acres	166
Total Constrained Acres	74.0	Resource Land Acres	-
Title 3 Acres	73.5	Percent Tree Canopy Cover	10%
Upland Steep Slope Acres	0.5		

General Site Description: Study Area 42 sits immediately east of Tualatin. To the north and east is the Tualatin River and Study Area 41. The southern edge of this study area is I-205, which is also the northern edge of Study Area 43. This area is in Clackamas County, and is inside of the Metro jurisdictional boundary. It contains a designated Corridor along SW Stafford Road/SW Borland Road, and Employment designations. Approximately 309 of the 654 total acres in this study area are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains about 150 tax lots. About two-thirds have improvements, though less than 10 have improvement values above \$250,000. Approximately one third of the tax lots in this study area are smaller than one acre in size. Three fourths are less than five acres in size. Agricultural uses are evident in this study area, and may include field crops, tree farms and nursery stock. Non-residential land uses include animal clinic, construction, interiors, education (West Linn-Wilsonville School), nursery and landscaping, lumber, restaurant and religious uses. Mining and aggregate uses are not evident within this area.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): Available data does not suggest the existence of power lines or public easements running through this area. There is no evidence of significantly high air traffic noise over this area.

Public Services Feasibility: Tualatin appears willing to accept the study area within its service area, if necessary. This area is contained by one drainage basin.

- **Water:** This study area would be moderately difficult to serve. Infrastructure improvements will be needed to alleviate possible impacts on the existing system.
- **Sewer:** This area would be moderately difficult to serve. Infrastructure improvements will also be needed to accommodate new development in this area.
- **Storm:** This area would be easy to serve. While the current system can generally accommodate new development, some minimal improvements within the UGB will still be necessary.

Agricultural Analysis

Zoning: This area is entirely exception land with the majority of the area zoned RRFF5 and two small areas zoned RC by Clackamas County. To the north and east is exception land and resource land zoned EFU in Study Area 41. To the south is exception land in Study Areas 36 and 43. To the west is the UGB.

Current Agricultural Activity: There are a number of row crops, field crop and nursery uses in this area intermixed with rural residential and commercial uses. To the north and east are very

dispersed areas of field crop and pastureland in Study Area 41. To the south across I-205 are some field crop areas intermixed with residences and forested parcels in Study Area 43. There is no agricultural activity to the west.

Compatibility: Urbanization of this area would increase traffic on SW Stafford Road and SW Borland Road. This increased traffic could possibly impede the normal movement of farm equipment and affect the transport of agricultural goods produced on the resource lands to the north. Urbanization of this area would not result in new development directly adjacent to active farming areas due to the Tualatin River and I-205. Therefore, there would be no issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development. Athey Creek and Saum Creek flow through this area to the Tualatin River. Urbanization of this area would result in increased impervious surfaces and may diminish water quality and increase flooding downstream but these consequences would not affect any agricultural activities. Overall, urbanization of this area would have little impact on agricultural activity.

Environmental Social Energy Economic Analysis

General Character of the Area

The area is characterized by a number of large predominately flat open parcels, many in agricultural use but also a mix of residential, commercial and institutional uses. There are a few small isolated areas of forested steep slopes associated with stream corridors and the Tualatin River, which forms the northern border of the area. Interstate 205 provides the southern edge of the area.

Environmental

The Tualatin River flows along the northern border of the study area for 2.4 miles. Athey Creek flows north through the center of the area to the Tualatin River for 0.9 miles. A tributary to Athey Creek also flows through this area for a quarter mile. Saum Creek meanders north along the western edge of the area for two-thirds mile before draining into the Tualatin River. A tributary to Saum Creek is also located in this area and flows north for a third mile. The 2.75-acre Schraber Brothers Reservoir is located in the center of the area along Athey Creek. The floodplain of the Tualatin River extends from 50 feet to 600 feet into the area, with the majority of the floodplain less than 100-feet in width. The larger areas of floodplain are near the points where Athey Creek and Saum Creek meet the river. The floodplain also extends up Athey Creek for approximately 650 feet. There are seven areas of steep slopes spread along the Tualatin River and Saum and Athey Creeks. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 36 percent of the area land in the proposed inventory. Urbanization of the area may impact these natural resources as outlined in the introduction to the ESEE analysis. There are three Metro owned open space parcels, totaling approximately 19 acres, adjacent to the Tualatin River and Stafford Elementary School and Athey Creek Middle School west of SW Stafford Road. Clackamas County and the State of Oregon own abutting open space land totaling 10.5 acres near the intersection of the Tualatin River and I-205. Urbanization of the area may inhibit the ability of the open space by I-205 to provide species habitat and other ecological functions. However, urbanization should not affect the Metro open space area due to its location adjacent to the school sites and the river.

Social Energy Economic

See Appendix A.

Study Area 43		Gross Vacant Buildable Acres 1,103	
Total Acres	1,807	Dwelling Unit Capacity	3,268
Total Developed Acres	549	Employment Acres	19
Total Constrained Acres	154	Resource Land Acres	113
Title 3 Acres	118	Percent Tree Canopy Cover	20%
Upland Steep Slope Acres	35		

General Site Description: Study Area 43 lies south of Tualatin. I-205 defines its northern edge. The eastern side of this Study Area is immediately south of Study Area 42. The I-5 Freeway defines western edge, and SW Stafford Road defines its eastern edge. Southwest Schatz Road and SW Meridian Way define the southern edge of the site. The site is accessible via SW 65th Avenue from the north. It is bisected through the center by the Clackamas/Washington County line, and is fully within the Metro jurisdictional boundary. The center of the study area is approximately two miles from Tualatin's central commercial area. This area contains Employment and Outer Neighborhood designation. Approximately 1,103 of the 1,807 acres in this study area are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains about 400 parcels, over three-fourths with improvements. Approximately 100 of these parcels have improvement values above \$250,000. Only about 10 percent of the parcels in this study area are less than one acre in size. About 75 percent of all the parcels in this study area are less than five acres in size. Agricultural activity is present in this area. There are several larger parcels with high-value improvements that use a portion of the area for field crops or perennials. Non-residential land uses include equine services, landscaping, construction, electric, education, construction, masonry, and food production, trucking financial services, auto repair, and religious uses. There is no evidence of aggregate or mining activities within this area.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or public easements running through this area. There is also no evidence of significantly high air traffic noise over this area.

Public Services Feasibility: Tualatin appears willing to accept the study area within its service area, if necessary. This size of this study area will allow it to be served with some degree of efficiency. However, this area contains multiple drainage basins, which may be a consideration in providing new services.

- **Water:** This study area would be easy to serve, though some improvements may be necessary.
- **Sewer:** This study area would be moderately difficult to serve. Infrastructure improvements will be needed to prevent new development from overburdening the existing system.
- **Storm:** This area would be relatively easy to serve. Although the infrastructure is in acceptable condition to develop the area, some improvements and extensions of lines are to be expected, both inside and outside the UGB.

Agricultural Analysis

Zoning: This area includes exception land zoned AF5 and MAE and resource land zoned EFU in Washington County and exception land zoned RRFF5 in Clackamas County. To the north and west is the UGB. To the northeast across I-205 is exception land in Study Area 42. To the south is exception land in Study Area 44 and areas of resource land zoned EFU further south.

Current Agricultural Activity: There are a number of locations of field and row crop production scattered throughout the study area as well as some nursery and pastureland associated with rural residences. There is no agricultural activity to the north or west. To the northeast across I-205 there are a number of row crops, field crop and nursery uses intermixed with rural residential and commercial uses in Study Area 42. To the east are very scattered areas of pasture and field crops in Study Area 36. The resource lands to the south contain large parcels in field crop production. Study Area 44 to the south contains some large areas of field crop, row crop, pasture and nursery operations.

Compatibility: Urbanization of this area might increase traffic on SW Stafford, and SW 65th Avenue. This increased traffic could impede the normal movement of farm equipment and affect the transport of agricultural goods produced on the resource lands to the south. Urbanization would bring development directly adjacent to active farming parcels in a few locations therefore, issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development may occur in these few areas. I-205 would act as buffer for the agricultural activities to the north in Study Area 42. Athey Creek and Saum Creek flow north through this area towards the Tualatin River. Urbanization of this area would result in increased impervious surfaces and may diminish water quality and increase flooding downstream which could affect agricultural activities to the north. Urbanization of this area may affect the value of a few adjacent farmland parcels by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area may have an impact on some dispersed areas of agricultural activity.

Environmental Social Energy Economic Analysis

General Character of the Area

The area is characterized by forested and open parcels on gently to moderately sloped land that includes residential and agricultural uses intermixed throughout. There are a number of fairly large areas of forested steep slopes associated with stream corridors. Interstate 205 provides the northern edge and I-5 the western edge of the area.

Environmental

Athey Creek flows north through the eastern portion of the area for just under a mile and also has two minor tributaries that total a quarter mile of stream corridor. Saum Creek flows north through the western portion of the area for 1.4 miles. There are five significant tributaries to Saum Creek that total 3.4 miles of stream corridor. There are eight dispersed small wetlands that total 5.5 acres. The Oregon Department of Transportation (ODOT) owns a linear 11.5-acre open space along I-205. There is a small amount of steep sloped areas located mostly along the various stream corridors. There are two private open spaces that area associated with residential developments in the eastern portion of the area that total 65 acres. Much of the private open space is dedicated to active uses and therefore may not provide a great deal of ecological functions. The linear open space owned by the ODOT may provide some ecological functions when combined with the private forested parcels to the south. Metro's draft Goal 5

fish and Wildlife Habitat Inventory identifies 44 percent of the study area land in the proposed inventory. Urbanization of the area may impact these natural resources as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Other Identified Resources

Clackamas County has identified a historic house is located at 4875 SW Schatz Road, Tualatin.

Study Area	44	Gross Vacant Buildable Acres	651
Total Acres	878	Dwelling Unit Capacity	2,174
Total Developed Acres	159	Employment Acres	-
Total Constrained Acres	28	Resource Land Acres	-
Title 3 Acres	16	Percent Tree Canopy Cover	13%
Upland Steep Slope Acres	12		

General Site Description: Study Area 44 is an unincorporated area of Clackamas County and Washington County. It is separated from the UGB, and Tualatin by Study Area 43, to the immediate north. Metro's jurisdictional boundary bisects the area into a northern section, which is within the boundary, and a southern section. A smaller section to the east is also inside of the Metro boundary. The southern boundary is partially defined by Elligen Road, and its western boundary is partially defined by SW 65th Avenue. The area is rolling, with a few smaller, steeper ridges interspersed throughout. The area has been designated as Outer Neighborhood, with some portions designated as Corridor. There are 651 vacant and buildable acres out of 878 total acres

Parcelization, Building Values, Development Patterns, Vacant Land: There are 194 parcels with recorded improvement values out of 230 total parcels. The median parcel improvement value is \$226,561. The median parcel size is 3.2 acres. There are 28 smaller than 1 acre and 51 parcels exceed 5 acres in size. Most of the study area is used for agricultural purposes; however, a small section running diagonally from the northeast to the southwest is urbanized. Records indicate that approximately 10 permits for single-family residential developments have been issued since 1990.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This area is near West Linn's service area, though there may be some difficulties in providing service.

- **Water:** The majority of Study Area 44 is in Clackamas County, making the more likely service provider West Linn, due to political boundaries. The study area is approximately 3 miles from the nearest West Linn service, though there are currently no services in the study owned or operated by West Linn. Existing water storage is inadequate to support addition of the study area. Service to the area would require increased plant capacity, pump stations, and transmission lines. This area is rated moderately difficult to serve.
- **Sewer:** The majority of Study Area 44 is in Clackamas County, making the more likely service provider West Linn, due to political boundaries. The study area is approximately 3 miles from the nearest West Linn service, and is not contiguous to the city limits. There are currently no services in the study owned or operated by West Linn. The majority of the area slopes to the southwest, to the Boeckman Creek drainage, and the southeast corner slopes east and south to the Newland Creek drainage. Pump stations and force mains would be necessary to convey sewer flows to the West Linn service area, approximately 5 miles distance. Flows would be treated at the Tri-Cities plant, which would need an upgrade to handle additional development. This area is rated moderately difficult to serve.

- **Stormwater:** Stormwater will be required to be treated, either with detention, water quality facilities, or both. As this will be on a per-development basis, Clackamas County Water Environment Services considers stormwater services to be easy to provide. This area is rated easy to serve.

Agricultural Analysis

Zoning: This area is entirely exception land and is zoned AF5 by Washington County and RRFF5 by Clackamas County. To the north is exception land in Study Area 43. To the east is an area of resource land zoned EFU and exception land in Study Area 36. To the south is resource land zoned EFU. To the west is an area of resource land zoned EFU and exception land in Study Area 47.

Current Agricultural Activity: There are a number of locations of field and row crop production scattered throughout the study area as well as some nursery and pastureland associated with rural residences. The area to the north is similar with a number of locations of field and row crop production scattered throughout the study area as well as some nursery and pastureland associated with rural residences. The resource lands to the east, south and west contains large parcels in field crop production. The resource lands to the south extend to the Willamette River

Compatibility: Urbanization of this area might increase traffic on SW Stafford Road and SW 65th Avenue. This increased traffic could impede the normal movement of farm equipment and affect the transport of agricultural goods produced on the resource lands to the south. Urbanization would bring development directly adjacent to active farming parcels on three sides therefore, issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development may occur in these areas. Boeckman Creek and a tributary of Newland Creek flow south through this area towards the Willamette River. Urbanization of this area would result in increased impervious surfaces and may diminish water quality and increase flooding downstream which could affect agricultural activities to the south. Urbanization of this area may affect the value of the adjacent farmland by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area has a high potential for negatively affecting adjacent agricultural activities.

Environmental Social Energy Economic Analysis

General Character of Area

The northern half of Study Area 44 is gently sloped and the southern half is moderately sloped. Forest cover is found in a few areas, mostly in the southeast and southwest corners. There are several residences throughout the study area. Though generally small, there are several agricultural operations in the area.

Environmental

Portions of two tributaries of Saum Creek flow north from the northern portion of the area. Portions of Boeckman and Newland Creeks flow south from the southern half of the study area. In total, the tributary segments measure approximately two miles in length. There are two wetlands in the western portion of the area measuring approximately 4.5 acres in total. There are very minor areas of steep slopes along Boeckman Creek. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 27 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Other Identified Resources

There is a sand and gravel pit owned by Tigard Sand and Gravel at 24980 SW Gage Road, which is directly adjacent to the south of the study area. This sand and gravel pit is identified in the 1978 DOGAMI report.

Study Area 45		Gross Vacant Buildable Acres 122	
Total Acres	183	Dwelling Unit Capacity	771
Total Developed Acres	41.9	Employment Acres	-
Total Constrained Acres	20	Resource Land Acres	-
Title 3 Acres	18	Percent Tree Canopy Cover	20%
Upland Steep Slope Acres	2		

General Site Description: Study Area 45 is a smaller tract of land situated just east of and adjacent to Wilsonville. The western edge of this site is defined by Boeckman Creek. At the east, running in a north-south direction is SW Stafford Road. At the south is Boeckman Road. The area is also accessible via Frog Pond Lane. This area is in Clackamas County, and is outside of the Metro jurisdictional boundary. This study area is almost immediately east of Wilsonville's commercial area. It has been designated completely as Inner Neighborhood. Approximately 122 of the 183 acres in this study area are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains about 40 tax lots. About three-fourths have improvements; none have improvement values above \$250,000. Fewer than 10 of these tax lots are less than one acre in size. There are some agricultural uses in this site, which may contain nursery stock or tree farms, and field crops. Non-residential land uses include concrete and financial services.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is a power line that runs over the northeastern corner of the site, though there do not appear to be any other public easements running through the area. There is no evidence of significantly high air traffic noise over this area.

Public Services Feasibility: Wilsonville showed a desire, or already had plans to serve the study area. This size of this study area may make it more difficult to serve efficiently. This area is contained within a single drainage basin.

- **Water:** This study area would be moderately difficult to serve. The infrastructure system is able to accommodate some additional development in this area. However, some improvements and extensions of lines, both inside and outside the existing UGB, are to be expected to serve new development, and prevent new development from overburdening the existing system.
- **Sewer:** This area would be moderately difficult to serve. Infrastructure improvements will be needed to alleviate possible impacts on the existing system.
- **Stormwater:** This area would be moderately difficult to serve. Some improvements and extensions of lines will be needed, both inside and outside the UGB.

Agricultural Analysis

Zoning: This area is entirely exception land and is zoned RRFF5 by Clackamas County. To the north and east is resource land zoned EFU. To the south and west is the UGB.

Current Agricultural Activity: Approximately 80 percent of the study area supports agricultural use, mainly in the form of field crops and pastureland. To the north and east are significant

areas of field crops and pastureland that extend for over a mile. There is no agricultural activity to the south or west.

Compatibility: Urbanization of this area might increase traffic on SW 65th Avenue. However due to the small size of the area the increase in traffic would be minimal and would not impede the normal movement of farm equipment or affect the transport of agricultural goods produced on the resource lands to the east. Urbanization would bring development directly adjacent to active farming parcels on to the north and east therefore, issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development may occur in these few areas. Beckman Creek flows on the west edge of this area towards the Willamette River. Urbanization of this area would result in increased impervious surfaces and may diminish water quality and increase flooding downstream but these consequences would not affect any agricultural activities. Urbanization of this area may affect the value of the adjacent farmland by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area may have an impact on areas of agricultural activity to the north and east.

Environmental Social Energy Economic Analysis

General Character of the Area

This small area is characterized as mostly flat open parcels in agricultural use with associated residences. There are some forested steep slopes on the western edge along a stream corridor.

Environmental

Boeckman Creek flows south through the west side of the area for less than a half-mile ultimately draining to the Willamette River. An unnamed stream also flows south through a portion of the middle of the area for less than a quarter-mile. There are steep slopes along the entire length of Boeckman Creek. Metro's draft Goal 5 fish and Wildlife Habitat Inventory identifies 25 percent of the study area land in the proposed inventory. Urbanization of the area may impact these natural resources as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Other Identified Resources

The Frogpond Grange #111 is located on SW Stafford Road near the intersection with SW Frogpond Lane.

Three parcels of Study Area 45 are owned by the West Linn-Wilsonville School District. The School District has requested that these parcels be brought into the UGB. This request is being considered in the Special Land Needs – School District Report.

Study Area 46		Gross Vacant Buildable Acres 40	
Total Acres	234	Dwelling Unit Capacity	238
Total Developed Acres	64	Employment Acres	-
Total Constrained Acres	11	Resource Land Acres	-
Title 3 Acres	11	Percent Tree Canopy Cover	40%
Upland Steep Slope Acres	-		

General Site Description: Study Area 46 consists of two small sub-areas south of Wilsonville. The western sub-area is located south of the Willamette River, directly west of the I-5 freeway. Northeast Butteville Road defines the western edge of the sub-area. The eastern sub-area is immediately south of the Charbonneau development on the east side of I-5. Northeast Airport Road forms the western edge and NE Miley Road the northern edge of the sub-area. Both sub-areas are within Clackamas County, outside of the Metro jurisdictional boundary and are designated Inner Neighborhood. Wilsonville's commercial area is approximately two miles to the north.

Parcelization, Building Values, Development Patterns: The western sub-area contains 46 tax lots, 7 of which are in public ownership. Thirty-five of the parcels have improvements, although none have improvement values above \$250,000. Four of the parcels with no improvements are in public ownership. Two parcels are greater than 5 acres and 24 are less than an acre in size. This sub-area contains the Boones Ferry Marina operated by Clackamas County. The eastern sub-area contains 69 tax lots. All but eight of the parcels have improvements, although only seven have improvement values above \$250,000. Almost all have improvements, though fewer than five have improvement values above \$250,000. As the majority of the land in this study area is within an existing subdivision, about 85 percent of the parcels in this study area (60 parcels) are less than one acre in size. There are very minimal agricultural activities and non-residential uses in the two sub-areas.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence that power lines or public easements run through this site. The Aurora airport is approximately four miles south of the eastern sub-area, which may create noise impacts.

Public Services Feasibility: Wilsonville does not desire to serve the western sub-area. Wilsonville appears willing to accept the eastern sub-area within its service area, if necessary. The smaller size of the two sub-areas may make it more difficult to serve efficiently. Both sub-areas are contained within one drainage basin.

- **Water:** The western sub-area would be difficult to serve. Infrastructure improvements are needed to develop the area, and to alleviate impacts to the existing system. The eastern sub-area would be moderately difficult to serve. The infrastructure system is in acceptable condition to develop the area. Minimal improvements within the UGB should be expected.
- **Sewer:** The western sub-area would be difficult to serve. Infrastructure improvements will also be needed in this area to prevent new development from overburdening the existing system. The eastern sub-area would be easy to serve. The infrastructure system is in acceptable condition to develop the area. Some

improvements and extensions of lines, inside and outside the UGB, may be necessary to prevent new development from overburdening the existing system.

- **Stormwater:** The western sub-area would be moderately difficult to serve. Although the infrastructure is in acceptable condition to develop the area, some improvements and extensions of lines will be needed, both inside and outside the UGB. The eastern sub-area would be moderately difficult to serve. While infrastructure is in acceptable condition to develop the area, some improvements and extensions of lines are to be expected, both inside and outside the UGB.

Agricultural Analysis

Zoning: This study area, which is separated into two sub-areas, is entirely exception land and both are zoned RRFF5 by Clackamas County. The UGB borders one side of each study area with the remaining lands that surround the two sub-areas zoned EFU.

Current Agricultural Activity: There is one location of field and row crop production in the two sub-areas. The EFU land to the south of both sub-areas supports extensive nursery operations and field crop production. The Langdon Farms Golf Club is also located on adjacent EFU land.

Compatibility: Urbanization of this area might increase traffic on Miley Road and NE Airport Road. Currently the southern of the two areas is almost completely urbanized thus the additional amount of traffic generated from this area would be negligible. Due to the very small amount of urbanizable area any increase in traffic would not impede the normal movement of farm equipment and affect the transport of agricultural goods produced on the resource lands to the east and south. Urbanization would bring new development directly adjacent to active farming parcels on to the west side of I-5 therefore, issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development may occur in these few areas. However, due to the very limited amount of urbanizable area this impact should be minimal. A couple of unnamed streams flow through area towards the Willamette River. Urbanization of this area would result in increased impervious surfaces however, due to the very small amount of urbanizable area any increased stream flow would be minimal. There is the possibility that urbanization could encourage land banking and speculation. However, the minimal amount of new development that could occur versus the large extent of adjacent agricultural activity would negate this consequence. Overall, urbanization of this area would have little impact on agricultural activity.

Environmental Social Energy Economic Analysis

General Character of the Area

This study area is separated into two sub-areas. The northern area is characterized by residential uses along the Willamette River and forested parcels adjacent to I-5 also in residential use. The land is generally flat with two minor areas of steep slopes. A large portion of this sub-area includes the I-5 right-of-way. The southern sub-area is a flat open residential community with one small location of agricultural activity. Both sub-areas are mostly built-out.

Environmental

The Willamette River forms the northern boundary of the northern sub-area for approximately three-quarters of a mile. The floodplain of the Willamette extends this entire length and also stretches 1,400 feet into the sub-area. The presence of the floodplain may restrict the amount of development that can occur in this location. Metro's draft Goal 5 Fish and Wildlife Habitat

Inventory identifies 43 percent of the study area land in the proposed inventory. Urbanization of the area may impact this floodplain as outlined in the introduction to the ESEE analysis.

Social Energy Economic
See Appendix A.

Study Area 47		Gross Vacant Buildable Acres	
Total Acres	998	Dwelling Unit Capacity	1,739
Total Developed Acres	240	Employment Acres	224
Total Constrained Acres	79	Resource Land Acres	-
Title 3 Acres	56	Percent Tree Canopy Cover	10%
Upland Steep Slope Acres	23		

General Site Description: Study Area 47 lies between Tualatin and Wilsonville. Southwest Boones Ferry Road and I-5 bisect it through the center. The western edge of this site is defined by a power line easement. This area is in Washington County, and is predominantly inside of the Metro jurisdictional boundary. A Corridor has been defined along SW Boones Ferry Road. The western portion has been designated as Industrial and Inner Neighborhood. Approximately 638 of the 998 acres in the study area are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains about 200 tax lots. Over half have improvements, though there are only a few with improvement values above \$250,000. About 20 percent of the tax lots in this study area are less than one acre. About 75 percent of all the tax lots are less than five acres. Smaller tax lots are mainly within the northwestern corner of the study area. Agricultural uses may include nursery stock, perennials and field crops. Non-residential land uses include nursery, landscaping, excavating, stables, janitorial services and business consulting. There is evidence of mining and aggregate uses in this study area.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is a power line easement that defines the eastern edge of this study area, as well as a power line running through the center of the site. There is no evidence of significantly high air traffic noise over this area.

Public Services Feasibility: Tualatin appears willing to accept the study area within its service area, if necessary. The size of this study area would likely allow it to be served with some degree of efficiency. This area is also contained within a single drainage basin.

- **Water:** In broader terms, this study area would be easy to serve. However, this area contains subsurface rock, which may cause some complications. While the infrastructure is in acceptable condition to serve this system, some improvements and line extensions are to be expected, both inside and outside of the UGB.
- **Sewer:** This area would be moderately difficult to serve. Subsurface rock may pose the same issues addressed above. Infrastructure improvements may also be needed to alleviate impacts on the existing system.
- **Stormwater:** This area would generally be easy to serve. However, as mentioned above, subsurface rock in this area may pose some construction issues. Some improvements and line extensions may also be necessary.

Agricultural Analysis

Zoning: This area is entirely exception land and is zoned AF10, AF5, MAE, and RR5 by Washington. To the north and south is the UGB. To the east is resource land zoned EFU. To

the west is exception land in Study Area 49. To the northwest is resource land zoned EFU, EFC, RIND and AF20 in Study Area 48 that is home to a mineral extraction operation.

Current Agricultural Activity: There are a few fairly large pockets of nursery land in the central portion of the study area as well as a few large rural residential lots that also contain pastureland. To the east is a large pocket of field crop production otherwise, there is very little agricultural activity in the surrounding areas.

Compatibility: Urbanization of this area would increase traffic on SW Boones Ferry Road and SW Garden Acres Road. This increased traffic would have little affect on the normal movement of farm equipment and the transport of agricultural goods as goods produced on the resource lands to the east would primarily use SW 65th Avenue and SW Elligsen Road. Urbanization would bring development directly adjacent to some active farming parcels to the east therefore, issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development may occur in this area. Seely Ditch flows through this area prior to crossing into the UGB. Urbanization of this area would result in increased impervious surfaces and may diminish water quality and increase flooding downstream but these consequences would not affect any adjacent agricultural activities. Urbanization of this area may affect the value of the adjacent farmland to the east by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area would have a minimal affect on agricultural activity.

Environmental Social Energy Economic Analysis

General Character of the Area

This area is characterized by rural residential and industrial uses and limited agricultural activity on generally flat to moderately sloped land. The majority of the land is open with forested areas associated with stream corridors. A mineral extraction operation is located in the northwest corner of the area and the agricultural uses are located in the center. Mineral extraction operation stretches into Study Area 49. Interstate 5 separates the far eastern portion from the rest of the area.

Environmental

A tributary of Seely Ditch flows south through the center of the area for approximately one-mile. A tributary of Saum Creek flows north through the northeast portion of the area for approximaely one-third mile. There is a 17-acre wetland associated with this stream with steep slopes adjacent to the wetland. Steep slopes are also found east of I-5 in the lower portion of the study area. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 36 percent of the study area land in the proposed inventory. The tributaries to Seely Ditch and Saum Creek are identified as significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. Urbanization of the area may impact these natural resources as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Other Identified Resources

The very northwest tip of the study area includes land identified as Mineral and Aggregate Overlay District A on Washington County's Rural/Natural Resource Plan. There is also an

adjoining area of Mineral and Aggregate District B in this location as well as in the central northern edge of the study area.

Study Area 48		Gross Vacant Buildable Acres 591	
Total Acres	1,080	Dwelling Unit Capacity	0
Total Developed Acres	323	Employment Acres	441
Total Constrained Acres	168	Resource Land Acres	1,080
Title 3 Acres	139	Percent Tree Canopy Cover	20%
Upland Steep Slope Acres	29		

General Site Description: Study Area 48 lies between Tualatin and Sherwood, just south of the UGB and Tualatin-Sherwood Road. This site is in Washington County, and is inside of the Metro jurisdictional boundary. Approximately 60 percent of the perimeter of this study area consists of the existing urbanized area. Southwest Dahlke Road serves this area from the north, and SW Tonquin Road from the west. This study area has been designated entirely as an Industrial Area. It is immediately south of a large industrial area within Tualatin. Approximately 591 of the 1,080 total acres are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains about 70 tax lots. Approximately half have improvements; though only about two have building values above \$250,000. Less than 10 percent of the tax lots in this study area are smaller than one acre. About one-third of all the tax lots are smaller than five acres. Limited agricultural uses in the northern section of the area may include some field crops. Non-residential land uses include paving, construction, excavation, wood products, social/non-profit uses. A good portion of land in this study area is being used by sand and gravel businesses.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is a power line easement that bisects this site diagonally from the northwest to the southeast. There is no evidence of significantly high air traffic noise over this area.

Public Services Feasibility: Tualatin appears willing to accept the area within its service area, if necessary. The moderately large size of this study area may allow service provision to occur with relative efficiency. However, this area contains multiple drainage basins, which is also a consideration for providing services.

- **Water:** In broader terms, this study area would be easy to serve. This area may have the same complications addressed for Study Area 49, above, due to the existence of subsurface rock. While the current infrastructure is in acceptable condition to serve the system, some improvements within the UGB will likely be necessary.
- **Sewer:** This area would be moderately difficult to serve. The existence of subsurface rock may pose the same complications addressed above. In addition, if infrastructure improvements are not made, the existing facilities will likely be impacted by additional development.
- **Stormwater:** This study area would be easy to serve. However, the existence of subsurface rock in this area may pose similar issues to those addressed above. Some improvements and extensions of existing lines may also be required to alleviate the impacts of new development on the existing system.

Agricultural Analysis

Zoning: This area is resource land and is zoned by Washington County as EFU, EFC, RIND and AF20. The area is basically surrounded on three sides by the UGB and the fourth side is exception land in Study Areas 47, 49, and 50.

Current Agricultural Activity: The predominant use in this area is a mineral extraction operation and the remaining area is largely forested and unfarmed. The very northern portion supports some field crops. There is a gun club in the southern portion of the area. The exception area to the south supports rural residential and rural industrial uses with no agricultural activity.

Compatibility: A significant increase in traffic on SW Tonquin Road may result from the urbanization of this area. This increased traffic would not impede the normal movement of farm equipment and the transport of agricultural goods produced due to the limited agricultural activities in the area. Urbanization of this area would not result in new development directly adjacent to active farming areas therefore, there would be no issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development. Rock Creek flows north through the area to the Tualatin River and Coffee Lake Creek flows south through the area to the Willamette River. Urbanization of this area would result in increased impervious surfaces and may diminish water quality and increase flooding downstream. Both of these streams ultimately pass through EFU zoned land and could negatively affect agricultural production. Due to the fact there is no adjacent agricultural activity there would be no land banking or speculation occurring. Overall, urbanization of this area would have a minimal affect on agricultural activity.

Environmental Social Energy Economic Analysis

General Character of the Area

This area is characterized by the mineral extraction operation that is the predominant use. The remaining area is largely forested and contains a gun club. The very northern portion has some agricultural activity. The topography of the area is varied, as would be expected with an extraction operation. There are some steep slopes along stream corridors.

Environmental

Rock Creek flows north through the west side of the area for just over three-quarters of a mile, ultimately draining to the Tualatin River. Three tributaries to Rock Creek also located in this section total a half-mile of additional stream corridor. Coffee Lake Creek flows south through the center of the area for just over a mile. One tributary to Coffee Lake Creek adds an additional three-quarter of a mile of stream corridor. Two unnamed tributaries of Hedges Creek flow north through the top portion of the study area, totaling 0.82 miles of stream corridor. There are 16 wetlands within the study area that total 47.3 acres. There are a number of scattered wetlands throughout the study area, the largest of which are associated with the two stream corridors. The floodplain of Rock Creek extends along the entire length within the area and varies in width from 200-600 with the majority of floodplain near the 300-foot width mark. There are large linear areas of steep slopes near Rock Creek and numerous dispersed smaller areas of steep slopes mainly in the lower portion of the area. Approximately 15 acres of a larger 35-acre open space of the Tualatin River Natural Wildlife Refuge extends into the area along Rock Creek. The US Fish and Wildlife agency also owns a 9-acre open space along the southern edge of the area near Rock Creek. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 54 percent of the study area land in the proposed inventory. The lower

portion of Rock Creek and the upper portion of Coffee Lake Creek are identified as significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. Two wetlands, one a half acre and the second 4 acres in size are also identified as significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. Urbanization of the area may impact these natural resources as outlined in the introduction to the ESEE analysis and may inhibit the ability of these natural and environmentally sensitive areas to provide species habitat and other ecological functions.

Social Energy Economic

See Appendix A.

Other Identified Resources

There are numerous stone quarry parcels in this study area, the majority of which are owned by Oregon Asphaltic Paving Company and Tigard Sand and Gravel of the same address in Troutdale. Morse Brothers of Lebanon, Oregon own the remaining stone quarry sites. These quarry sites are identified in the 1978 DOGAMI report. In addition, almost the entire study area is identified as Mineral and Aggregate Overlay District A or District B on Washington County's Rural/Natural Resource Plan.

Study Area 49		Gross Vacant Buildable Acres 501	
Total Acres	990	Dwelling Unit Capacity	6
Total Developed Acres	324	Employment Acres	373
Total Constrained Acres	238	Resource Land Acres	-
Title 3 Acres	230	Percent Tree Canopy Cover	20%
Upland Steep Slope Acres	8		

General Site Description: Study Area 49 is situated northwest of Wilsonville and the UGB. The majority of this area is within Clackamas County, though a portion is within Washington County. The majority of this study area is outside of the Metro jurisdictional boundary. Approximately 15 percent of the perimeter of this study area is located immediately adjacent to the UGB. This study area is also adjacent to Study Areas 48 to the north and west, and 47 to the east. This study area is defined mainly by selected parcel boundaries. It is accessible mainly from SW Grahams Ferry Road and SW Garden Acres Road. It is also accessible via SW Tonquin Road, from the north. This study area is designated entirely as Industrial Area. Approximately 501 of the 990 acres in this study area are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains about 200 parcels, over half of which have improvements. Approximately six parcels have building values above \$250,000. About 15 percent of the parcels in this study area are smaller than one acre, and approximately 66 percent of the parcels in this study area are smaller than five acres. Agricultural uses in this study area are more limited, but appear mainly on the western portion of the site, and appear to include field crops and possibly nursery stock. Non-residential land uses include stables, nursery, construction, utilities, plastering, metals, trucking, forest products, bark, concrete, printing, and health services.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): A power line easement cuts through the eastern portion of this site. There is no evidence of significantly high air traffic noise over this area. Aerial photo inspections indicate the existence of mining and aggregate activities in this study area.

Public Services Feasibility: Wilsonville showed a desire, or already has plans to serve the study area. The area's moderately large size would allow it to be served with some degree of efficiency. However, this area contains multiple drainage basins, which may be a consideration.

- **Water:** In broader terms, this study area would be easy to serve. However, the existence of subsurface rock may cause some construction difficulties. While the infrastructure is in acceptable condition to serve this area some additions and extensions may be necessary to serve new development, both inside and outside of the UGB. Failure to make such improvements could overburden the existing system.
- **Sewer:** This area would be moderately difficult to serve. There may be some rock complications during construction, which would require mitigation or avoidance. Wetlands are also located in this study area, and a large portion of the area is relatively flat, which could make it difficult to drain sewage. Sewer depth may need to be increased, and additional pump stations may be required. While infrastructure is in acceptable condition to serve the area, some improvements and extensions

may be required to alleviate impacts of additional development on the existing system.

- **Stormwater:** This area would be easy to serve. The complications of subsurface rock, mentioned above, apply to storm sewers as well. While current infrastructure can accommodate additional development, some improvements and extensions may be required, both inside and outside of the UGB, to alleviate the impacts of new development.

Agricultural Analysis

Zoning: This area is entirely exception land and is zoned by Washington County as MAE and AF5 and RI and RFFF5 by Clackamas County. To the north is resource land zoned EFU in Study Area 48. To the east are exception lands in Study Area 47 and the UGB. To the south and west is resource land zoned EFU in Study Area 51 and also to the west is exception land in Study Area 50.

Current Agricultural Activity: With the exception of some small orchards associated with a few residences there is very little agricultural activity occurring in this study area. The EFU land to the north is forested and contains a mineral extraction operation. To the east are a few fairly large pockets of nursery land and a few large rural residential lots that also contain pastureland. To the south and the west are extensive areas of field and row crops, nursery operations and pastureland.

Compatibility: Urbanization of this area may cause an increase in traffic on SW Grahams Ferry Road, SW Tonquin Road, SW Baker Road and Morgan Road. This increased traffic could impede the normal movement of farm equipment and affect the transport of agricultural goods produced to the south and west of this area. Urbanization would bring new development adjacent to some active farming areas so complaints due to noise, odor, and the use of pesticides and fertilizers might arise. However, the gun club and the sand and gravel operation located to the north may have more of an affect on new residential development. Rock Creek flows north through the area to the Tualatin River and Coffee Lake Creek flows south through the area to the Willamette River. Urbanization of this area would result in increased impervious surfaces and may diminish water quality and increase flooding downstream. Both of these streams ultimately pass through EFU zoned land and could negatively affect agricultural production. Urbanization of this area may affect the value of some adjacent farmland by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area may have an affect on agricultural activity to the south and west.

Environmental Social Energy Economic Analysis

General Character of the Area

This area is characterized as mostly flat to moderately sloped with very small areas of steep slopes. Most of the area is forested or semi-open with shrubs and supports a number of rural industrial uses. There is a small residential area in the southeast corner and very little agricultural activity.

Environmental

Rock Creek flows north through the western side of area towards the Tualatin River for approximately 0.91 miles. A tributary of Rock Creek also flows in this section for 0.7 miles. Coffee Lake Creek flows south through the center of the area for 1.1 miles. One tributary of

Coffee Lake Creek flows from the northern edge for one mile. Two other smaller tributaries flow for just over a third of a mile. The floodplain along the top Rock Creek varies from 200-400 feet in width and extends along 3,100 feet of the stream. The floodplain along Coffee Lake Creek extends almost the entire 1.1-mile length of the stream and varies from 400-1000 feet in width. There are twelve wetlands, mostly associated with the two streams that range from less than an acre in size to a 46-acre wetland that stretches between the two streams. The total acreage of all the wetlands is approximately 86 acres. Metro owns a 24.5-acre open space that includes a large portion of the 46-acre wetland in the center of the area. Metro also owns an approximately 30-acre parcel that is part of a larger 135-acre open space area that continues along Coffee Lake Creek and Seely Ditch to the south. The US Fish and Wildlife agency also owns an open space adjacent to the northern edge of the area near Rock Creek. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 55 percent of the study area land in the proposed inventory. A small portion of the tributary to Rock Creek noted above is in Washington County and has been identified as a Significant Natural Area on Washington County's Rural/Natural Resource Plan. Coffee Lake Creek and its main tributary are identified as significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. The area where these two streams meet is identified as a Significant Natural Area on the plan. Urbanization of the area may impact these natural resources as outlined in the introduction to the ESEE analysis and may inhibit the ability of these natural and environmentally sensitive areas to provide species habitat and other ecological functions.

Social Energy Economic

See Appendix A.

Other Identified Resources

Morse Brothers of Lebanon, Oregon own stone quarry sites in this study area at 12000 and 12080 SW Tonquin Road. This quarry site is identified in the 1978 DOGAMI report. These two areas are identified as Mineral and Aggregate Overlay District A on Washington County's Rural/Natural Resource Plan. The surrounding area is identified as Mineral and Aggregate Overlay District B on Washington County's Rural/Natural Resource Plan.

Study Area 50		Gross Vacant Buildable Acres		142
Total Acres	183	Dwelling Unit Capacity	822	
Total Developed Acres	30	Employment Acres	0	
Total Constrained Acres	10	Resource Land Acres	0	
Title 3 Acres	10	Percent Tree Canopy Cover	16%	
Upland Steep Slope Acres	0			

General Site Description: Study Area 50 is a small study area directly to the southeast of the Sherwood. Southwest Morgan Lane defines the study area in the east and SW Morgan Road in the south. Southwest Baker Road runs in a north south direction through the middle of the study area. The area is in Clackamas County, outside of the Metro jurisdictional boundary and approximately two miles from the intersection of Highway 99W and Tualatin-Sherwood highway, the general vicinity of the Sherwood Town Center area. The entire area has been designated as Inner Neighborhood and is adjacent to Study Areas 49 to the east and 48 to the north, which have Industrial Area designations.

Parcelization, Building Values, Development Patterns: This study area contains 37 parcels, all but 3 of which have improvements. Of the parcels in this study area 10 have improvement values above \$250,000. One parcel is smaller than one acre, and about 75 percent of all parcels in the study area are five acres or larger. Farming uses include minor locations of row crops, nursery stock and pastureland with associated rural residences.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of significantly high air traffic noise over this site. Available data does not suggest the existence of power lines or public easements through this site.

Public Services Feasibility: Wilsonville has shown a desire, or already has plans to serve the study area. This area is relatively small in size, which may make it more difficult to provide services with maximum efficiency.

- **Water:** This area would be moderately difficult to serve. The infrastructure system is in acceptable condition to develop the area, though some minimal improvements will be necessary.
- **Sewer:** This area will be moderately difficult to serve. Some improvements and extensions of lines, both inside and outside the UGB, will be necessary. Existing facilities could be impacted by future development without such improvements.
- **Storm:** This study area would be moderately difficult to serve. While infrastructure is acceptable to accommodate new development in this area, some improvements and extensions of lines will be necessary, both inside and outside the UGB.

Agricultural Analysis

Zoning: This small area is entirely exception land and is zoned by Clackamas County as FF10 and RRFF5. To the north is the UGB. To the east is exception land in Study Area 49. To the south and west is resource land zoned EFU in Study Area 51, and further west is exception land in Study Area 54.

Current Agricultural Activity: There are very minor locations of nursery, row crop, and pastureland associated with rural residences in this area. There is no agricultural activity to the north and east. To the south and west are extensive areas of field and row crops, nursery operations and pastureland.

Compatibility: Urbanization of this area may result in a slight increase in traffic on Baker Road and Morgan Road. Due to the small size of this area any increase in traffic would have a minimal affect on the normal movement of farm equipment and the transport of agricultural goods produced in and around this area. Urbanization of this area would bring development directly adjacent to the agricultural areas to the south and west, which could result in complaints due to noise, odor, and the use of pesticides and fertilizers associated with active farming near new development. Urbanization of this area may affect the value of adjacent farmland by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area may have an affect on agricultural activity to the south and west.

Environmental Social Energy Economic Analysis

General Character of the Area

This area is characterized by gently to moderately sloped parcels mostly in rural residential uses. There are two pockets of forest cover otherwise the land is open, with a minor amount of agricultural activity, usually associated with large lot residences.

Environmental

Rock Creek flows south along the southwest corner of the study area for less than 800 feet. A small tributary of Rock Creek flows in a U-shaped pattern from the central to the northeast corner of the area prior to joining Rock Creek in Study Area 48. This stream is approximately two-thirds mile long. There is one 1.8-acre wetland in the area and no steep slopes or floodplain. Directly adjacent to the north is an 11-acre private open space that is centered on the aforementioned tributary to Rock Creek. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 43 percent of the study area land in the proposed inventory. Urbanization of the area may impact these natural resources as outlined in the introduction to the ESEE analysis and may inhibit the ability of the natural area to the north to provide species habitat and other ecological functions

Social Energy Economic

See Appendix A.

Study Area	51	Gross Vacant Buildable Acres	1,535
Total Acres	1,938	Dwelling Unit Capacity	7,545
Total Developed Acres	129	Employment Acres	0
Total Constrained Acres	225	Resource Land Acres	1,938
Title 3 Acres	191	Percent Tree Canopy Cover	16%
Upland Steep Slope Acres	35		

General Site Description: Study Area 51 is in unincorporated Clackamas County. It runs diagonally between Sherwood, to the north, and Wilsonville, to the east. It is just outside of Metro's jurisdictional boundary. The area has an irregular configuration, the majority of which is defined by property boundaries. The UGB and Metro's jurisdictional boundary define parts of the area's eastern boundary. Southwest Westfall Road partially defines the area's southern boundary. Study areas 47-50 are situated immediately to the northeast. Pleasant Hill Road, SW Tooze Road, SW Graham's Ferry Road, and Baker Road provide access into the area. This study area is relatively flat on the eastern side, and becomes rolling and moderately sloped toward the western side. The area is designated entirely as Inner Neighborhood. There are 1,535 acres of vacant and buildable land out of 1,938 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: The area has 87 parcels with recorded improvement values out of 135 total parcels. The median improvement value is \$224,789. The median parcel size is seven acres. There are 11 parcels smaller than 1 acre, and 82 parcels are larger than 5 acres. The land in this area is primarily in agricultural use, but has patches of urban and forest uses as well. Since 1990, four single-family dwelling permits have been issued.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: Although a majority of this area falls within the service area for Wilsonville, there is no provision in the City's public service master plan to provide infrastructure services to this area. Currently, only existing developed areas are in the plan to receive public services. Wilsonville has stated it is not willing to serve this area, and will oppose annexation. Other potential service providers are Tualatin Valley Water District for water, and Clean Water Services for Sewer and Storm. This area is not contiguous, and would be difficult to serve.

- **Water:** Topography would make this study area difficult to serve. Most of the area is on hills, and new transmission lines, pump stations, and reservoir storage would need to be added. This area is rated difficult to serve.
- **Sewer:** The existing wastewater treatment plant may not have enough capacity to be expanded. A new treatment plant, main lines and pump stations would need to be added. This area is rated moderately difficult to serve.
- **Stormwater:** New development in the study area is regulated for stormwater treatment by Clean Water Services. Stormwater will be required to be treated with detention, water quality facilities, or both. Under Clean Water Services guidelines, responsibility for the required treatment will be with the developer. With the required treatment, impacts to downstream facilities will be minimal. Clean Water Services anticipates no difficulty in implementation. This area is rated easy to serve.

Agricultural Analysis

Zoning: This area is entirely resource land and is zoned by Clackamas County as EFU. To the north is the UGB and exception land in Study Areas 49 and 50. To the east is the UGB. To the south is resource land zoned EFU and exception land in Study Area 53. To the west is exception land in Study Areas 53, 54 and 55 and resource land zoned AF20 in Study Area 55.

Current Agricultural Activity: This entire area is either in an agricultural use or forested. There are extensive areas of nursery, row crop, field crop and pastureland spread throughout. There is very little agricultural activity to the north, consisting of minor areas of nursery stock, orchards, row crops and pastureland associated with rural residences. To the south are extensive areas of field and row crops, pastureland and forested areas. To the west are localized areas of field and row crops, orchards, tree farms and pastureland intermixed with rural residences, many of which have minor agricultural activities as well.

Compatibility: Urbanization of this area may result in an increase in traffic on Baker Road, SW Tooze Road, Pleasant Hill Road, SW McConnell Road and SW Westfall Road. Much of this traffic may be directed to SW Grahams Ferry Road. This increased traffic could impede the normal movement of farm equipment and affect the transport of agricultural goods produced to the south along Baker Road, Wilsonville Road and SW Ladd Hill Road. Urbanization of this area would bring development directly adjacent to active farming areas on the south and west therefore issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development may occur. Rock Creek and some of its tributaries flow north through the area while a couple of tributaries to Mill Creek flow south. Urbanization of this area would result in increased impervious surfaces and may diminish water quality and increase flooding in the downstream portions of these creeks. This may negatively affect agricultural activities on the resource land to the south where Mill Creek flows. However, any impact on Rock Creek would not affect agricultural activities as it flows through very little active farming areas on its way north to the UGB. Urbanization of this area may affect the value of adjacent agricultural land by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Due to the large extension of agricultural activities to the south and the impacts that would result from such a large area urbanizing, the potential for negatively affecting agricultural activity is great.

Environmental Social Energy Economic Analysis

General Character of Area

Area 51 is characterized by gentle to moderate slopes throughout, except for a few steep slopes (2 percent of area) along some creek areas. Approximately 20 percent of this area is forest covered, mostly concentrated along the creeks. The entire study area is zoned for resource use, in this case EFU. There are few residences and most of the area is in agricultural use except for the far eastern portion.

Environmental

Rock Creek flows east and north through much of Area 51, with an associated wetland in the central portion of this area. Mill Creek flows south through the southern portion of the study area. The Coffee Lake Creek/Seely Ditch complex, running north/south, is located along the eastern boundary of the study area. There are a total of about 9.5 miles of stream corridor within the area. There are nine wetlands in this study area measuring approximately nine acres in total. Approximately one mile of a larger floodplain is located in the southern portion of the eastern edge of the area. There are very minor areas of steep slopes along some of the

tributaries to Rock Creek. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 42 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area 52		Gross Vacant Buildable Acres 208	
Total Acres	320	Dwelling Unit Capacity	1,165
Total Developed Acres	87	Employment Acres	-
Total Constrained Acres	18	Resource Land Acres	-
Title 3 Acres	17	Percent Tree Canopy Cover	10%
Upland Steep Slope Acres	1		

General Site Description: Study Area 52 is west of the Dammasch State Hospital, and the area formerly known as Urban Reserve 41. Approximately 85 percent of this study area is not contiguous to the UGB. This area is in Clackamas County, and is outside of the Metro jurisdictional boundary. The study area is bound on the east by SW Grahams Ferry Road, on the west by Tooze Road, and on the north and south by parcel boundaries. The center of this study area is approximately 1.5 miles from the center of Wilsonville's commercial area. This study area is designated entirely as Inner Neighborhood. Approximately 208 of the 320 acres in this study area are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains about 90 parcels, the majority of which have improvements. Fewer than 10 parcels have improvement values less than \$250,000. About 10 parcels are less than one acre in size, although approximately 70 parcels (90 percent) are less than five acres in size. Agricultural uses including nursery stock and tree farms appear mainly in the northern section of this area. Non-residential land uses include landscaping, equipment, and contracting, excavating, logging and educational uses. There is no evidence of mining or aggregate activities on this area.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There are no evident power lines or public easements that run through this area. There is no evidence of significantly high air traffic noise over this area.

Public Services Feasibility: Wilsonville seemed willing to accept the area within its service area if necessary. The smaller size of this study area may make it more difficult to serve efficiently. However, this study area is contained within a single drainage basin, which is also a consideration.

- **Water:** This study area would be moderately difficult to serve. Infrastructure improvements will be to prevent new development from overburdening the existing system.
- **Sewer:** This area would also be moderately difficult to serve. Some infrastructure improvements will also be needed in this area to alleviate impacts of new development on the existing system.
- **Stormwater:** This area would be moderately difficult to serve. While infrastructure is in an acceptable condition, some improvements and extensions of lines will still be necessary.

Agricultural Analysis

Zoning: This area is entirely exception land and is zoned by Clackamas County as RFF5. To the north is a strip of resource land zoned EFU in Study Area 51 and exception land in Study

Area 49. To the east is resource land zoned EFU adjacent to the northern portion of the area and the UGB in the south portion of the study area. To the west is resource land zoned EFU both within and outside of Study Area 51.

Current Agricultural Activity: The northern portion of this area is a mix of rural residential uses with orchards, row crops, field crops and pastures. The southern portion of this area consists of predominantly rural residential parcels with scattered pastureland. To the north and northeast is a fairly large area of pastureland, some field crops and forested areas. To the west is an extensive area of pasture, orchards and field crops. This large resource land area extends south to the Willamette River.

Compatibility: Urbanization of this area would result in an increase in traffic on Tooze Road, SW Grahams Ferry Road, and SW Westfall Road. This increased traffic could impede the normal movement of farm equipment and affect the transport of agricultural goods produced to the south and west of this area. Urbanization of this area would bring development directly adjacent to active farming areas on three sides of this study area therefore issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development may occur. A tributary of Mill Creek passes through the southern portion of this area as it flows south towards the Willamette River. Urbanization of this area would result in increased impervious surfaces and may diminish water quality and increase flooding downstream negatively affecting agricultural activities on the resource land to the south. Urbanization of this area may affect the value of adjacent farmland by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area has the potential to negatively affect agricultural activity.

Environmental Social Energy Economic Analysis

General Character of Area

Area 52 is characterized mostly by gentle slopes with some moderate and a few steep sloped area (2 percent of area) in the north central and southwestern areas. Approximately 20 percent of this study area is forest covered, which is concentrated in the northern and southwestern portions. Residential uses are scattered throughout the area and there are a few small farming operations taking place (approximately 15 percent of land).

Environmental

Approximately two-thirds mile of a Corral Creek tributary flows through a portion of the southern section of Area 52. There are minimal steep slopes adjacent to this tributary. There are about three acres of wetlands in the study area. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 27 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area	53	Gross Vacant Buildable Acres	1,043
Total Acres	1,825	Dwelling Unit Capacity	3,850
Total Developed Acres	314	Employment Acres	0
Total Constrained Acres	413	Resource Land Acres	0
Title 3 Acres	64	Percent Tree Canopy Cover	26%
Upland Steep Slope Acres	349		

General Site Description: Study Area 53 is situated within unincorporated Clackamas County and Washington County. It is not contiguous to the UGB, with Study Areas 51, 54 and 55 to the immediate north and east. It is approximately one mile south of Sherwood and 1.5 miles west of Wilsonville. The area is outside of Metro's jurisdictional boundary. Southwest Parrett Mountain Road, Heater Road, SW Ladd Hill Road, SW Bell Road, SW 145th Avenue, SW Tooze Road and McConnell Road provide access to the area. There is significant topographic change on the site due to a foothill that is over 1,200 feet in height. There are steep slopes through the northwestern part of the area. The area is designated entirely as Outer Neighborhood. It has 1,043 acres of vacant and buildable land out of 1,825 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: The area has 232 improved parcels out of 392 total parcels. The median improvement value is \$165,600. The median parcel size is approximately three acres. There are 39 parcels smaller than 1 acre in size, and 124 parcels exceed 5 acres. This area has a mix of agricultural, forested and urbanized lands. Since 1990, 17 residential development permits have been issued.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: Although a majority of this area falls within the service area for Wilsonville, there is no provision in the City's public service master plan to provide infrastructure services to this area. Currently, only existing developed areas are in the plan to receive public services. Wilsonville and Sherwood have stated they are not willing to serve this area. Other potential service providers are Tualatin Valley Water District for water, and Clean Water Services for sewer and stormwater.

- **Water:** Topography would make this area difficult and costly to serve. The area is predominately hilly. The area is not contiguous with Sherwood or Wilsonville. Neither city is willing to provide service. Transmission lines, pump stations, and reservoir storage would need to be added. This area is rated difficult to serve.
- **Sewer:** The existing City of Wilsonville wastewater treatment plant may not have enough capacity to be expanded. A new treatment plant, main lines and pump stations would need to be added. This area would be difficult for Clean Water Services to serve. Conditions for annexation may have to be set, and these areas may need to be annexed separately to Clean Water Services' jurisdiction. This area is rated difficult to serve.
- **Stormwater:** New development in the study area is regulated for stormwater treatment by Clean Water Services. Stormwater will be required to be treated with detention, water quality facilities, or both. Under Clean Water Services guidelines, responsibility for the required treatment will be with the developer. With the required treatment, impacts to downstream facilities will be minimal. Clean Water Services anticipates no difficulty in implementation. This area is rated easy to serve.

Agricultural Analysis

Zoning: This area is entirely exception land and is zoned AF5 by Washington county and RRFF5 by Clackamas County. To the north is a mixture of resource land zoned EFU and exception land in Study Areas 54 and 55. To the east and south is resource land zoned EFU. To the west is resource land zoned TBR, AGF, and AF20.

Current Agricultural Activity: There are a few localized areas of field and orchard uses however, this study area is predominantly rural residential with associated pasture, field crop and forested uses. There are a number of large forested areas associated with stream corridors. To the north are scattered areas of field crop and pastureland. To the east and southeast is an extensive area of field crop and pastureland that also includes some orchard uses and forested parcels. The area to the southwest is mainly forested but does include a few areas of pastureland and tree farms including the Magness Memorial Tree Farm. To west is a mixture of field and row crops, pastureland and forest.

Compatibility: Urbanization of this area would result in an increase in traffic on SW Parrett Mountain Road, SW Ladd Hill Road, SW Bell Road and Baker Road. This increased traffic could impede the normal movement of farm equipment and affect the transport of agricultural goods produced to the south along Baker Road and SW Ladd Hill Road. Urbanization of this area would bring development directly adjacent to active farming areas on the east and south side therefore issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development may occur. A tributary of Cedar Creek passes through the northern portion of this area as it flows north toward Sherwood. The North Fork of Corral Creek and other tributaries flow through the area to the south toward the Willamette River. Urbanization of this area would result in increased impervious surfaces and may diminish water quality and increase flooding of Corral Creek negatively affecting agricultural activities near the Willamette River. Cedar Creek flows in a canyon therefore reducing any affect on the limited agricultural activities to the north. Urbanization of this area may affect the value of adjacent resource land to the east and south by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Due to the large extension of agricultural activities to the east and south and the impacts that would result from such a large area urbanizing, the potential for negatively affecting agricultural activity is great.

Environmental Social Energy Economic Analysis

General Character of Area

Mostly moderate slopes with several steep-sloped areas (20 percent of area), which are concentrated in the northern section of the study area characterize Area 53. Over 40 percent of the study area is forest covered, with the largest expanse found in the northwestern portion. There are scattered rural residential uses throughout area, especially along Parrett Mountain and Ladd Hill Roads. There are a few small agricultural activities mostly in the central portion of the study area.

Environmental

There are approximately five miles of streams within Area 53. Mill Creek (central portion) and Corral Creek (southern portion) comprise most of this distance. Two short tributaries of Cedar Creek occur in the northern portion of the study area. A wetland approximately one-third of an acre in size is located in the southern portion of the study area. There are large areas of steep

slopes in both the western and eastern sections of the study area that are associated with all of the noted stream corridors. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 37 percent of the study area land in the proposed inventory. The two short tributaries of Cedar Creek and the small portion of Mill Creek that is in Washington County are identified as significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. In addition two small segments of the North Fork of Corral Creek are also identified as significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area 54		Gross Vacant Buildable Acres 134	
Total Acres	199	Dwelling Unit Capacity	718
Total Developed Acres	44	Employment Acres	0
Total Constrained Acres	16	Resource Land Acres	0
Title 3 Acres	1	Percent Tree Canopy Cover	8%
Upland Steep Slope Acres	15		

General Site Description: Study Area 54 is a small linear area located to the south of Sherwood. Southwest Brookman Road forms the edge of the area in the northwestern portion of the area. Southwest Ladd Hill Road runs in a north south direction through the middle of the study area, which is in Clackamas County and outside of the Metro jurisdictional boundary. The area is approximately two miles from the intersection of Highway 99W and Tualatin-Sherwood highway, the general vicinity of the Sherwood Town Center area and has been designated as Inner Neighborhood.

Parcelization, Building Values, Development Patterns: This study area contains 76 parcels, all but 16 of which have improvements. Six of the parcels in this study area have improvement values above \$250,000. About 30 percent of all the parcels in this study area are smaller than one acre, and about 9 percent are five acres or greater. The study area is generally in rural residential use.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of significantly high air traffic noise over this site. Available data does not suggest the existence of power lines or public easements through this site.

Public Services Feasibility: Wilsonville has shown a desire, or already has plans to serve the study area. This area is relatively smaller in size, which may make it more difficult to provide services with maximum efficiency.

- **Water:** This area would be moderately difficult to serve. The infrastructure system is in acceptable condition to develop the area, though some minimal improvements will be necessary.
- **Sewer:** This area will be difficult to serve. Steep slopes are located within the study area, which could increase construction difficulty and create operational problems. Some improvements and extensions of lines, both inside and outside the UGB, will be necessary. Existing facilities could be impacted by future development without such improvements.
- **Stormwater:** This study area would be difficult to serve. It contains land with steep slopes, which would increase construction difficulty and pose operational problems. While infrastructure is acceptable to accommodate new development in this area, some improvements and extensions of lines will be necessary, both inside and outside the UGB.

Agricultural Analysis

Zoning: This area is entirely exception land and is zoned by Clackamas County as RFFF5. To the north is the UGB. To the east and south is resource land zoned EFU in Study Area 51. To

the west is a mixture of exception land and resource land zoned AF20 in Study Area 55 and to the southwest is exception land in Study Area 53.

Current Agricultural Activity: There are selected lots in this area with small row crops or orchards but the area is primarily in rural residential use. To the east and southeast is an extensive area of field crop and pastureland that also includes some orchard and nursery uses as well as forested parcels. To the southwest are a few localized areas of field and orchard uses mixed with rural residences with associated pasture, field crop and forested uses. To the west are a few localized areas of tree farms, orchards, field crop and pasture uses mixed with rural residences with associated pasture, field crop and forested uses.

Compatibility: Urbanization of this area would increase traffic on SW Brookman Road and SW Ladd Hill Road, although the increase would be relatively minor due to the small amount of land available for new development. This increased traffic would not impede the normal movement of farm equipment nor would it affect the transport of agricultural goods produced to the east. Urbanization of this area would bring development directly adjacent to active farming areas on the east and south side therefore issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development may occur. A small portion of a tributary to Rock Creek flows through this area prior to flowing through EFU land to the east. Urbanization of this area would result in increased impervious surfaces and may diminish water quality and increase flooding downstream negatively affecting this active agriculture area. Urbanization of this area may affect the value of adjacent farmland to the east and south by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization may have an affect on the agricultural activity to the east however the small amount of land available for new development may lessen the impact.

Environmental Social Energy Economic Analysis

General Character of the Area

This area is characterized by a mixture of rural residential and agricultural uses on open and forested parcels. The majority of the area contains moderate slopes with a few substantial locations of steep slopes along a stream corridor.

Environmental

A tributary to Cedar Creek flows north through the central western edge of the area for approximately 700 feet. A tributary to Rock Creek flows in a northeast direction through the central eastern edge of the area for approximately a quarter mile. There is an area of steep slopes in the central west side, mainly associated with the tributary to Cedar Creek. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 28 percent of the study area land in the proposed inventory. Urbanization of the area may impact these three natural features as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area 55		Gross Vacant Buildable Acres 547	
Total Acres	964	Dwelling Unit Capacity	3,446
Total Developed Acres	192	Employment Acres	-
Total Constrained Acres	231	Resource Land Acres	313
Title 3 Acres	139	Percent Tree Canopy Cover	20%
Upland Steep Slope Acres	92		

General Site Description: Study Area 55 sits immediately south of Sherwood. Southwest Pacific Highway defines its western edge. The eastern edge is marked by SW Brookman Road, which also marks the western edge of Study Area 54. This study area is completely within Washington County, and is outside of the Metro jurisdictional boundary. The center of the study area is approximately one mile from the intersection of Pacific Highway W and SW Tualatin-Sherwood Road, the general vicinity of Sherwood's Town Center. This study area has been designated completely as Inner Neighborhood. Approximately 547 of the 964 total acres are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains about 152 parcels, the vast majority of which have improvements. None of the tax lots in this study area have buildings with improvement values above \$250,000. About 20 percent of the tax lots in this study area are smaller than one acre, and about 65 percent of all the tax lots are smaller than five acres. Agricultural uses are evident in this area, and may include tree farms, field crops and nursery stock. Non-residential land uses include auto repair, horse stables, construction, landscaping and general contracting.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): Aerial photo inspections suggest that there may be an easement, or an unimproved road, running through the northwestern edge of the study area. There is no evidence of power lines running through this study area. There is no evidence of significantly high air traffic noise over this area.

Public Services Feasibility: Sherwood has shown a desire, or already has plans to serve the study area. The area's moderately large size may allow it to be served with relative efficiency. In addition, the area is contained within a single drainage basin.

- **Water:** In broader terms, this study area would be easy to serve. The infrastructure system is in acceptable condition to develop the area. Minimal improvements within the UGB should be expected.
- **Sewer:** This area would be easy to serve. However, steep slopes in the area could pose some construction difficulties and could create some operational problems. The infrastructure system is able to serve new development, though some improvements and extensions of lines are expected, both inside and outside the UGB.
- **Stormwater:** This area would be easy to serve. However, steep slopes, as noted above, could also pose construction and operational issues. While infrastructure is able to serve new development in this area, some improvements will be necessary.

Agricultural Analysis

Zoning: This area in Washington County contains exception land zoned AF5 and AF10 and 313 acres of resource land zoned AF20. To the north is the UGB. To the east is a strip of exception land in Study Area 54 and resource land zoned EFU in Study Area 51. To the south is exception land in Study Area 53 and resource land zoned AF20. To the west is exception land and resource land zoned AF20 in Study Area 58.

Current Agricultural Activity: The agricultural uses in this area include a few localized areas of tree farms, orchards, field crop and pasture uses mixed with rural residences with associated pasture, field crop and forested uses. To the east are selected lots with small row crops or orchards on exception land and further east is an extensive area of EFU land that supports a mixture of row and field crops, pastureland, nursery and orchard operations and forested areas. To the south are localized areas of field and orchard uses and rural residences with associated pasture, field crop and forested uses. To the southwest are a few large parcels of field and row crops and pastureland. To the west across Pacific Highway W is a large area of orchards, field crops and tree farms.

Compatibility: Urbanization of this area will increase traffic on SW Brookman Road, SW Middleton Road and SW Ladd Hill Road. This increase in traffic could impede the normal movement of farm equipment and affect the transport of agricultural goods produced to the east and southeast especially along SW Ladd Hill Road. Urbanization of this area would bring development directly adjacent to a few active farming locations on the east and south side therefore issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development may occur. Pacific Highway W would act as a buffer for the agriculture areas to the west and serve to reduce complaints if this study area urbanized. Goose Creek and Cedar Creek and their tributaries flow through this area on their way north to Sherwood. Urbanization of this area would result in increased impervious surfaces and may diminish water quality and increase flooding downstream but these consequences would not affect any agricultural activities. Urbanization of this area may affect the value of a few adjacent farmland parcels by encouraging land banking and speculation. Overall, urbanization of this area may impact only a few areas of agricultural activity to the east and south.

Environmental Social Energy Economic Analysis

General Character of the Area

A mixture of rural residential and agricultural uses on open and forested parcels characterizes this area. There are a few large agricultural parcels in the central portion of the area. The northern portion of the area is flat to gently sloped while the southern portion is moderately to steeply sloped. There are a number of streams, many of which have steep slopes.

Environmental

Goose Creek flows in a southeasterly direction through the northwest corner prior to joining Cedar Creek in the central portion of the study area. Goose Creek has a number of small tributaries and the total stream corridor is approximately one mile. Cedar Creek flows in a southwestern-northeastern direction through the center of the study area. It has five tributaries that flow from the south and two from the north. The total stream corridor length is approximately six miles. There is a large floodplain associated with the main stem of Cedar Creek that extends approximately 1.7 miles in length and varies in width from 180-670 feet. There is a smaller floodplain area centered on Goose Creek near the confluence with Cedar

Creek that varies in width from 170-300 feet. There are large areas of steep slopes associated with the main stem of Cedar Creek and the tributaries from the south. There are five wetlands that are centered on streams that vary in size from 4,000 feet to 3 acres, totaling 4.6 acres altogether. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 56 percent of the study area land in the proposed inventory. The main stems of Goose Creek and Cedar Creek, and four of Cedar Creek's tributaries are identified as significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. Urbanization of this area may impact these natural resources as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area	56	Gross Vacant Buildable Acres	47
Total Acres	162	Dwelling Unit Capacity	358
Total Developed Acres	60	Employment Acres	0
Total Constrained Acres	40	Resource Land Acres	0
Title 3 Acres	22	Percent Tree Canopy Cover	10%
Upland Steep Slope Acres	18		

General Site Description: Study Area 56 is situated in unincorporated Washington County. This area is outside Metro's jurisdictional boundary. It is not contiguous to the UGB, as it is southwest of Areas 55 and 58. This area is on a hillside where Bell Road and Highway 99W meet, and these roads provide access to the area. The area is designated entirely as Outer Neighborhood. Of the 162 total acres, 47 acres are vacant and buildable.

Parcelization, Building Values, Development Patterns, Vacant Land: There are 46 parcels with recorded improvement values out of 51 total parcels. The median parcel improvement value is \$100,250. There are 23 parcels smaller than 1 acre, and 9 parcels exceed 5 acres. Land in this area is in agricultural and urban use. Since 1990, four permits for residential development have been issued.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This study area falls within several jurisdictions for public services, and the following conditions apply:

- **Water:** This study area is approximately two miles from Sherwood, and not contiguous to its city limits. Tualatin Valley Water District would be the service provider for the area. Transmission lines would need to be added, and a booster pump may be required. This is a small area for service. This area is rated moderately difficult to serve.
- **Sewer:** Clean Water Services would be the service provider. The area could easily be served, but would require pipe upsizing and possible plant upsizing. Information provided assumes that current plants and trunk lines are at capacity. Conditions may have to be set on annexation. This area is rated moderately difficult to serve.
- **Stormwater:** New development in the study area is regulated for stormwater treatment by Clean Water Services. Stormwater will be required to be treated with detention, water quality facilities, or both. Under Clean Water Services guidelines, responsibility for the required treatment will be with the developer. With the required treatment, impacts to downstream facilities will be minimal. Clean Water Services anticipates no major difficulty in implementation. Due to other environmental features, this area is rated moderately difficult to serve.

Agricultural Analysis

Zoning: This small area of exception land is zoned AF5 by Washington County. To the north is resource land zoned AF20 and EFU, some of which is in Study Area 58. To the east and south across Highway 99W is resource land zoned AF20 and exception land. To the west is resource land zoned AF20.

Current Agricultural Activity: The agricultural uses in this area include a few localized areas of pastureland and row crops with a predominant use of rural residences. To the north/west is an extensive area of orchard, field crops and pastureland. To the east and south across Highway 99W is a mixture of field and row crops, pastureland and forest coverage.

Compatibility: Urbanization of this area will increase traffic on Highway 99W, Old Pacific Highway W, Hells Canyon Road and Bell Road, although the increase would be relatively minor due to the small amount of land available for new development. This increased traffic would not impede the normal movement of farm equipment nor would it affect the transport of agricultural goods produced to the west and north. Urbanization of this area would bring development directly adjacent to active farming areas to the east and north/west therefore issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development may occur. Highway 99W would act as a buffer for the agriculture areas to the east and serve to reduce complaints if this study area urbanized. A tributary of Cedar Creek flows through this area. Urbanization of this area would result in increased impervious surfaces and may diminish water quality and increase flooding downstream but these consequences would not affect the agricultural activities to the east due to the stream flowing near the highway in a gully. Urbanization of this area may affect the value of adjacent resource agricultural parcels to the north by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization may have an affect on the agricultural activity to the north however the small amount of land available for new development may lessen the impact.

Environmental Social Energy Economic Analysis

General Character of Area

The central portion of this area is mostly open land with scattered rural residential and some small agricultural uses. The majority of the forest canopy is located along the two stream corridors in the northern and southern portions. The majority of the area is moderately sloped with three locations of steep slopes.

Environmental

Two tributaries flow in an easterly direction into Cedar Creek. One is located along the northern portion of the area and the other in the lower third. Together they total approximately three-fourths of a mile of stream corridor. There are steep slopes adjacent to both tributaries, some are located in the jutting southern peninsula of the area as well as in dispersed smaller segments. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 20 percent of the study area land in the proposed inventory. The two tributaries of Cedar Creek are identified as significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area	57a	Gross Vacant Buildable Acres	3
Total Acres	4	Dwelling Unit Capacity	15
Total Developed Acres	1	Employment Acres	0
Total Constrained Acres	0	Resource Land Acres	4
Title 3 Acres	0	Percent Tree Canopy Cover	0%
Upland Steep Slope Acres	0		

General Site Description: Study Area 57a is a single parcel of land in unincorporated Washington County on SW Lebeau Road. This area is approximately three miles northwest of Sherwood. It is not contiguous to the UGB. There is not much elevation change in this area. It is designated as Outer Neighborhood. There are three vacant and buildable acres out of four total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: The one parcel in this study area is 4.3 acres. Records indicate that this dwelling was permitted after 1990.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This study area falls within several jurisdictions for public services, and the following conditions apply:

- **Water:** Tualatin Valley Water District would be the service provider for this study area. The area is not contiguous to existing service areas. The cost of pipe installation would not be justified for the low volume of service to be provided. This area is rated moderately difficult to serve.
- **Sewer:** Clean Water Services would be the service provider for this study area, but would not be willing to annex it. The area is very small, not contiguous, and has no natural drainage. This area is rated moderately difficult to serve.
- **Stormwater:** New development in the study area is regulated for stormwater treatment by Clean Water Services. Stormwater will be required to be treated with detention, water quality facilities, or both. Under Clean Water Services guidelines, responsibility for the required treatment will be with the developer. With the required treatment, impacts to downstream facilities will be minimal. Clean Water Services anticipates no difficulty in implementation. This area is rated easy to serve.

Agricultural Analysis

Zoning: The three separate parcels that make up this study area are designated as marginal lands by Washington County, which is a resource land classification and are zoned AF20. All three of the parcels are bordered by resource land on three sides that is zoned AF20.

Current Agricultural Activities: The parcel adjacent to Highway 99W is part of a horse riding stable complex and contains no agricultural activity. To the west and north of this parcel are some large areas devoted to orchard, field crops and pastureland. The two marginal land parcels north of Study Area 60 contain only minor pastureland activity and forest cover. Mostly rural residences and some additional pasture and forestland surround the farthest west parcel. The other parcel is surrounded by row and field crops, orchards, and forested parcels.

Compatibility: Urbanization of these three parcels would not have an affect on the movement of farm equipment nor would it affect the transport of agricultural goods. Urbanization of the eastern most parcel to the north would bring new development directly adjacent to active farming parcels which could result in issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development. The West Fork of Chicken Creek flows through the eastern most parcel to the north prior to flowing through active farming areas. Urbanization of this area would result in increased impervious surfaces however the limited amount of development that could occur on this one parcel would not diminish water quality and increase flooding in the active farming areas. Overall, due to the limited amount of development that could occur on these three parcels, urbanization would not affect adjacent agricultural activity.

Environmental Social Energy Economic Analysis

General Character of Area

Area 57 (1) is adjacent to Pacific Highway and is mostly open land engaged in agricultural activity and has a complex of buildings located in its northwest corner. The majority of the area is gently to moderately sloped. Forested areas are located along the eastern and southern perimeter of the land, with a thinner canopy of trees running along the northern edge of the land. Area 57 (2) is located on the west side of Lebeau Street, south of Scholls Road and east of Highway 219. The land is characterized by moderate slopes, with the greater portion of the western half of the study area engaged in agricultural activity, and the remainder in open land. Area 57 (3) is located north of Areas 59 and 60. The top three-fourths of the area is moderately sloped, while the bottom quarter is steeply sloped. Three quarters of the land is forested, with the heaviest canopy south of the creek located in the central portion of the study area. There is open land along the northern and top half of the western perimeters.

Environmental

Area 57(1) A tributary of Cedar Creek flows through a portion of the northeast corner of the study area for approximately 390 feet. Area 57 (3) Chicken Creek flows for one tenth of a mile east across the central portion of the study area. There are steep slopes located in the bottom fourth of this area. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 57 percent of the study area land in the proposed inventory. Urbanization of these three areas may impact the natural resources as outlined in the introduction to the ESEE analysis.

Study Area	57b	Gross Vacant Buildable Acres	12
Total Acres	17	Dwelling Unit Capacity	58
Total Developed Acres	0	Employment Acres	0
Total Constrained Acres	5	Resource Land Acres	17
Title 3 Acres	2	Percent Tree Canopy Cover	38%
Upland Steep Slope Acres	3		

General Site Description: Study Area 57b is a single parcel of land in unincorporated Washington County approximately one mile northwest of Sherwood. It is outside Metro's jurisdictional boundary, and is not contiguous to the UGB. The southern end of the area, which may be accessible from the east via Conzelmann Road, is fully constrained by slopes above 25 percent. This area has been designated as Outer Neighborhood. It has 12 vacant and buildable acres of out 17 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: This area contains only one parcel with no improvements. It is approximately 17 acres in size. The area appears to contain both agricultural and forest uses.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This study area falls within several jurisdictions for public services, and the following conditions apply:

- **Water:** Tualatin Valley Water District would be the service provider for this study area. The area is not contiguous to existing service areas. The cost of pipe installation would not be justified for the low volume of service to be provided. This area is rated difficult to serve.
- **Sewer:** Clean Water Services would be the service provider for this study area, but would not be willing to annex it. The area is very small, not contiguous to existing served areas. It is also has no natural drainage. This area is rated moderately difficult to serve.
- **Stormwater:** New development in the study area is regulated for stormwater treatment by Clean Water Services. Stormwater will be required to be treated with detention, water quality facilities or both. Under Clean Water Services guidelines, responsibility for the required treatment will be with the developer. With the required treatment, impacts to downstream facilities will be minimal. Clean Water Services anticipates no major issues. Due to other environmental features, this area is rated moderately difficult to serve.

Agricultural Analysis

See Study Area 57a.

Environmental Social Energy Economic Analysis

See Study Area 57a.

Study Area	57c	Gross Vacant Buildable Acres	7
Total Acres	8	Dwelling Unit Capacity	45
Total Developed Acres	0	Employment Acres	0
Total Constrained Acres	0.3	Resource Land Acres	8
Title 3 Acres	0.3	Percent Tree Canopy Cover	1%
Upland Steep Slope Acres	0		

General Site Description: Study Area 57c is a single parcel of land in unincorporated Washington County. It is not contiguous to the UGB, but is situated about two-thirds of a mile southwest of Sherwood, immediately west of the point where Highway 99W meets Middleton Road. It is outside Metro's jurisdictional boundary. This area is relatively flat. The area has seven vacant and buildable acres out of eight total acres. It is designated Inner Neighborhood.

Parcelization, Building Values, Development Patterns, Vacant Land: The area is composed of a single parcel in non-residential use, with a driveway and small outbuildings. The driveway and uses are associated with the larger, 36-acre campus industrial facility adjoining on the west, in Study Area 58. This site is approximately 7.6 acres in size. Permits for minor alterations have been issued on this site, but not for new residential development.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This study area falls within several jurisdictions for public services, and the following conditions apply:

- **Water:** Tualatin Valley Water District would be the service provider for this study area. The area is not contiguous to existing service areas. The cost of pipe installation would not be justified for the low volume of service to be provided. This area is rated moderately difficult to serve.
- **Sewer:** Clean Water Services would be the service provider for this study area. Conditions may have to be set on annexation because plants and trunk lines are at capacity. Some infrastructure adjustments would be required to serve this area, though service could be provided. This area is rated moderately difficult to serve.
- **Stormwater:** New development in the study area is regulated for stormwater treatment by Clean Water Services. Stormwater will be required to be treated with detention, water quality facilities, or both. Under Clean Water Services guidelines, responsibility for the required treatment will be with the developer. With the required treatment, impacts to downstream facilities will be minimal. Clean Water Services anticipates no difficulty in implementation. This area is rated easy to serve.

Agricultural Analysis

See Study Area 57a.

Environmental Social Energy Economic Analysis

See Study Area 57a.

Study Area	58	Gross Vacant Buildable Acres	337
Total Acres	463	Dwelling Unit Capacity	1,815
Total Developed Acres	63	Employment Acres	-
Total Constrained Acres	64	Resource Land Acres	332
Title 3 Acres	36	Percent Tree Canopy Cover	21%
Upland Steep Slope Acres	27		

General Site Description: Study Area 58 is situated within a section of unincorporated Washington County that is adjacent to the southwestern corner of Sherwood and the UGB. The area is outside of Metro's jurisdictional boundary, which partially defines the area's northeastern boundary. Highway 99W runs along the entire eastern extent of the study area. Highway 99W and Chapman Road serve the area. This study area has some steep contours running through forested areas along the western edge. The area is designated as Inner Neighborhood with a small portion designated as Corridor, along Pacific Highway. There are 337 vacant and buildable acres out of 463 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: Of the 57 total parcels, 36 parcels have recorded improvement values. The median improvement value is \$115,000. The median parcel size is five acres. There are 4 parcels smaller than 1 acre in size, and 29 parcels exceed 5 acres. The area is almost exclusively in agricultural use, with the exception of some residential and forested land on the steep slopes in the area's western section. In addition, a large 36-acre campus industrial facility is located in the southern end of this area, adjacent to Highway 99W. Since 1990, four new single-family residential development permits have been issued.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This study area falls within several jurisdictions for public services, and the following conditions apply:

- **Water:** The Tualatin Valley Water District would be the water service provider for this area. There is service in the area, however there is little pressure on the upper end of the study area. Service would require the addition of reservoirs and possible pump stations. This area is rated difficult to serve.
- **Sewer:** Clean Water Services would be the service provider for this area. Conditions may have to be set on annexation because plants and trunk lines are at capacity. Some infrastructure adjustments may be required. This area is rated moderately difficult to serve.
- **Stormwater:** New development in the study area is regulated for stormwater treatment by Clean Water Services. Stormwater will be required to be treated with detention, water quality facilities, or both. Under Clean Water Services guidelines, responsibility for the required treatment will be with the developer. With the required treatment, impacts to downstream facilities will be minimal. Clean Water Services anticipates no difficulty in implementation. This area is rated easy to serve.

Agricultural Analysis

Zoning: This area contains exception land zoned AF5 and 332 acres of resource land zoned AF20 by Washington County. To the north is exception land and resource land zoned AF20 in Study Area 59. To the east is exception land and resource land zoned AF20 in Study Area 55. To the south is a parcel of marginal land in Study Area 57, exception land in Study Area 56 and resource land zoned AF20. To the west is resource land zoned AF20.

Current Agricultural Activity: The majority of this study area is devoted to agricultural activities including orchards, tree farms and field crops. There is also a large riding stable in the southern portion of the area. To the north are dispersed areas of field crops and orchards intermixed with rural residences. To the east are a few localized areas of tree farms, orchards, field crop and pasture uses mixed with rural residences with associated pasture, field crop and forested uses. To the south across Highway 99W is a pocket of pastureland and row crops. To the west is a large area of pastureland, nursery and orchards.

Compatibility: Urbanization of this area will increase traffic on Highway 99W and Chapman Road. This increased traffic may impede the normal movement of farm equipment and affect the transport of agricultural goods produced to the west and southwest. Urbanization of this area would bring development directly adjacent to active farming areas on the west side therefore issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development may occur. Highway 99W would act as a buffer for minor agriculture areas to the east and serve to reduce complaints if this study area urbanized. Chicken Creek flows north through the western edge of the study area. Urbanization of this area would result in increased impervious surfaces however the limited amount of development that could occur at the edge would not diminish water quality and increase flooding in the active farming areas much further to the north. The portion of Chicken Creek that flows through this area as well as Study Area 59 to the north is in a ravine, further reducing any chances for flooding. Urbanization of this area may affect the value of adjacent resource land to the west by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization may have some affect on the agricultural activity to the west.

Environmental Social Energy Economic Analysis

General Character of Area

The study area is located on the western side of Highway 99W, and is mostly open land engaged in a patchwork of agricultural activity with a scattering of associated buildings. Moderate slopes characterize the majority of the area, with a few areas of steep slopes located in the northwestern portion of the study area. There are scattered pockets of trees, with the greatest concentration of canopy associated with the steep sloped Chicken Creek corridor. Four creeks and one small wetland are located in the study area.

Environmental

Two tributaries of Cedar Creek flow south from the lower portion of the area. One is associated with a small wetland slightly larger than a third of an acre in size. The steeply sloped, heavily treed Chicken Creek corridor is located in the western top portion of the study area. There are also some areas of steep slopes just east of Chicken Creek. Goose Creek flows through the eastern edge of the middle portion of the area. The total length of stream corridor in this study area is approximately one mile. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 30 percent of the study area land in the proposed inventory. Chicken Creek, Goose

Creek and the western tributary of Cedar Creek are identified as significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area 59		Gross Vacant Buildable Acres 749	
Total Acres	1,009	Dwelling Unit Capacity	3,916
Total Developed Acres	119	Employment Acres	-
Total Constrained Acres	133	Resource Land Acres	259
Title 3 Acres	98	Percent Tree Canopy Cover	10%
Upland Steep Slope Acres	35		

General Site Description: Study Area 59 is situated immediately west of Sherwood. Southwest Elwert Road defines its eastern edge. Southwest Conzelmann Road defines the northern side. Southwest Ramblin Reck Road defines the western edge. The study area is accessible via SW Edy Road at the north, SW Haide Road toward the center, and SW Kruger Road toward the south. This area is in Washington County, and is inside of the Metro jurisdictional boundary. The center of this study area is approximately two miles from the intersection of SW Pacific Highway and SW Tualatin-Sherwood Road, the general vicinity of Sherwood's Town Center area. This study area has been designated entirely as Inner Neighborhood. Approximately 749 of the 1,009 acres in this study area are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains about 140 parcels, about 100 of which have improvements. Fewer than five of the parcels with improvements have building values above \$250,000. Approximately 10 percent of the parcels in this study area are smaller than one acre, and about 60 percent of all the parcels in this study area are smaller than five acres. Agricultural uses are present in this study area, and may include field crops, nursery stock and trees. Non-residential land uses include contracting, appliances, excavating, and a nursery. There is no evidence of mining or aggregate activities in this area.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of significantly high air traffic noise over this site. There is also no evidence of power lines or other public easements running through this site.

Public Services Feasibility: Wilsonville showed a desire, or already has plans to serve the study area. The moderately large size of this study area will allow it to be served with relative efficiency. However, the area contains multiple drainage basins, which are also a consideration.

- **Water:** In broader terms, this study area would be easy to serve. The infrastructure system is in acceptable condition to develop the area. Minimal improvements within the UGB should be expected.
- **Sewer:** This area would be easy to serve. However, some improvements and extensions of lines inside and outside the existing UGB will be needed to alleviate the impacts of new development on the existing system.
- **Stormwater:** In broader terms, this study area would be easy to serve. Although the infrastructure is in acceptable condition to develop the area, some improvements and extensions of lines are to be expected, both inside and outside the UGB.

Agricultural Analysis

Zoning: This area contains exception land zoned AF5 and AF10 and 259 acres of resource land zoned AF20 by Washington County. To the north is resource land zoned AF20, two parcels of marginal land in Study Area 57 and exception land. To the east is the UGB. To the south is resource land zoned AF20 and exception land in Study Area 58. To the west is exception land in Study Area 60 and resource land zoned AF20.

Current Agricultural Activity: There are large pockets of nursery, field crop and pastureland in the eastern, northern and southern portions of the study area. A large forested area runs through the central portion of the area that has some field crop areas along the edge. To the north is a fairly large area of field crop, orchards and nursery land. To the south is a substantial area of orchards, tree farms and field crops. Directly adjacent to the west are dispersed areas of field crops with a much larger expanse of nursery and field and row crops further west.

Compatibility: Urbanization of this area would increase traffic on SW Elwert Road, SW Edy Road and SW Kruger Road. This increased traffic could impede the normal movement of farm equipment and affect the transport of agricultural goods produced to the north, south and west of this area. Urbanization of this area would bring urban development directly adjacent to active farming areas to the west, north and south therefore issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development may occur. Chicken Creek and a number of its tributaries pass through this area prior to flowing through active farming areas to the north. Urbanization of this area would result in increased impervious surfaces that may diminish water quality and increase flooding downstream in these active farming areas. Urbanization of this area may affect the value of adjacent farmland to the north and south by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. This is also true of the exception land to the west that is currently in agricultural use. Overall, urbanization of this area has a high potential to negatively affect adjacent agricultural activity.

Environmental Social Energy Economic Analysis

General Character of the Area

This area is characterized by large pockets of agricultural activity and rural residences on generally flat to moderately sloped land. The majority of the land is open with forested areas associated with stream corridors.

Environmental

Chicken Creek flows in a northeasterly direction through the center of the area and joins the West Fork of Chicken Creek just prior to leaving the study area. There are four tributaries to Chicken Creek and two tributaries to West Fork Chicken Creek that also run through the area. A small segment of Goose Creek flows through the very bottom portion of the area. The total stream corridor length is approximately 4.3 miles. The floodplain associated with Chicken Creek extends west into the study area for approximately a quarter mile. The floodplain associated with the West Fork Chicken Creek extends a third of a mile into the study area. Both floodplains are approximately 250 feet in width. There are six wetlands, mainly associated with Chicken Creek that total 24 acres in size. There are a few areas of steep slopes associated with the main stem of Chicken Creek. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 40 percent of the study area land in the proposed inventory. Chicken Creek, West Fork of Chicken Creek and their tributaries are identified as significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. The small segment

of Goose Creek in the lower portion of the study area is also identified as a significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. Urbanization of the area may impact these stream features as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area	60	Gross Vacant Buildable Acres	122
Total Acres	244	Dwelling Unit Capacity	537
Total Developed Acres	43	Employment Acres	7
Total Constrained Acres	76	Resource Land Acres	0
Title 3 Acres	47	Percent Tree Canopy Cover	41%
Upland Steep Slope Acres	29		

General Site Description: Study Area 60 is an L-shaped area in unincorporated Washington County. It is located outside of Metro's jurisdictional boundary. It is not adjacent to the UGB, with study area 59 immediately to the east. A ridge of steep slopes cuts through the middle of the study area. Southwest Kruger Road and SW Edy Road provide access to the area. The area is designated as Outer Neighborhood with a small area of Corridor, along SW Edy Road. There are 122 vacant and developable acres out of 244 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: Out of 42 parcels, the area has 34 parcels that have recorded improvement values. The median parcel improvement value is \$137,865. The median parcel size is 4.3 acres. There are 4 parcels are smaller than 1 acre in size, and 18 parcels are larger than 5 acres. The area is predominantly in forest and agricultural use, with some associated residential uses. Since 1990, four development permits have been issued for single-family dwellings.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This study area falls within several jurisdictions for public services, and the following conditions apply:

- **Water:** The Tualatin Valley Water District would be the water service provider for this area. It is approximately one-half mile to the reservoir service line. Service would not be difficult to provide, although the higher portion of the delivery system may need to be boosted. Steep topography will also pose some issues with installation. There are no reported rocky soils in the area. This area is rated moderately difficult to serve.
- **Sewer:** Clean Water Services would be the service provider for this area. Conditions may have to be set on annexation because plants and trunk lines are at capacity. Some infrastructure additions may be necessary. This area is rated moderately difficult to serve.
- **Stormwater:** New development in the study area is regulated for stormwater treatment by Clean Water Services. Stormwater will be required to be treated with detention, water quality facilities, or both. Under Clean Water Services guidelines, responsibility for the required treatment will be with the developer. With the required treatment, impacts to downstream facilities will be minimal. Clean Water Services anticipates no major difficulties. Due to environmental features, this area is rated as moderately difficult to serve.

Agricultural Analysis

Zoning: This area is entirely exception land and is zoned AF5 and AF10 by Washington County. To the north is resource land zoned AF20, two parcels of marginal land in Study

Area 57, and exception land. To the east is resource land zoned AF20 and exception land in Study Area 59. To the south and west is resource land zoned AF20 and exception land.

Current Agricultural Activity: This area includes a few locations of field crops intermixed with forested land and rural residential development. To the north are a few large parcels of field and row crops, nursery and orchards and pastureland dispersed between forested parcels and rural residences. To the east are a couple of large pockets of nursery, field crop and pastureland, and a large forested area with field crops along the edge. To the south and west is a large expanse of nursery, row crop and orchards intermixed with forested land.

Compatibility: Urbanization of this area would increase traffic on SW Elwert Road, and SW Kruger Road. This increased traffic could impede the normal movement of farm equipment and affect the transport of agricultural goods produced to the north, south and west of this area. Urbanization of this area would bring urban development directly adjacent to active farming areas to the north, south and west therefore issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development may occur. A tributary of Chicken Creek flows through this area on its course north to the Tualatin River. Urbanization of this area would result in increased impervious surfaces that may diminish water quality and increase flooding downstream in the active farming areas to the north. Urbanization of this area may affect the value of adjacent resource land to the north, south and west by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area has a high potential to negatively affect adjacent agricultural activity.

Environmental Social Energy Economic Analysis

General Character of Area

The top and bottom one-third of this study area are mostly open land, with moderate slopes and rural residential uses. Radiating out from the central portion of the land are fingers of steep slopes and heavy tree canopies associated with four of the five stream segments that flow through the study area.

Environmental

There are five stream segments that flow through the study area toward Chicken Creek, four are in the top half of the area and the fifth is located in the bottom half. The total length of the stream corridor is approximately 1.5 miles. Steep slopes are located through the central portion, along the bottom half of the eastern edge, and along the bottom half of the western edge of the study area. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 45 percent of the study area land in the proposed inventory. Four of the stream segments noted above are identified as significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area 61-1		Gross Vacant Buildable Acres 24	
Total Acres	50	Dwelling Unit Capacity	117
Total Developed Acres	24	Employment Acres	2
Total Constrained Acres	2	Resource Land Acres	-
Title 3 Acres	2	Percent Tree Canopy Cover	-
Upland Steep Slope Acres	-		

General Site Description: Study Area 61-1 is a small area located just west of Tualatin. Southwest Pacific Drive and Highway 99W (which also constitutes the Metro jurisdictional boundary) bisect the study area. This area sits fully within Washington County. The northern portion is inside of the Metro boundary. This area is also near Tualatin's general industrial area. This study area has been designated as Inner Neighborhood and Industrial south of Highway 99W. Approximately 24 of the 50 acres in this study area are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains only 12 tax lots, half have improvement values, though none have improvement values above \$250,000. Two of the tax lots in this study area are less than one acre; most of the remaining tax lots are less than five acres. Agricultural uses in this study area consist mainly of field crops and nursery stock. Non-residential land uses include a nursery.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): A power line bisects this study area. There is no evidence of significantly high air traffic noise over this area.

Public Services Feasibility: The study area falls within several jurisdictions for public services. The area's relatively small size may prevent it from being served with maximum efficiency. This area is contained within a single drainage basin.

- **Water:** Tualatin appears willing to accept the area within its service area, if necessary. This study area would be moderately difficult to serve. The infrastructure system is in acceptable condition to develop the area. Minimum improvements within the UGB should be necessary.
- **Sewer:** Clean Water Services appears willing to accept the study area within its service area, if necessary. Generally, this area would be difficult to serve. Infrastructure improvements will be needed to alleviate the impact of new development on the existing system.
- **Stormwater:** Clean Water Services appears willing to accept the study area within its service area, if necessary. This area would be moderately difficult to serve. The infrastructure system is generally acceptable condition to develop the area, though some minimal improvements within the UGB are anticipated.

Agricultural Analysis

Zoning: This study area in Washington County is composed of two sub-areas of exception land, the area to the north is zoned AF5 and RR5, and the area to the south is zoned MAE. The northern sub-area is bordered on the east by the UGB with resource land zoned AF20 and EFU on the remaining three sides. The southern sub-area is bordered on the east and south by the UGB with resource land zoned AF20 and EFU on the remaining two sides.

Current Agricultural Activity: The northern sub-area includes a nursery operation and field crop. The southern one contains some pastureland. Large areas of nursery, pasture and field crop uses are adjacent to both areas, mainly to the west. There is a large stretch of Tualatin River Natural Wildlife Refuge land further west of these areas. There is a Metro owned openspace to the north of the northern sub-area.

Compatibility: Urbanization of this area may result in a small increase in traffic on SW Kummrow Avenue and Highway 99W. Due to the limited amount of development that could occur in this small area, any increased traffic would not impede the normal movement of farm equipment to the agricultural lands to the west and north. Urbanization of this area would bring urban development directly adjacent to active farming areas to the west therefore issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development may occur. Due to the limited amount of development that could occur in this small area, any affect would be minimal. Urbanization of this area may affect the value of adjacent resource land by encouraging land banking and speculation that results in the inability of farmers to acquire parcels of land needed for agricultural production. However the minimal amount of new development that could occur versus the large expanse of agricultural land and land in public ownership would negate this consequence. Overall, urbanization of this area would have little affect on adjacent agricultural activity.

Environmental Social Energy Economic Analysis

General Character of the Area

This area is separated into two small sub-areas both characterized by agricultural activity on generally flat land. The land is open and contains no stream corridors.

Environmental

Metro owns a 5.5-acre open space site in the northern sub-area that is part of a larger 125-acre Metro-owned open space to the north that stretches to the Tualatin River. The U.S. Fish and Wildlife Service owns a 1.75-acre open space site within the northern sub-area that is part of the Tualatin River National Wildlife Refuge. Due to the location of these two open space parcels within the study area, urbanization may affect the ability of these two small areas to provide species habitat and other ecological functions. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 14 percent of the study area land in the proposed inventory. The lower section of the northern sub-area is part of a larger identified significant Water Areas and Wetlands resource on Washington County's Rural/Natural Resource Plan. Urbanization may affect the ability of these two small open space areas to provide species habitat and other ecological functions.

Social Energy Economic

See Appendix A.

Study Area	61-2	Gross Vacant Buildable Acres	4
Total Acres	5	Dwelling Unit Capacity	0
Total Developed Acres	1	Employment Acres	5
Total Constrained Acres	0	Resource Land Acres	0
Title 3 Acres	0	Percent Tree Canopy Cover	0%
Upland Steep Slope Acres	0		

General Site Description: Study Area 61-2 is a portion of a single parcel in unincorporated Washington County that is adjacent to the north edge of Sherwood. The area is on SW Cipole Road, which defines its eastern boundary. Metro's jurisdictional boundary defines the northwestern edge of the study area. Its southern boundary is defined by Sherwood's border and the UGB. This area is virtually flat. It is designated completely as an Industrial Area. The area has four vacant and buildable acres out of five total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: Study Area 61-2 is a section of one 20-acre parcel. The parcel contains a single family dwelling with associated agricultural uses.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This study area falls within several jurisdictions for public services, and the following conditions apply:

- **Water:** The study area is adjacent to Tualatin and Sherwood. Tualatin Valley Water reported that Sherwood would most likely provide service, though Sherwood may not be willing to have current city services impacted. Development would require extension and possible upgrade of service lines. This area is rated moderately difficult to serve.
- **Sewer:** Clean Water Services would be the service provider for sewer for this study area. Conditions may have to be set on annexation because plants and trunk lines are at capacity. General flow is toward Tualatin, and the study area appears to be in a sensitive area. This area is rated moderately difficult to serve.
- **Stormwater:** New development in the study area is regulated for stormwater treatment by Clean Water Services. Stormwater will be required to be treated with detention, water quality facilities, or both. Under Clean Water Services guidelines, responsibility for the required treatment will be with the developer. With the required treatment, impacts to downstream facilities will be minimal. Clean Water Services anticipates no difficulty in implementation. This area is rated easy to serve.

Agricultural Analysis

See Study Area 61-1.

Environmental Social Energy Economic Analysis

See Study Area 61-1.

Study Area	62	Gross Vacant Buildable Acres	118
Total Acres	163	Dwelling Unit Capacity	644
Total Developed Acres	39	Employment Acres	0
Total Constrained Acres	17	Resource Land Acres	0
Title 3 Acres	15	Percent Tree Canopy Cover	28%
Upland Steep Slope Acres	2		

General Site Description: Study Area 62 is in unincorporated Washington County. The UGB defines the eastern and northern edges. The southern edge is defined by the Tualatin River and floodplain. The area is outside of Metro's jurisdictional boundary. Serving the area is SW 137th Avenue to the east, and SW Beef Bend Road to the north. The area is mostly flat. It is designated completely as Inner Neighborhood. There are 118 acres of vacant and developable land out of 163 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: The area has 62 parcels with recorded improvement values out of 84 total parcels. The median improvement value is \$103,500. The median parcel size is 1.3 acres. There are 35 parcels smaller than 1 acre in size, and 7 parcels are greater than 5 acres. The area is mostly in agricultural or forest use, but there is a stretch of 1-2 acre lot residential development along SW 137th Avenue and parts of SW Beef Bend Road. Since 1990, three permits for residential development have been issued.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This study area falls within several jurisdictions for public services, and the following conditions apply:

- **Water:** Tigard would be the service provider for portions of this area where there is currently no service. The Tigard Master Plan includes plans for a reservoir to be built in the vicinity of 150th and Woodhue (north of this study area) by 2021. With the reservoir in place, service could be provided easily after an addition of approximately three-quarters of a mile of trunk line. For service expansion, new contracts would have to be negotiated for additional water supplies. There are no reports of rocky soils in the area. This area is rated moderately difficult to serve.
- **Sewer:** Clean Water Services would be the service provider for this area. The area would be difficult to serve. There is currently no sewer, and costly main lines would need to be added. A portion of the area is in flood plain, which could add a constraint to annexation. This area is rated moderately difficult to serve.
- **Stormwater:** New development in the study area is regulated for stormwater treatment by Clean Water Services. Stormwater will be required to be treated with detention, water quality facilities, or both. Under Clean Water Services guidelines, responsibility for the required treatment will be with the developer. With the required treatment, impacts to downstream facilities will be minimal. Clean Water Services anticipates no difficulty in implementation. This area is rated easy to serve.

Agricultural Analysis

Zoning: This area is entirely exception land and is zoned as AF10 and RR5 by Washington County. To the north and east is the UGB. To the south and west is resource land zoned EFU and AF20.

Current Agricultural Activity: Agricultural production in this area consists of one large area of pastureland with some scattered field crops and row crops intermixed with rural residential development. To the south and west is an extensive area of field and row crops, nursery operations and pastureland. West of SW Beef Bend Road is a large parcel in Tualatin River Natural Wildlife Refuge ownership. The land directly adjacent to the Tualatin River is forested.

Compatibility: Urbanization of this area would result in an increase in traffic on SW Beef Bend Road, SW 137th Avenue, SW 147th Avenue and SW 150th Avenue. This increased traffic could affect the transport of agricultural goods produced to the west and southwest of this area along SW Beef Bend Road and SW Elsner Road. Much of this increase in traffic would likely be directed into the UGB where the increased affect from this area on the movement of goods would be negligible compared to the affect of current traffic levels on the movement of goods. The agricultural lands south of the Tualatin River would not be impacted by this increase in traffic. Urbanization of this area would bring urban development directly adjacent to active farming areas to the west therefore issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development may occur. Presently there is a grove of trees along this western edge of the study area that would help mitigate these impacts. The Tualatin River and its floodplain serves as a natural buffer between new development and the agricultural activities to the south. A couple of small streams flow through the study area to the Tualatin River. Urbanization of this area would result in increased impervious surfaces that may diminish water quality and increase flooding in these small streams but these consequences would not affect any adjacent agricultural activities. Urbanization of this area may affect the value of some adjacent farmland to the west by encouraging land banking and speculation and inhibit the ability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area may have some affect on the adjacent agricultural activity to the west.

Environmental Social Energy Economic Analysis

General Character of the Area

This area is characterized by either rural residences or agricultural activity on mostly flat to moderately sloped land. The majority of the land is open with forested areas associated with stream corridors. There are a few areas of steep slopes associated with the stream corridors.

Environmental

Two streams flow south through the area towards the Tualatin River totaling approximately two-thirds of a mile of stream corridor. There are a few small areas of steep slopes associated with the western most stream and a small area near the southern edge of the study area. The floodplain of the Tualatin River forms the southern boundary of the study area. A Metro-owned open space parcel is directly across the Tualatin River from the study area. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 41 percent of the study area land in the proposed inventory. Urbanization of the area may impact these natural features as outlined in the introduction to the ESEE analysis. Urbanization of the area would not inhibit the ability of the Metro open space site to provide species habitat and other ecological functions due to the natural buffer of the Tualatin River stream corridor

Social Energy Economic
See Appendix A.

Study Area 63		Gross Vacant Buildable Acres 183	
Total Acres	218	Dwelling Unit Capacity	688
Total Developed Acres	21	Employment Acres	-
Total Constrained Acres	15	Resource Land Acres	-
Title 3 Acres	9	Percent Tree Canopy Cover	20%
Upland Steep Slope Acres	6		

General Site Description: Study Area 63 is situated west of the UGB in unincorporated Washington County. The area is defined by SW 150th Avenue to the east, and by a section of SW April Lane to the west. This area is outside of the Metro jurisdictional boundary. It is served by SW Pomeroy Lane and by SW 150th Avenue. This study area has been designated entirely as Inner Neighborhood. It is approximately two miles from King City's Town Center area. Approximately 183 of the 218 total acres in this study area are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains about 25 tax lots, about 20 of which have reported improvement values. Approximately 10 have improvement values above \$250,000. Almost all tax lots in this study area are larger than one acre, and about one-third are between one and five acres. Limited farming uses include field crops. Non-residential uses include a seed business, residential care and construction.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of significantly high air traffic noise over this area. Available data does not suggest the existence of power lines or other public easements through this area.

Public Services Feasibility: The study area falls within several jurisdictions for public services. The smaller size of this area may prevent it from being served with maximum efficiency. This area is contained within a single drainage basin.

- **Water:** This study area would be moderately difficult to serve. The existence of subsurface rock may cause some construction difficulties. The infrastructure system is in acceptable condition to develop the area, and minimal improvements within the UGB should be expected.
- **Sewer:** Clean Water Services appears willing to accept the study area within its service area, if necessary. This area would be moderately difficult to serve due to the existence of subsurface rock, as noted above. While the infrastructure system is in acceptable condition to develop the area, some improvements and extensions of lines inside and outside the existing UGB are to be expected. Existing facilities could suffer under future development if improvements are not made.
- **Stormwater:** Clean Water Services appears willing to accept the study area within its service area if necessary. This study area would be moderately difficult to serve, due in part to the existence of subsurface rock, noted above. Although the infrastructure is in acceptable condition to develop the area, some improvements and extensions of lines are to be expected both inside and outside the UGB.

Agricultural Analysis

Zoning: This area is entirely exception land and is zoned AF5 and AF10 by Washington County. To the north and east is the UGB. To the south and west is resource land zoned EFU.

Current Agricultural Activity: There are a couple of isolated locations of nursery, field crop and pastureland uses in this predominantly rural residential area. To the south and west is an extensive area of field and row crop production and nursery operations that extends to the Tualatin River.

Compatibility: Urbanization of this area will increase traffic on SW Finis Lane, SW 150th Avenue, SW Bull Mountain Road and SW Beef Bend Road. The increased traffic on SW Beef Bend Road could impede the normal movement of farm equipment and affect the transport of agricultural goods produced to the west and south of this area. Urbanization of this area would bring urban development directly adjacent to active farming areas to the west and south therefore issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development may occur. A small stream passes through this area and flows south through active agricultural areas to the Tualatin River. Urbanization of this area would result in increased impervious surfaces and may diminish water quality and increase downstream flooding negatively affecting these agricultural areas. Urbanization of this area may affect the value of adjacent resource land to the west and south by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area may have an affect on adjacent agricultural activity to the south and west.

Environmental Social Energy Economic Analysis

General Character of the Area

An even mix of open land in rural residences and some agricultural activity and forested areas characterizes this study area. The majority of the area is moderately sloped with a small area of steep slopes in the middle, associated with one of the two stream corridors that flow through the study area.

Environmental

Two streams flow south through the area towards the Tualatin River, totaling approximately two-thirds of a mile of stream corridor. There are two small isolated wetlands totaling less than an acre in the northeast corner of the area. The western stream has an area of steep slopes adjacent to it that total approximately 6.8 acres. There are a few other very small areas of steep slopes scattered in the western part of the area. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 49 percent of the study area land in the proposed inventory. The western stream segment noted above is identified as significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. Urbanization of the area may impact these natural features as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area 64		Gross Vacant Buildable Acres 203	
Total Acres	262	Dwelling Unit Capacity	1,047
Total Developed Acres	39	Employment Acres	-
Total Constrained Acres	10	Resource Land Acres	-
Title 3 Acres	10	Percent Tree Canopy Cover	10%
Upland Steep Slope Acres	0		

General Site Description: Study Area 64 lies west of the UGB in unincorporated Washington County, just southwest of Beaverton and west of the Tigard service area. Southwest Scholls Ferry Road defines the area's northern edge. The study area is predominantly outside of the Metro jurisdictional boundary. The area is served by SW Scholls Ferry Road towards the north and by SW Bull Mountain Road, towards the southern end. Southwest Beef Bend Road divides the site into an eastern and western portion. The center of this area is approximately 2.5 miles from King City's commercial area, and about 3.5 miles, straight-line distance, from Tigard's general commercial area. This area has been designated as Inner Neighborhood and Corridor. Approximately 203 of the 262 total acres are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains about 40 tax lots, roughly half of which have reported improvement values. There is only one tax lot in this study area with a reported improvement value above \$250,000. About five tax lots are smaller than one acre, and about half of all the tax lots in this study area are smaller than five acres. Agricultural uses, including nursery stock and field crops, appear to be active in this area. Non-residential land uses include animal care, tree service and transportation services.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of significantly high air traffic noise over this area. Available data does not suggest the existence of power lines over this area. A public easement appears to be situated near SW Beef Bend Road.

Public Services Feasibility: The study area falls within several jurisdictions for public services, and the following conditions apply:

- **Water:** Tigard showed a desire or already has plans to serve the area. This study area would be moderately difficult to serve, partially because this area contains subsurface rock. Subsurface rock may pose some construction complications. The current infrastructure is in acceptable condition to accommodate new development, and minimal improvements within the UGB should be expected.
- **Sewer:** Clean Water Services appears willing to accept the study area within its service area if necessary. This area would be difficult to serve. As noted above, subsurface rock may create some construction difficulties. The infrastructure will be able to accommodate development in the area, though some improvements and extensions of lines, both inside and outside the UGB, are to be expected. The existing facilities could be negatively impacted if improvements are not made.
- **Stormwater:** Clean Water Services appears willing to accept the study area within its service area, if necessary. This area would be moderately difficult to serve for the same reasons mentioned above, including the existence of subsurface rock. While

infrastructure is in acceptable condition to develop the area, some improvements and extensions of lines are to be expected, both inside and outside the UGB.

Agricultural Analysis

Zoning: This area is entirely exception land and is zoned as AF5 and AF10 by Washington County. To the east is the UGB. To the north is resource land zoned AF20 in Study Area 68. To the south and west is resource land zoned EFU and AF20.

Current Agricultural Activity: This area contains a substantial amount of agriculture activity, mainly orchards and field crops in relation to its overall size. There are a few rural residences scattered about on forested land as well. To the north is a large parcel in field crop production and smaller orchard row crop and pastureland parcels. To the south and west is an extensive area in field and row crop and orchard production. The resource land to the southwest extends for a number of miles to the Tualatin River.

Compatibility: Urbanization of this area will result in an increase in traffic on SW Scholls Ferry Road, SW Beef Bend Road and SW Bull Mountain Road. This increased traffic could impede the normal movement of farm equipment and affect the transport of agricultural goods produced to the west along SW Scholls Ferry Road and to the south along SW Beef Bend Road. Urbanization of this area would bring urban development directly adjacent to active farming areas to the north, west and south therefore issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development may occur. A small stream passes through this area and flows south through active agricultural areas to the Tualatin River. Urbanization of this area would result in increased impervious surfaces and may diminish water quality and increase downstream flooding negatively affecting these agricultural areas. Urbanization of this area may affect the value of adjacent resource land to the north, south and west by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area has a high potential to negatively impact adjacent agricultural activity.

Environmental Social Energy Economic Analysis

General Character of the Area

This area is mostly open land engaged in agricultural activity with a very small amount of forest cover that is partially along a stream corridor. The majority of the area is flat to moderately sloped.

Environmental

One stream flows west through the center of the area for just over a half a mile, ultimately joining the Tualatin River. There are two wetlands that encompass approximately three acres in the center portion of the area. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 33 percent of the study area land in the proposed inventory. The stream segment noted above is identified as significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. Urbanization of the area may impact these three natural features as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area 65		Gross Vacant Buildable Acres 290	
Total Acres	439	Dwelling Unit Capacity	1,416
Total Developed Acres	124	Employment Acres	-
Total Constrained Acres	26	Resource Land Acres	-
Title 3 Acres	12	Percent Tree Canopy Cover	40%
Upland Steep Slope Acres	14		

General Site Description: Study Area 65 lies just west of Beaverton and the UGB. Southwest Weir Road defines the northern edge, and SW Horse Tail Road defines the southern edge. Southwest Weir Road serves the area from the north, and SW 175th Avenue serves it from the northwest. This area is in Washington County, and is inside of the Metro jurisdictional boundary. Approximately 40 percent of the perimeter of this study area is adjacent to the UGB. It is about 3.5 miles from the Washington Square Regional Center. This area has been designated as Inner Neighborhood and Corridor along SW 175th Avenue. About 290 of the 439 total acres in this study area are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains about 150 tax lots, approximately 120 of which have improvements. There are approximately 25 tax lots in this study area with improvement values above \$250,000. About 20 percent of the tax lots in this study area are smaller than one acre, and over 90 percent of the tax lots are smaller than five acres. Larger tax lots are generally situated in the northern half of the area. Land uses are predominantly residential, with some agriculture and forestry. Non-residential uses include construction, real estate, special trade contracting and adult care. There is no evidence of mining or aggregate activities within this area.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of significantly high air traffic noise over this area. Available data does not suggest the existence of power lines or public easements running through this area.

Public Services Feasibility: The study area falls within several jurisdictions for public services. The relatively small size of this study area could prevent it from being served with maximum efficiency. In addition, this area contains multiple drainage basins, which is also a consideration in servicing.

- **Water:** The Tualatin Valley Water District has shown a desire or already has plans to serve the area. This study area would be moderately difficult to serve. The infrastructure system is in acceptable condition to develop the area, and some minimal improvements within the UGB will likely be necessary.
- **Sewer:** Clean Water Services appears willing to accept the study area within its service area if necessary. This area would be moderately difficult to serve. The current infrastructure system can accommodate new development, though some improvements and extensions of lines inside and outside the existing UGB will be necessary to serve new development. The existing facilities could be negatively impacted by future development if improvements are not made.
- **Stormwater:** Clean Water Services appears willing to accept the study area within its service area if necessary. This area would be moderately difficult to serve. While

current infrastructure can serve new development, some improvements and extensions of lines are to be expected, both inside and outside the UGB.

Agricultural Analysis

Zoning: This area is entirely exception land and is zoned AF5 and RR5 by Washington County. To the north and east is the UGB. To the south and west is resource land zoned AF20 and EFU in Study Area 68.

Current Agricultural Activity: The agricultural activity consists of a few minor field crops associated with rural residences, which is the predominant use in the study area. To the south and west are extensive areas of field and row crops, nursery operations, and pastureland intermixed with forested parcels.

Compatibility: Urbanization of this area will result in an increase in traffic on SW 175th Avenue, SW High Hill Lane, SW Alvord Lane, SW Weir Road and SW Scholls Ferry Road. This increased traffic could impede the normal movement of farm equipment on SW 175th Avenue and may affect the transport of agricultural goods on SW Scholls Ferry Road from the active farming areas further west. The impact on SW Scholls Ferry Road may be reduced by SW Weir Road, which also provides a direct route into Beaverton. Urbanization of this area would bring urban development directly adjacent to active farming areas to the west and south therefore issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development may occur. Urbanization of this area may affect the value of adjacent resource land to the south and west by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area may have an impact on adjacent agricultural activity to the south and west.

Environmental Social Energy Economic Analysis

General Character of the Area

The majority of this area is forested with rural residences with very minor locations of agricultural activity. The land is moderately sloped with a number of scattered locations of steep slopes. The largest steep sloped areas are adjacent to a stream corridor.

Environmental

One stream flows east through the top portion of the area toward Beaverton for just over one half mile. There is one small wetland associated with this stream that is less than a half-acre in size. There are large areas of steep slopes associated with approximately a quarter mile of the stream near the eastern edge of the study area, with other smaller locations of steep slopes dispersed throughout the western portion. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 50 percent of the study area land in the proposed inventory. The stream segment noted above is identified as significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. Urbanization of the area may impact these three natural features as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area	66	Gross Vacant Buildable Acres	96
Total Acres	114	Dwelling Unit Capacity	333
Total Developed Acres	7	Employment Acres	0
Total Constrained Acres	1.2	Resource Land Acres	114
Title 3 Acres	1.0	Percent Tree Canopy Cover	26%
Upland Steep Slope Acres	0.2		

General Site Description: Study Area 66 is a square section of unincorporated Washington County, approximately one-third mile west of Beaverton. The area is entirely within Metro's jurisdictional boundary. The northern and eastern extents of the area are defined by the UGB. Southwest 157th Avenue provides access to the area. The area has some light slopes, but no significant elevation change. This area is designated entirely as Inner Neighborhood. The area has 96 vacant and buildable acres out of 114 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: Study Area 66 has four parcels with recorded improvement values out of six total parcels. The median improvement value is \$105,000. The median parcel size is 11.5 acres. There is one parcel that is smaller than one acre and four parcels that are larger than five acres. The area is almost exclusively in agricultural use. There have been two permits issued for single-family dwellings since 1990.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This study area falls within several jurisdictions for public services, and the following conditions apply:

- **Water:** This study area is in the Tualatin Valley Water District service area. It is considered easy to serve, and is planned for. This area is rated easy to serve.
- **Sewer:** This study area is in the Clean Water Services service area, for which plants and trunk lines are at capacity. It is located at the top of a hill, and is considered moderately difficult to serve. Conditions may have to be set on annexation. The area is two to three miles from the nearest sewer connection. This area is rated moderately difficult to serve.
- **Stormwater:** New development in the study area is regulated for stormwater treatment by Clean Water Services. Stormwater will be required to be treated with detention, water quality facilities, or both. Under Clean Water Services guidelines, responsibility for the required treatment will be with the developer. With the required treatment, impacts to downstream facilities will be minimal. Clean Water Services anticipates no difficulty in implementation. This area is rated easy to serve.

Agricultural Analysis

Zoning: This area is entirely resource land zoned AF20 by Washington County. To the north and east is the UGB. To the south is exception land in Study Area 65 and resource land zoned AF20 and EFU in Study Area 68. To the west is exception land in Study Area 67.

Current Agricultural Activity: There are two large parcels in the area that are basically vacant and appear to be in a pasture or unfarmed state. To the south is a mixture forested and field

crop uses. To the southwest is a large expanse of land that is vacant and is owned by the Metro Parks and Greenspaces Department.

Compatibility: Urbanization of this area may result in a small increase in traffic on SW 175th Avenue, and SW Kemmer Road however, this increase in traffic would be focused into the current urbanized area and would have no affect on agricultural activities. Urbanization of this area would bring urban development directly adjacent to one parcel where minimal active farming is occurring therefore, complaints related to the presence of active farming practices near new development will not be an issue. Due to the limited amount of adjacent agricultural activity the value of adjacent agricultural land will not be affected by urbanization. Overall, urbanization of this area will not impact adjacent agricultural activity.

Environmental Social Energy Economic Analysis

General Character of Area

The area is characterized by gently to moderately sloped open land with scattered structures along with small farming operations. Patches of forested areas are scattered throughout but mostly concentrated in two wide swaths, one in the southern and the other in the western portions of the area.

Environmental

A small wetland, approaching one-third of an acre in size, is located in the northwest corner of the area. There are two pockets of forested steep slopes located toward the middle of the western edge of the study area. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 24 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area 67		Gross Vacant Buildable Acres 188	
Total Acres	507	Dwelling Unit Capacity	1,019
Total Developed Acres	308	Employment Acres	-
Total Constrained Acres	8	Resource Land Acres	-
Title 3 Acres	2	Percent Tree Canopy Cover	10%
Upland Steep Slope Acres	6		

General Site Description: Study Area 67 is situated west of the City of Beaverton. It is defined to the north and east by the UGB, to the south by the Metro jurisdictional boundary, and at the western edge by SW Grabhorn Road. It is in Washington County, and inside the Metro jurisdictional boundary. It is accessible via SW Miller Hill Road from the north, and SW Kenner Road from the east. This study area is about three miles from the Washington Square Regional Center area. It has been designated entirely as Inner Neighborhood. About 188 of the 507 total acres in this study area are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains about 250 tax lots, about 190 of which have improvements. Approximately 30 tax lots have improvement values above \$250,000. Roughly 30 percent of the tax lots in this study area are smaller than one acre, and about 95 percent of all the tax lots in this study area are smaller than five acres. Rural and residential land uses predominate in this area. Agricultural activities, primarily in the western portion of the site, consist of grapes. Non-residential uses include construction, transportation, landscape design, masonry, roofing, wine production, financial services and communications.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): This area is in the general vicinity of the Hillsboro Airport. There may be some air traffic over this area. Available data does not suggest the existence of power lines or public easements through this study area.

Public Services Feasibility: The study area falls within several jurisdictions for public services. The relatively small size of this study area may prevent it from being served with maximum efficiency. In addition, this area contains multiple drainage basins, which is also a consideration in providing services.

- **Water:** The Tualatin Valley Water District showed a desire or already has plans to serve the area. In broader terms, this study area would be easy to serve. The infrastructure system can accept new development. Minimal improvements within the UGB will be necessary.
- **Sewer:** Clean Water Services appears willing to accept the study area within its service area if necessary. This area will be moderately difficult to serve. The infrastructure system can accept new development, though some improvements and extensions within the existing UGB will be necessary to alleviate the impacts of new development.
- **Stormwater:** Clean Water Services appears willing to accept the study area within its service area, if necessary. This area will be moderately difficult to serve. Some improvements and extensions of existing lines will be necessary, both inside and outside the UGB.

Agricultural Analysis

Zoning: This area is entirely exception land and is zoned as AF10 and RR5 by Washington County. The predominant use in this area is rural residential. To the north is the UGB. To the east is the UGB and resource land zoned AF20 in Study Area 66. To the south and west is resource land zoned AF20, EFU and EFC and a pocket of exception land in Study Area 68.

Current Agricultural Activity: The agricultural activity in this area is limited to a 36-acre vineyard and a few locations of field crops. The large undeveloped portion in the southeast corner of the study area is in Metro Parks and Greenspaces ownership, as well as some additional lands adjacent to the south in Study Area 68. To the southwest is a mixture of uses including field crops, pastureland and rural residences intermixed with forested areas. Directly to the west is a large mineral and aggregate extraction operation. Further west past Clark Hill Road and along Farmington Road is an extensive area of field, nursery and row crops.

Compatibility: Urbanization of this area would increase traffic on SW Grabhorn Road, SW Gassner Drive, SW 190th Avenue and SW Kemmer Road. However, due to the fact that the majority of this study area is currently developed with rural residences and a large portion of the vacant land is in public ownership, the overall increase in traffic would be small. Increased traffic on SW Grabhorn Road could have a minimal affect on the transport of agricultural goods produced to the south. Urbanization of this area would bring new development directly adjacent to a very small amount of actively farmed land therefore complaints related to the presence of active farming practices near new development will not be an issue. Three tributaries to Lindow Creek flow south from this area through adjacent resource land areas that are actively farmed. Urbanization of this area would result in some increased impervious surfaces however these three streams originate in the lands that are in public ownership therefore, the agricultural activities to the south would not be affected by increased stream flow. Due to the limited amount of adjacent agricultural activity the value of adjacent agricultural land will not be affected by urbanization. Overall, urbanization of this area will not impact adjacent agricultural activity.

Environmental Social Energy Economic Analysis

General Character of the Area

This area is mostly open land and is almost completely developed in a rural residential use, with the exception of one active agricultural parcel on the west side and publicly owned open space in the southeast corner. The majority of the area is moderately sloped with a few small areas of steep slopes in the southern and northeastern portions of the study area. The majority of the small segment of forested canopy in the area is associated with the public open space.

Environmental

Three tributaries of Lindow Creek flow south from the lower portion of the area. The total length of stream corridor is approximately three-quarters of a mile. There is an area of steep slopes associated with one of the streams. There is a small wetland, less than a half-acre in size, in the southwest portion of the study area. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 23 percent of the study area land in the proposed inventory. Two of the tributaries to Lindow Creek in the lower portion of the study area are identified as significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. One wetland in the southwest section is also identified as significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. Urbanization of the area may impact these three natural features as outlined in the introduction to the ESEE analysis. Metro owns 88 acres of open space located in the southeast corner of the study area.

Due to the current developed nature of the study area and the relatively small additional dwelling units that would result from urbanization, the Metro owned open space area would not be significantly impacted by new development in the area.

Social Energy Economic

See Appendix A.

Other Identified Resources

The entire western edge of the study area is identified as Mineral and Aggregate Overlay District B on Washington County's Rural/Natural Resource Plan.

Study Area 68		Gross Vacant Buildable Acres	958
Total Acres	1,546	Dwelling Unit Capacity	5,766
Total Developed Acres	486	Employment Acres	44
Total Constrained Acres	107	Resource Land Acres	1,440
Title 3 Acres	86	Percent Tree Canopy Cover	21%
Upland Steep Slope Acres	20		

General Site Description: Study Area 68 is a stair-shaped area in unincorporated Washington County. The southern most section of this area is adjacent to the western end of Beaverton, however, the majority of this study area is not contiguous to the UGB, as Study Areas 65, 66 and 67 are immediately to the east. Approximately half of the area is within Metro's jurisdictional boundary. Transportation access is provided by SW 175th Avenue and Farmington Road. Study Area 68 has moderate topographic change, with steep ridges cutting through the center of the study area. The area is designated as Inner Neighborhood with a small area of Corridor, along SW 175th Avenue. There are 958 vacant and developable acres out of 1,546 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: The area has 53 parcels with recorded improvement values out of 91 total parcels. The median improvement value is \$115,000. The median parcel size is eight acres. There are 6 parcels smaller than 1 acre in size, and 52 parcels are larger than 5 acres. The study area is mostly used for agricultural purposes, although there are some sections of this area that have forest and associated residential uses. Since 1990, three single-family dwelling permits have been issued.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This study area falls within several jurisdictions for public services, and the following conditions apply:

- **Water:** This study area is in the Tualatin Valley Water District service area. It is considered easy to serve, and is planned for. This area is rated easy to serve.
- **Sewer:** This study area is in the Clean Water Services service area, for which plants and trunk lines are at capacity. It is located at the top of a hill, and is considered moderately difficult to serve. Conditions may have to be set on annexation. There is a distance of two to three miles to the nearest sewer connection. This area is rated moderately difficult to serve.
- **Stormwater:** New development in the study area is regulated for stormwater treatment by Clean Water Services. Stormwater will be required to be treated with detention, water quality facilities, or both. Under Clean Water Services guidelines, responsibility for the required treatment will be with the developer. With the required treatment, impacts to downstream facilities will be minimal. Clean Water Services anticipates no difficulty in implementation. This area is rated easy to serve.

Agricultural Analysis

Zoning: The majority of this area is resource land zoned AF20, EFU, and EFC, with a pocket of exception land that is mostly zoned AF5 with a single parcel zoned RR5. Generally this study

area is bordered on the north and east sides by exception land in Study Areas 65, 67 and 69 or the UGB. To the south and west is resource land zoned EFU and a pocket of exception land.

Current Agricultural Analysis: The agricultural activity in this study area is limited to distinct areas of nursery and field crops in the northwest and nursery, field crop, pastureland and orchards in the southeast. A large mineral and aggregate extraction operation occupies a considerable amount of land. Metro owns a substantial amount of openspace land in the central part of the study area. To the south and west is a very large expanse of resource lands that support substantial and diverse agricultural activities including field and row crops, pastureland, orchards and nursery operations. This resource land area extends for a number of miles beyond the Tualatin River and contains numerous parcels over 100 acres in size.

Compatibility: Urbanization of this large resource land area would increase traffic on numerous roads including SW Farmington Road, SW Clark Hill Road, SW Grabhorn Road, SW Tile Flat Road, SW 175th Avenue and SW Scholls Ferry Road. The increased traffic on all of these roads may impede the normal movement of farm equipment and affect the transport of agricultural goods from the extensive active farming areas further south and west. Urbanization of this area would bring urban development directly adjacent to active farming areas to the south and west therefore issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development may occur. Numerous tributaries to Lindow Creek flow south from this area through adjacent resource land that is actively farmed. Urbanization of this area would result in increased impervious surfaces and may diminish water quality and increase downstream flooding negatively affecting these agricultural areas. Urbanization of this area may affect the value of adjacent resource land to the south and west by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area may have an impact on adjacent agricultural activity to the south and west.

Environmental Social Energy Economic Analysis

General Character of Area

This study area is a patchwork of open land with agricultural uses, associated structures, streams and a sprinkling of small-forested areas with the highest concentration of tree canopy in the central portion of the area. The majority of the land is moderately sloped, with one small area of gentle slopes in the northwest corner and dispersed pockets of wooded steep slopes.

Environmental

Four tributaries of the Tualatin River are located in the northwest portion of the area, one of which flows through a wetland. Nine tributaries of Lindow Creek are in the central portion of the study area; one is associated with a small wetland. In the lower southeast portion of the area there are two tributaries of the Tualatin River, one flows through a wetland. In total there are approximately seven miles of stream corridor. There are five wetlands of varying size located in the study area, three in the northwestern portion and two in the southeastern portion. The total wetland area is approximately 16 acres. Wooded steep slopes adjacent to stream corridors are located in the top western and central portions of the area. Four of the tributaries to Lindow Creek in the central portion of the study area are identified as significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. One wetland in the southern section and a second in the northwest section are also identified as significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis. There are four areas of Metro open space

land, three contiguous lots in the central portion and one in the bottom southwest corner of the area. The acreage for these open space lands totals approximately 160 acres. Urbanization of this area may also inhibit the ability of this natural area to provide species habitat and other ecological functions. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 42 percent of the study area land in the proposed inventory.

Social Energy Economic

See Appendix A.

Other Identified Resources

A very large portion of the western section of the area is identified as Mineral and Aggregate Overlay District A or District B on Washington County's Rural/Natural Resource Plan.

Adjacent to the top part of Study Area 68 is the Jenkins Estate, located at 8005 SW Grabhorn Road. This property has been identified in the Washington County Rural/Natural Resource Plan as a historic property and is operated by the Tualatin Hills Parks and Recreation District.

Study Area 69-1		Gross Vacant Buildable Acres 160	
Total Acres	381	Dwelling Unit Capacity	884
Total Developed Acres	117	Employment Acres	-
Total Constrained Acres	20	Resource Land Acres	-
Title 3 Acres	20	Percent Tree Canopy Cover	-
Upland Steep Slope Acres	-		

General Site Description: Study Area 69-1 is situated west of the City of Beaverton in unincorporated Washington County. It is oblong and irregularly shaped, covering about two miles from the northern to the southern tip. The Metro jurisdictional boundary cuts through this study area, leaving a portion of the area to the west outside of the boundary. The study area is bound on the north by SW McInnis Lane, to the west and south by selected parcel boundaries, and to the east by SW 209th Avenue, which also marks the UGB. Southwest McInnis Lane, SW Hagg Lane, SW Vermont Street, SW Murphy Lane, SW Rosedale Road, and SW Farmington Road serve this study area. The center of this site is approximately two miles from the Washington Square Regional Center. About 20 percent of the perimeter of this study area is adjacent to the UGB. The center of this study area is approximately 1.5 miles south of SE Tualatin Valley Highway. It has been designated entirely as Inner Neighborhood. About 160 of the 381 total acres are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains about 140 tax lots, approximately 110 of which have improvements. Only two tax lots in this study area have reported building values above \$250,000. About 30 percent of the tax lots are smaller than one acre, and approximately 85 percent are smaller than five acres. Smaller parcels generally lie in the center of this study area. Land uses in this study area include rural, residential, commercial and agricultural. Aerial photography indicates field crops and nursery stock on agricultural lands. Non-residential land uses in this study area include construction, general contractors, landscaping, animal care, security and wholesale trade, and business services. There is no evidence of mining or aggregate uses in this study area.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): This area is in the general vicinity of the Hillsboro Airport. There may be some air traffic over this area. There is a power line that runs north-south through sections of this study area.

Public Services Feasibility: The study area falls within several jurisdictions for public services. The smaller size of this area may prevent it from being served with maximum efficiency. This area contains multiple drainage basins, which is also a consideration in servicing.

- **Water:** The Tualatin Valley Water District has shown a desire to serve, or already has plans to serve the area. This study area would be moderately difficult to serve. Generally, however, the infrastructure system is in acceptable condition to develop the area. Minimal improvements within the UGB should be expected.
- **Sewer:** Clean Water Services appears willing to accept the study area within its service area if necessary. This area will be moderately difficult to serve. A large portion of the area is relatively flat, which could cause difficulties with draining sewage. Increased sewer depth and additional pump stations may be necessary. Some improvements and extensions of lines inside and outside the existing UGB are

to be expected to serve new development and alleviate impacts to the existing system.

- **Stormwater:** Clean Water Services appears willing to accept the study area within its service area if necessary. This area will be moderately difficult to serve. A large portion of the area is relatively flat, which poses the same issues addressed above. Some improvements and extensions of lines are to be expected, both inside and outside the UGB.

Agricultural Analysis (69-1 & 69-2)

Zoning: This area is entirely exception land and is zoned AF5 by Washington County. To the north is resource land zoned EFU. To the east is the UGB. To the south and west is resource land zoned EFU and AF20 in Study Areas 68 and 70.

Current Agricultural Activity: There are small-localized areas of field and row crops, nursery and orchard uses in this otherwise rural residential area. To the north are two very large parcels, totaling approximately 470 acres in field crop production. To the south is an area of nursery stock and field crops as well as the mineral and aggregate extraction operation across SW Farmington Road on EFC zoned land in Study Area 68. To the west is a very large area of row and field crops, orchards and nursery stock that stretches to the Tualatin River. The Reserve Vineyards and Golf Club is located west of this study area along SW 229 Avenue on EFU zoned land.

Compatibility: Urbanization of this area may increase traffic on SW 209th Avenue and SW Rosedale Road, which both connect to SW Farmington Road. This increased traffic could impede the normal movement of farm equipment accessing the large parcels to the north on SW 209th Avenue and affect the transport of agricultural goods on SW Farmington Road produced to the west of the study area. Urbanization of this area would bring urban development directly adjacent to actively farmed areas to the north, south and west. The proximity of urban development to these adjacent agricultural uses could cause a number of conflicts relating to safety, liability and vandalism. Additionally, complaints due to noise, odor, and the use of pesticides and fertilizers may be exacerbated by the proximity of new development to these farming operations. Butternut Creek and two other tributaries of the Tualatin River flow briefly through this area, continuing west through adjacent actively farmed resource lands. Urbanization of this area would result in increased impervious surfaces and may diminish water quality and increase downstream flooding that would negatively affect these agricultural lands to the west. Urbanization of this area may affect the value of adjacent resource land to the north, south and west by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area has a high potential to negatively impact adjacent agricultural activity, although the relatively small amount of new development that may occur will lessen this impact.

Environmental Social Energy Economic Analysis (69-1 & 69-2)

General Character of the Area

This area consists of flat open land, mostly in rural residences with some minor agricultural activity.

Environmental

Three short stream segments, Butternut Creek and two unnamed tributaries of the Tualatin River, flow west through the area. The total length of stream corridor is approximately three-quarters of a mile. There are three wetlands associated with the stream corridors that together represent about seven acres. There is a small area of floodplain associated with Butternut Creek in the north portion of the area that varies in width from 145-200 feet. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 24 percent of the study area land in the proposed inventory. All three stream segments are identified as significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. Urbanization of the area may impact these three natural features as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Other Identified Resources

A small portion of the southern section of the study area is identified as Mineral and Aggregate Overlay District B on Washington County's Rural/Natural Resource Plan.

Study Area	69-2	Gross Vacant Buildable Acres	76
Total Acres	130	Dwelling Unit Capacity	457
Total Developed Acres	45	Employment Acres	19
Total Constrained Acres	1	Resource Land Acres	0
Title 3 Acres	1	Percent Tree Canopy Cover	21%
Upland Steep Slope Acres	0		

General Site Description: Study Area 69-2 is a rectangular area in unincorporated Washington County. It is approximately 2.7 miles west of Beaverton. The eastern section of this study area is inside of the Metro jurisdictional boundary. The area is adjacent to the UGB, which defines its eastern boarder. The area is served by SW Farmington Road. It is mostly flat. Study Area 69-2 has been designated as Inner Neighborhood and Corridor. There are 76 vacant and developable acres out of 130 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: The area has 46 parcels with recorded improvement values out of 49 total parcels. The median parcel improvement value is \$111,300. The median parcel size is 2.2 acres. There are 8 parcels smaller than 1 acre in size, and 4 parcels are larger than 5 acres. The study area contains both residential and small-scale agricultural uses. Since 1990, three permits for single-family residential development have been issued.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This study area falls within several jurisdictions for public services, and the following conditions apply:

- **Water:** Tualatin Valley Water District would be the service provider for this area. Since there are already lines in the area on SW Farmington Road and on SW Riggs Road, the area is considered easy to serve. No upgrade of transmission lines is anticipated. This areas is rated easy to serve.
- **Sewer:** Clean Water Services is the service provider for this area. The area is considered difficult to serve, will need pump stations, and has wetlands issues. Conditions may have to be set on annexation. Plants and trunk lines are at capacity. This area is rated moderately difficult to serve.
- **Stormwater:** New development in the study area is regulated for stormwater treatment by Clean Water Services. Stormwater will be required to be treated with detention, water quality facilities, or both. Under Clean Water Services guidelines, responsibility for the required treatment will be with the developer. With the required treatment, impacts to downstream facilities will be minimal. Clean Water Services anticipates no difficulty in implementation. This area is rated easy to serve.

Agricultural Analysis

See Study Area 69-1.

Environmental Social Energy Economic Analysis

See Study Area 69-1.

Study Area	70	Gross Vacant Buildable Acres	371
Total Acres	448	Dwelling Unit Capacity	1,962
Total Developed Acres	36	Employment Acres	0
Total Constrained Acres	32	Resource Land Acres	448
Title 3 Acres	32	Percent Tree Canopy Cover	9%
Upland Steep Slope Acres	0		

General Site Description: Study Area 70 is in unincorporated Washington County. Its eastern half is partially within Metro's jurisdictional boundary. It is approximately two miles straight-line distance west of Beaverton, and its not contiguous to the UGB. Southwest Rosedale Road bisects the area north to south. Southwest Farmington Road also provides access to the area. Study Area 70 is moderately flat, with some slight topography running through the center. The area is designated completely as an inner-neighborhood. The study area has 371 vacant and buildable acres out of 448 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: Study Area 70 has 23 parcels with recorded improvement values out of 29 total parcels. The median improvement value is \$14,000. The median parcel size is 4.8 acres. There are 3 parcels are smaller than 1 acre, and 14 parcels exceed 5 acres. Most of the area appears to be in agricultural use. There has been one permit issued for a single-family dwelling since 1990.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This study area falls within several jurisdictions for public services, and the following conditions apply:

- **Water:** Tualatin Valley Water District would be the likely service provider for this area. Since there are already lines in the area on SW Farmington and SW 209th Street, the study area is considered easy to serve.
- **Sewer:** Clean Water Services is the service provider for this area. The area will probably need pump stations, and has wetlands issues. Conditions may have to be set on annexation. Plants and trunk lines are at capacity. This area is rated moderately difficult to serve.
- **Stormwater:** New development in the study area is regulated for stormwater treatment by Clean Water Services. Stormwater will be required to be treated with detention, water quality facilities, or both. Under Clean Water Services guidelines, responsibility for the required treatment will be with the developer. With the required treatment, impacts to downstream facilities will be minimal. Clean Water Services anticipates no difficulty in implementation. This area is rated easy to serve.

Agricultural Analysis

Zoning: This area is entirely resource land and is zoned EFU and AF20 by Washington County. To the north is resource land zoned AF20 and EFU and a strip of exception land in Study Area 69. To the east is exception land in Study Area 69 bordered by the UGB. To the south is a strip of exception land in Study Area 69 and resource land zoned AF20 and EFC. To the west is resource land zoned EFU.

Current Agricultural Activity: Agricultural activity is the dominant use in this area and includes orchards, field and row crops and some nursery stock and pastureland. Directly to the north is a large parcel that contains the remainder of a tree farm and an extensive area of field crops. To the east are a few parcels that are in row and field crop production and nursery stock. To the south beyond a strip of rural residences is nursery stock and field crops as well as the mineral and aggregate extraction operation across SW Farmington Road on EFC zoned land in Study Area 68. To the west is a very large area of row and field crops, orchards and nursery stock that stretches to the Tualatin River. The Reserve Vineyards and Golf Club is located northwest of this study area along SW 229 Avenue on EFU zoned land.

Compatibility: Urbanization of this area may increase traffic on SW Rosedale Road and SW Murphy Lane, both of which connect to SW 209th Avenue that also connects to SW Farmington Road. SW Riggs Road, which also connects to SW Farmington Road, may also see an increase in traffic. This increased traffic could impede the normal movement of farm equipment accessing the large parcels to the north on SW 209th Avenue and affect the transport of agricultural goods on SW Farmington Road produced to the west of the study area. Urbanization of this area would bring urban development directly adjacent to actively farmed areas to the west. The proximity of urban development to these adjacent agricultural uses could cause a number of conflicts relating to safety, liability and vandalism. Additionally, complaints due to noise, odor, and the use of pesticides and fertilizers may be exacerbated by the proximity of new development to these farming operations. Two streams that form a tributary of the Tualatin River flow through this area, continuing west through adjacent actively farmed resource lands. Urbanization of this area would result in increased impervious surfaces and may diminish water quality and increase downstream flooding that would negatively affect these agricultural lands to the west. Urbanization of this area may affect the value of adjacent resource land to the north and west by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area may have an impact on adjacent agricultural activity to the north and west.

Environmental Social Energy Economic Analysis

General Character of the Area

This area consists of flat open land almost entirely in agricultural activity with associated rural residences.

Environmental

Two streams that form an unnamed tributary of the Tualatin River flow west through the area. The total length of stream corridor is approximately two miles. There is approximately two acres of wetlands associated with the northern most stream corridor. There is a fairly large area of floodplain that varies in width from 200-300 feet associated with the two stream corridors. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 33 percent of the study area land in the proposed inventory. The two stream segments are identified as significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. Urbanization of the area may impact these three natural features as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Other Identified Resources

A small portion of the southern section of the study area is identified as Mineral and Aggregate Overlay District B on Washington County's Rural/Natural Resource Plan.

Study Area 71		Gross Vacant Buildable Acres 64	
Total Acres	88	Dwelling Unit Capacity	416
Total Developed Acres	16	Employment Acres	-
Total Constrained Acres	6	Resource Land Acres	-
Title 3 Acres	6	Percent Tree Canopy Cover	30%
Upland Steep Slope Acres	-		

General Site Description: Study Area 71 consists of a single parcel and a non-adjacent larger tract of land immediately south of Hillsboro in Washington County. The single parcel is inside of the Metro jurisdictional boundary; the larger tract of land is outside of it. This general area is less than one-half mile south of SE Tualatin Valley Highway. With the UGB and Metro jurisdictional boundary defining the northern edge, the larger tract is bound by SW 229th Avenue to the east, and to the west and south by the boundaries of parcels within it. Approximately 40 percent of the perimeter of this study area is adjacent to the UGB. This site has been designated entirely as Inner Neighborhood. About 64 of the 88 total acres in this study area are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains about 20 parcels, 18 of which have improvements. There are no parcels with improvement values above \$250,000. Fewer than 5 parcels in this study area are smaller than 1 acre, and about 10 parcels are smaller than 5 acres. The area generally contains rural land uses. Aerial photo inspections indicate that there may be limited agricultural uses in this study area, primarily consisting of field crops. There are no evident non-residential uses in this study area. There is no evidence of mining or aggregate activities in this study area.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): This area is in the vicinity of the Hillsboro Airport. There may be some air traffic over this area. Available data does not suggest the existence of power lines or public easements through this area.

Public Services Feasibility: The study area falls within several jurisdictions for public services. The relatively small size of this study area may prevent it from being served with maximum efficiency. In addition, this area contains multiple drainage basins, which may pose other servicing complexities.

- **Water:** Hillsboro showed a desire or already has plans to serve the area. In general terms, this study area would be difficult to serve. The infrastructure system is in acceptable condition to develop the area, and minimal improvements within the UGB should be expected.
- **Sewer:** Clean Water Services appears willing to accept the study area within its service area if necessary. Generally, this area will be difficult to serve. A large portion of the area is relatively flat, which could make it difficult to drain sewage. Increase sewer depth and additional pump stations may be necessary. Such improvements will be necessary to alleviate impacts of new development on the existing system.
- **Stormwater:** Clean Water Services appears willing to accept the study area within its service area if necessary. In general terms, this study area would be difficult to serve. The area's flat topography poses some of the same developmental issues

addressed above. While the infrastructure can accommodate new development in this area, some improvements and extensions of lines will be necessary, both inside and outside the UGB.

Agricultural Analysis

Zoning: Two locations of exception land make up this area and are zoned AF5 by Washington County. To the north is the UGB. To the east, south and west is resource land zoned EFU. The small sub-area consists of one parcel less than an acre in size that contains a residence.

Current Agricultural Activity: Agricultural activity in the larger sub-area is limited to three parcels with field crop production associated with a residence. To the east are two large parcels of field crops. To the south are some field crops and the Reserve Vineyards and Golf Club. To the west is a mixture of field crops and pastureland intermixed with forested rural residences.

Compatibility: Urbanization of this area would result in a small increase in traffic on SW 229th and SW 234th Avenues. This increased traffic would not affect any nearby agricultural practices due to the limited amount of urbanization that would occur in this small study area and the fact that these roads do not connect with extensive agricultural areas. The large farming area to the east has access off of SW 229th Avenue as well as TV Highway. The proximity of urban development to this one adjacent agricultural use could cause conflicts relating to safety, liability and vandalism. Additionally, complaints due to noise, odor, and the use of pesticides and fertilizers may be exacerbated by the proximity of new development to these farming operations. Due to the small amount of land that could be urbanized impacts would most likely be minimal. The golf course to the south serves as a buffer between new development and agricultural activity further south. Gordon Creek flows through this area, continuing west to Ettinger Pond located on the golf course. Urbanization of this area would result in increased impervious surfaces and may diminish water quality and increase downstream flooding with the pond on the golf course being most affected. The value of the adjacent agricultural land would not be affected by the development of this small area. Overall, urbanization of this area would not impact adjacent agricultural activity.

Environmental Social Energy Economic Analysis

General Character of the Area

This area is separated into two sub-areas. The eastern sub-area is characterized by flat mostly forested land in rural residential use with some pockets of agricultural activity. A stream corridor flows through the top portion of this sub-area and also forms the northern boundary of the sub-area. The western sub-area consists of a rural residence on one parcel. The Reserve Vineyards and Golf Club separates the two areas.

Environmental

Gordon Creek flows west through the top portion of the eastern sub-area for approximately a third of a mile and then forms the northern boundary for the remainder of the sub-area. Gordon Creek flows into Ettinger Pond that is located adjacent to the eastern study area on the Reserve Vineyards and Golf Club. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 60 percent of the study area land in the proposed inventory. Gordon Creek is identified as a significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. Urbanization of the area may impact Gordon Creek, which could also impact Ettinger Pond with increased stream flows.

Social Energy Economic
See Appendix A.

Study Area	72	Gross Vacant Buildable Acres	43
Total Acres	69	Dwelling Unit Capacity	302
Total Developed Acres	23	Employment Acres	0
Total Constrained Acres	0.2	Resource Land Acres	69
Title 3 Acres	0.2	Percent Tree Canopy Cover	0%
Upland Steep Slope Acres	0		

General Site Description: Study Area 72 is adjacent to Hillsboro's southwestern edge in unincorporated Washington County. The UGB defines its northern edge and the area is outside Metro's jurisdictional boundary. The area is served by SW Minter Bridge Road, which runs north and south and divides the study area into eastern and western sections. This area is mostly flat. It has been designated as Inner Neighborhood. Of the 69 total acres, 43 acres are vacant and buildable.

Parcelization, Building Values, Development Patterns, Vacant Land: There are 12 parcels with recorded improvements out of 13 total parcels. The median improvement value is \$90,000. The median parcel size is 2.2 acres. There are 4 parcels are smaller than 1 acre in size, and 5 parcels exceed 5 acres. The area appears to be mostly in agricultural use. There have been no permits for single-family dwellings issued since 1990.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This study area falls within several jurisdictions for public services, and the following conditions apply:

- **Water:** Hillsboro would be the service provider for this area. The City is planning to provide service to this area within the next two to three years. No capacity or infrastructure issues can be foreseen at this time. This area is rated moderately difficult to serve.
- **Sewer:** Clean Water Services is the service provider for this area. Lines need to be placed approximately one mile to connect to existing service. This area is rated moderately difficult to serve.
- **Stormwater:** New development in the study area is regulated for stormwater treatment by Clean Water Services. Stormwater will be required to be treated with detention, water quality facilities, or both. Under Clean Water Services guidelines, responsibility for the required treatment will be with the developer. With the required treatment, impacts to downstream facilities will be minimal. Clean Water Services anticipates no difficulty in implementation. This area is rated easy to serve.

Agricultural Analysis

Zoning: This area is entirely resource land zoned EFU by Washington County. To the north is the UGB. To the east, south and west is resource land zoned EFU.

Current Agricultural Activity: The Agricultural activities in this area are limited to the parcels to the east of SW Minter Bridge Road and are in orchard and field crop production. The Hillsboro Landfill occupies the parcels to the west of SW Minter Bridge Road, and extends outside of the study area to the Tualatin River. One of the landfill's parcels is currently being

farmed in field crops. To the east and south are field and row crop areas that extend past the Tualatin River to SW Rood Bridge Road.

Compatibility: Urbanization of this area would result in a small increase in traffic on SW Minter Bridge Road. This increased traffic would not affect any nearby agricultural practices due to the limited amount of urbanization that would occur in the eastern portion of the study area. Urbanization of this area would bring new development directly adjacent to active farming areas to the south therefore issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development may occur. Urbanization of this area may affect the value of adjacent resource land by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area would not impact adjacent agricultural activity.

Environmental Social Energy Economic Analysis

General Character of Area

The majority of this study area is characterized by flat to gentle sloping land with a small area of steep slopes. There are industrial uses in the top half of the western portion of the area. Scattered rural residential with small pockets of trees and agricultural uses are located in the remainder of the study area.

Environmental

Two small formations of steep slopes are located in the extreme western edge of the study area. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies none of the study area land in the proposed inventory. The very western edge of the study area is identified as part of a larger significant Water Areas and Wetlands on Washington County's Rural/Natural Resource Plan. Urbanization of this area may impact the small natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area	73	Gross Vacant Buildable Acres	3
Total Acres	4	Dwelling Unit Capacity	14
Total Developed Acres	1	Employment Acres	0
Total Constrained Acres	0.3	Resource Land Acres	0
Title 3 Acres	0.3	Percent Tree Canopy Cover	40%
Upland Steep Slope Acres	0		

General Site Description: Study Area 73 is adjacent to the southern end of Forest Grove's western-wing. Metro's Jurisdictional Boundary, the UGB, and Forest Grove's municipal boundary define the area's northern edge. The area has frontage on approximately 250 feet of Gales Creek Road. It is virtually flat, and runs up against the floodplain along its southern edge. This area has been designated entirely as Outer Neighborhood. There are three acres vacant and buildable out of four total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: The area has been defined to include the 4-acre portion of a much larger parcel that is within the floodplain. This 4-acre study area has improvements; the larger portion of the parcel that is not within the study area is in agricultural use, and is fully covered by the floodplain.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: Forest Grove would be the service provider for this study area, and the following conditions apply:

- **Water:** The City has indicated that a six-inch line in Gales Creek Road will need to be upgraded, but it is willing to provide service to this area. This area is rated moderately difficult to serve.
- **Sewer:** A lift station would be needed to connect to the trunk line on Gales Creek Road. The Forest Grove plant is at capacity at this time. Winter flows are bypassed to the Clean Water Services' Rock Creek plant. This study area is rated moderately difficult to serve.
- **Stormwater:** New development in the study area is regulated for stormwater treatment by Clean Water Services. Stormwater will be required to be treated with detention, water quality facilities, or both. Under Clean Water Services guidelines, responsibility for the required treatment will be with the developer. With the required treatment, impacts to downstream facilities will be minimal. Clean Water Services anticipates no difficulty in implementation. This area is rated easy to serve.

Agricultural Analysis

Zoning: This area is entirely exception land zoned FD10 by Washington County. To the north and east is the UGB. To the south and west is resource land zoned EFU.

Current Agricultural Activity: This study area is part of a larger 138-acre parcel that is in field crop production. To the south and west is an extensive area of field and row crops that extend to Gales Creek. To the south of Gales Creek is a large area of nursery stock.

Compatibility: Urbanization of this area would result in a very minimal amount traffic that would access Willamina Avenue therefore, this increased traffic would not affect any nearby agricultural practices. Urbanization of this area would bring new development directly adjacent to active farming areas to the south and west. The small amount of new development that could occur would not be impacted by the dust, noise and spray associated with active farming to negatively affect the farming practices. Overall, urbanization of this area would not impact adjacent agricultural activity.

Environmental Social Energy Economic Analysis

General Character of Area

Open land with flat areas in the central portion and gentle sloping land in the remainder of the area describe this land. There is a residential structure and tree canopy in the western portion of the study area and a farm use related structure located in the eastern portion.

Environmental

Adjacent to this study area is a large floodplain; a small portion of it runs along the southern flank of Area 73 for approximately one-fifth of a mile. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 82 percent of the study area land in the proposed inventory. There is a stream to the south of the study area that is identified as a significant Water, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. Urbanization of this area may impact these natural resource areas in a minor way as outlined in the introduction to the ESEE analysis. The private Reuter Farm Open Space, which includes floodplain areas, is immediately to the east. Due to the small amount of expected dwelling units, urbanization of this area would not inhibit the ability of this natural area to provide species habitat and other ecological functions

Social Energy Economic

See Appendix A.

Study Area	74	Gross Vacant Buildable Acres	240
Total Acres	501	Dwelling Unit Capacity	1,150
Total Developed Acres	29	Employment Acres	0
Total Constrained Acres	190	Resource Land Acres	501
Title 3 Acres	4	Percent Tree Canopy Cover	55%
Upland Steep Slope Acres	186		

General Site Description: Study Area 74 is a larger study area in Washington County that is adjacent to the western wing of Forest Grove. It is outside of Metro's jurisdictional boundary. The area's southwestern boundary is defined by Gales Creek Road and the floodplain. This area is rolling to hilly, with scattered slopes above 25 percent. David Hill Road runs east and west through the area. Study Area 74 is designated entirely as Outer Neighborhood. The area has 240 vacant and buildable acres out of 501 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: There are 19 parcels with recorded improvements out of 25 total parcels. The median improvement value is \$90,000. The median parcel size is 9.1 acres. There are 4 parcels that are smaller than 1 acre, and 18 parcels that exceed 5 acres. This area is mostly in forest and farm use, with associated residential uses. There have been two single-family residential permits issued since 1990.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the site.

Public Services Feasibility: Forest Grove is the service provider for this area, and the following conditions apply:

- **Water:** There is little or no infrastructure in this area. There is a water main on David Hill Road, but the line would have to be upgraded. There is a water tank at approximately 550 feet. New reservoir capacity and lift stations would have to be installed. There are some soil stability problems and steep slopes that could affect trenching. The area lacks infrastructure. This area is rated difficult to serve.
- **Sewer:** A lift station would be needed to connect to the trunk line on Gales Creek Road. The Forest Grove plant is at capacity at this time. Winter flows are bypassed to the Clean Water Services' Rock Creek plan. Forest Grove would provide service if the major infrastructure improvements are completed. This area is rated difficult to serve.
- **Stormwater:** New development in the study area is regulated for stormwater treatment by Clean Water Services. Stormwater will be required to be treated with detention, water quality facilities, or both. Under Clean Water Services guidelines, responsibility for the required treatment will be with the developer. With the required treatment, impacts to downstream facilities will be minimal. Due to environmental factors, this area is rated as moderately difficult.

Agricultural Analysis

Zoning: This area is entirely resource land zoned AF20 by Washington County. To the north and east is resource land zoned AF20. The UGB is approximately 450 feet to the east of the southeast corner of the study area. To the south and west is resource land zoned EFU.

Current Agricultural Activity: Located on a large parcel on the central east side of the study area is the David Hill Winery. The majority of the area is forested with a few smaller areas of field crop and tree farm uses in the southeast corner. Directly to the northeast is a forested area with row crop and field crops beyond. To the southeast is a small strip of field and row crops between the study area and the UGB. To the south across Gales Creek Road is an extensive area of field and row crops that extend south well beyond Gales Creek. To the west is forested land.

Compatibility: Urbanization of this area would result in a small increase in traffic on David Hill Road and Gales Creek Road. This increase in traffic could affect the movement of farm equipment and agricultural goods on both roads, but the main impacted road would be Gales Creek Road. Urbanization of this area would bring new development directly adjacent to a small amount of active farming areas to the southeast therefore issues related to safety, liability and complaints that might arise from the dust, noise and spray associated with active farming near new development may occur. A stream flows south through this area prior to joining Gales Creek within the resource lands south of Gales Creek Road. Urbanization of this area would result in increased impervious surfaces and may diminish water quality and increase downstream flooding that would negatively affect these agricultural lands to the south. Urbanization of this area may also affect the value of these few adjacent active farm areas by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area may affect a small amount of active agricultural lands to the southeast.

Environmental Social Energy Economic Analysis

General Character of Area

The entire study area is marbled with moderate and steep slopes. Heavily treed throughout, this study area has some scattered structures, a vineyard and other agricultural uses.

Environmental

Two floodplains run along the southwesterly edge of the study area for a little over a mile in length. One stream associated with steep slopes and tree canopy flows south through in the top eastern edge of the area. In total the stream corridor length is approximately three-quarters of a mile. Steep slopes are integrated throughout the geography of the study area. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 62 percent of the study area land in the proposed inventory. The stream segment noted above is identified as a significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Other Identified Resources

The David Hill Winery located at 46340 NW David Hill Road is identified as a Historic Resource on Washington County's Rural/Natural Resource Plan.

Study Area 75		Gross Vacant Buildable Acres 40	
Total Acres	71	Dwelling Unit Capacity	0
Total Developed Acres	14	Employment Acres	-
Total Constrained Acres	17	Resource Land Acres	30
Title 3 Acres	17	Percent Tree Canopy Cover	30%
Upland Steep Slope Acres	-		

General Site Description: Study Area 75 sits immediately north of Cornelius and the UGB. Northwest Cornelius/Schefflin Road defines its western edge. The northern and eastern sides are defined by the boundaries of parcels within it. This study area is served by NW Spiesschaert Road, which runs in an east-west direction through it. This study area is within Washington County, and is bisected by the Metro jurisdictional boundary, which is defined by Council Creek. The center of this study area is less than one mile north of E Baseline Street, Cornelius' Main Street area. Approximately 30 percent of the perimeter of this study area is adjacent to the existing UGB. This study area has been designated entirely as Industrial Neighborhood. About 40 of the 71 total acres are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains about 20 tax lots, roughly half of which have improvements. None of the tax lots have improvement values above \$250,000. Two tax lots are smaller than one acre, and about 15 are smaller than five acres. Land uses include rural residential and small farm operations. Aerial photo inspections indicate the existence of nursery stock and field crops within the northern section of the site. Non-residential uses include construction and a church. There is no evidence of mining or aggregate activities within this study area.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): This area is in the vicinity of the Hillsboro Airport. There may be some air traffic over this area. Available data does not suggest the existence of power lines or public easements through this area.

Public Services Feasibility: The study area falls within several jurisdictions for public services. The small size of this area may prevent it from being served with maximum efficiency. This area is contained within a single drainage basin.

- **Water:** Cornelius showed a desire or already has plans to serve the area. This study area would be easy to serve, and the infrastructure system is in acceptable condition to accommodate new development. Minimal improvements within the UGB should be expected.
- **Sewer:** Clean Water Services showed a desire or already has plans to serve the study area. This area will be easy to serve. The current infrastructure system can accept new development, though some minimal improvements will be necessary within the UGB.
- **Stormwater:** Clean Water Services showed a desire or already has plans to serve the study area. This area will be easy to serve. Infrastructure can accommodate new development in this area, though some improvements and extensions of lines are to be expected, both inside and outside the UGB.

Agricultural Analysis

Zoning: This area is entirely exception land zoned as AF5 by Washington County. To the north is resource land zoned EFU and to the east and west is resource land zoned AF20. To the south is the UGB.

Current Agricultural Activity: The agricultural activity in this area is limited to a few parcels that are in field crop and pastureland uses. The Cornelius Methodist Cemetery and a number of forested parcels associated with Council Creek make up the remainder of the area. To the north and west is an extensive area of mostly field crop production with some row crops intermixed. To the east are a few large parcels of field crops between this study area and Study Area 76 that also contains a number of parcels in field crop production.

Compatibility: Urbanization of this area would increase traffic on NW Cornelius Schefflin Road and NW Spiesschaert Road. Due to the cemetery and limited development of the parcels that would be regulated by protection of Council Creek, this increase in traffic would not be great. In addition, the majority of the daily increased traffic flow would most likely be directed into Cornelius and therefore, would have a minimal affect on the normal movement of farm equipment and the movement of agricultural goods on NW Cornelius Schefflin Road. Urbanization of this area would bring new development directly adjacent to actively farmed land on all sides but the south. Issues relating to safety, liability and vandalism, and complaints due to noise, odor, and the use of pesticides and fertilizers may be exacerbated by the proximity of new development to these farming operations. The cemetery may serve as a partial buffer to a limited amount of resource land to the west. Council Creek and a tributary pass through this area prior to flowing east through a small amount of actively farmed land. Urbanization would result in increased impervious surfaces and may diminish water quality and increase downstream flooding negatively affecting areas of agricultural production. However, due to the limited development potential and the resulting small increase in stream flow, this impact may be minimal. Urbanization of this area may affect the value of adjacent resource land to the north, east and west by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. However the small amount of new development that could occur versus the very large expanse of adjacent agricultural land would negate this consequence. Overall, urbanization of this area will result in a small amount of new development that could impact some of the adjacent agricultural activity to the north, east and west.

Environmental Social Energy Economic Analysis

General Character of the Area

The character of this area is dominated by agricultural activities occurring on flat open land. There also are forested areas along two stream corridors and a few rural residences scattered about the area. Emanuel Cemetery, which is affiliated with the Cornelius United Methodist church occupies just over four acres of the study area.

Environmental

Council Creek flows east through the southern portion of the area for approximately three-quarters of a mile. The floodplain along Council Creek varies in width from 175-350 feet. There is a large wetland centered along Council Creek that extends the entire length of the study area. A tributary to Council Creek flows south through the central portion of the area prior joining Council Creek near the western edge of the study area. This stream segment is approximately a quarter mile in length. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies

52 percent of the study area land in the proposed inventory. All of the stream segments noted above are identified as significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. Urbanization of this area may impact these natural resources as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area 76-1		Gross Vacant Buildable Acres	
Total Acres	122	Dwelling Unit Capacity	0
Total Developed Acres	18	Employment Acres	50-
Total Constrained Acres	40	Resource Land Acres	-
Title 3 Acres	40	Percent Tree Canopy Cover	20%
Upland Steep Slope Acres	-		

General Site Description: Study Area 76-1 sits immediately north of Cornelius and the UGB. It is defined to the north by NW Hobbs Road, and on the other sides by selected parcel boundaries. This study area lies completely within Washington County, and is bisected by the Metro jurisdictional boundary, which is defined by Council Creek. The area is served by NW Susbauer Road and by NW Hobbs Road. It is about one mile from N Adair Street, the general vicinity of Cornelius' Main Street. Approximately 35 percent of the perimeter of this study area is adjacent to the existing UGB. This study area has been designated entirely as Industrial Neighborhood. Approximately 66 to the 122 total acres are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains about 30 tax lots, 22 of which have reported improvements. There are no tax lots with improvement values above \$250,000. About five parcels are smaller than one acre, and about 20 of all parcels in this study area are smaller than five acres. Agricultural activity appears through the northern and eastern section of the study area, primarily consisting of field crops, nursery stock and perennials. Limited non-residential uses include food production.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): This area is in the vicinity of the Hillsboro Airport. There may be some air traffic over this area. Available data does not suggest the existence of power lines or other public easements through this area.

Public Services Feasibility: The study area falls within several jurisdictions for public services. The area is contained within a single drainage basin.

- **Water:** Cornelius showed a desire or already has plans to serve the area. In broader terms, this study area would be easy to serve. The infrastructure system is in acceptable condition to accommodate additional development. Minimal improvements within the UGB should be expected.
- **Sewer:** Clean Water Services showed a desire or already has plans to serve the study area. This area would be easy to serve. The infrastructure system is in acceptable condition to develop the area, though some minimal improvements within the UGB are anticipated.
- **Stormwater:** Clean Water Services has shown a desire, or already has plans to serve the study area. Generally, for storm services, this area would be easy to serve. While infrastructure is in acceptable condition to develop the area, some improvements and extensions of lines are to be expected, both inside and outside the UGB.

Agricultural Analysis

Zoning: This area is entirely exception land and is zoned as AF5 and RIND by Washington County. To the north is resource land zoned EFU and to the east and west is resource land zoned AF20. To the south is the UGB.

Current Agricultural Activity: Agricultural activity in this area is made up of a number of parcels in field crop production. To the north and east is an extensive area of mostly field crop production with some row crop and orchard uses intermixed. To the west are a few large parcels of field crops between this study area and Study Area 75, which is limited to a few parcels of agricultural activity in field crop and pastureland uses. There are also a number of forested parcels associated with Council Creek.

Compatibility: Urbanization of this area would increase traffic on NW Susbauer Road and NW Hobbs Road. Due to limited development of the parcels that would be regulated by protection of Council Creek, this increase in traffic would not be substantial. In addition, the majority of the daily increased traffic flow would most likely be directed into Cornelius and therefore would have a minimal affect on the normal movement of farm equipment and the movement of agricultural goods on NW Susbauer Road. Increased traffic on NW Hobbs Road may affect on the normal movement of farm equipment and affect the movement of agricultural goods. Urbanization of this area would bring new development directly adjacent to actively farmed land on all sides but the south. Issues relating to safety, liability and vandalism, and complaints due to noise, odor, and the use of pesticides and fertilizers may be exacerbated by the proximity of new development to these farming operations. Council Creek and a tributary pass through this area prior to flowing east through a small amount of actively farmed land. Urbanization of would result in increased impervious surfaces and may diminish water quality and increase downstream flooding negatively affecting areas of agricultural production. However, due to the limited development potential and the resulting small increase in stream flow, this impact may be minimal. Urbanization of this area may affect the value of adjacent resource land to the north, east and west by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. However the small amount of new development that could occur versus the very large expanse of adjacent agricultural land would negate this consequence. Overall, urbanization of this area will result in a small amount of new development that could impact some of the adjacent agricultural activity to the north, east and west.

Environmental Social Energy Economic Analysis

General Character of the Area

This area is separated into two sub-areas. The larger northern sub-area is characterized by mostly flat open land in agricultural use in the north and forested moderately sloped land along a stream corridor in the south. There are a few very small steep sloped spots along the stream. The small southern sub-area consists of flat open land that is four acres of a larger 19-acre developed parcel.

Environmental

Council Creek flows east through the lower portion of the northern sub-area for approximately a two-thirds of a mile. The floodplain along Council Creek varies in width from 275-325 feet. There is a large wetland centered along Council Creek that extends the entire length of this sub-area. A tributary to Council Creek flows south through the western edge of the sub-area prior joining Council Creek. This stream segment is approximately a quarter mile in length. A

second tributary flows north through the southeast tip of this sub-area. This stream segment is approximately 380 feet in length and has a floodplain that varies from 50-100 feet in width. Metro owns 9.5 acres of open space along Council Creek in the eastern side of the sub-area. A third tributary to Council Creek flows north through the southern sub-area. This stream segment is approximately 450 feet in length and has a floodplain that varies from 150-225 feet in width, and basically covers the entire sub-area. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 46 percent of the study area land in the proposed inventory. All of the stream segments noted above are identified as significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. Urbanization of this area may impact these natural resources as well as affect the ability of the open space area to provide species habitat and other ecological functions.

Social Energy Economic

See Appendix A.

Study Area	76-2	Gross Vacant Buildable Acres	0
Total Acres	4	Dwelling Unit Capacity	0
Total Developed Acres	0	Employment Acres	4
Total Constrained Acres	4	Resource Land Acres	0
Title 3 Acres	4	Percent Tree Canopy Cover	0%
Upland Steep Slope Acres	0		

General Site Description: Study Area 76-2 is a very small, narrow strip of land that sits right between Cornelius to the west, and urban Washington County, to the east. The area is within Metro's jurisdictional boundary. The southern end of the area has frontage on Baseline Road. The area is virtually flat, and has been designated for Industrial use. This four-acre site is completely covered by the floodplain, and thus has no vacant and buildable land.

Parcelization, Building Values, Development Patterns, Vacant Land: The area represents a portion of a larger rectangular parcel extending to the east, most of which is inside of the UGB and unincorporated Washington County. This larger parcel, of 19.3 acres, is in use as a manufactured home park. As noted above, the four unimproved acres that have been designated as area 76-2 are entirely covered by the floodplain.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This study area falls within several jurisdictions for public services, and the following conditions apply:

- **Water:** This area is rated easy to serve.
- **Sewer:** Clean Water Services would be the service provider for this area. This area is on McKay Creek, and may be in a significant flood plain area. Sewer is in the vicinity, but the plant and trunk lines are at capacity. Conditions may have to be set for annexation. This area is rated moderately difficult to serve.
- **Stormwater:** New development in the study area is regulated for stormwater treatment by Clean Water Services. Stormwater will be required to be treated with detention, water quality facilities, or both. Under Clean Water Services guidelines, responsibility for the required treatment will be with the developer. With the required treatment, impacts to downstream facilities will be minimal. Clean Water Services anticipates no difficulty in implementation. This area is rated easy to serve.

Agricultural Analysis

See Study Area 76-1.

Environmental Social Energy Economic Analysis

See Study Area 76-1.

Study Area 77		Gross Vacant Buildable Acres 51	
Total Acres	171	Dwelling Unit Capacity	309
Total Developed Acres	84	Employment Acres	-
Total Constrained Acres	44	Resource Land Acres	-
Title 3 Acres	44	Percent Tree Canopy Cover	-
Upland Steep Slope Acres	-		

General Site Description: Study area 77 sits between Cornelius and Hillsboro. It is in the vicinity of SW Tualatin Valley Highway, in an area where the Metro UGB is “interrupted” between these two cities. This study area is within Washington County, and is in the Metro jurisdictional boundary. The study area is served by NW 341st Avenue, NW 338th Avenue and NW 334th Avenue from the north. Southwest Tualatin Valley Highway also serves it from the south, which runs into E Baseline Street. Approximately 15 percent of the perimeter of this study area is adjacent to the UGB. However, this study area contributes to filling a “gap” within the current boundary. The center of this study area is approximately 1.5 miles, straight-line distance from downtown Hillsboro, and directly adjacent to East Baseline Street, Cornelius’ Main Street. This study area has been designated as Inner Neighborhood and Corridor along SW Tualatin Valley Highway. Approximately 51 of 171 total acres are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains about 115 parcels, roughly 100 of which have improvements. Only two tax lots in this study area have reported improvement values above \$250,000. About 70 percent of the tax lots in this study area are smaller than one acre, and about 90 percent of the tax lots in this study area are smaller than five acres. Smaller tax lots, including a residential subdivision, generally lie in the central and southern portion of the site. Predominant land uses include agriculture and single family residential. A railroad line runs through this area, separating the northern portion from the southern, more developed portion. Agricultural uses in the northern portion appear to consist of field crops. Non-residential uses include veterinary services, farm services, contracting, and repair services. There is no evidence of mining or aggregate activities in this study area.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): This area is in the vicinity of the Hillsboro Airport. There may be some air traffic over this area. Available data does not suggest the existence of power lines running through this area, though there is a railroad track that bisects the northern portion of the site from the southern portion.

Public Services Feasibility: The study area falls within several jurisdictions for public services. It contains multiple drainage basins. The following conditions apply.

- **Water:** Cornelius has shown a desire or already has plans to serve the area. In broader terms, this study area would be easy to serve. The infrastructure system is in acceptable condition to accommodate additional development. Minimal improvements within the UGB should be expected.
- **Sewer:** Clean Water Services has shown a desire or already has plans to serve the study area. This area would be easy to serve. The infrastructure system is in acceptable condition to develop the area, but some minimal improvements within the UGB are anticipated.

- **Stormwater:** Clean Water Services has shown a desire or already has plans to serve the study area. This area would be easy to serve. Although the infrastructure is in acceptable condition to accommodate new development, some improvements and extensions of lines are to be expected, both inside and outside the UGB.

Agricultural Analysis

Zoning: This area is entirely exception land and is zoned AF5, RR5 and RCOM by Washington County. To the north, east and south is resource land zoned AF20, with EFU zoned land further to the south. To the west is the UGB.

Current Agricultural Activity: Agricultural activity in this area is made up of small-scattered areas of field crop production and orchard uses intermixed with rural residences, which is the predominant use. To the north and northeast is an extensive area of mostly field crop production with some row crop and orchard uses intermixed. There are also two golf courses located to the north and northeast of the study area. To the east is a small area of field crops between this study area and Hillsboro. To the south beyond the P & W railroad tracks is a relatively uninterrupted network of actively farmed land mostly in field crops with some intermixed orchard uses.

Compatibility: Urbanization of this area would result in an increase in traffic on TV Highway and a smaller amount on the minor network of streets presently serving the area, including NW 334th Avenue, NW 336th Avenue, NW 338th Avenue and NW 341st Avenue. These smaller streets do not extend north past the railroad tracks into adjacent resource land, except NW 334th Avenue leading to the Killarney West Golf Club, therefore any increase in traffic on these streets will not affect current agricultural activities. The small amount of increased traffic generated from new development in this already fairly well built out study area will not adversely affect the movement of farm equipment on TV Highway, which is already constrained. The two P & W railroad tracks provide the northern and southern boundaries of this study area, essentially acting as a 60-foot barrier between any new development and resource land. Therefore, issues related to vandalism, safety and liability due to the proximity of new development to active farming areas would be minimal. However, complaints due to noise, odor, and the use of pesticides and fertilizers may still occur. Dairy Creek, a tributary of the Tualatin River, is a few hundred feet east of this study area. Urbanization of this study area may ultimately impact the water quality and potential for flooding in the downstream portions were it crosses active farmland. Overall, urbanization of this area would have a minimal impact on adjacent agricultural activity.

Environmental Social Energy Economic Analysis

General Character of the Area

This area is characterized by a large pocket of rural residences on 1/3-1/2 acre lots located in the center of this flat study area. The east and west edges contain larger lots that support some agricultural activity. South of TV Highway is a strip of commercial and agricultural uses.

Environmental

There is a very small amount of floodplain associated with a tributary of Council Creek in the southwest corner of the area. This location also contains a very small amount of steep sloped land along the stream corridor. Urbanization of this area may impact these two very small natural resource areas as outlined in the introduction to the ESEE analysis. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 3 percent of the study area land in the proposed

inventory. The very small portion of floodplain associated with Council Creek in the southwest corner is identified as a significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. Urbanization of this area may impact these two very small natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area 78-1		Gross Vacant Buildable Acres 62	
Total Acres	123	Dwelling Unit Capacity	351
Total Developed Acres	37	Employment Acres	-
Total Constrained Acres	20	Resource Land Acres	-
Title 3 Acres	20	Percent Tree Canopy Cover	10%
Upland Steep Slope Acres	-		

General Site Description: Study Area 78-1 lies immediately north of the northwestern section of the UGB and Hillsboro. The western and northern edges of this site area defined by the parcels within it. Northwest Evergreen Road, running in an east-west direction, defines the southern edge. The study area is also intersected by NW Glencoe Road, running north-south. This area is in Washington County and outside of the Metro jurisdictional boundary. Approximately 20 percent of the perimeter of this study area is adjacent to the existing UGB. This study area has been designated entirely as Inner Neighborhood. Approximately 62 of the 123 total acres are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains about 30 parcels, roughly 25 of which have improvements. There is only one parcel with a reported improvement value above \$250,000. About 2 parcels are smaller than one acre, and about 20 parcels, in total, are smaller than five acres. Land use designations are primarily rural and residential. Larger tracts of land through the western half of the study area contain active farming activities, consisting of field crops and/or perennials. Non-residential land uses include landscaping, manufacturing, machinery, food products, auto services and religious uses. There is no evidence of mining or aggregate uses in this study area.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There are no power lines or public easements running through this area, though there is a power line running east-west, just north of this study area. This area is in the general vicinity of the Hillsboro Airport. There may be some air traffic over this area.

Public Services Feasibility: The study area falls within several jurisdictions for public services. The relatively small size of this study area may make it more difficult to serve with maximum efficiency. This area is contained within a single drainage basin.

- **Water:** Hillsboro seemed willing to accept the area within its service area, if necessary. This study area would be moderately difficult to serve. The infrastructure system is in acceptable condition to develop the area, though some limited improvement will be necessary.
- **Sewer:** Clean Water Services appears willing to accept the study area within its service area if necessary. This area would be difficult to serve. The relatively flat topography of the area could pose drainage issues, and could create the need for increased sewer depth and additional pump stations. Some improvements and extensions of lines, both inside and outside the existing UGB, will be necessary alleviate the impacts of new development on the existing system.
- **Stormwater:** Clean Water Services appears willing to accept the study area within its service area if necessary. This study area would be moderately difficult to serve.

The relatively flat topography may pose similar issues as those addressed above. Some limited improvements to the existing infrastructure system may be necessary.

Agricultural Analysis (78-1 & 78-2)

Zoning: This area is entirely exception land and is zoned as AF5 by Washington County. To the north, east and west is resource land zoned EFU. To the south is the UGB.

Current Agricultural Activity: Agricultural activity in this area is limited to field crops in the center of the area near a church. To the north, east and west is an extensive agricultural area that is predominately in a field crop use with nursery and row crops as well.

Compatibility: Urbanization of this area would result in a slight increase in traffic on NW Glencoe Road and NW Evergreen Road. This small increase in traffic could slightly impede the normal movement of farm equipment on these two roads, but the affect should be minimal. The main transport route for the agricultural goods produced to the north, east and west is generally north to Highway 26, and should not be affected by this slight increase in traffic. Urbanization of this area would bring new development directly adjacent to actively farmed land on all sides but the south. Issues relating to safety, liability and vandalism, and complaints due to noise, odor, and the use of pesticides and fertilizers may be exacerbated by the proximity of new development to these farming operations. McKay Creek flows along the western edge of the study area. Urbanization of this study area would result in an increase in impervious surface that may ultimately impact the water quality and potential for flooding in the downstream portions were it runs adjacent to active farming areas. Urbanization of this area may affect the value of adjacent resource land to the north, east and west by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area would have a high potential for impacting adjacent agricultural activity.

Environmental Social Energy Economic Analysis (78-1 & 78-2)

General Character of the Area

This area is characterized by open flat agricultural land to the east of NW Glencoe Road and rural residential uses on partially forested land to the west of NW Glencoe Road. The western edge of the study area is defined by McKay Creek. The Evergreen Christian Center Foursquare Gospel Church occupies a 17-acre parcel within the study area.

Environmental

McKay Creek forms the western edge of the study area. A tributary of McKay Creek briefly crosses the area for a length of 200 feet. Two very small portions of larger wetlands are located in the western and northern portions of the area, respectively. The very top portion of the area, north of the first tributary is completely in the floodplain of McKay Creek as is about half of the study area that is west of NW Glencoe Road. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 34 percent of the study area land in the proposed inventory. All of the stream segments noted above are identified as significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. Urbanization of this area may impact these natural resources as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area	78-2	Gross Vacant Buildable Acres	0
Total Acres	11	Dwelling Unit Capacity	2
Total Developed Acres	0	Employment Acres	0
Total Constrained Acres	10	Resource Land Acres	-
Title 3 Acres	10	Percent Tree Canopy Cover	24%
Upland Steep Slope Acres	0		

General Site Description: Study Area 78-2, in Washington County, represents an addition to area 78-1, which was evaluated in the Phase I study. The area is immediately north of Study Area 78-1, and about one-third of a mile north of Hillsboro. The area has a small amount of frontage onto NW Glencoe Road. It is outside of Metro's jurisdictional boundary. This area has been designated as an Inner Neighborhood. It does not have any significant topographic change, though it is completely within the McKay Creek floodplain. Due to this constraint, there are zero acres of vacant and buildable land out of 11 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: This area consists of a single unimproved parcel, of 11 acres, which is in agricultural use. The ownership and use of this parcel are associated with a much larger, approximately 40-acre parcel to the east (outside of the study area). The larger parcel is also in farm use, and contains residential uses and structures associated with the farm uses.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This study area falls within several jurisdictions for public services, and the following conditions apply:

- **Water:** Hillsboro would be the service provider for this study area. The study area is within one-quarter mile of service. No upgrade to the line is anticipated. This area is rated moderately difficult to serve.
- **Sewer:** Clean Water Services would be the service provider for this study area. Conditions may have to be set for annexation. This area is rated moderately difficult to serve.
- **Stormwater:** New development in the study area is regulated for stormwater treatment by Clean Water Services. Stormwater will be required to be treated with detention, water quality facilities, or both. Under Clean Water Services guidelines, responsibility for the required treatment will be with the developer. With the required treatment, impacts to downstream facilities will be minimal. Clean Water Services anticipates no difficulty in implementation. This area is rated easy to serve.

Agricultural Analysis

See Study Area 78-1.

Environmental Social Energy Economic Analysis

See Study Area 78-1.

Study Area 79-1		Gross Vacant Buildable Acres	142
Total Acres	191	Dwelling Unit Capacity	0
Total Developed Acres	38	Employment Acres	107
Total Constrained Acres	10	Resource Land Acres	-
Title 3 Acres	10		
Upland Steep Slope Acres	-	Percent Tree Canopy Cover	35%

General Site Description: Study Area 79-1 sits north of the City of Hillsboro. Northwest Evergreen Road and the UGB define the southern edge. Northwest 278th Avenue defines a portion of the eastern edge. The tax lots within it define the remaining edges. This study area lies within Washington County, and is outside of the Metro jurisdictional boundary. The area is served by NW Evergreen Road at the south, running east-west, and by NW 273rd Avenue and NW Sewall Road running north-south from NW Evergreen Road. Approximately 15 percent of the perimeter of this study area is adjacent to the existing UGB. This study area has been designated entirely as an Industrial Area. About 142 of the 191 total acres are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains about 55 parcels, roughly 40 of which have improvements. There are no parcels in this study area with improvement values above \$250,000. About one quarter of the parcels in this study area are smaller than one acre, and about 80 percent of all parcels in this study area are smaller than five acres. Most of the tax lots in this study area are classified as rural. There is evidence of agricultural activity, consisting of field crops and/or perennials, primarily within the southern section of the site. Larger farms surround the study area. There are limited non-residential land uses, including management services. There is no evidence of mining or aggregate activities in this study area. Immediately south of this study area is a large area of industrial zoning/land uses within Hillsboro.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): This area is in the general vicinity of the Hillsboro Airport. There may be some air traffic over this area. There is a power line that runs east-west, through the center of this study area.

Public Services Feasibility: The study area falls within several jurisdictions for public services. The relatively small size of the area may make it difficult to serve with maximum efficiency.

- **Water:** Hillsboro has shown a desire, or already has plans to serve the area. This study area would be moderately difficult to serve. While the current infrastructure can accommodate new development, some improvements within the UGB may be necessary.
- **Sewer:** Clean Water Services appears willing to accept the study area within its service area if necessary. This area will be difficult to serve. The relatively flat topography of this area will pose drainage issues. Increased sewer depth and additional pump stations will be required. Some infrastructure improvements will also be needed to alleviate the impacts of new development on the existing system.
- **Stormwater:** Clean Water Services appears willing to accept the study area within its service area if necessary. This area will be moderately difficult to serve. The relatively flat topography within this study area poses the same issues addressed

above. Some additional infrastructure improvements or extensions may be necessary.

Agricultural Analysis (79-1 & 79-2)

Zoning: This area is entirely exception land and is zoned AF5 by Washington County. To the north, east and west is resource land zoned EFU and AF20. To the south is the UGB.

Current Agricultural Activity: The agricultural activity in this area includes field crops and pastureland intermixed with rural residences and forested areas associated with streams. To the north, east and west is an extensive agricultural area that is predominately in a field crop use with nursery and row crops as well.

Compatibility: Urbanization of this area would increase traffic on NW Sewell Road, Meek Road, NW 273rd Avenue and NW Evergreen Road. This increased traffic on all four roads could impede the normal movement of farm equipment and affect the transport of agricultural goods produced near this area. Urbanization of this area would bring new development directly adjacent to actively farmed land on all sides but the south. Issues relating to safety, liability and vandalism, and complaints due to noise, odor, and the use of pesticides and fertilizers may be exacerbated by the proximity of new development to these extensive farming operations. Gulch Creek and Storey Creek pass through this area prior to draining into Waible Reservoir, which is located in an actively farmed area. Waible Reservoir drains to McKay Creek. Urbanization of this area would result in increased impervious surfaces that may diminish water quality and increase downstream flooding in these actively farmed areas. Urbanization of this area may affect the value of adjacent resource land to the north, east and west by encouraging land banking and speculation that results in the inability of farmers to acquire parcels of land needed for agricultural production. However the small amount of new development that could occur versus the large expanse of adjacent agricultural land may negate this consequence. Overall, urbanization of this area would have a high potential for impacting adjacent agricultural activity.

Environmental Social Energy Economic Analysis (79-1 & 79-2)

General Character of the Area

This area is characterized as mainly flat with some moderate slopes near stream corridors. The southern portion of the area is a mix of agricultural activity and rural residences on mostly open land with some forested parcels. The northern portion contains open agricultural lands with related residences.

Environmental

Storey Creek flows across the top portion of the area in a southwesterly direction, prior to flowing into Waible Reservoir. This stream section is approximately one-third of a mile in length and has a floodplain that varies in width from 300-400 feet in width. Waible Gulch and a small tributary flow west across the central portion of the area for approximately a half-mile. Waible Gulch has a floodplain that varies in width from 150-200 feet. There is an unnamed stream that flows through the very southern portion of the area adjacent to NW Evergreen Road for approximately a half-mile. A portion of a very large wetland associated with Waible Reservoir, Storey Creek and Waible Gulch extends into the top portion of the area within the floodplain boundaries. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 25 percent of the study area land in the proposed inventory. All of the stream segments noted above are identified as significant Water Area, Wetland and Fish and Wildlife Habitat on Washington

County's Rural/Natural Resource Plan. Urbanization of this area may impact these natural resource features as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area	79-2	Gross Vacant Buildable Acres	107
Total Acres	166	Dwelling Unit Capacity	0
Total Developed Acres	33	Employment Acres	81
Total Constrained Acres	24	Resource Land Acres	0
Title 3 Acres	24	Percent Tree Canopy Cover	3%
Upland Steep Slope Acres	0		

General Site Description: Study Area 79-2 is an addition to Study Area 79-1, evaluated during the Phase I study. This area, situated in Washington County, is approximately three-quarters of a mile north of Hillsboro. It is outside of Metro's jurisdictional boundary. The area's northern boundary is partially defined by Meek Road. The area is largely flat, with floodplains bisecting its northwestern and southwestern portions. This study area has been designated completely for Industrial Use. There are 107 vacant and buildable acres out of 166 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: This area has 33 parcels with recorded improvement values out of 54 total parcels. The median improvement value is \$121,500. The median parcel size is approximately two acres. There are three parcels that are smaller than one acre in size, and eight parcels that exceed five acres. Smaller parcels with residential uses run the length of Meek Road, while larger parcels with agricultural uses extend southward, along NW 271st, NW 268th and NW Sewell. Since 1990, five permits for single-family residential development have been issued.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This study area falls within several jurisdictions for public services, and the following conditions apply:

- **Water:** Hillsboro would be the service provider for this area. The area is within three-quarters of a mile of service. No upgrade to the line is anticipated. This area is rated moderately difficult to serve.
- **Sewer:** This area is in the Waible Creek area. This area is rated moderately difficult to serve.
- **Stormwater:** New development in the study area is regulated for stormwater treatment by Clean Water Services. Stormwater will be required to be treated with detention, water quality facilities, or both. Under Clean Water Services guidelines, responsibility for the required treatment will be with the developer. With the required treatment, impacts to downstream facilities will be minimal. Clean Water Services anticipates no difficulty in implementation. This area is rated easy to serve.

Agricultural Analysis

See Study Area 79-1.

Environmental Social Energy Economic Analysis

See Study Area 79-1.

Study Area 80		Gross Vacant Buildable Acres	
Total Acres	40	Dwelling Unit Capacity	0
Total Developed Acres	22	Employment Acres	11-
Total Constrained Acres	5	Resource Land Acres	-
Title 3 Acres	5	Percent Tree Canopy Cover	-
Upland Steep Slope Acres	-		

General Site Description: Study Area 80 sits north and west of Hillsboro, and is very small when compared to other study areas. Sunset Highway defines the northern side of this area, and the UGB defines the eastern edge. The remaining sides are defined by the boundaries of tax lots within it. This study area lies within Washington County, and is outside of the Metro jurisdictional boundary. It is approximately 2.5 miles, straight-line distance from the Orenco Town Center. Northwest Shute Road serves it. Approximately 10 percent of the perimeter of this study area lies against the UGB; the remainder is a peninsula. This study area has been designated entirely as Industrial. Approximately 14 of the 40 acres in this study area are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains about 20 tax lots, almost all of which have improvements. None of the tax lots have improvement values above \$250,000. About 10 of the tax lots are smaller than one acre, and all tax lots are smaller than five acres. Residential uses, and some limited farming activity (field crops or perennials) are evident in this study area. Non-residential land uses include general contracting, and printing. There is no evidence of mining or aggregate activities in this study area.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): This area is in the general vicinity of the Hillsboro Airport. There may be some air traffic over this area. Available data does not suggest the existence of power lines or public easements in this study area.

Public Services Feasibility: The study area falls within several jurisdictions for public services. The relatively small size of this area may make it difficult to serve with maximum efficiency. However, this area is contained within a single drainage basin, which may ease some servicing issues.

- **Water:** Hillsboro has shown a desire or already has plans to serve the area. This study area would be moderately difficult to serve. The infrastructure system is in acceptable condition to develop the area, though some minimal improvements within the UGB should be expected.
- **Sewer:** Clean Water Services appears willing to accept the study area within its service area if necessary. This study area would be difficult to serve, and additional infrastructure improvements will be needed to alleviate the impacts of new development on the existing system.
- **Stormwater:** Clean Water Services appears willing to accept the study area within its service area if necessary. This study area would be difficult to serve. Although the infrastructure is in acceptable condition to develop the area, some improvements and extensions of lines are to be expected both inside and outside the UGB.

Agricultural Analysis

Zoning: This area is entirely exception land and is zoned as AF5 by Washington County. The northern edge of the area abuts Highway 26. To the east is the UGB. To the south, west and to the north of Highway 26 is resource land zoned EFU.

Current Agricultural Activity: The main use of this area is rural residential with associated pasture and field crop uses. To the south, west and north of Highway 26 is an extensive agricultural area that is predominately in a field crop use with minor orchard and row crop locations as well.

Compatibility: Urbanization of this area would result in a slight increase in traffic on Meek Road and NW Shute Road. This small increase in traffic would be negligible compared to the traffic generated from areas within the UGB, and therefore would have no effect on nearby agricultural activity. Urbanization of this area would bring new development directly adjacent to actively farmed land to the south and west. Issues relating to safety, liability and vandalism, and complaints due to noise, odor, and the use of pesticides and fertilizers may be exacerbated by the proximity of new development to these extensive farming operations. Highway 26 provides a buffer between the study area and the agricultural lands to the north, which would limit any impact of new development on those agricultural lands. Gulch Creek passes through the northern tip of the area prior to flowing through actively farmed lands. Urbanization of the area would result in increased impervious surfaces that may diminish water quality and increase downstream flooding in this actively farmed area. The limited amount of increased stream flow resulting from the small development potential of the area may reduce this impact to the adjacent agricultural land. Urbanization of this area may affect the value of adjacent resource land by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. However the small amount of new development that could occur versus the large expanse of adjacent agricultural land may negate this consequence. Overall, urbanization of this area will result in a small amount of new development that could impact some of the adjacent agricultural activity to the south and west.

Environmental Social Energy Economic Analysis

General Character of the Area

This area is characterized by flat land in a rural residential use.

Environmental

A tributary to Waible Gulch crosses the very northwest corner of the area for 450 feet. There is a small area of floodplain adjacent to this stream that varies in width from 150-350 feet. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 25 percent of the study area land in the proposed inventory. The tributary to Waible Gulch is identified as a significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. Urbanization of this area may impact these two very small natural resource features as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area	81	Gross Vacant Buildable Acres	134
Total Acres	244	Dwelling Unit Capacity	0
Total Developed Acres	36	Employment Acres	100
Total Constrained Acres	31	Resource Land Acres	162
Title 3 Acres	31	Percent Tree Canopy Cover	1%
Upland Steep Slope Acres	0		

General Site Description: Study Area 81 is a rectangular area. It is adjacent to Hillsboro and the UGB, which define its southern and eastern boundaries. Northwest West Union Road defines the area's northern boundary and NW Helvetia Road defines the area's western boundary. It is outside Metro's jurisdictional boundary. A floodplain runs along the western side of this area. The area is designated entirely for Industrial use. There are 134 acres of vacant and buildable land out of 244 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: The area has 19 parcels with recorded improvement values out of 34 total parcels. The median improvement value is \$3,420. The median parcel size is 4.7 acres. There are 5 parcels are smaller than 1 acre in size, and 9 parcels are larger than 5 acres. Larger parcels define the northern and southern sections, while smaller, five-acre parcels run across the middle of the study area. The area is mostly in agricultural use, though a 15-acre manufactured home park has been established in the southern section of this area, along NW Jacobson Road. Since 1990, three new single-family dwelling permits have been issued.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This study area falls within several jurisdictions for public services, and the following conditions apply:

- **Water:** Tualatin Valley Water District would be the service provider for this area. Service exists in the areas of NW Cornelius Pass Road, NW Dick Road, NW Jackson School Road and NW Helvetia Road. Service is considered to be easy.
- **Sewer:** Clean Water Services would be the service provider for this area. Nearest sewer is on NW Evergreen Road. Connection would be expensive due to length of trunk line extensions, but service could be provided. The area is rated moderately difficult to serve.
- **Stormwater:** New development in the study area is regulated for stormwater treatment by Clean Water Services. Stormwater will be required to be treated with detention, water quality facilities, or both. Under Clean Water Services guidelines, responsibility for the required treatment will be with the developer. With the required treatment, impacts to downstream facilities will be minimal. Clean Water Services anticipates no difficulty in implementation. This area is rated easy to serve.

Agricultural Analysis

Zoning: This area includes exception zoned AF5 and RCOM and resource land zoned EFU by Washington County. To the north and west is resource land zoned EFU. To the east and south is the UGB.

Current Agricultural Activity: Agricultural activity in this study area consists of a few large parcels in field crop and pastureland uses on the resource land portions of the study area and smaller field crop areas associated with rural residences on the exception land portion. The area in the BPA easement is in field crop production. To the west and north is an extensive agricultural area that is predominately in a field crop use with minor orchard and row crop locations as well.

Compatibility: Urbanization of this area would result in an increase in traffic on NW Helvetia Road and NW West Union Road. This increase in traffic would be negligible compared to the traffic generated from adjacent areas within the UGB, specifically the new adjacent Intel site, and therefore would have no affect on nearby agricultural activity. Urbanization of this area would bring new development directly adjacent to actively farmed land to the north and west. Issues relating to safety, liability and vandalism, and complaints due to noise, odor, and the use of pesticides and fertilizers may be exacerbated by the proximity of new development to these extensive farming operations. Two tributaries of Gulch Creek pass through this area prior to flowing through actively farmed lands. Urbanization of the area would result in increased impervious surfaces that may diminish water quality and increase downstream flooding in this actively farmed area. Urbanization of this area may affect the value of adjacent resource land to the north and west by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area may impact some of the adjacent agricultural activity to the north and west.

Environmental Social Energy Economic Analysis

General Character of the Area

This area is characterized by open flat land that supports agricultural activity along with some large lot rural residences and a mobile home park. A BPA power line easement runs along the east edge of the study area in a north-south direction.

Environmental

An unnamed creek flows south along the western edge of the area, parallel to NW Helvetia Road for approximately a half-mile. A tributary to this stream flows west through the top portion of the area for approximately a half-mile as well. There is a half-acre wetland centered on this tributary stream. There is a large floodplain area associated to the stream adjacent to NW Helvetia Road that extends from 200-350 feet in width. This floodplain also extends west along the tributary for approximately two-tenths of a mile. A second tributary to the stream along NW Helvetia Road flows west through the southern portion of the area for approximately a half-mile. This location also contains a very small amount of steep sloped land along the stream corridor. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 37 percent of the study area land in the proposed inventory. The unnamed creek that is parallel to NW Helvetia Road and its tributary that flows through the top portion of the area are identified as significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. Urbanization of this area may impact these natural resource features as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area 82		Gross Vacant Buildable Acres 88	
Total Acres	153	Dwelling Unit Capacity	514
Total Developed Acres	55	Employment Acres	-
Total Constrained Acres	13	Resource Land Acres	-
Title 3 Acres	13	Percent Tree Canopy Cover	25%-
Upland Steep Slope Acres	-		

General Site Description: Study Area 82 sits northeast of the northern tip of Hillsboro and the UGB. The area is triangular shaped and is defined by NW West Union Road, Northwest Old Pass Road and selected parcel boundaries. The area is served by NW Old Pass Road, which connects NW West Union Road to NW Cornelius Pass Road. Northwest Bendemeer Road also serves the area. Approximately 35 percent of the perimeter of this study area is adjacent to the UGB. This area is in Washington County and is outside of the Metro jurisdictional boundary. This study area is approximately three miles, straight-line distance, from both the Orenco and the Tanasbourne Town Centers. This study area has been designated entirely as Inner Neighborhood. Approximately 88 of the 153 acres are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains about 65 tax lots, the vast majority of which have improvements. Only one tax lot in this study area has improvement values above \$250,000. About 10 of the tax lots are smaller than one acre and almost all tax lots are smaller than five acres. The area contains both residential and farming activities. Aerial photo site inspections suggest the existence of perennials and nursery stock on these farms. Non-residential land uses in this study area include construction services, food stores and a nursery. There is no evidence of mining or aggregate uses in this study area.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is a public easement bisecting the center of the area, which is owned by the Oregon Department of Transportation. This area is in the general vicinity of the Hillsboro Airport. There may be some air traffic over this area. Available data does not suggest the existence of power lines running through this area.

Public Services Feasibility: The study area falls within several jurisdictions for public services. The relatively small size of this area may make it difficult to serve with maximum efficiency. In addition, this area contains multiple drainage basins, which may pose additional servicing issues.

- **Water:** The Tualatin Valley Water District showed a desire or already has plans to serve the area. This study area would be moderately difficult to serve. The infrastructure system is in acceptable condition to develop the area, though some limited improvements within the UGB will be necessary.
- **Sewer:** Clean Water Services appears willing to accept the study area within its service area if necessary. This area will be difficult to serve. While the current infrastructure system can accept some new development, some improvements and extensions of lines will be required, both inside and outside the UGB.
- **Stormwater:** Clean Water Services appears willing to accept the study area within its service area if necessary. This area will also be difficult to serve for storm sewers. While infrastructure can accommodate new development, some

improvements and extensions of lines will be necessary, both inside and outside the UGB.

Agricultural Analysis

Zoning; This area is entirely exception land zoned as AF5 and RCOM by Washington County. To the north is resource land zoned EFU and an island of exception land zoned RIND. To the east is resource land zoned EFU and AF20. To the south and west is the UGB.

Current Agricultural Activity: The main use of this area is rural residential with limited associated pasture and field crop uses. To the north and east is an extensive agricultural area that is predominately in a field crop use with minor nursery and row crop locations as well. There are a number of forested parcels Intermixed in this agricultural area.

Compatibility: Urbanization of this area would result in an increase in traffic on NW Dick Road, NW West Union Road, NW Old Pass Road and NW Cornelius Pass Road. This increased traffic, especially on NW Dick Road, NW West Union Road, and NW Cornelius Pass Road could impede the normal movement of farm equipment and affect the transport of agricultural goods produced to the north and east. Urbanization of this area would bring new development directly adjacent to actively farmed land to the north and east. Issues relating to safety, liability and vandalism, and complaints due to noise, odor, and the use of pesticides and fertilizers may be exacerbated by the proximity of new development to these extensive farming operations. NW Cornelius Pass Road and the cemetery located in the northwest corner of the study area may somewhat buffer new development from the nearby farmland, but odor, pesticide and fertilizer use may still be a problem. Holcomb Creek passes through a very small portion of the study area prior to draining into Holcomb Lake, which is located on resource land. Urbanization of this area will result in increased impervious surfaces that may ultimately drain to this stream, diminishing water quality and increasing the chance of flooding on the resource land to the east. Much of this resource land is forested so the impact on agricultural land is neutralized. Urbanization of this area may affect the value of adjacent agricultural land to the north and east by encouraging land banking and speculation that results in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area may impact some of the adjacent agricultural activity to the north and east.

Environmental Social Energy Economic Analysis

General Character of the Area

This area is characterized by rural residential uses with some agricultural activity on a mixture of open and forested parcels. The land is mostly flat to gently sloped. There is a small amount of commercial activity at the intersection of NW Union Road and NW Cornelius Pass Road. The east and west edges contain larger lots that support some agricultural activity. South of TV Highway is a strip of commercial and agricultural uses.

Environmental

Holcomb Creek crosses the northwest corner of the area prior to flowing into Holcomb Lake, which is approximately three-quarters of a mile to the southeast in Study Area 83. This stream corridor is approximately 670 feet in length and has a floodplain that varies from 200-400 feet in width. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 24 percent of the study area land in the proposed inventory. This short segment of Holcomb Creek is identified as a significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's

Rural/Natural Resource Plan. Urbanization of this area may impact these natural resource features as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Other Identified Resources

The Washington County Rural/Natural Resource Plan identifies the West Union Baptist Church at 22365 NW West Union Road as a historic property.

Study Area	83	Gross Vacant Buildable Acres	1,244
Total Acres	1,816	Dwelling Unit Capacity	6,510
Total Developed Acres	152	Employment Acres	39
Total Constrained Acres	395	Resource Land Acres	1,688
Title 3 Acres	390	Percent Tree Canopy Cover	13%
Upland Steep Slope Acres	5		

General Site Description: Study Area 83 is a large swath of land north of NW West Union Raod in unincorporated Washington County. The area is mostly outside of Metro's jurisdictional boundary, with the exception of the southeast corner of the study area. The UGB defines the area's southern boundary. Northwest 185th Avenue defines the eastern boarder. It can be accessed via NW West Union Road, NW Cornelius Pass Road, NW Springville Road or NW 185th Avenue. Holcomb Lake is in the center of this area, and Rock Creek runs through it in a north-south direction. Slopes in this area are rolling to hilly, with more elevation changes occurring closer to Rock Creek and Holcomb Lake. Generally, areas to the north of NW Cornelius Pass Road have been designated as Outer Neighborhood, while areas to the south have been designated as Inner Neighborhood. A Corridor is designated along NW Cornelius Pass Road.

Parcelization, Building Values, Development Patterns, Vacant Land: This area contains 70 parcels that have recorded improvement values out of 104 total parcels. The median improvement value is \$121,500. The median parcel size in this study area is 9.5. There are 13 parcels smaller 1 acre in size, and 61 parcels exceed 5 acres. While most parcels in this study area are larger, and associated with agricultural use, there is one larger, 10-acre industrial operation located near the western end of the study area. A cluster of smaller, five-acre residential parcels also occurs towards the northeastern section of this study area.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There appears to be an unimproved right-of-way owned by the Oregon Department of Transportation running north-south in the western section of this area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This study area falls within several jurisdictions for public services, and the following conditions apply:

- **Water:** Tualatin Valley Water District would be the service provider for this area. Service exists in the areas of NW West Union Road and Springville Road. Extension would be needed to NW Cornelius Pass Road. Rock Creek passes through the study area, and there are extensive wetlands in the vicinity of Rock Creek. This area is rated moderately difficult to serve.
- **Sewer:** Clean Water Services would be the service provider for this area. There would be long extensions of gravity lines to the nearest service at the Rock Creek plant. Rock Creek passes through the study area, and there are extensive wetlands in the vicinity of Rock Creek. This area is rated moderately difficult to serve.
- **Stormwater:** New development in the study area is regulated for stormwater treatment by Clean Water Services. Stormwater will be required to be treated with detention, water quality facilities, or both. Under Clean Water Services guidelines, responsibility for the required treatment will be with the developer. With the required treatment, impacts to downstream facilities will be minimal. Clean Water Services anticipates no difficulty in implementation. This area is rated easy to serve.

Agricultural Analysis

Zoning: The majority of this study area is resource land zoned EFU and AF20 by Washington County. There are three exception land areas, one zoned RIND, one zoned RCOM and the last zoned AF5 and AF10. To the north and west is resource land zoned EFU. To the east is resource land zoned EFU and exception land in Study Areas 84, 87, and 88. To the south is the UGB.

Current Agricultural Activity: The resource land in the study area supports an extensive amount of filed crop production as well as some nursery stock and pastureland. There are a number of forested areas intermixed, mainly along stream corridors and slopes. The three exception land areas contain no agricultural activity. To the north and east are large parcels in field crop and nursery production intermixed with rural residences. Many of the residential parcels are partially or fully forested with some small pasture or field crop sections. To the west is a larger zone of uninterrupted field crops and orchards.

Compatibility: Urbanization of this area would result in a significant increase in traffic on NW Dick Road, NW West Union Road, NW 185th Avenue, NW Germantown Road, NW Springville Road and NW Cornelius Pass Road. This increased traffic on all of these roads could affect the transport of agricultural goods produced on nearby farmland. Increased traffic on NW Dick Road, NW 185th Avenue, NW Germantown Road, NW Springville Road and NW Cornelius Pass Road could impede the normal movement of farm equipment. Urbanization of this area would bring new development directly adjacent to large tracts of actively farmed land to the north and west. Issues relating to safety, liability and vandalism, and complaints due to noise, odor, and the use of pesticides and fertilizers may be exacerbated by the proximity of new development to these extensive farming operations. Holcomb Creek and some tributaries flow through a large portion of this study area prior to draining into Holcomb Lake, which is also located in the study area. Rock Creek also flows through the area and also is the outlet for Holcomb Lake. Urbanization of this area will result in increased impervious surfaces that may diminish water quality and increase the chance of flooding downstream, but these consequences will not affect agricultural activities as Rock Creek flows south through the UGB. Urbanization of this area may affect the value of adjacent agricultural land by encouraging land banking and speculation that results in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area would have a high potential for impacting adjacent agricultural activity.

Environmental Social Energy Economic Analysis

General Character of Area

This study area is composed of one large portion [Area 83 (1)] with three smaller areas [referred to as 83(2), (3) and (4)] contained within its perimeter. A variety of water related features such as wetlands, creeks, a lake and floodplains are located throughout this large study area. Moderate slopes with scattered flat areas, pockets of steep slopes and dispersed patches of tree canopy generally associated with water related features, characterize this study area. There are commercial, agricultural, and industrial uses found in this area. 83(2) a flat open area in the northwest quadrant is characterized by industrial uses. 83(3) in the northeast corner is moderately sloped open land, patches of tree canopy, with agricultural uses and associated buildings. 83(4) is flat open land characterized by a commercial use located on the corner of West Union and SW 185th Avenue.

Environmental

Rock Creek flows from the northeast corner of the area in a generally southerly direction, cuts below Holcomb Lake and exits the southern edge of the area. Holcomb Creek and a tributary enter the study area from the north and merge together flowing into Holcomb Lake located in the south central portion of the area. There are a number of tributaries to Rock and Holcomb Creeks as well as Holcomb Lake in the study area. Two short segments of McKay Creek flow from the western edge of the study area. The total stream length for the study area is approximately nine miles. An extensive floodplain area corresponds with Rock and Holcomb Creeks. There are 11 wetland areas located in the northwest and bottom half of the study area, totaling approximately 90 acres. There are very minor pockets of steep slopes located in the northeast corner and along a small segment of Rock Creek in the lower portion of the area. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 38 percent of the study area in the proposed inventory. Holcomb Lake and Holcomb and Rock Creeks are identified as significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis. There is an approximately 32-acre Metro open space located in the southern portion of the area in a wetland and floodplain. Urbanization of this area may also inhibit the ability of this natural area to provide species habitat and other ecological functions.

Social Energy Economic

See Appendix A.

Other Identified Resources

The Washington County Rural/Natural Resource Plan identifies the Bethany Bible Church at 18245 NW Germantown Road and the Farmstead at 8645 NW Old Cornelius Pass Road as historic properties.

Study Area 84		Gross Vacant Buildable Acres		187
Total Acres	210	Dwelling Unit Capacity		1,155
Total Developed Acres	25	Employment Acres		-
Total Constrained Acres	13	Resource Land Acres		-
Title 3 Acres	13	Percent Tree Canopy Cover		30%
Upland Steep Slope Acres	-			

General Site Description: Study Area 84 is situated in the general vicinity of 185th Avenue in unincorporated Washington County. This study area consists of two non-contiguous sub-areas. The larger, northern piece is defined by NW Breuger Road to the east, and NW 185th Avenue to the west. The southern portion is defined by NW 185th Avenue to the west, and the UGB on the north, east and south. Northwest Springville Road also runs along the southern boundary of this piece. These areas are all approximately two miles from the Bethany Town Center. This study area has been designated entirely as Inner Neighborhood. Approximately 187 of the 210 total acres are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains about 30 tax lots, most of which have improvements. One tax lot in this study area (in the northernmost section) has an improvement value above \$250,000. About 10 tax lots are smaller than one acre, and lie mainly in the central and southern pieces. About 90 percent of the tax lots in this study area are smaller than five acres. Aerial photo inspections indicate that agricultural activity is present throughout a large portion of the northern piece, and to a limited extent in the central piece. Agricultural uses may include perennials and nursery stock. Non-residential land uses, primarily in the central piece, include landscaping and plumbing services. There is no evidence of mining or aggregate activities within this study area.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): A power line runs across the northern piece of this study area. There is no evidence of significantly high air traffic noise over this area.

Public Services Feasibility: The study area falls within several jurisdictions for public services. The smaller size of this area may make it relatively difficult to serve with optimal efficiency. The area is contained within a single drainage basin.

- **Water:** The Tualatin Valley Water District showed a desire or already has plans to serve the area. In general terms, this study area would be difficult to serve. Infrastructure improvements are needed to alleviate impacts of new development on existing facilities.
- **Sewer:** Clean Water Services appears willing to accept the study area within its service area if necessary. This area will be moderately difficult to serve. While the current system can accommodate some new development, some improvements and extensions of lines inside and outside the existing UGB are to be expected.
- **Stormwater:** Clean Water Services appears willing to accept the study area within its service area if necessary. This area will be moderately difficult to serve. Although the infrastructure is in acceptable condition to develop the area, some improvements and extensions of lines are to be expected both inside and outside the UGB.

Agricultural Analysis

Zoning: This study area is entirely exception land and is separated into two locations. The southern portion (12 acres) is zoned AF5 and the northern portion (197 acres) is zoned AF5 and AF10 by Washington County. The southern portion is surrounded by the UGB on three sides and has EFU zoned land on the fourth side. To the north of the northern portion is resource land zoned EFU and a few pockets of exception land in Study Areas 83 and 87. To the east is resource land zoned EFU and AF20 and exception land in Study Area 86. To the south is the UGB. To the west is resource land zoned EFU in Study Area 83.

Current Agricultural Activity: The southern portion is in a rural residential use with a few small lot field crops and unfarmed areas with a forest canopy. Land within the northern portion supports rural residential uses with associated pastures, field crops and unfarmed open areas. There is a large area of field crop and pastureland north of Portland Community College. There are large areas of field and row crops, pasture and forested areas to the north, east and west of the northern portion of the study area.

Compatibility: Urbanization of this area would result in an increase in traffic on NW 185th Avenue, NW Springville Road and NW Germantown Road. This increase in traffic is mainly due to the 197-acre northern portion of the study area. This increased traffic could impede the normal movement of farm equipment and affect the transport of agricultural goods produced to the north, east and west of this study area. Any increased traffic generated from the urbanization of the 12-acre southern portion would most likely be directed into the UGB, which surrounds it on three sides, thereby eliminating any potential impact on agricultural activities to the north. Urbanization of this area would bring new development directly adjacent to pockets of actively farmed land to the north, east and west that are intermixed with forested areas. Issues relating to safety, liability and vandalism, and complaints due to noise, odor, and the use of pesticides and fertilizers may be exacerbated by the proximity of new development to these farming operations. The forested areas may act to reduce this impact slightly. Rock Creek is located north of the study area and a small tributary flows across the western edge of the area. Urbanization of this area will result in increased impervious surfaces that may ultimately drain to this stream, diminishing water quality and increasing the chance of flooding on the farmland to the west. Urbanization of this area may affect the value of adjacent agricultural land to the north, east and west by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area may impact adjacent agricultural activity to the north, east and west.

Environmental Social Energy Economic Analysis

General Character of the Area

This area is characterized by rural residential uses some with related agricultural activities on a mixture of open and forested parcels. There are a few parcels that are being farmed in conjunction with larger adjacent parcels around Portland Community College, which is adjacent to the south. The land is moderately sloped with a few large flat areas.

Environmental

Approximately 900 feet of a tributary to Rock Creek crosses the western edge of the northern sub-area. A quarter acre wetland is also located in this area. An approximately 10-acre portion of the very large floodplain of Rock Creek covers a triangular shaped area of the western edge of the northern sub-area. A third of an acre wetland is located in the southern sub-area. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 39 percent of the study area

land in the proposed inventory. The tributary to Rock Creek is identified as significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. Urbanization of this area may impact these small natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area	85	Gross Vacant Buildable Acres	217
Total Acres	246	Dwelling Unit Capacity	1,294
Total Developed Acres	14	Employment Acres	-
Total Constrained Acres	6	Resource Land Acres	235
Title 3 Acres	6	Percent Tree Canopy Cover	13%
Upland Steep Slope Acres	0		

General Site Description: Study Area 85 is in Washington County north of NW Springville Road. It is contiguous to the UGB, which defines its southern boundary. The area's eastern boundary is partially defined by NW Kaiser Road and its western boundary is partially defined by NW Brugger Road. Northwest Springville Road and NW Kaiser Road provide access to the area. The area is bisected by the Metro jurisdictional boundary. It is approximately two miles from both the cities of Hillsboro and Portland. There is slight elevation change in this area. Study Area 85 is designated completely as Inner Neighborhood with a small portion designated as Corridor along NW Kaiser Road. There are 217 acres of vacant and buildable land out of 246 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: The study area contains 12 parcels with recorded improvement values of 21 total parcels. The median improvement value is \$41,500. Three parcels are smaller than one acre, and 15 parcels are greater than five acres. The area is largely in agricultural use, with some associated residential uses. Small, forested patches also exist to the north and in the center. Records indicate that no single-family dwelling permits have been issued since 1990.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the site.

Public Services Feasibility: This study area falls within several jurisdictions for public services, and the following conditions apply:

- **Water:** Tualatin Valley Water District would be the service provider for this area. Service already exists on NW Springville Road east of Portland Community College and could be provided to this area. Additional transmission lines would be needed. Tualatin Valley Water District is willing to serve. This area is rated moderately difficult to serve.
- **Sewer:** Clean Water Services would be the service provider for this area. New trunk lines would be needed to connect to the Rock Creek plant, which would need an upgrade. Conditions may have to be set on annexation. This area is rated moderately difficult to serve.
- **Stormwater:** New development in the study area is regulated for stormwater treatment by Clean Water Services. Stormwater will be required to be treated with detention, water quality facilities, or both. Under Clean Water Services guidelines, responsibility for the required treatment will be with the developer. With the required treatment, impacts to downstream facilities will be minimal. Clean Water Services anticipates no difficulty in implementation. This area is rated easy to serve.

Agricultural Analysis

Zoning: This study area contains one parcel (0.6 acres) of exception land zoned AF5 with the remainder of the study area designated as resource land. Most of the resource land is zoned as either EFU and AF20 however, 112 acres of resource land is zoned as R9 by Washington County as a result of a previous attempt to bring a portion of this area into the UGB. To the north is a mixture of exception land in Study Areas 84 and 86 and resource land zoned EFU in Study Area 87. Directly east is a strip of exception land in Study Area 86 and resource land zoned EFU further east in Study Areas 87 and 90. To the south and southwest is the UGB. To the northwest is a pocket of exception land in Study Area 84 and resource land zoned EFU further west in Study Area 83.

Current Agricultural Activity: The majority of resource land in this study area supports field crops, with a few parcels in row crops or forested. The exception land parcel contains a residence. To the north is a large extension of field crop uses intermixed with forested parcels and pockets of rural residences. To the east is some fairly large field crop and nursery stock uses intermixed with rural residences. To the west beyond the UGB and the exception land in Study Area 84 is extensive land in field crop production.

Compatibility: Urbanization of this area would result in an increase in traffic on NW Brugger Road and NW Springville Road, resulting in a probable increase on NW 185th Avenue and NW Kaiser Road within the UGB. The increased traffic along NW 185th Avenue and NW Kaiser Road could affect the transport of agricultural goods produced to the north, east and west of this study area. The movement of agricultural equipment should not be affected too much, as the adjacent active farming areas are small and intermixed with residences. Urbanization of this area would bring new development directly adjacent to a few tracts of actively farmed land to the north and east. Issues relating to safety, liability and vandalism, and complaints due to noise, odor, and the use of pesticides and fertilizers may occur in these limited areas. A stream flows through this study area prior to crossing NW Springville Road and flowing into the Rock Creek Open Space Park. Urbanization of this area will result in increased impervious surfaces that may diminish water quality and increase the chance of flooding downstream, but these consequences will not affect nearby agricultural activities as the park is within the UGB. Urbanization of this area may affect the value of few adjacent agricultural parcels to the north and east by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area may impact adjacent agricultural activity to the north and east.

The Beaverton School District has requested that a 10-acre parcel within this study area be brought into the UGB. This request is being considered in the Special Land Need report.

Environmental Social Energy Economic Analysis

General Character of Area

This area is characterized by mostly open land with agricultural activity, scattered rural residential, stream tributaries and wetlands. There are patches of tree canopy located in the north and south sections of the central portion of the area. The top third of the area is flat to gently sloped, and progresses to a moderate slope through the bottom two thirds. Study Area 85 is comprised of two sections; a large one with a smaller one contained within its southwest corner. The smaller area has a flat to gentle slope, with a wooded perimeter and contains a rural residential structure.

Environmental

A tributary of Rock Creek flows through the lower portion of the area in a southwesterly direction. A tributary of Rock Creek enters the area up from the southwest corner where it forks to the west for a short distance and to the east through a wetland and flows on to exit at the east perimeter of the area. The total length of stream segment is approximately three-quarters of a mile. There are two wetlands in this study area, one in the north and approximately three-quarters of another in the southeast. In total the area of wetland is approximately 2.5 acres. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 75 percent of the study area land in the proposed inventory. This tributary to Rock Creek is also identified as a significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area	86	Gross Vacant Buildable Acres	101
Total Acres	136	Dwelling Unit Capacity	453
Total Developed Acres	27	Employment Acres	-
Total Constrained Acres	3	Resource Land Acres	0
Title 3 Acres	3	Percent Tree Canopy Cover	16%
Upland Steep Slope Acres	0		

General Site Description: Study Area 86 is in Washington County north of NW Springville Road and east of Study Area 85. It is contiguous to the UGB, which defines the area's southern edge. The area is outside of Metro's jurisdictional boundary. The area has roadway access onto NW Kaiser Road and NW Springville Road. This area is mostly flat. It is designated as Inner Neighborhood with a section of Corridor running through the center, along NW Kaiser Road. This area contains 101 acres of vacant and buildable land out of 136 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: Of the 34 total parcels, 27 parcels have recorded improvement values. The median improvement value is \$168,000. Two parcels are smaller than one acre, and nine parcels exceed five acres. The area is largely in agricultural use, with some associated residential uses. Records indicate that two permits for single-family dwellings have been issued since 1990.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This study area falls within several jurisdictions for public services, and the following conditions apply:

- **Water:** Tualatin Valley Water District would be the service provider for this area. Service exists on NW Springville Road east of Portland Community College and could be provided to this area. Tualatin Valley Water District is willing to serve. Rock Creek passes through the study area. This area is rated easy to serve.
- **Sewer:** Clean Water Services would be the service provider for this area. New trunk lines would be needed to connect to the Rock Creek plant, which would need an upgrade. Conditions may have to be set on annexation. Rock Creek passes through the study area, and there are extensive wetlands in the vicinity of Rock Creek. This area is rated moderately difficult to serve.
- **Stormwater:** New development in the study area is regulated for stormwater treatment by Clean Water Services. Stormwater will be required to be treated with detention, water quality facilities, or both. Under Clean Water Services guidelines, responsibility for the required treatment will be with the developer. With the required treatment, impacts to downstream facilities will be minimal. Clean Water Services anticipates no difficulty in implementation. This area is rated easy to serve.

Agricultural Analysis

Zoning: This area is entirely exception land and is zoned AF5 and AF10 by Washington County. To the north and east is resource land zoned EFU in Study Areas 87 and 90. To the south is the UGB. To the west is resource land in Study Area 85 zoned EFU, AF20 and R9.

Current Agricultural Activity: Agricultural activity in this study area consists of a few large parcels in field crop and pastureland uses mixed with rural residences. To the north are a number of large parcels with mostly field crops and some pastureland mixed with forested areas along streams and slopes. Directly adjacent to the east are two parcels totaling approximately 65 acres that are in nursery stock. To the west are large parcels in field crop production with a few small row crop areas.

Compatibility: Urbanization of this area will result in an increase in traffic on NW Kaiser Road, NW Brugger Road and NW Springville Road. This Increase in traffic could impede the normal movement of farm equipment and affect the transport of agricultural goods produced around this area. Urbanization of this area would bring new development directly adjacent to some fairly large tracts of actively farmed land to the north, east and west. Issues relating to safety, liability and vandalism, and complaints due to noise, odor, and the use of pesticides and fertilizers may occur in these areas. A stream flows through this study area prior to passing through the resource land to the west, ultimately crossing NW Springville Road and flowing into the Rock Creek Open Space Park. Urbanization of this area will result in increased impervious surfaces that may diminish water quality and increase the chance of flooding downstream, which could negatively affect the adjacent farming activities to the west.

Urbanization of this area may affect the value of adjacent agricultural land by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area may impact adjacent agricultural activity to the north, east and west.

Environmental Social Energy Economic Analysis

General Character of the Area

This area is characterized by rural residential uses with related agricultural activities on mostly open parcels. There also are residences on forested parcels scattered throughout the area. The land is gently to moderately sloped.

Environmental

An unnamed stream flows west through the lower portion of the area for a little less than a half mile. This stream ultimately joins Rock Creek. There is a very small portion of a 1.5-acre wetland centered on this stream that is in the study area. A third of an acre wetland is located in the northern portion of the area. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 44 percent of the study area land in the proposed inventory. This unnamed stream is also identified as a significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. Urbanization of this area may impact these two very small natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area	87	Gross Vacant Buildable Acres	287
Total Acres	425	Dwelling Unit Capacity	1,228
Total Developed Acres	21	Employment Acres	28
Total Constrained Acres	113	Resource Land Acres	419
Title 3 Acres	105	Percent Tree Canopy Cover	24%
Upland Steep Slope Acres	12		

General Site Description: Study Area 87 is an L-shaped area approximately three-quarters of a mile from Portland. Most of the southern half of this area is in Washington County and inside the Metro jurisdictional boundary; while the northern half is in Multnomah County and outside of Metro's boundary. The area is not contiguous to the UGB, with study area 86 immediately to the south. Northwest Germantown Road defines the area's northern boundary. Along with Kaiser Road, it provides access to the area. A confluence of three streams occurs toward the western extent of this study area. The area is designated as Inner Neighborhood with a Corridor designation along NW Kaiser Road. There are 287 acres of vacant and buildable land out of 425 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: The area has 14 parcels with recorded improvement values out of 18 total parcels. The median improvement value is \$35,000. There is 1 parcel smaller than 1 acre in size, and 14 parcels exceed 5 acres. The area is mostly in forest and agricultural use, with some associated residential uses. Since 1990, one permit has been issued for a single-family dwelling.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the site.

Public Services Feasibility: This study area falls within several jurisdictions for public services, and the following conditions apply:

- **Water:** Half of this study area is in Multnomah County Water District. Tualatin Valley Water Services could also serve the area with a reservoir. This area is rated moderately difficult to serve.
- **Sewer:** Clean Water Services would be the service provider for this area. New trunk lines would be needed to connect to the Rock Creek plant, which would need an upgrade. Conditions may have to be set on annexation. This area is rated moderately difficult to serve.
- **Stormwater:** New development in the study area is regulated for stormwater treatment by Clean Water Services. Stormwater will be required to be treated with detention, water quality facilities, or both. Under Clean Water Services guidelines, responsibility for the required treatment will be with the developer. With the required treatment, impacts to downstream facilities will be minimal. Clean Water Services anticipates no difficulty in implementation. This area is rated easy to serve.

Agricultural Analysis

Zoning: This area is entirely resource land zoned EFU by Washington and Multnomah Counties. To the north and east is resource land zoned EFU in Study Areas 88 and 90, along with some exception land in Study Areas 88, 89 and 91. To the south is exception land in Study

Areas 84 and 86 and resource land zoned EFU, AF20 and R9 in Study Area 85. To the west is resource land zoned EFU and exception land in Study Area 83.

Current Agricultural Activity: The agricultural activity in this study area includes large parcels in nursery stock, field crops and pastureland. Every parcel in the study area either supports an agricultural use and/or has a significant portion of the parcel that is forested. To the north are a few large parcels supporting field and row crops and pastureland as well as forested parcels and rural residential uses. There are smaller parcels of field crop and nursery stock intermixed with forested parcels and rural residences to the east and south. To the west, especially west of NW 185th Avenue, is a large area of field crop production with limited forested and rural residential uses.

Compatibility: Urbanization of this area will result in an increase in traffic on NW Kaiser Road, NW Germantown Road and NW 185th Avenue. This increase in traffic could impede the normal movement of farm equipment and affect the transport of agricultural goods produced to the north, east and west of this area. Urbanization of this area would bring new development directly adjacent to some fairly large tracts of actively farmed land to the north, and smaller tracts to the east and west. Issues relating to safety, liability and vandalism, and complaints due to noise, odor, and the use of pesticides and fertilizers may occur in these areas. Abbey Creek and a tributary of Rock Creek flow through the study area before joining together on the east edge of Study Area 83. Urbanization of this area will result in increased impervious surfaces that may diminish water quality and increase the chance of downstream flooding of Rock Creek on the farmland to the west. Urbanization of this area may affect the value of adjacent agricultural land by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. This may especially be the case on the smaller parcels to the east and west. Overall, urbanization of this area would have a high potential for impacting adjacent agricultural activity.

Environmental Social Energy Economic Analysis

General Character of Area

Flat to gentle slopes extend from the western edge halfway across the area in the general location of the floodplain. There are also flat areas located in the southeast "heel" of the study area. The remainder of the land has moderate slopes and patches of scattered tree canopy along waterways and steep slopes, with the most extensive tree canopy concentrated in the bottom southwestern corner of the area. The land is characterized by open areas, agricultural uses, and scattered structures. The southeast "heel" of the study area is dedicated to nursery uses with associated structures.

Environmental

Six wetlands of varying size extend across the study area from the western edge out to its central portion. One wetland is located in the southwest corner of the eastern portion of the larger area. A floodplain extends into the area from the western edge halfway across the area, for approximately a mile in length. Abby Creek runs the width of the area from east to west through a floodplain and joins Rock Creek just outside the western perimeter of the study area. A number of small tributaries also flow into Abby Creek. A tributary of Rock Creek flows into the wetland located at the southeast edge where it enters the area. In total there are approximately three miles of stream corridor in the study area. Pockets of steep slopes are located from the central portion of the area to the eastern boundary. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 57 percent of the study area land in the proposed inventory. The portions of Abby Creek and its tributaries that flow through Washington County

is identified as a significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area	88	Gross Vacant Buildable Acres	1,144
Total Acres	1,652	Dwelling Unit Capacity	3,324
Total Developed Acres	149	Employment Acres	-
Total Constrained Acres	268	Resource Land Acres	1,234
Title 3 Acres	116	Percent Tree Canopy Cover	30%
Upland Steep Slope Acres	154		

General Site Description: Study Area 88 is a larger study area, with portions of the western sections in Washington County, and the balance in Multnomah County. The study area is adjacent to the UGB and Portland, defining part of the area's eastern boarder. Most of the eastern section of this area is inside of Metro's jurisdictional boundary. NW Kaiser Road, NW Skyline Road, NW Germantown Road, and NW Cornelius Pass Road serve the area. There is a high degree of elevation change, including some steep ridges running along the northeastern section of the area. The area is designated Outer Neighborhood with a small area designated as Corridor. There are 1,144 acres of vacant and buildable land out of 1,652 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: The area has 157 parcels with recorded improvement value out of 194 total parcels. The median improvement value is \$126,830. The median parcel size is 3.3 acres. There are 26 parcels smaller than 1 acre in size, and 67 parcels exceed 5 acres. The area is mostly in forest and agricultural use, with associated residential improvements. Smaller residential clusters occur in the northwestern section, as well as in the central and southern portions of the area. There have been 10 permits for single-family dwellings since 1990.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This study area falls within several jurisdictions for public services, and the following conditions apply:

- **Water:** The majority of this area is in Multnomah County. It would be more difficult for Tualatin Valley Water District to provide service. Portland has a water main on Skyline Boulevard, but service would require upgrade of reservoirs and transmission lines and addition of pump stations. To serve that portion of the study area that is in Washington County, Tualatin Valley Water District would have to increase reservoir size and trunk lines. The area is steep, with a high potential for rocky soils. The area is rated moderately difficult to serve.
- **Sewer:** Clean Water Services would be the service provider for this area. New trunk lines would be needed to connect to the Rock Creek plant, which would need an upgrade. Conditions may have to be set on annexation. This area is rated moderately difficult to serve.
- **Stormwater:** New development in the study area is regulated for stormwater treatment by Clean Water Services. Stormwater will be required to be treated with detention, water quality facilities, or both. Under Clean Water Services guidelines, responsibility for the required treatment will be with the developer. With the required treatment, impacts to downstream facilities will be minimal. Clean Water Services anticipates no difficulty in implementation. This area is rated easy to serve.

Agricultural Analysis

Zoning: The majority of this study area is resource land zoned EFU by Washington County and EFU and CFU2 by Multnomah County. There are three exception land areas, one zoned AF5 by Washington County, the second zoned AF5 by Washington County and MUA20 by Multnomah County, and the third zoned AF5 and AF10 by Washington County and RR and MUA20 by Multnomah County. To the north is resource land that is mostly zoned CFU1 and CFU2 plus a small amount of EFU zoned land, as well as some exception land. To the east is the UGB and exception land in Study Area 89. Directly south is resource land zoned EFU in Study Area 87. To the west is exception land and resource land zoned EFU and EFC.

Current Agricultural Activity: Agricultural activities in this large study area are located on distinct sections of the resource land. The lower portion of the area contains a number of large parcels that support field and row crops and pastureland with some forested areas. The middle of the area, north of NW Kaiser Road supports field and row crops on smaller parcels along with forested tracts. The northern portion supports a few parcels of field crops but otherwise is forested or open tracts with residences. The exception land areas contain rural residences. To the south are large parcels in nursery stock, field crops and pastureland, with every parcel either supporting an agricultural use and/or has a significant portion of the parcel that is forested. There are a few areas of field crop production intermixed with forested land to the west. West of NW Old Cornelius Pass Road is a larger area of field crops.

Compatibility: Urbanization of this area will result in an increase in traffic on NW Kaiser Road, NW Germantown Road, NW Skyline Boulevard and NW Cornelius Pass Road. This increase in traffic could impede the normal movement of farm equipment and affect the transport of agricultural goods produced to the south and west of this area. Urbanization of this area would bring new development directly adjacent to some fairly large tracts of actively farmed land to the south and a couple to the west. Issues relating to safety, liability and vandalism, and complaints due to noise, odor, and the use of pesticides and fertilizers may occur in these areas. A number of tributaries of Rock Creek flow south and west through this area prior to flowing through actively farmed parcels. Urbanization of this area will result in increased impervious surfaces that may diminish water quality and increase the chance of downstream flooding of Rock Creek on the farmland to the west. Urbanization of this area may affect the value of adjacent agricultural land by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area would have a high potential for impacting adjacent agricultural activity.

Environmental Social Energy Economic Analysis

General Character of Area

This large "L" shaped area contains two smaller areas, one toward the center [Area 88 (2)] and one adjacent to the southern edge [Area 88(3)]. The larger area is a patchwork of agricultural uses and scattered structures, with streams along the east and west perimeters. Moderate slopes cover most of the area with some interspersed flat spots, and an extensive area of steep slopes. 88(2) Residential structures, agricultural uses and a wooded canopy in the southwest corner characterize this area. It has gentle to moderate slopes, with some steep slopes. 88(3) One-third of this gentle to moderate sloped area is in tree canopy, with rural residential and agricultural uses.

Environmental

There are three wetlands in the upper half of the area totaling a little over an acre in size. At its southwestern corner, a floodplain extends into the area for a little more than a quarter of a mile. Extensive steep slopes extend along the eastern perimeter as well as some scattered small pockets in the mid-portion of the western side of the area. There is one small area of steep slopes located in the center of the upper portion of 88(2). Tributaries of Rock Creek flow from a north to southwest direction along the western edge. From the northeast portion, the stream tributaries flow along steep sloped wooded areas to the southern edge. There are two stream tributaries located in the western half of 88(2). In total, there are approximately 4.75 miles of stream corridor contained in this study area. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 34 percent of the study area land in the proposed inventory. A small segment of a tributary to Rock Creek along the southwestern edge of the study area is identified as a significant Water Area, Wetland and Fish and Wildlife Habitat on Washington County's Rural/Natural Resource Plan. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Other Identified Resources

There is a stone quarry owned by Multnomah County located at 10814 NW Quarry Road in the very northern Tier 1A portion of the study area. Directly adjacent to the west of the study area is a stone quarry owned by ODOT near the junction of NW Rock Creek Road and NW Old Cornelius Pass Road. These two stone quarries are identified in the 1978 DOGAMI report. The very western edge of this northern Tier 1A portion of the study area that is in Washington County is identified as Mineral and Aggregate Overlay District B on Washington County's Rural/Natural Resource Plan.

Study Area 89		Gross Vacant Buildable Acres 235	
Total Acres	485	Dwelling Unit Capacity	904
Total Developed Acres	80	Employment Acres	-
Total Constrained Acres	119	Resource Land Acres	-
Title 3 Acres	26	Percent Tree Canopy Cover	70%
Upland Steep Slope Acres	117		

General Site Description: Study Area 89 is adjacent to Forest Park and the Portland city limits. The UGB and Portland city limits define it on the north and east, and selected parcel boundaries define it on the west. Mainly NW Germantown Road and NW Old Germantown Road serve the study area. It is in Multnomah County, and inside the Metro jurisdictional boundary. It is approximately two miles, straight-line distance, from the Bethany area Town Center and has been designated entirely as Outer Neighborhood. Approximately 235 of the 485 acres in this study area are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains about 100 tax lots; over half have improvements. Fewer than 10 have improvement values above \$250,000. About 10 percent of the tax lots are smaller than one acre, and about 70 percent of all tax lots are smaller than five acres. Farming uses are not evident in this study area, and would not be expected, due to the topography. Non-residential land uses include construction, transportation, and business services. Mining and aggregate activities are not evident.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): This is no evidence of significantly high air traffic noise over this area. There is a power line easement that runs through the site in a northeasterly-southwesterly direction.

Public Services Feasibility: Portland seemed willing to accept the study area within its service area, if necessary. The relatively small size of this area may make it somewhat more difficult to serve with maximum efficiency.

- **Water:** In broader terms, this study area would be easy to serve. As stated above, steep slopes are located throughout a large percentage of the area, which could increase the difficulty in delivering water services. The infrastructure in this area is able to accommodate additional development. Minimal improvements within the UGB should be expected.
- **Sewer:** This study area would be moderately difficult to serve due to the existence of steep slopes, noted above. This could increase the construction difficulty and could create some operational problems. The infrastructure system is in acceptable condition to develop the area, though some minimal improvements within the UGB are anticipated.
- **Stormwater:** This study area would be moderately difficult to serve due to the existence of steep slopes, noted above. While infrastructure is in acceptable condition to develop the area, some improvements and extensions of lines will be necessary.

Agricultural Analysis

Zoning: This area is entirely exception land zoned RR by Multnomah County. To the north and east is the UGB. To the south is resource land zoned CFU2 and EFU in Study Area 90. To the west is resource land zoned CFU2 and EFU in Study Area 88.

Current Agricultural Activity: There is no agricultural activity occurring in this study area, as the study area is composed of rural residences on forested parcels. Land to the south contains parcels of field and row crops along with a couple of parcels of pastureland and nursery stock intermixed with rural residences and forested land. Land to the west contains a number of large parcels that support field and row crops and pastureland with some forested areas.

Compatibility: Urbanization of this area will result in an increase in traffic on NW Germantown Road, NW Old Germantown Road and NW Skyline Boulevard. This Increase in traffic could affect the transport of agricultural goods produced to the west of this area. The normal movement of farm equipment would not be affected as the agricultural activities are concentrated to the south and west and equipment would have no need to move through this area to the UGB on the other side. Urbanization of this area would bring new development near a few tracts of actively farmed land to the west and south, although there are sections of forest canopy in these locations. Issues relating to safety, liability and vandalism, and complaints due to noise, odor, and the use of pesticides and fertilizers may occur however, the forest canopy could act as a buffer between the two uses. Tributaries of Abbey Creek flow south and west through this area prior to flowing through actively farmed parcels. Urbanization of this area will result in increased impervious surfaces that may diminish water quality and increase the chance of downstream flooding of Abbey Creek on the farmland to the west, where the land is relatively flat in Study Areas 87 and 84. Urbanization of this area may affect the value of a few adjacent agricultural parcels by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area may have an impact adjacent agricultural activity to the west and south.

Environmental Social Energy Economic Analysis

General Character of the Area

This area is characterized by rural residential uses on lots ranging from an acre to 26 acres on forested parcels. More than half of the area contains steep slopes and the remainder contains moderately to steep slopes. There is a 100-foot BPA power line easement that runs diagonally through the area in northeast to southwest direction.

Environmental

A number of tributaries to Abbey Creek flow west through the study area, totaling 1.7 miles of stream corridor. Adjacent to the area across Skyline Boulevard is Forest Park. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 25 percent of the study area land in the proposed inventory. Urbanization of this area may impact these two very small natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area	90	Gross Vacant Buildable Acres	775
Total Acres	1,180	Dwelling Unit Capacity	2,579
Total Developed Acres	40	Employment Acres	0
Total Constrained Acres	337	Resource Land Acres	1,175
Title 3 Acres	90	Percent Tree Canopy Cover	46%
Upland Steep Slope Acres	247		

General Site Description: Study Area 90 is in Multnomah County. It surrounds areas 91 and 92, and abuts area 93, which are toward the south. The remaining segments along the southwestern edge are adjacent to the UGB and unincorporated Washington County. Portland aligns the eastern edge, with area 94 further to the east. Area 89 is directly to the north. The area is within Metro's jurisdictional boundary. Northwest Springville Road serves Study Area 90. There is significant change in the elevation of this area, with slopes above 25 percent interspersed throughout the study area. This area is designated as Outer Neighborhood. It has 775 acres of vacant and buildable land out of 1,180 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: Thirty-five parcels have recorded improvement value out of 94 total parcels. The median parcel improvement value is \$2,360. The median parcel size is 5.7 acres. There are 19 parcels less than 1 acre and 49 parcels exceed 5 acres. Most of the small parcels are in the southwest and northeast extents of the site. The area contains a good deal of forestland, as well as agricultural uses mixed with residential uses. There have been three permits for single-family dwellings issued since 1990.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This study area falls within several jurisdictions for public services, and the following conditions apply:

- **Water:** The area falls within Multnomah County's jurisdiction. Portland has a trunk line along Skyline Boulevard, which could serve the area. Service would require upgrade of the trunk line, added reservoir capacity, and possible pump stations. Steep Terrain and rocky soils would make installation of services difficult.
- **Sewer:** Clean Water Services would be the service provider for this area. New trunk lines would be needed to connect to the Rock Creek plant and the Springville plant, which would need upgrades. Conditions may have to be set on annexation. This area is rated difficult to serve.
- **Stormwater:** New development in the study area is regulated for stormwater treatment by Clean Water Services. Stormwater will be required to be treated with detention, water quality facilities, or both. Under Clean Water Services guidelines, responsibility for the required treatment will be with the developer. With the required treatment, impacts to downstream facilities will be minimal. Due to environmental factors, this area is rated as moderately difficult.

Agricultural Analysis

Zoning: This area is entirely resource land zoned CFU2 and EFU by Multnomah County. To the north is exception land in Study Area 89 and the UGB. To the east is a small amount of

exception land in Study Area 94 and the UGB. To the south is exception land in Study Areas 91, 92 and 93, and the UGB. To the west is a small portion of the UGB and exception land in Study Area 86 and resource land zoned EFU in Study Area 87.

Current Agricultural Activity: Agricultural activity in this area includes parcels of field and row crops along with a couple of parcels of pastureland and nursery stock intermixed with rural residences and some large expanses of forested land. To the west are large parcels in nursery stock, field crops and pastureland, with every parcel either supporting an agricultural use and/or has a significant portion of the parcel that is forested.

Compatibility: Urbanization of this area will result in an increase in traffic on NW Springville Road, NW Skyline Boulevard and NW 124th Avenue. Some of this traffic may move on to NW Kaiser Road and NW Saltzman Road within the UGB. This increase in traffic could affect the transport of agricultural goods produced to the west of this area. The normal movement of farm equipment would not be affected as the agricultural activities are concentrated to the west and equipment would have no need to move through this area to the UGB on the other side. Urbanization of this area would bring new development directly adjacent to some fairly large tracts of actively farmed land to the west. Issues relating to safety, liability and vandalism, and complaints due to noise, odor, and the use of pesticides and fertilizers may occur in this area. Abbey Creek flows west and Bronson Creek flows south through this area. Urbanization of this area will result in increased impervious surfaces that may diminish water quality and increase the chance of downstream flooding of Abbey Creek on the farmland to the west, where the land is relatively flat in Study Areas 87 and 84. Bronson Creek continues to flow through the UGB therefore, any diminished water quality or increased flows due to urbanization of this area would not affect agricultural activity. Urbanization of this area may affect the value of a few adjacent agricultural parcels to the west by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area may have an impact adjacent agricultural activity to the west.

Environmental Social Energy Economic Analysis

General Character of Area

Open areas with agricultural uses, scattered structures and wooded steep slopes adjacent to stream corridors characterize the area. There are gentle slopes in the lower three-quarters of the western edge of the study area.

Environmental

Four wetlands are located in the top half of the study area, and five are located in a loose cluster south of them. When totaled, there are approximately 4.25 acres of wetlands. Located in the top two-thirds of the study area, several tributaries of Abby Creek flow in a east to southwesterly direction. Segments of Bannister Creek tributaries, located in the lower third of the area, flow from east to west. When totaled together the tributaries measure approximately 4.3 miles in length. Extensive areas of steep slopes are located from west of center to the eastern boundary of the area. There is also a pocket of steep slopes in the northwestern corner. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 56 percent of the study area land in the proposed inventory. Urbanization of this area may impact these natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area 91		Gross Vacant Buildable Acres 88	
Total Acres	133	Dwelling Unit Capacity	384
Total Developed Acres	35	Employment Acres	0
Total Constrained Acres	9	Resource Land Acres	0
Title 3 Acres	4	Percent Tree Canopy Cover	32%
Upland Steep Slope Acres	5		

General Site Description: Study Area 91 is a small L-shaped area northeast of the Bethany Town Center. Northwest Springville Road runs east west through the middle of the western section and forms the southern boundary of the eastern portion of the area. The area is in Multnomah County and is inside of the Metro jurisdictional boundary. The area is approximately one mile from the Bethany Town Center and is designated as Inner Neighborhood.

Parcelization, Building Values, Development Patterns: There are 46 parcels in this study area, of which all but eleven have improvements. Three parcels have improvement values above \$250,000. There are 7 parcels greater than 5 acres and 13 parcels less than an acre in size. This study area is mainly composed of rural residences on forested parcels.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of significantly high air traffic noise over this site.

Public Services Feasibility: The study area falls within several jurisdictions for public services. The relatively small size of this study area may make it difficult to serve with optimal efficiency.

- **Water:** The Tualatin Valley Water District has shown a desire or already has plans to serve the area. This study area would be moderately difficult to serve. The infrastructure system can accept new development, though some improvements will be required, both inside and outside of the UGB.
- **Sewer:** Clean Water Services appears willing to accept the study area within its service area if necessary. Improvements and extensions of lines inside and outside the existing UGB will be required to alleviate the impacts of new development on the existing system. This area will be difficult to serve.
- **Stormwater:** Clean Water Services appears willing to accept the study area within its service area if necessary. Although the infrastructure is in acceptable condition to develop the area, some improvements and extensions of lines will be necessary, both inside and outside the UGB. This area will be difficult to serve.

Agricultural Analysis

Zoning: This study area is entirely exception land zoned MUA20 by Multnomah County. To the north is resource land zoned EFU and CFU2. To the east, partially to the south and to the west is resource land zoned EFU. The UGB also abuts a portion of the southern edge of the study area as well as beyond the strip of resource land to the west.

Current Agricultural Activity: There is no agricultural activity occurring in this study area, as the study area is composed of rural residences on forested parcels. To the north is a mixture of

field and row crops, nursery stock, pastureland and forested areas. The resource lands to the east, south and west contains field and row crops, along with some forested areas.

Compatibility: Urbanization of this area will result in an increase in traffic on NW Springville Road with most of the traffic continuing to NW Skyline Boulevard or NW Kaiser Road. This increase in traffic could impede the normal movement of farm equipment and affect the transport of agricultural goods produced to the north, south and west of this area. Urbanization of this area would bring new development directly adjacent to some fairly large tracts of actively farmed land to the north, south and west. Issues relating to safety, liability and vandalism, and complaints due to noise, odor, and the use of pesticides and fertilizers may occur in these areas. A tributary of Abbey Creek flows through the northeast corner of the study area. Urbanization of this area will result in increased impervious surfaces that may ultimately drain to this stream, diminishing water quality and increasing the chance of flooding on the farmland to the west, where the land is relatively flat in Study Areas 87 and 84. Urbanization of this area may affect the value of the adjacent agricultural parcels by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area may have an impact adjacent agricultural activity to the north, south and west.

Environmental Social Energy Economic Analysis

General Character of the Area

This area is characterized by rural residential uses on mostly forested parcels with a few pockets of open land. The land varies from a large flat area in the central portion to steep slopes along the eastern edge of the study area.

Environmental

A tributary to Abbey Creek flows west through the northeast portion of the area for approximately a quarter mile. There are a few fairly large locations of steep slopes in the eastern portion of the area that are forested. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 56 percent of the study area land in the proposed inventory. Urbanization of this area may impact these two natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area 92		Gross Vacant Buildable Acres	
Total Acres	40	Dwelling Unit Capacity	94
Total Developed Acres	0.5	Employment Acres	-
Total Constrained Acres	20	Resource Land Acres	-
Title 3 Acres	9	Percent Tree Canopy Cover	100%
Upland Steep Slope Acres	11		

General Site Description: Study Area 92 is a smaller tract of land situated east of the Washington/Multnomah County line, and south of NW Springville Road. It is within Multnomah County and the Metro jurisdictional boundary. This study area is served by NW 124th Avenue, entering from the south side. It is about 1.5 miles, straight-line distance, from the Bethany Town Center. It has been designated entirely as Outer Neighborhood. Approximately 19 of the 40 total acres are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains about 10 tax lots, only one of which has reported improvements. There are no improvements valued over \$250,000. Most of the tax lots are smaller than five acres; one is larger than 10 acres. Land uses include only single family residential and vacant. There is no commercial activity, and no mining or aggregate uses.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of significantly high air traffic noise over this area. Available data does not suggest the existence of power lines or public easements running through this area.

Public Services Feasibility: The study area falls within several jurisdictions for public services. The relatively small size of this study area may make it difficult to serve with maximum efficiency. The area is contained by a single drainage basin, which may ease some servicing issues.

- **Water:** The Tualatin Valley Water District has shown a desire, or already has plans to serve the area. This study area would be moderately difficult to serve. As stated above, steep slopes are located throughout a large percentage of the area, which could increase the difficulty in delivering water services. While the infrastructure system is in acceptable condition to develop the area, some minimal improvements within the UGB should be expected.
- **Sewer:** Clean Water Services appears willing to accept the study area within its service area if necessary. This area will be difficult to serve due reasons noted above. Some improvements and extensions of lines inside and outside the existing UGB will be necessary accommodate the impacts of new development.
- **Stormwater:** Clean Water Services appears willing to accept the study area within its service area if necessary. This area will be difficult to serve, for some of the same reasons mentioned above.

Agricultural Analysis

Zoning: This area is entirely exception land and is zoned as RR by Multnomah County. To the north is resource land zoned EFU. To the east and south is resource land zoned CFU2.

Beyond the strip of EFU zoned land to the east is the UGB, and beyond the EFU land to the south is exception land in Study Area 93. To the west is the UGB.

Current Agricultural Activity: There is no agricultural activity occurring in this study area, as the study area is composed of rural residences on forested parcels. To the north is a strip of resource land that contains a few large parcels that support field crops. The resource land to the east and south is forested.

Compatibility: Urbanization of this area would result in a minimal increase in traffic on NW 124th Avenue, with most of the traffic continuing on to NW Thompson Road by way of NW Laidlaw Road or NW Saltzman Road. This increased traffic would not impede the normal movement of farm equipment or affect the transport of agricultural goods produced to the north as that farmland takes access off of NW Springville Road. Urbanization of this area would bring new development directly adjacent to some fairly large tracts of actively farmed land to the north. Issues relating to safety, liability and vandalism, and complaints due to noise, odor, and the use of pesticides and fertilizers may occur in this area. Bronson Creek runs through the center of this study area prior to flowing west to the UGB. Urbanization of this area will result in increased impervious surfaces that may diminish water quality and increase the chance of flooding downstream, but these consequences will not affect nearby agricultural activities as the stream is within the UGB. Urbanization of this area may affect the value of adjacent agricultural land to the north by encouraging land banking and speculation resulting in the inability of farmers to acquire parcels of land needed for agricultural production. Overall, urbanization of this area may have an impact adjacent agricultural activity to the north.

Environmental Social Energy Economic Analysis

General Character of the Area

This area is characterized as vacant forested parcels on moderately to steep sloped land. Of the 11 parcels in the area only 1 has improvements.

Environmental

Bannister Creek flows for approximately a quarter mile in a westerly direction through the center of the area. A little less than half of the area is steep sloped. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 97 percent of the study area land in the proposed inventory. Urbanization of this area may impact these small natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area 93		Gross Vacant Buildable Acres	
Total Acres	383	Dwelling Unit Capacity	767
Total Developed Acres	76	Employment Acres	-
Total Constrained Acres	71	Resource Land Acres	-
Title 3 Acres	42	Percent Tree Canopy Cover	50%
Upland Steep Slope Acres	51		

General Site Description: Study Area 93 is situated in a pocket surrounded by the UGB. Its two sections lie both north and east of the Washington/Multnomah County line. It is inside of the Metro jurisdictional boundary. Streets serving this area include NW 124th Avenue from the north, NW Laidlaw Road from the northeast, NW Marcotte Road from the south, NW McDaniel Road from the southeast, and NW Thompson Road from both the southwest and southeast. The center of this study area is approximately two miles, straight-line distance, from the Bethany Town Center. This study area has been designated entirely as Outer Neighborhood. Approximately 190 of 383 total acres are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains approximately 175 tax lots, roughly three-fourths of which are improved. Fewer than 10 have improvements valued above \$250,000. About half of all tax lots in this study area are smaller than one acre, and most are smaller than five acres. Non-residential land uses include construction and general trade, insurance and holding/investments. There is no evidence of mining or aggregate activities in this study area.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of significantly high air traffic noise over this area. Available data does not suggest the existence of power lines or public easements.

Public Services Feasibility: The study area falls within several jurisdictions for public services.

- **Water:** The Tualatin Valley Water District showed a desire or already has plans to serve the area. This study area would be moderately difficult to serve. While the current infrastructure can accommodate some new development, minimal improvements within the UGB may be required, as well.
- **Sewer:** Clean Water Services appears willing to accept the study area within its service area if necessary. For sewer, this area will be difficult to serve. Steep slopes will increase construction difficulty and could create some operational problems. Some improvements and extensions of lines inside and outside the existing UGB will be needed to serve new development.
- **Stormwater:** Clean Water Services appears willing to accept the study area within its service area if necessary. This area will be difficult to serve, in large part, due to the existence of steep slopes, noted above. Some improvements and extensions of lines will likely be needed, both inside and outside the UGB.

Agricultural Analysis

Zoning: This area is entirely exception land and is zoned RR by Multnomah County. To the north is resource land zoned CFU2 and exception land in Study Area 92. To the east, south and west is the UGB.

Current Agricultural Activity: There is no agricultural activity occurring in this study area, as the study area is composed of rural residences on forested parcels. The resource land to the north is forested.

Compatibility: Urbanization of this area would result in a significant increase in traffic on NW Laidlaw Road and NW Old Laidlaw Road, with most of the traffic continuing on to NW Thompson Road directly or by NW Saltzman Road. This increased traffic would not impede the normal movement of farm equipment or affect the transport of agricultural goods produced much to the north as that farmland takes access off of NW Springville Road. Urbanization of this area would not bring new development near any active farming areas. Therefore, there is no impact on the value of adjacent agricultural land. A large tributary of Bronson Creek runs through the center of this study area prior to flowing west to the UGB. Urbanization of this area will result in increased impervious surfaces that may diminish water quality and increase the chance of flooding downstream, but these consequences will not affect nearby agricultural activities as the stream is within the UGB. Overall, urbanization of this area would have no impact on adjacent agricultural activity.

Environmental Social Energy Economic Analysis

General Character of the Area

This area is characterized by rural residential uses on mostly forested parcels with a few pockets of open land. Approximately one quarter of the area contains steep slopes with the remainder of the area gently to moderately sloped.

Environmental

A number of tributaries to Bannister Creek flow west through the area for approximately 2.5 miles. A small 575-foot segment of a tributary to Cedar Mill Creek flows south through the lower portion of the area. Most of the steep slopes are located along the stream corridors with the greatest amount located in the northeast corner of the area. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 70 percent of the study area land in the proposed inventory. Urbanization of this area may impact these small natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area 94-1		Gross Vacant Buildable Acres 133	
Total Acres	355	Dwelling Unit Capacity	471
Total Developed Acres		Employment Acres	0
Total Constrained Acres	168	Resource Land Acres	0
Title 3 Acres	6	Percent Tree Canopy Cover	80%
Upland Steep Slope Acres	154		

General Site Description: Study Area 94-1 is an island within the current UGB and is served by NW Skyline Boulevard and NW Saltzman Road. This study area is in Multnomah County, and is inside the Metro jurisdictional boundary. It is approximately four miles, straight-line distance, from the Sunset Transit Center. It has been designated as Outer Neighborhood. Approximately 133 of 355 total acres are vacant and buildable.

Parcelization, Building Values, Development Patterns: This study area contains about 35 tax lots. About 10 have improvements, and about three have improvements valued above \$250,000. The majority of parcels in this study area are larger than one acre. Agricultural uses are not evident in this study area. Non-residential land uses are not evident in this study area.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): Available data does not suggest the existence of power lines or public easements running through this area. There is no evidence of significantly high air traffic noise over this area.

Public Services Feasibility: Portland appears willing to accept the study area within its service area. The relatively small size of this study area may make it more difficult to serve with maximum efficiency. This area contains multiple drainage basins.

- **Water:** This study area would be moderately difficult to serve. Steep slopes are located throughout a large percentage of the area, which could increase the difficulty in delivering water services. While the infrastructure system is in acceptable condition to develop the area, some limited improvements within the UGB may be necessary, as well.
- **Sewer:** This study area would be moderately difficult to serve, generally due to the existence of steep slopes, noted above. Some minimal improvements within the UGB are also anticipated for sewer services.
- **Stormwater:** This study area would be moderately difficult to serve due to the existence of steep slopes, noted above. Although the infrastructure is in acceptable condition to develop the area, some improvements and extensions of lines are to be expected both inside and outside the UGB.

Agricultural Analysis (94-1 & 94-2)

Zoning: This area is entirely exception land; the lower portion is zoned RR by Multnomah County while the remaining area is zoned as RF by Portland even though it is outside the UGB. The study area is, for all intensive purposes, surrounded by the UGB. The northwest corner of the study area on the west side of NW Skyline Boulevard is adjacent to resource land zoned CFU2.

Current Agricultural Activity: There is no agricultural activity occurring in this study area, as the study area is composed of rural residences on forested parcels and vacant forested parcels.

Compatibility: Urbanization of this area would increase traffic on NW Skyline Boulevard. This increased traffic would not impede the normal movement of farm equipment or affect the transport of agricultural goods. Urbanization of this area would not bring new development near any active farming areas. Therefore there is no impact on the value of adjacent agricultural land. Several streams flow from the central portions of this area toward the Willamette River. Urbanization of this area will result in increased impervious surfaces that may diminish water quality and increase the chance of flooding downstream, but these consequences will not affect nearby agricultural activities as these streams flow through Forest Park. Overall, urbanization of this area would have no impact on adjacent agricultural activity.

Environmental Social Energy Economic Analysis (94-1 & 94-2)

General Character of the Area

Rural residential uses forested steep sloped parcels characterize this area. Forest Park is adjacent to the north.

Environmental

Several tributaries to Doane Creek flow north through the area totaling approximately two-thirds of a mile of stream corridors. There is about one mile of unnamed stream corridors that also flow north through the central portion of the area. Steep slopes cover almost the entire study area. Metro's draft Goal 5 Fish and Wildlife Habitat Inventory identifies 81 percent of the study area land in the proposed inventory. Urbanization of this area may impact these two very small natural resource areas as outlined in the introduction to the ESEE analysis.

Social Energy Economic

See Appendix A.

Study Area	94-2	Gross Vacant Buildable Acres	63
Total Acres	162	Dwelling Unit Capacity	175
Total Developed Acres	59	Employment Acres	0
Total Constrained Acres	60	Resource Land Acres	0
Title 3 Acres	0	Percent Tree Canopy Cover	54%
Upland Steep Slope Acres	60		

General Site Description: Study Area 94-2 is an extension of Study Area 94-1, evaluated during Phase I of this study. The area is within Portland and Metro's jurisdiction, and is almost completely encircled by the UGB. Much of this area has steep slopes. Skyline Road and Springville Road serve this area. It has been designated as Outer Neighborhood. There are 63 vacant and buildable acres out of 162 total acres.

Parcelization, Building Values, Development Patterns, Vacant Land: Of the 38 total parcels, 29 parcels have recorded improvement values. The median parcel improvement value is \$107,545. The median parcel size is one acre. There are 19 parcels smaller than 1 acre in size, and 5 parcels are greater than 5 acres. This area contains forestland, some farm land and land in residential uses. There has been one permit issued for a single-family dwelling since 1990.

Physical Attributes (Power lines, Easements, Airport Fly-over Zones): There is no evidence of power lines or other public easements in the study area. There is no evidence of significantly high air traffic noise over the area.

Public Services Feasibility: This study area falls within several jurisdictions for public services, and the following conditions apply:

- **Water:** The area falls within Multnomah County's jurisdiction. Portland has a trunk line along Skyline Boulevard, which could serve the area. Service would require upgrade of the trunk line, added reservoir capacity, and possible pump stations. Steep Terrain and rocky soils would make installation of services difficult.
- **Sewer:** Provision of service is still under study.
- **Stormwater:** New development in the study area is regulated for stormwater treatment by Clean Water Services. Stormwater will be required to be treated with detention, water quality facilities, or both. Under Clean Water Services guidelines, responsibility for the required treatment will be with the developer. With the required treatment, impacts to downstream facilities will be minimal. Due to environmental factors, this area is rated as moderately difficult to serve.

Agricultural Analysis

See Study Area 94-1.

Environmental Social Energy Economic Analysis

See Study Area 94-1.

4 CONCLUSION

Background and Approach

Metro Code Section 3.01.020, *Legislative Amendment Criteria*, states that the locational factors 3 through 7 of Statewide Planning Goal 14 must be balanced when determining which study areas are the most appropriate for inclusion in the UGB. Each area was analyzed for productivity (section 2.1 of this report), public services feasibility (sections 2.2 and 2.3), ESEE consequences (section 2.4) and agricultural compatibility (section 2.5). As discussed in the above sections, rankings were assigned to each area based on elements specific to each topic. The rankings are expressed in relative terms. The rankings from each Goal 14 factor were combined to yield an overall suitability ranking for each study area. The overall suitability rankings, expressed as 'least', 'more' or 'most' suitable for urbanization, form the initial basis for determining which study areas should be eliminated or moved on for further consideration.

Application to Study Areas

Applying the Goal 14 factors in a balanced way is not an exact science. It uses the best available information and is subject to interpretation. Those areas that on balance do not score as high as others may not necessarily be poor candidates for urbanization in the future. An area could be a candidate for urbanization in the future when obstacles have been removed, timing issues resolved or development patterns adjacent to the area have changed. Because the analysis was developed on a site by site basis, it did not consider the feasibility and impacts on groupings of study areas. The timing of services and the overall suitability based on governance were also not part of this analysis.

The rankings of 'most', 'more' and 'least' are relative to each other and serve as an indication that some study areas, when taken individually, are more suitable than others for future urbanization. A total of 94 study areas were analyzed and assigned an overall suitability ranking. Of these, 20 areas are ranked as the 'most' suitable for urbanization, with 13 of these areas being Tier 1. Fifty (50) areas are ranked as 'more' suitable with 41 of these being Tier 1. Twenty-four (24) areas are 'least' suitable with 19 of these being Tier 1 (see Table 4-1).

Next Step

After the Goal 14 factors were applied to the study areas, Metro applied its own goals and objectives to choose among the exception lands that were studied for urbanization. Application of the Goal 14 factors alone do not necessarily result in UGB amendments that fulfill the overall goals of Metro or provide the best planning for growth in the region. For this reason, Metro next filtered every Tier 1 study area through the eight fundamentals, which are aggregated from Metro 2040 growth management policies. This exercise bridges the results of applying the state Goal 14 factors with Metro's adopted growth management plan. More information about this process, including results, are found in the report *Applying 2040 Policies to Potential Expansion Areas*.

Table 4-1. 2002 ALTERNATIVES ANALYSIS STUDY AREAS

Areas	Study Area No	Study Area Acres	DU Capacity	Employ Acres (net)	Goal 14 Alternatives Analysis Factors							Goal 14 Alternatives Analysis Suitability	Application of 2040 Fundamentals ⁱⁱⁱ		Overall Suitability W/ 2040
					Transp Service ⁱ	Sewer Service	Water Service	Storm Service	ESEE Envio ⁱⁱ	ESEE Soc/En/Econ	Agricult Conseq.		Meets	Does not meet	
Gresham	1	11	18	0	E	M	D	M	H	L	L	More	--	1, 2, 3, 5, 6, 7, 8	Least
	2	616	1,626	0	E	M	E	E	H	L	H	More	--	1, 2, 3, 5, 6, 7, 8	Least
	3	355	1,550	0	E	M	M	E	L	L	H	Most	--	1, 2, 3, 5, 6, 7, 8	Least
	4	363	1,039	0	E	D	M	E	L	L	L	Most	--	1, 2, 3, 4, 5, 6, 7, 8	Least
	5	1,789	4,898	0	M	D	M	E	H	H	H	Least	--	1, 2, 3, 4, 5, 6, 7, 8	Least
	6	1,506	4,034	90	M	M	E	E	H	M	M	More	--	1, 2, 3, 4, 5, 6, 7, 8	Least
	7	140	95	83	E	M	E	E	L	M	M	Most	--	1, 2, 3, 4, 5, 6, 7, 8	Least
Damascus	8	782	2,343	0	D	D	M	E	L	L	H	Most	--	1, 2, 3, 4, 5, 6, 7, 8	Least
	9	1,963	6,490	0	M	D	E	E	H	H	H	Least	--	1, 2, 3, 4, 5, 6, 7, 8	Least
	10	8,102	10,092	559	D	M	M	E	H	M	M	Least	1, 3, 5, 6, 7, 8	2	More
	11	777	394	394	E	M	M	E	M	M	M	More	1, 3, 5, 6, 7, 8	2	More
	12	2,038	4,743	175	M	M	E	E	H	M	M	More	1, 3, 5, 6, 7, 8	2	More
	13	1,576	3,065	185	D	M	M	E	H	M	M	Least	1, 3, 5, 6, 7, 8	2	More
	14	1,275	2,898	247	D	E	E	E	H	M	L	More	1, 3, 5, 6, 7, 8	2	More
	15	930	2,607	0	D	M	M	M	M	M	L	More	1, 3, 5, 6, 7, 8	2	More
	16	79	118	0	M	E	E	M	L	L	L	Most	1, 2, 3, 5, 6, 7, 8	--	Most
	17	597	432	168	D	E	E	E	M	L	M	More	1, 2, 3, 5, 6, 7, 8	--	More
	18	277	0	144	D	E	E	E	L	L	L	Most	1, 2, 3, 5, 7, 8	--	Most
19	1,042	2,278	54	E	E	E	E	M	L	L	Most	1, 2, 3, 5, 6, 7, 8	--	Most	
Oregon City	20	433	776	0	M	M	M	E	L	L	M	Most	1, 6, 7	2, 3, 5, 8	Least
	21	1,800	4,059	0	M	M	M	E	H	M	L	More	1, 6, 7	2, 3, 5, 8	Least
	22	2,180	5,719	0	D	M	M	E	H	H	L	More	1, 6, 7	2, 3, 5, 8	Least
	23	944	2,751	0	M	M	E	E	H	M	H	More	1, 6, 7	2, 3, 5, 8	Least
	24	985	3,078	17	D	M	M	E	M	M	L	More	1, 5, 6, 7, 8	2, 3	Least
	25	666	1,364	0	D	M	E	M	H	M	L	More	1, 6, 7	2, 3, 5, 8	More
	26	1,885	6,141	116	D	D	E	E	H	H	L	More	1, 5, 6, 7, 8	2, 3	More
	27	2,973	7,385	0	D	D	M	E	H	H	M	Least	1, 6, 7	2, 3, 5, 8	Least
	28	1,532	4,277	51	D	M	M	E	M	M	M	More	1, 5, 6, 7, 8	2, 3	More
	29	1,584	4,351	0	D	D	M	E	M	H	M	Least	1, 6, 7	2, 3, 5, 8	Least
	30	2,306	5,963	0	M	M	E	E	H	H	H	Least	1, 6, 7	2, 3, 5, 8	Least
	31	1,322	5,756	0	D	D	M	E	H	L	H	Least	1, 6, 7	2, 3, 5, 8	Least
	32	696	2,242	35	D	M	E	M	L	L	L	Most	1, 3, 5, 6, 7, 8	2	Least
	33	786	1,558	0	D	D	D	M	H	L	L	Least	1, 6, 7	2, 3, 5, 8	Least

Areas	Study Area No	Study Area Acres	DU Capacity	Employ Acres (net)	Goal 14 Alternatives Analysis Factors							Goal 14 Alternatives Analysis Suitability	Application of 2040 Fundamentals		Overall Suitability W/ 2040
					Transp Service	Sewer Service	Water Service	Storm Service	ESEE Envio	ESEE Soc/En/Econ	Agricult Conseq.		Meets	Does not meet	
Stafford Basin	34	514	452	0	E	D	D	M	M	L	L	More	1, 6, 7	2, 3, 5, 8	Least
	35	965	1,409	0	M	M	M	E	H	M	L	More	1, 6, 7	2, 3, 5, 8	Least
	36	1,187	1,655	0	M	D	D	E	M	M	M	Least	1, 6, 7	2, 3, 5, 8	Least
	37	373	1,166	0	D	D	M	D	L	M	L	Least	1, 6, 7	2, 3, 5, 8	Least
	38	1,500	3,704	0	D	M	E	E	M	M	M	More	1, 6, 7	2, 3, 5, 8	Least
	39	526	1,695	0	M	M	D	E	L	M	M	More	1, 6, 7	2, 3, 5, 8	Least
	40	313	1,329	0	M	M	D	E	L	M	M	More	1, 6, 7	2, 3, 5, 8	Least
	41	558	1,329	0	D	D	E	M	H	M	M	Least	1, 6, 7	2, 3, 5, 8	Least
	42	654	172	166	D	M	M	E	H	M	L	More	1, 6, 7	2, 3, 5, 8	Least
	43	1,807	3,266	0	D	M	E	E	H	M	M	More	1, 6, 7	2, 3, 5, 8	Least
	44	878	2,174	0	M	M	M	E	L	H	H	More	1, 6, 7	2, 3, 5, 8	Least
Wilsonville Tualatin and Sherwood	45	183	660	0	M	M	M	M	L	L	M	More	1, 3, 5, 6, 7, 8	2	More
	46	80	238	0	M	D	D	M	M	L	L	More	--	1, 2, 3, 5, 6, 7, 8	Least
	47	1,014	1,739	224	M	M	E	E	L	M	L	Most	1, 6, 8	2, 3, 4, 5, 7	Least
	48	1,080	0	441	M	M	E	E	H	M	L	More	1, 3, 5, 7	2, 8	Least
	49	1,095	6	373	M	M	E	E	H	M	M	More	1, 8	2, 3, 4, 5, 7	Least
	50	183	822	0	M	M	M	M	L	M	M	More	1, 6, 7	2, 3, 5, 8	Least
	51	1,938	7,545	0	D	M	D	E	H	H	H	Least	1, 3, 6, 8	2, 5, 7	Least
	52	320	1,165	0	M	M	M	M	L	L	H	Least	2, 6, 8	1, 3, 5, 7	Least
	53	1,825	3,850	0	D	D	D	E	H	H	M	More	1, 6, 7	2, 3, 5, 8	Least
	54	199	830	0	M	D	M	D	L	M	M	Least	1, 6, 7	2, 3, 5, 8	Least
	55	964	3,446	0	M	E	E	E	H	M	M	More	1, 6, 7	2, 3, 5, 8	Least
	56	162	358	0	E	M	M	M	L	L	M	Most	1, 6, 7	2, 3, 5, 8	Least
	57	29	118	0	M/M/E	M/M/M	M/D/M	E/M/E	L	L	L	Most	--	1, 2, 3, 5, 6, 7, 8	Least
	58	463	1,815	0	E	M	D	E	L	M	M	More	1, 6, 7	2, 3, 5, 8	Least
	59	1,009	3,916	0	M	E	E	E	M	M	H	More	1, 6, 7	2, 3, 5, 8	Least
60	244	537	0	M	M	M	M	M	M	M	More	--	1, 2, 3, 5, 6, 7, 8	Least	
61	55	117	5	E	D	M	M	L	L	M	More	1, 2, 3, 6, 8	5, 7	More	
King City Tigard Beaverton	62	163	644	0	E	M	M	E	L	L	L	Most	1, 2, 3, 6, 8	5, 7	Most
	63	218	688	0	M	M	M	M	L	L	M	More	1, 2, 3, 6, 8	5, 7	More
	64	262	1,047	0	M	D	M	M	L	L	H	More	1, 2, 3, 6, 8	5, 7	More
	65	439	1,416	0	M	M	M	M	L	L	M	More	1, 2, 3, 6, 8	5, 7	More
	66	114	333	0	M	M	E	E	L	L	L	Most	1, 2, 3, 6, 8	5, 7	Most
	67	507	1,019	0	M	M	E	M	L	L	L	Most	1, 2, 3, 6, 8	5, 7	Most
	68	1,546	5,766	0	M	M	E	E	H	H	H	More	6	1, 2, 3, 5, 7, 8	Least

Areas	Study Area No	Study Area Acres	DU Capacity	Employ Acres (net)	Goal 14 Alternatives Analysis Factors							Goal 14 Alternatives Analysis Suitability	Application of 2040 Fundamentals		Overall Suitability W/2040
					Transp Service	Sewer Service	Water Service	Storm Service	ESEE Envio	ESEE Soc/En/Econ	Agricult Conseq.		Meets	Does not meet	
South Hillsboro	69	130	1,341	0	E	M	M	M	L	L	H	More	2	1, 3, 5, 6, 7, 8	Least
	70	448	1,962	0	E	M	E	E	M	H	M	More	2	1, 3, 5, 6, 7, 8	Least
	71	88	416	0	E	D	D	D	L	L	L	More	1, 2, 3, 6, 8	5, 7	More
	72	69	302	0	M	E	M	E	L	L	L	Most	2	1, 3, 5, 6, 7, 8	Least
Forest Grove Cornelius	73	4	14	0	E	M	M	E	L	L	L	Most	2	1, 3, 5, 6, 7, 8	Least
	74	501	1,150	0	M	D	D	M	L	L	M	More	2	1, 3, 5, 6, 7, 8	Least
	75	71	0	30	M	E	E	E	M	L	M	Most	1, 2, 3, 5	7, 8	More
	76	122	0	50	E	E	E	E	M	L	M	Most	1, 2, 3, 5	7, 8	More
	77	171	309	0	M	E	E	E	L	L	L	Most	--	1, 2, 3, 4, 5, 6, 7, 8	Least
North Hillsboro	78	123	353	0	E	D	M	M	M	L	H	More	--	1, 2, 3, 5, 6, 7, 8	Least
	79	191	0	188	E	D	M	M	M	L	H	More	--	1, 2, 3, 5, 6, 7, 8	Least
	80	40	0	11	E	D	M	D	L	L	M	More	--	1, 2, 3, 5, 6, 7, 8	Least
	81	244	0	100	M	M	E	E	M	L	M	More	--	1, 2, 3, 5, 6, 7, 8	More
Bethany	82	153	514	0	M	D	M	D	L	L	M	More	1, 2, 3, 6, 8	5, 7	More
	83	1,816	6,510	0	D	D	D	E	H	H	H	Least	--	1, 2, 3, 5, 6, 7, 8	Least
	84	210	1,155	0	M	M	D	M	L	M	M	More	1, 3, 5, 6, 7, 8	2	More
	85	246	1,237	0	M	M	M	E	L	M	L	Most	1, 3, 5, 6, 7, 8	2	More
	86	136	453	0	M	M	E	D	L	M	M	More	1, 3, 5, 6, 7, 8	2	More
	87	425	1,228	0	M	M	M	E	M	M	H	More	3, 5, 6, 8	1, 2, 7	More
	88	1,652	3,532	0	D	M	M	E	H	H	H	Least	--	1, 2, 3, 5, 6, 7, 8	Least
	89	485	904	0	D	M	E	M	L	M	M	More	--	1, 2, 3, 5, 6, 7, 8	Least
	90	1,180	2,579	0	D	D	D	M	M	H	M	Least	--	1, 2, 3, 5, 6, 7, 8	Least
Forest Park	91	133	384	0	M	D	M	D	L	M	H	Least	--	1, 2, 3, 5, 6, 7, 8	Least
	92	40	94	0	E	D	M	D	M	M	M	Least	--	1, 2, 3, 5, 6, 7, 8	Least
	93	383	767	0	E	D	M	D	H	M	L	Least	--	1, 2, 3, 5, 6, 7, 8	Least
	94	355	646	0	D	D	M	M	H	M	L	Least	--	1, 2, 3, 5, 6, 7, 8	Least

ⁱ Infrastructure serviceability rankings area expressed as: E= easy to serve, M= moderately easy to serve and D= difficult to serve

ⁱⁱ ESEE and Agricultural Consequences rankings are expressed as: L= low level of consequences, M= moderate level of consequences and H= high level of consequences

ⁱⁱⁱ 2040 Fundamentals: 1) Encourage efficient use of land, 2) Protect/restore the natural environment, 3) Provide a balanced transportation system, 4) Maintain separation between the Metro Region and neighboring cities, 5) Enable communities within Metro to preserve their physical sense of place, 6) Ensure diverse housing options for all residents, 7) Create a vibrant place to live and work, and 8) Encourage a strong economy. Note: Fundamental #4 does not apply to all study areas and is only noted where applicable. Fundamental #6 does not apply to study areas designated entirely as employment land.

APPENDICES

Appendix A: Summaries of the various studies to determine suitability for urbanization.

Table A-1 Productivity Estimates

Table A-2 Phase I Study Areas, Assessments for Water, Sanitary Sewer and Storm Water Serviceability

Table A-3 Phase II Study Areas, Composite Scores for Water, Sanitary Sewer and Stormwater Serviceability

Table A-4 Phase 1 Study Areas, Transportation Serviceability Assessment

Table A-5 Phase II Study Areas, Transportation Serviceability Assessment

Table A-6 Summary of Environmental Factors of ESEE Analysis

Table A-7 Summary of Agricultural Compatibility Factors

Appendix B: Detailed methodology for Phase I analyses

Appendix C: Detailed methodology for Phase II analyses

Appendix D: A memorandum from ECONorthwest, addressing redevelopment assumptions used in the build out study described in section 2

Appendix E: A log of service provider contacts for Phase II areas, as well as a copy of the letter sent to service providers for the water, sewer and stormwater assessments

Appendix F: Alternatives Analysis Map, Study Area Maps and Aerial Photos

Appendix A - Summaries

Appendix A is divided into six sections.

- Section A1 Dwelling Unit Productivity Estimates
- Section A2 Water, Sanitary Sewer and Stormwater Serviceability Assessment
- Section A3 Transportation Serviceability Assessment
- Section A4 Economic, Social and Energy Analysis
- Section A5 Environmental Analysis
- Section A6 Agricultural Analysis

Section A-1 contains a summary of the dwelling unit productivity estimates (Table A-1). A very detailed explanation of the methodology can be found in Section 2.1 of this report.

Section A-2 is separated into three parts. Table A-2 is a summary of the water, sanitary sewer and storm water serviceability assessment for the Phase I study areas. The study area identification numbers have been adjusted to reflect the study area reference numbers used in this consolidated report. Following Table A-2 is a text summary of the findings. Table A-3 is a summary of the water, sanitary sewer and storm water serviceability assessment for the Phase II study areas.

Section A3 contains Tables A-4 and A-5 that provide a summary of the transportation serviceability assessments for the Phase I and Phase II study areas respectively. Following each table is a text summary of the findings.

Sections A4 and A5 correspond to the Environmental Social Energy and Economic (ESEE) analysis that was completed. Section A4 is a text summary of the energy, social and economic consequences of the adding land to the UGB. Section A5 contains Table A-6 that provides a summary of the environmental factors utilized in determining the consequence of adding land to the UGB. A detailed explanation of the methodology can be found in Section 2.4 of this report.

Section A6 contains Table A-7 that provides a summary of the agricultural compatibility factors utilized in the agricultural analysis. A detailed explanation of the methodology can be found in Section 2.5 of this report.

SECTION A-1 PRODUCTIVITY ESTIMATES FOR ALL STUDY AREAS

Table A-1: Productivity Estimates – All Study Areas

Study Area Number	Phase	Acres in Parcels	Gross Vacant Buildable Acres	Net Vacant Buildable Acres	Town Center	2040 Design Type Designation (NVBA)					Units on Vacant Land	Units from Env. Areas	Units from Redevelopment	Total Estimated Units
						IN	ON	COR	EMP	IND				
01a	I	8	1	1	-	1	-	-	-	-	6	-	-	6
01b	I	4	3	1	-	1	-	-	-	-	8	4	-	12
02	I	607	318	197	-	184	-	13	-	-	1,458	42	126	1,626
03	II	338	287	186	-	186	-	-	-	-	1,430	38	82	1,550
04	II	337	226	153	-	-	153	-	-	-	894	6	139	1,039
05	II	1,692	1,214	825	-	-	730	95	-	-	4,583	97	218	4,898
06a	I	1,125	723	521	-	421	-	100	-	-	3,570	48	390	4,008
06b	I	155	130	97	-	-	-	7	-	90	24	2	-	26
07	I	140	116	87	-	6	-	3	-	78	62	-	18	80
08	II	753	548	351	-	-	351	-	-	-	2,053	8	282	2,343
09	II	1,846	1,153	738	-	-	697	41	-	-	4,208	150	585	4,943
10	II	7,635	3,830	2,565	379	1,627	-	-	224	335	16,636	187	1,869	18,692
11	II	756	649	444	-	50	-	-	195	199	362	16	16	394
12	I	1,910	1,148	736	-	561	-	-	-	175	4,363	48	332	4,743
13	I	1,498	812	553	-	368	-	-	-	185	2,820	15	230	3,065
14	I	1,148	775	537	127	163	-	-	67	180	2,579	29	290	2,898
15	I	920	551	351	3	348	-	-	-	-	2,503	50	54	2,607
16	I	79	38	15	-	15	-	-	-	-	118	-	-	118
17	I	561	305	220	-	52	-	-	32	136	406	9	17	432
18	I	270	193	144	-	-	-	-	144	-	-	-	-	-
19-1	I	941	427	317	-	263	-	-	44	10	2,031	20	197	2,248
19-2	II	12	5	4	-	4	-	-	-	-	27	-	3	30
20	II	409	167	117	-	-	117	-	-	-	686	13	77	776
21	II	1,704	938	638	-	-	616	22	-	-	3,669	40	350	4,059

Study Area Number	Phase	Acres in Parcels	Gross Vacant Buildable Acres	Net Vacant Buildable Acres	Town Center	2040 Design Type Designation (NVBA)					Units on Vacant Land	Units from Env. Areas	Units from Redevelopment	Total Estimated Units
						IN	ON	COR	EMP	IND				
22	II	2,137	1,444	918	-	-	917	1	-	-	5,360	96	263	5,719
23	II	881	488	315	-	315	-	-	-	-	2,417	103	231	2,751
24	II	945	549	385	-	365	-	20	-	-	2,870	67	141	3,078
25	I	559	217	155	-	154	-	1	-	-	1,187	80	97	1,364
26	II	1,845	1,029	706	-	688	-	18	-	-	5,349	210	582	6,141
27	II	2,882	1,726	1,180	-	-	1,120	60	-	-	6,744	165	476	7,385
28	II	1,471	771	541	-	504	-	37	-	-	3,994	111	172	4,277
29	II	1,535	990	704	-	-	704	-	-	-	4,111	78	162	4,351
30	II	2,192	1,400	941	-	-	898	43	-	-	5,390	104	469	5,963
31	II	1,305	983	713	-	713	-	-	-	-	5,472	153	131	5,756
32	I	677	528	302	-	267	-	-	35	-	2,058	13	171	2,242
33	II	670	401	257	-	-	257	-	-	-	1,501	32	25	1,558
34	II	454	134	76	-	-	76	-	-	-	443	6	3	452
35	I	831	375	187	-	166	-	21	-	-	1,346	13	50	1,409
36	II	1,111	684	272	-	-	255	17	-	-	1,547	28	80	1,655
37	I	359	265	146	-	146	-	-	-	-	1,122	3	41	1,166
38	I	1,360	822	466	-	439	-	27	-	-	3,465	65	174	3,704
39	II	494	353	224	-	214	-	10	-	-	1,676	-	19	1,695
40	II	305	279	180	-	161	-	19	-	-	1,300	-	29	1,329
41	I	529	307	173	-	157	-	16	-	-	1,263	31	35	1,329
42	I	555	309	213	-	-	-	47	166	-	158	-	14	172
43	I	1,627	1,103	509	-	-	498	11	-	-	2,946	51	269	3,266
44	II	835	651	367	-	-	327	40	-	-	2,045	7	122	2,174
45	I	174	122	89	-	89	-	-	-	-	686	-	85	771
46a	I	69	28	21	-	21	-	-	-	-	160	6	12	178
46b	I	69	12	6	-	6	-	-	-	-	47	14	-	61
47	I	886	638	444	-	199	-	21	-	224	1,602	32	104	1,739
48	I	1,051	591	441	-	-	-	-	-	441	-	-	-	-

Study Area Number	Phase	Acres in Parcels	Gross Vacant Buildable Acres	Net Vacant Buildable Acres	Town Center	2040 Design Type Designation (NVBA)					Units on Vacant Land	Units from Env. Areas	Units from Redevelopment	Total Estimated Units
						IN	ON	COR	EMP	IND				
49	I	963	501	375	-	-	-	2	-	373	6	-	-	6
50	I	182	142	100	-	100	-	-	-	-	765	6	51	822
51	II	1,873	1,535	918	-	918	-	-	-	-	7,050	286	209	7,545
52	I	298	208	137	-	137	-	-	-	-	1,054	34	77	1,165
53	II	1,766	1,043	609	-	-	609	-	-	-	3,558	28	263	3,850
54	I	192	134	90	-	90	-	-	-	-	689	1	28	718
55	I	882	547	390	-	390	-	-	-	-	2,994	105	347	3,446
56	II	138	47	36	-	-	36	-	-	-	208	11	139	358
57a	II	4	3	3	-	-	3	-	-	-	15	-	-	15
57b	II	17	12	9	-	-	9	-	-	-	53	6	-	58
57c	II	8	7	6	-	6	-	-	-	-	43	2	-	45
58	II	458	337	227	-	225	-	2	-	-	1,733	21	60	1,815
59	I	986	749	507	-	460	-	47	-	-	3,692	40	184	3,916
60	II	238	122	84	-	-	81	3	-	-	483	9	45	537
61-1	I	35	24	18	-	11	-	5	-	2	101	-	17	117
61-2	II	5	4	3	-	-	-	-	-	3	-	-	-	-
62	II	172	118	77	-	77	-	-	-	-	595	21	29	644
63	I	217	183	81	-	81	-	-	-	-	626	29	33	688
64	I	238	203	143	-	120	-	23	-	-	998	17	32	1,047
65	I	412	290	187	-	163	-	24	-	-	1,334	21	62	1,416
66	II	112	96	42	-	42	-	-	-	-	324	-	8	333
67	I	479	188	121	-	121	-	-	-	-	932	2	85	1,019
68	II	1,529	958	609	-	570	-	39	-	-	4,511	120	1,135	5,766
69-1	I	239	160	112	-	107	-	5	-	-	840	10	34	884
69-2	II	122	76	56	-	47	-	9	-	-	394	-	63	457
70	II	438	371	237	-	237	-	-	-	-	1,822	61	79	1,962
71a	I	84	64	48	-	48	-	-	-	-	368	-	48	416
71b	I	1	0	0	-	-	-	-	-	-	-	-	-	0

Study Area Number	Phase	Acres in Parcels	Gross Vacant Buildable Acres	Net Vacant Buildable Acres	Town Center	2040 Design Type Designation (NVBA)					Units on Vacant Land	Units from Env. Areas	Units from Redevelopment	Total Estimated Units
						IN	ON	COR	EMP	IND				
72	II	66	43	33	-	33	-	-	-	-	251	-	51	302
73	II	4	3	2	-	-	2	-	-	-	14	-	-	14
74	II	472	240	180	-	-	180	-	-	-	1,049	1	100	1,150
75	I	69	40	30	-	-	-	-	-	30	-	-	-	-
76-1	I	109	66	50	-	-	-	-	-	50	-	-	-	-
76-2	II	4	0	0	-	-	-	-	-	-	-	-	-	-
77	I	108	51	39	-	32	-	7	-	-	267	-	42	309
78-1	I	117	62	41	-	41	-	-	-	-	319	2	30	351
78-2	II	10	0	0	-	-	-	-	-	-	1	1	-	2
79-1	I	187	142	107	-	-	-	-	-	107	-	-	-	-
79-2	II	163	107	81	-	-	-	-	-	81	-	-	-	-
80	I	35	14	11	-	-	-	-	-	11	-	-	-	-
81	II	242	134	100	-	-	-	-	-	100	-	-	-	-
82	I	146	88	59	-	56	-	3	-	-	439	11	64	514
83-1	I	1	0	0	-	-	-	-	-	-	-	-	-	-
83-2	II	1,724	1,244	831	-	483	318	30	-	-	5,666	671	173	6,510
84a	I	240	182	111	-	111	-	-	-	-	853	248	18	1,119
84b	I	12	5	4	-	4	-	-	-	-	31	5	-	36
85	II	237	217	162	-	162	-	-	-	-	1,243	17	34	1,294
86	II	131	101	64	-	50	-	14	-	-	432	1	20	453
87	II	420	287	157	-	141	-	16	-	-	1,134	46	48	1,228
88	II	1,575	1,144	579	-	-	576	3	-	-	3,375	27	122	3,524
89	I	464	235	145	-	-	145	-	-	-	846	13	45	904
90	II	1,149	775	423	-	-	423	-	-	-	2,472	73	34	2,579
91	I	126	88	56	-	-	56	-	-	-	327	-	57	384
92	I	40	19	14	-	-	14	-	-	-	84	10	-	94
93	I	359	190	120	-	-	120	-	-	-	699	29	39	767
94-1	I	428	133	80	-	-	80	-	-	-	465	-	6	471

Study Area Number	Phase	Acres in Parcels	Gross Vacant Buildable Acres	Net Vacant Buildable Acres	Town Center	2040 Design Type Designation (NVBA)					Units on Vacant Land	Units from Env. Areas	Units from Redevelopment	Total Estimated Units
						IN	ON	COR	EMP	IND				
94-2	II	155	63	30	-	-	30	-	-	-	173	2	-	175
TOTAL		73,532	45,551	29,463	509	13,917	10,398	922	907	2,810	176,125	4,277	13,143	193,545

SECTION A-2 – ASSESSMENTS FOR WATER, SEWER AND STORM WATER SERVICEABILITY – BY PHASE

Table A-2 Assessments for Water, Sewer and Stormwater Serviceability Phase I Study Areas				
Study Area (Number)	(Comment)	Water	Sewer	Stormwater
1(N)	-	D	D	D
1(S)		D	MD	MD
2	-	E	MD	E
6		E	MD	E
12	-	E	MD	E
13		MD	MD	E
14	-	E	E	E
15		MD	MD	MD
16	1	E	E	MD
17		E	E	E
18		E	E	E
19	-	E	E	E
20		E	E	E
24	-	E	E	E
25		E	MD	MD
26	-	E	MD	E
28		E	MD	E
32	-	E	MD	MD
33		MD	MD	E
37	-	MD	D	D
38		E	MD	E
41	1	E	D	MD
42		MD	MD	E
43	-	E	MD	E
44		MD	MD	MD
46(E)	1	MD	E	MD
46(W)		D	D	MD
47	1	E	MD	E
48		E	MD	E
49	1	E	MD	E
50		MD	D	MD
52	-	MD	MD	MD
53		MD	D	D
55	-	E	E	E
56		E	E	E
61	-	MD	D	MD
62		MD	E	MD

Study Area Number	Sanitary	Water	Sewer	Stormwater
63	-	MD	MD	MD
64	-	MD	E	MD
65	-	MD	MD	MD
67	-	E	MD	MD
69	-	MD	MD	MD
70	-	D	D	D
71	-	E	E	E
76	1	E	E	E
77	-	E	E	E
78	-	MD	D	MD
79	-	MD	D	MD
80	-	MD	D	D
81	-	D	D	D
82	-	D	MD	MD
84	-	MD	MD	MD
86	-	MD	D	D
89	-	E	MD	MD
91	-	MD	D	D
92	-	MD	D	E
93	-	MD	D	D
94	-	MD	MD	MD

Findings Phase 1, Water, Sewer and Stormwater Serviceability

All proposed service areas can be served. Most cities and providers are willing to serve any area that is geographically logical (proximate) for them to serve. However, there are variations in level of difficulty, and cost per hook-up. More difficult-to-serve study areas include those with topographical constraints and unfavorable drainage patterns. Many of these areas, particularly those that slope away from the UGB, will require pumping for sanitary sewer. A few of the service areas are divided by draining basin boundaries, and have more than one potential service provider.

Providers generally assume that at least some upgrades, improvements, and/or expansion will be necessary to support growth. Additional infrastructure necessary to serve new development could include storage tanks, installation or extension of water mains, pump stations, or pressure reducing valves. In some cases providers have recognized these needs, and are currently making plans to upgrade their existing systems.

Stormwater control and treatment was not a large concern for most providers, who account for the fact that developers frequently provide required water quality treatment and stormwater detention systems. No water provider expressed serious concern about the quantity of water. While the City of Wilsonville is currently experiencing water issues, for example, the City feels they have practical solutions to these shortages. Considerations such as these have been incorporated into the scorings for water expansion, shown in Summary Table A2. A more detailed feasibility study will be needed to identify specific improvements that would be necessary to urbanize each study area.

General comments and findings, grouped by region

West of the Willamette River: Clean Water Services (CWS) is willing to provide sanitary sewer service to the Study Areas in question. However, many of the areas adjacent to CWS's jurisdictional boundary, particularly towards the north, flow away from the UGB. These areas would most likely require a pump station or gravity fed lines, which would leave the UGB and could be costly. Study Areas 75, 76, and 77 are easy to serve for all facilities and the City of Cornelius actively wants to serve these areas.

East of the Willamette River: Clackamas County anticipates serving some of the proposed areas specifically Study Areas 14, 15, 16, 17, 18 and 19. Sanitary sewer service should be relatively easy to implement, but steeper areas, such as Study Area 15, will be more difficult to serve. Study Areas 14 and 23 would likely require a new pump station. The Beavercreek area will require pumping to provide sanitary sewer service. Area 16 is surrounded by the UGB and can be easily served with the existing infrastructure.

Study Areas towards the South: Areas near West Linn (35 and 38) slope away from all jurisdictions and will be more difficult to serve. The sanitary sewer system will likely require the construction of one or more pump stations. These areas are also difficult to serve with water since they are high and steep, and new storage tanks will most likely be required. It may be logical to split Study Area 48 between Sherwood and Tualatin along the power line easement running through it. Subsurface rock in Study Area 58 might affect digging and utility installation in both 48 and 49 which would make these two areas more difficult to develop.

In general, urbanization within the study areas is expected to have some impact on areas currently within the UGB. Without extensive research, most providers cannot guarantee that their systems

will be able to handle additional loads created from new development. Some providers have already begun researching the capacity of lines, pump stations, water mains and treatment plants in anticipation of future growth. Since some of the systems do have available capacity and other systems are already past the desired capacity levels, the impacts of urbanization on current urban areas vary greatly by study area. This study has incorporated findings on such impacts into the scoring system (Easy, Moderately Difficult, Difficult) detailed in Summary Table A2.

Table A-3: Phase II Study Areas, Composite Scores for Water, Sanitary Sewer and Stormwater

Study Area Number	Water		Sanitary Sewer		Stormwater	
	Score	Rating	Score	Rating	Score	Rating
03	80	Moderate	102	moderate	132	Easy
04	77	Moderate	46	difficult	132	Easy
05	100	Moderate	57	difficult	146	Easy
08	106	Moderate	50	difficult	136	Easy
09	123	Easy	58	difficult	144	Easy
10	113	Moderate	98	moderate	140	Easy
11	120	Moderate	108	moderate	138	Easy
19-2	77	Moderate	86	moderate	110	Moderate
20	83	Moderate	86	moderate	122	Easy
21	115	Moderate	100	moderate	142	Easy
22	102	Moderate	96	moderate	138	Easy
23	126	Easy	93	moderate	126	Easy
24	117	Moderate	96	moderate	126	Easy
26	125	Easy	64	difficult	134	Easy
27	95	Moderate	67	difficult	140	Easy
28	113	Moderate	73	moderate	140	Easy
29	104	Moderate	61	difficult	134	Easy
30	124	Easy	87	moderate	148	Easy
31	79	Moderate	61	difficult	134	Easy
33	50	Difficult	57	difficult	114	Moderate
34	46	Difficult	57	difficult	120	Moderate
36	51	Difficult	58	difficult	124	Easy
39	69	Difficult	82	moderate	134	Easy
40	67	Difficult	80	moderate	132	Easy
44	71	Moderate	85	moderate	136	Easy
51	59	Difficult	71	moderate	148	Easy
53	43	Difficult	49	difficult	132	Easy
56	75	Moderate	90	moderate	120	Moderate
57a	80	Moderate	100	moderate	130	Easy

Study Area Number	Water		Sanitary Sewer		Stormwater	
	Score	Rating	Score	Rating	Score	Rating
57b	70	Difficult	75	moderate	120	Moderate
57c	80	Moderate	85	moderate	130	Easy
58	53	Difficult	94	moderate	124	Easy
60	95	Moderate	80	moderate	110	Moderate
61-2	80	Moderate	94	moderate	130	Easy
62	100	Moderate	94	moderate	130	Easy
66	130	Easy	100	moderate	130	Easy
68	142	Easy	112	moderate	142	Easy
69-2	130	Easy	94	moderate	130	Easy
70	134	Easy	98	moderate	134	Easy
72	118	Moderate	118	moderate	130	Easy
73	115	Moderate	115	moderate	130	Easy
74	55	Difficult	70	difficult	112	Moderate
76-2	121	Easy	94	moderate	130	Easy
78-2	109	Moderate	112	moderate	130	Easy
79-2	109	Moderate	112	moderate	130	Easy
81	132	Easy	120	moderate	132	Easy
83-2	116	Moderate	113	moderate	146	Easy
85	117	Moderate	102	moderate	132	Easy
86	130	Easy	118	moderate	130	Easy
87	111	Moderate	99	moderate	132	Easy
88	85	Moderate	82	moderate	130	Easy
90	67	Difficult	70	difficult	118	Moderate
94-2	59	Difficult	47	difficult	110	Moderate

SECTION A-3 TRANSPORTATION ANALYSIS BY STUDY PHASE

Table A-4 Phase I Transportation Serviceability Assessment

Study Area Number	Possible Residential Units	Two-Hour Peak Auto Trips	Lanes of Arterial Capacity	Travel Activity	Connectivity to Built Systems	Potential Auto Serviceability	Composite Score	General Assessment
	70,526	64,344	90.0		(1=good, 2=fair, 3=poor)			
1	20	24	0.0	1	1	1	3	Good
2	1,805	2,182	2.1	2	1	1	4	Good
3	2,085	2,521	2.2	3	1	1	5	Fair
12	2,910	3,518	3.4	3	1	1	5	Fair
13	1,690	3,670	3.3	3	2	2	7	Poor
14	3,795	4,588	4.4	3	2	3	8	Poor
15	2,820	3,409	3.2	3	2	3	8	Poor
16	160	193	0.2	1	2	3	6	Fair
17	680	822	0.8	2	2	3	7	Poor
19	2,385	2,883	2.8	3	3	3	9	Poor
20	2,225	2,690	2.6	3	1	3	7	Poor
24	2,995	3,621	3.5	3	2	3	8	Poor
25	1,175	1,421	1.4	3	1	3	7	Poor
26	4,965	6,003	5.8	3	1	3	7	Poor
28	2,635	3,185	3.1	3	1	3	7	Poor
32	2,175	2,630	2.5	3	1	3	7	Poor
35	1,565	1,892	1.8	2	2	3	7	Poor
37	1,015	1,227	1.2	2	2	3	8	Poor
38	3,250	3,929	3.6	3	3	3	9	Poor
41	1,110	1,342	1.3	2	3	3	8	Poor
42	1,200	1,462	1.4	1	3	3	7	Poor
43	3,785	4,576	4.4	3	2	3	8	Poor
45	540	658	0.6	1	2	2	5	Fair
46(E)	35	42	0.0	1	2	2	5	Fair
46(W)	130	157	0.2	1	2	2	5	Fair
47	1,360	1,644	1.6	2	2	2	6	Fair
48	90	1,258	1.0	2	1	2	5	Fair
49	6	1,008	0.6	2	1	2	5	Fair
50	1,015	1,227	1.2	2	2	3	6	Fair
50,54	770	931	0.9	2	2	1	5	Fair
55	2,695	3,258	3.1	3	2	1	6	Fair
56	3,235	3,929	3.6	3	3	3	9	Poor
61	95	115	0.1	1	2	2	5	Fair
62	325	395	0.3	1	2	2	5	Fair
63	580	701	0.7	1	1	3	5	Fair
64	1,175	1,421	1.4	2	1	3	6	Fair
65	1,265	1,529	1.5	2	2	2	6	Fair
66	840	1,016	1.0	2	2	2	6	Fair

Study Area Number	Possible Residents	Available Peak Hours	Ratio of Potential Capacity	Travel Volume	Connectivity to Public Systems	Potential for Sustainability	Commuter Score	General Assessment
69	1,350	1,632	1.6	2	1	1	4	Good
71	390	475	1.2	1	1	1	3	Good
75	175	212	0.2	1	2	3	6	Fair
76	305	368	0.4	1	2	2	5	Fair
77	290	351	0.3	1	2	2	5	Fair
78	275	332	0.5	1	2	2	4	Good
79	0	305	0.1	1	1	1	4	Good
80	60	75	0.2	1	2	1	4	Good
81	165	199	0.2	1	2	1	4	Good
82	405	490	0.5	1	3	1	5	Fair
84	925	1,118	1.1	2	2	1	5	Fair
86,91	880	1,064	1.7	2	2	2	6	Fair
89	1,110	1,342	1.3	2	3	2	7	Poor
92	100	121	0.1	1	2	1	4	Good
93	785	949	0.8	1	2	1	4	Good
94	570	689	0.7	2	2	2	6	Fair

Findings Phase 1 Transportation Assessment:

West of the Willamette River: Study Areas 62, 63, 64, 65, 67, 69 and 71 border the west side of Tigard, Beaverton and south side of Hillsboro. Study areas 62, 63 and 64 feed into Scholls Ferry Road and Highway 99W, and both are heavily congested in peak periods assuming Draft RTP projections. Access to pedestrian and bicycle amenities is good in these urban and suburban corridors, but highway expansion beyond current plans is not expected. Areas 67 and 69 feed into the Farmington Road corridor, which is less congested than the above two facilities, but has substantial peak period delays. Area 71 is relatively small, and has more than adequate transportation capacity and alternative mode services. The Draft RTP identified a Tualatin Valley Highway expressway facility that was sufficient to service former Urban Reserve sites 55 and 56.

Areas 75,76 and 77 in Cornelius are relatively small and require a lesser level of service. The Highway 8 corridor through Cornelius is forecasted to exceed peak period capacity. Parallel collector facilities could be provided through planned area development (Study areas 76 and 77) to help relieve forecasted deficiencies. Study areas 78, 79 and 80 are relatively small and have little incremental impacts to the regional system.

Development of Study Area 82 along West Union Road in North Hillsboro would require upgrading this facility beyond the planned three-lane section and possibly require additional capacity at the Cornelius Pass Road interchange with Highway 26. Bus and bike/pedestrian services are limited, but could be readily expanded. Similar results are shown for Area 84 along Springville Road. Regional carrying capacity on Highway 26 is very good and can readily serve expanded development north of the highway with added capacity to local interchanges.

Study Area 89 is remote from alternative mode services and relies on primarily rural road systems. Significant upgrades to existing facilities would be required for this area.

East of the Willamette River: Areas 1, 2, 6 and 12 in east Gresham have excellent potential for extension of services given their proximity to current facilities and the long-range forecasts for system performance. Year 2020 travel forecasts on regional corridors are well below capacity in these areas. Burnside Street and Powell Valley Road have high levels of service for auto and alternative travel modes. Areas in the Pleasant Valley and Damascus vicinity (Study Areas 13, 15, 16, 17, 18 and 19) are relatively large in terms of travel intensity and the demands added to the arterial system. Improvements to Sunnyside Road and Highway 212/224 (and a rapid bus service) have been programmed into the Draft RTP to serve as primary commute routes for new residential development in these areas. However, Foster Road capacity improvements in the City of Portland have not been reflected in their latest plans. Even with the programmed improvements, the peak period service for autos is near the minimum threshold desired by Metro standards. This finding may change as the balance of residential and employment uses within the Pleasant Valley /Damascus areas evolves through on-going planning. A higher level of nearby employment uses in Clackamas County may lessen the corridor demands on these facilities.

Southern Study Areas: Study Areas 23, 24, 25, 26 and 28 in Clackamas County and Oregon City are relatively large development sites that tie into a severely congested regional and arterial system in 2020. Interstate 205 between Highway 224 and Highway 43 in West Linn is at or above capacity during peak hours. Highway 213 through Oregon City is similarly heavily congested in the peak direction. Capacity expansion through these corridors is needed beyond the current RTP project to facilitate commute patterns to Washington and Multnomah Counties. Access to alternative modes is good to fair because of proximity to urban centers. Study Area 32 along southwest Oregon City

relies on Highway 99W for regional service to Interstate 205. Peak direction travel is below acceptable levels for this area. The bridge crossing of the Willamette River to 7th Street in downtown Oregon City is severely limited in capacity for autos and freight traffic. No upgrades to the bridge are reflected in the RTP or local plans.

Study Areas 35, 37, 38, 41, 42 and 43 in West Linn, Tualatin, Lake Oswego and Clackamas County will rely upon one regional freeway and three existing interchanges. Year 2020 forecasts are at or above peak period capacity on Interstates 5 and 205. The limited freeway access concentrates arterial demands along Stafford Road and Salamo Road. The lack of capacity in the I-205 corridor shifts travel onto parallel collector and arterial facilities (e.g., Borland Road, Childs Road and Jean Road that are built to rural standards). Additional freeway interchanges should be considered to service Areas 35 and 37 in particular. Transit and bicycle facilities are very limited in this sector primarily because of hilly terrain and sparse existing development.

Study Areas 45, 46, 47, 49, and 52 surrounding Wilsonville have acceptable local arterial capacity, but the Interstate 5 regional corridor is severely congested during peak hours. Access to I-5 is constrained as a result of there being only two local freeway interchanges, and City of Wilsonville policy balances development to system capacity. An additional freeway interchange would likely be needed to service Areas 47, 48, and 49 near Norwood Avenue in Tualatin. This interchange is one component of the planned expressway facility between I-5 and Highway 99W in Sherwood. The total project cost for that improvement is \$250 million while the interchange itself should be less than one-tenth that cost. Local bus and trail systems could be expanded to service these areas. Commuter rail service between Wilsonville and downtown Beaverton could further relieve peak period auto travel.

Study area 50, 54 55 and 59 in Sherwood, have limited transit and bicycle service, although the local arterial facilities are adequate or could be upgraded to accommodate growth. Regional highways into core work areas are congested during peak hours along Highway 99W in Tigard and I-5. The current peak period congestion on Tualatin-Sherwood Road will be relieved by the planned Highway 99W to I-5 expressway project noted above. The feasibility of the expressway is still under environmental review, and the preliminary cost of \$250 million could increase. Without this added east-west high capacity facility the local arterials would be much more congested during peak periods.

In summary, the most difficult areas to serve from the transportation perspective are Study Areas 14, 15, 19, 24, 37, 38, 41 and 43.

Table A- 5 Phase II Study Areas – Ratings for Potential Transportation Service

Study Area Number	Potential Residential Units	Potential Industrial Use (Ac.)	Two-Hour Peak Direction Auto Trips	# Lanes Peak Direction Arterial Capacity	(A) Potential Trip Generation	(B) Impact to Existing System	(C) Connectivity to Existing System	(D) Env. Factors (e.g. slope)	Composite Score	General Overall Transportation Assessment
	137,953	184	111,995	62.2	(1 = good, 2 = fair, 3 = poor)					≤ 11 = easy; 12-15 = moderate; >16 = difficult
03	1,550	0	1,251	0.7	2	1	1	1	9	easy
04	1,039	0	838	0.5	1	1	2	1	10	easy
05	4,898	0	3,953	2.2	3	2	2	1	15	moderate
08	2,343	0	1,891	1.1	2	2	3	2	18	difficult
09	4,943	0	3,990	2.2	3	2	2	1	15	moderate
10	19,964	0	16,112	9.0	3	3	1	1	16	difficult
11	3,451	0	2,786	1.5	2	1	1	1	9	easy
19-2	30	0	24	0.0	1	1	1	1	8	easy
20	776	0	627	0.3	1	2	2	1	13	moderate
21	4,059	0	3,276	1.8	2	2	2	1	14	moderate
22	5,719	0	4,616	2.6	3	3	2	1	18	difficult
23	2,751	0	2,220	1.2	2	2	2	1	14	moderate
24	3,078	0	2,484	1.4	2	2	2	2	16	difficult
26	6,141	0	4,957	2.8	3	3	2	2	20	difficult
27	7,385	0	5,960	3.3	3	3	2	1	18	difficult
28	4,277	0	3,452	1.9	2	2	2	2	16	difficult
29	4,351	0	3,512	2.0	2	3	3	2	21	difficult
30	5,963	0	4,812	2.7	3	2	2	1	15	moderate
31	5,756	0	4,646	2.6	3	3	2	1	18	difficult
33	1,558	0	1,257	0.7	2	2	2	2	16	difficult
34	452	0	364	0.2	1	1	2	1	10	easy

Study Area Number	Potential Residential Units	Potential Industrial Use (Ac.)	Two-Hour Peak Direction Auto Trips	# Lanes Peak Direction Arterial Capacity	(A) Potential Trip Generation	(B) Impact to Existing System	(C) Connectivity to Existing System	(D) Env. Factors (e.g. slope)	Composite Score	General Overall Transportation Assessment
	137,953	184	111,995	62.2	(1 = good, 2 = fair, 3 = poor)				≤ 11 = easy; 12-15 = moderate; >16 = difficult	
36	1,655	0	1,336	0.7	2	3	1	1	15	moderate
39	1,695	0	1,368	0.8	2	2	1	1	12	moderate
40	1,329	0	1,072	0.6	2	2	1	1	12	moderate
44	2,174	0	1,754	1.0	2	2	2	1	14	moderate
51	7,545	0	6,089	3.4	3	3	2	1	18	difficult
53	3,850	0	3,107	1.7	2	2	2	2	16	difficult
56	358	0	289	0.2	1	1	2	1	10	easy
57a	15	0	12	0.0	1	1	3	1	12	moderate
57b	58	0	47	0.0	1	1	3	1	12	moderate
57c	45	0	36	0.0	1	1	2	1	10	easy
58	1,815	0	1,465	0.8	2	1	2	1	11	easy
60	537	0	433	0.2	1	1	3	1	12	moderate
61-2	0	3	9	0.0	1	1	2	1	10	easy
62	644	0	520	0.3	1	1	2	1	10	easy
66	333	0	269	0.1	1	2	3	1	15	moderate
68	5,766	0	4,654	2.6	3	2	2	1	15	moderate
69-2	457	0	369	0.2	1	1	2	1	10	easy
70	1,962	0	1,583	0.9	2	1	2	1	11	easy
72	302	0	243	0.1	1	1	3	1	12	moderate
73	14	0	11	0.0	1	1	2	1	10	easy
74	1,150	0	928	0.5	1	1	2	2	12	moderate
76-2	0	0	0	0.0	1	1	1	1	8	easy
78-2	2	0	2	0.0	1	1	2	1	10	easy
79-2	0	81	231	0.1	1	1	2	1	10	easy
81	0	100	286	0.2	1	2	2	2	15	moderate
83-2	6,510	0	5,379	3.0	3	2	3	1	17	difficult

Study Area Number	Potential Residential Units	Potential Industrial Use (Ac.)	Two-Hour Peak Direction Auto Trips	# Lanes Peak Direction Arterial Capacity	(A) Potential Trip Generation	(B) Impact to Existing System	(C) Connectivity to Existing System	(D) Env. Factors (e.g. slope)	Composite Score	General Overall Transportation Assessment
	137,953	184	111,995	62.2	(1 = good, 2 = fair, 3 = poor)					≤ 11 = easy; 12-15 = moderate; >16 = difficult
85	1,294	0	1,044	0.6	2	1	3	1	13	moderate
86	453	0	365	0.2	1	2	2	1	13	moderate
87	1,228	0	991	0.6	2	2	2	1	14	moderate
88	3,524	0	2,850	1.6	2	2	2	2	16	difficult
90	2,579	0	2,081	1.2	2	2	2	3	18	difficult
94-2	175	0	141	0.1	1	2	2	3	17	difficult

Findings Phase II Transportation Assessment:

Each of the study areas was evaluated for potential transportation service and assigned a rating, as shown in the summary table below. Lower scores indicate the area would face fewer constraints to transportation service, and be relatively less expensive to serve. Higher scores indicate increasing constraints, greater impacts to the existing system, and higher costs of providing transportation services to serve the study area.

As with the Phase I analysis, Washington County contains the majority of higher value sites that are capable of serving additional residential development. More than half the sites in Washington County, the majority of which are located in western Washington County, received the highest overall rating.

By contrast, overall transportation assessment ratings of the sites in Clackamas County were about evenly split between good, fair and poor. Many Clackamas County sites are in areas that will be very difficult and expensive to provide the additional capacity needed to serve new development.

Only five study areas are in Multnomah County. The two sites in eastern Multnomah County southeast of Gresham generally rated more favorable than the three in western Multnomah County, which are located north of the Sunset Highway in areas with few existing roadways.

SECTION A-4 SUMMARY OF ENERGY, SOCIAL AND ECONOMIC CONSEQUENCES OF ADDING LAND TO THE EXISTING METRO URBAN GROWTH BOUNDARY – ALL STUDY AREAS

Summarized below are the results of the Energy, Social and Economic analysis separated into groups of study areas that share common traits.

Low Energy/Social/Economic Consequence

There are three general categories of study areas that have low economic, social, and energy consequences from urbanization. Each group shares a number of attributes with location to the current UGB being the main difference.

Study Areas 1, 16, 45, 46, 61, 62, 63, 64, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81

Generally these areas are small in size, directly adjacent to the current UGB and are stand alone study areas. They commonly contain a number of small-developed parcels and a relatively small degree of agricultural activities and environmental features related to area size. Urbanization of these areas will not significantly change the current use of the land or negatively impact the general activity of the residents as these small areas are currently more urban than other study areas. The relatively small amount of agricultural activity and environmental features will reduce the potential negative economic impacts of a lost farming economy and costs for natural resource protection. Accordingly, urbanization of these areas would result in a low energy/social/economic consequence.

Study Areas 4, 8, 20, 56, 57

These study areas are small in size, contain a number of smaller sized parcels and a relatively small degree of agricultural activity and environmental features. However they are located at the outer edge of the study areas, not contiguous to the current UGB. Due to their small size and the corresponding small increase in potential dwelling units, the increased vehicle miles traveled for the entire area will be less than a larger area in the same location. The small size and isolated nature of these study areas may also reduce the negative impact of a lost rural way of life. The relatively small amount of agricultural activity and environmental features will reduce the potential negative economic impacts of a lost farming economy and costs for natural resource protection. Accordingly, urbanization of these areas would result in a low energy/social/economic consequence.

Study Areas 2, 3, 31, 32, 33, 34, 52, 65, 66, 67, 69, 82

These study areas are small in size, contiguous to the current UGB, and adjacent to other study areas. The parcel sizes range from small to mid-size and contain either significant environmental features and/or agricultural activities. Due to the small area size and being located adjacent to the UGB, the corresponding small increase in dwelling units will result in a smaller increase in vehicle miles traveled for the two areas than a larger area in the same location. Study Area 69 is highly parceled and urbanization would not appreciably impact the way of life of the residents. Environmental protection measures and areas in public ownership will also reduce the overall number of future dwelling units. The economic loss of the agricultural activity, mainly in Study Areas 3 and 31, would be offset by the increased economic opportunity offered by urbanization to a small area near the current UGB. The large expanse of agricultural activity to the east of Study Areas 2 and 3 and to the west of Study Area 52 would still function as a complete agricultural community. Therefore, urbanization of these areas would result in a low energy/social/economic consequence.

Moderate Energy/Social/Economic Consequence

There are many attributes of study areas that have moderate economic, social, and energy consequences from urbanization. Each category may share one or two attributes but there is not a consensus on size, location to the current UGB or degree of environmental features and agricultural activity.

Study Areas 6, 7, 12, 13, 14, 15, 17, 18, 19, 23, 24, 25, 26, 28, 35, 37, 38, 39, 40, 41, 42, 43, 47, 48, 49, 50, 54, 55, 58, 59, 84, 85, 86, 89, 91, 92, 93, 94

These study areas are adjacent to the UGB and vary in overall size and size of parcels. Some areas contain mostly mid-sized parcels (areas 15 & 9) whereas others (areas 17, 28 & 41) contain pockets of small lots in a distinctly urban pattern. The areas contain a mixture of uses and in most cases there is not a dominant use. Environmental attributes and agricultural activities are present but not overriding. The increased VMT from urbanization of the areas will be less than areas that are farther from the current UGB. Due to the current mixture of uses in these areas, urbanization will not significantly alter the existing way of life or feeling of the study area. Areas 92, 93 and 94 contain significant steep slopes that would restrict the amount of development that could occur, resulting in less impact to current residents. Negative economic impacts associated with environmental resource protection or loss of agricultural activity due to urbanization will not outweigh the potential economic benefits from development opportunities. Therefore, urbanization of these areas would result in a moderate energy/social/economic consequence.

Study Areas 10, 11, 21, 36, 60, 87

These study areas are not adjacent to the UGB and vary in overall size and size of parcels. Some areas contain mostly mid-sized parcels (areas 36 & 87) whereas others (area 10) contain pockets of small lots in a distinctly urban pattern. The areas contain a mixture of uses and in most cases there is not a dominant use. Environmental attributes and agricultural activities are present but not overriding. Area 10 contains significant areas of both environmental resources and agricultural activity, but due to the very large size of the study area the various uses seem balanced. The increased VMT from urbanization for the areas will be more than areas that are closer to the current UGB however, the opportunity to develop complete communities in these areas should reduce this overall increased VMT. Due to the current mixture of uses in the areas, urbanization will not significantly alter the existing way of life or feeling of the study area. Negative economic impacts associated with environmental resource protection or loss of agricultural activity due to urbanization will not outweigh the potential economic benefits from development opportunities. Therefore, urbanization of these areas would result in a moderate energy/social/economic consequence.

High Energy/Social/Economic Consequence

There are many attributes of study areas that have high economic, social, and energy consequences from urbanization. Each category may share one or two attributes but there is not a consensus on size, location to the current UGB or degree of environmental features and agricultural activity.

Study Areas 5, 9, 27, 29, 30, 44, 53, 88

These study areas are generally large in size, located at the edge of the study area boundary and contain either high amounts of environmental features or agricultural activities. Many of the parcel sizes are large and there are extensive areas of resource land adjacent to the areas. Urbanization of the large nursery land in areas 5 and 9 would have an economic impact on the nursery industry and could affect the large areas of nursery land that is between the two study areas. Protection of the environmental features in areas 29 and 88, combined with impacts to the agricultural industry in these two areas, would have a negative economic impact. These large areas on the outer edge have a potential for a significant increase in dwelling units that would result in an increase in VMT

as compared to areas closer to the current UGB. Urbanization of these large parceled areas that contain substantial agricultural and or environmental features would result in a negative impact to the current resident's way of life. Therefore, urbanization of these areas would result in a high energy/social/economic consequence.

Study Areas 22, 51, 68, 70, 83, 90

These study areas are large in size, contain resource land that supports substantial agricultural activity or forestland and are adjacent to or in some cases almost surrounded by exception land study areas. The parcels are mostly large and there are no areas or pockets that resemble an urban development pattern. The dominant use of the land as forestland, farmland or both provides an identity that would be significantly altered if the area urbanized. Negative economic impacts associated with environmental resource protection or loss of agricultural activity due to urbanization may be equal to or greater than the potential economic benefits from development opportunities. Therefore, urbanization of these areas would result in a high energy/social/economic consequence.

SECTION A-5 ENVIRONMENTAL FACTOR OF ESEE ANALYSIS – ALL STUDY AREAS

Table A-6 Summary of Environmental Factors of ESEE Analysis

Factor	Study Areas									
	1	2	3	4	5	6	7	8	9	10
Streams	600 ft	4 miles	1 1/4 mi	1 1/3 mi	6 3/4 mi	5.35 mi	1/4 mi	1 1/3 mi	9 mi	29 1/2 mi
River	1,100 ft	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Floodplains	Half	1 mile	n/a	n/a	1/2 mile	1.9 miles	1/4 mile	n/a	n/a	n/a
Wetlands	N/a	n/a	n/a	n/a	11- 19 1/4 ac	1.6 acres	n/a	5- 5 1/3 ac	17- 67 1/4 ac	26-16 1/2 ac
Steep	Half	Significant	n/a	minimal	Minimal	minimal	n/a	minimal	minimal	moderate
Open space	N/a	38 acre	n/a	n/a	N/a	n/a	n/a	n/a	n/a	300 acres
Goal 5	69%	47%	28%	32%	29%	31%	21%	21%	33%	43%
Rating	High	High	low	low	High	high	low	low	high	high

Factor	Study Areas									
	11	12	13	14	15	16	17	18	19	20
Streams	2 1/4 mi	9.8 mi	3.7 mi	6.6 mi	3.33 mi	n/a	3.25 mi	1.2 mi	2.33 mi	1 1/2 mi
River	N/a	n/a	n/a	n/a	N/a	n/a	n/a	n/a	2.6 miles	n/a
Floodplains	N/a	1.7 miles	n/a	n/a	N/a	n/a	n/a	n/a	large	n/a
Wetlands	3-1/2 acre	9.8 acres	1.1 acres	5- 4.8 acres	1/2 acre	n/a	minor	minor	n/a	3- 0.5 ac
Steep	Minimal	Significant	significant	minimal	Significant	significant	significant	significant	88 acres	moderate
Open space	N/a	n/a	207 acres	n/a	N/a	n/a	private	n/a	4 acres	n/a
Goal 5	39%	46%	57%	38%	62%	41%	35%	38%	55%	59%
Rating	Moderate	High	high	high	Moderate	low	moderate	low	moderate	low

Factor	Study Areas									
	21	22	23	24	25	26	27	28	29	30
Streams	5 1/2 mi	7 3/4 mi	3.31 mi	3.66 mi	3.4 mi	8.25 mi	11 3/4 mi	3.5 mi	4 1/3 mi	9.5 mi
Rivers	N/a	1.3	2.5 miles	n/a	N/a	n/a	n/a	n/a	n/a	n/a
Floodplains	N/a	1 3/4 miles	very large	n/a	2/3 mile	n/a	3 1/2 miles	n/a	n/a	n/a
Wetlands	7- 2 acres	4- 8 acres	n/a	n/a	N/a	3.2 acres	2- 1 acre	6+ acres	7- 64 acre	13- 19.75 ac
Steep	Minimal	Moderate	significant	significant	Half	significant	moderate	minimal	moderate	minimal
Open space	N/a	n/a	n/a	n/a	86 acres	n/a	n/a	n/a	n/a	n/a
Goal 5	37%	55%	54%	56%	65%	50%	53%	35%	30%	25%
Rating	High	High	high	moderate	High	high	high	moderate	moderate	high

Factor	Study Areas									
	31	32	33	34	35	36	37	38	39	40
Streams	6 mi	1.3 mi	1 1/2 mi	1 mi	2.67 mi	3 1/2 mi	n/a	1.59 mi	1 1/2 mi	2 mi
River	N/a	n/a	4 miles	1 mile	4 miles	n/a	n/a	1.7 miles	n/a	n/a
Floodplains	N/a	n/a	small	small	Extensive	n/a	n/a	n/a	n/a	n/a
Wetlands	6- 6 acres	2.5 acres	2- 1/2 acres	1- 4 1/2 acres	N/a	1- 1 3/4 acres	n/a	4- 1.76 acres	3- 2 1/4 acres	n/a
Steep	Moderate	Minimal	significant	moderate	Very significant	moderate	some	along streams	n/a	minimal
Open space	N/a	n/a	60 acres	30 acres	N/a	n/a	n/a	165 priv-4 pub	n/a	n/a
Goal 5	57%	37%	70%	31%	49%	42%	58%	62%	29%	47%
Rating	High	Low	high	moderate	High	moderate	low	moderate	low	low

Factor	Study Areas									
	41	42	43	44	45	46	47	48	49	50
Streams	3 mi	2.14 mi	5.86 mi	2 mi	< .75 mi	n/a	1 mi	3.82 mi	4 mi	.85 mi
River	2 miles	2.4 miles	n/a	n/a	N/a	3 1/4 miles	n/a	n/a	n/a	n/a
Floodplains	2 miles-river	large on river	n/a	n/a	N/a	large	n/a	3/4 mile	extensive	n/a
Wetlands	N/a	2.75 acres	8- 5.5 acres	2- 4 1/2 acres	N/a	n/a	17 acres	16- 47.3 ac	12- 86 acres	1.8 acres
Steep	Significant	Minimal	minimal	minimal	Minimal	minimal	minimal	significant	n/a	n/a
Open space	N/a	19 ac 10.5 pub	11.5 acres	n/a	N/a	n/a	n/a	24acresTRNW R	n/a	11 ac. (Adj)
Goal 5	63%	36%	44%	27%	25%	43%	36%	54%	55%	43%
Rating	High	High	high	low	Low	moderate	low	high	high	low

	51	52	53	54	55	56	57	58	59	60
Streams	9.5 mi	2/3 mi	5 mi	.42 mi	7.7 mi	3/4 mi	920 ft	1 mi	4.3 mi	1 1/2 mi
River	N/a	n/a	n/a	n/a	N/a	n/a	n/a	n/a	n/a	n/a
Floodplains	1 mile	n/a	n/a	n/a	Large	n/a	n/a	n/a	small	n/a
Wetlands	9- 9 acres	3 acres	1/3 acre	n/a	4.6 acres	n/a	n/a	1- 1.3 ac	6- 24 acres	n/a
Steep	Minimal	Minimal	moderate	minimal	N/a	moderate	minimal	minimal	minimal	significant
Open space	N/a	n/a	n/a	n/a	N/a	n/a	n/a	n/a	n/a	n/a
Goal 5	42%	27%	37%	28%	56%	20%	57%	30%	40%	45%
Rating	High	Low	high	low	High	low	low	low	moderate	moderate

Factor	Study Areas									
	61	62	63	64	65	66	67	68	69	70
Streams	N/a	2/3 mi	2/3 mi	1/2 mi	1/2 mi	n/a	3/4 mi	7 mi	3/4 mi	2 mi
River	N/a	n/a	n/a	n/a	N/a	n/a	n/a	n/a	n/a	n/a
Floodplains	N/a	n/a	n/a	n/a	N/a	n/a	n/a	n/a	small	moderate
Wetlands	N/a	n/a	< 1 acre	3 acres	< 1/2 acre	1/3 acre	1/2 acre	5- 16 acres	7 acres	2 acres
Steep	N/a	Minimal	minimal	n/a	Moderate	minimal	some	minimal	n/a	n/a
Open space	7.25 acres	n/a	n/a	n/a	N/a	n/a	88 acres	160 acres	n/a	n/a
Goal 5	14%	41%	49%	33%	50%	24%	23%	42%	24%	33%
Rating	low	Low	low	low	Low	Low	low	high	low	moderate

	71	72	73	74	75	76	77	78	79	80
Streams	1/3 mi.adj. pond	n/a	n/a	3/4 mi	1 mi	1 mi	n/a	1/4 mi	1.3 mi	450 ft
River	n/a	n/a	n/a	n/a	N/a	N/a	n/a	n/a	n/a	n/a
Floodplains	n/a	n/a	large/adj	minimal	mod-linear	mod-linear	very small	large	some large	small
Wetlands	n/a	n/a	n/a	n/a	mod-linear	mod-linear	n/a	small	large	n/a
Steep	n/a	Minimal	n/a	significant	N/a	N/a	minimal	n/a	n/a	n/a
Open space	n/a	n/a	n/a	n/a	N/a	9.5 acres	n/a	n/a	n/a	n/a
Goal 5	60%	0%	82%	62%	52%	46%	3%	34%	25%	25%
Rating	low	Low	low	low	Moderate	Moderate	low	moderate	moderate	low

Factor	Study Areas									
	81	82	83	84	85	86	87	88	89	90
Streams	1.5 mi	670 ft	9 mi	900 ft	¼ mi	.42 mi	3 mi	4 3/4 mi	1/7 mi	4 1/3 mi
River	n/a	n/a	n/a	n/a	N/a	n/a	n/a	n/a	n/a	n/a
Floodplains	large	Small	3 1/2 miles	10 acres-same location	N/a	n/a	1 mile	1/4 mile	n/a	n/a
Wetlands	1/2 acre	n/a	11- 90 acres	1/4 acre	2- 2 1/2 acres	1/4 acre	7- 15 acres	3- 1acre+	n/a	9- 4 1/4 ac
Steep	n/a	n/a	minimal	n/a	N/a	n/a	minimal	moderate	majority of area	moderate
Open space	n/a	n/a	32 acres	n/a	N/a	n/a	n/a	n/a	n/a	n/a
Goal 5	37%	24%	38%	39%	75%	44%	57%	34%	25%	56%
Rating	moderate	Low	high	low	Low	low	moderate	high	low	moderate

	91	92	93	94						
Streams	.25 miles	1/4 mile	2.5 mi	2 mi						
River	n/a	n/a	n/a	n/a						
Floodplains	n/a	n/a	n/a	n/a						
Wetlands	n/a	n/a	n/a	n/a						
Steep	pockets	almost half, remainder fairly steep	1/4 steep	all steep						
Open space	n/a	n/a	n/a	n/a						
Goal 5	56%	97%	70%	81%						
Rating	low	Moderate	high	high						

SECTION A-6 SUMMARY AGRICULTURAL ANALYSIS – ALL STUDY AREAS

Table A-7 Summary of Agricultural Compatibility Factors

Factor	Study Areas									
	1	2	3	4	5	6	7	8	9	10
Traffic	High	Low	High	moderate	low	low	high	low	low	low
Nuisances	High	Low	Moderate	moderate	low	moderate	moderate	low	low	moderate
Streams	High	Moderate	High	high	low	moderate	high	low	moderate	moderate
Speculation	High	Low	Moderate	moderate	low	moderate	moderate	low	low	moderate
Adjacent	High	Low	Moderate	moderate	low	low	moderate	low	low	moderate
Buffer	High	Low	Low	high	low	low	low	low	low	moderate
Rating	high	Low	Moderate	moderate	low	moderate	moderate	low	low	moderate
	11	12	13	14	15	16	17	18	19	20
Traffic	moderate	Low	Moderate	high	high	high	moderate	high	high	moderate
Nuisances	moderate	Moderate	Moderate	high	high	high	moderate	high	high	high
Streams	high	High	Moderate	high	high	high	moderate	high	high	moderate
Speculation	low	Moderate	Moderate	high	high	high	high	high	high	moderate
Adjacent	moderate	Moderate	Moderate	high	high	high	moderate	high	high	moderate
Buffer	low	Low	Moderate	low	low	low	low	low	high	moderate
Rating	moderate	Moderate	Moderate	high	high	high	moderate	high	high	moderate
	21	22	23	24	25	26	27	28	29	30
Traffic	moderate	Moderate	Low	moderate	moderate	moderate	moderate	low	moderate	low
Nuisances	high	High	Low	high	high	high	moderate	high	moderate	low
Streams	high	High	Moderate	high	high	high	high	moderate	moderate	low
Speculation	high	High	Moderate	high	high	moderate	moderate	moderate	moderate	low
Adjacent	high	High	Low	high	high	high	moderate	high	moderate	low
Buffer	low	Low	Moderate	low	low	low	low	moderate	low	low
Rating	high	High	Low	high	high	high	moderate	moderate	moderate	low
	31	32	33	34	35	36	37	38	39	40
Traffic	moderate	Moderate	High	high	moderate	moderate	high	high	high	high
Nuisances	low	High	High	high	high	moderate	high	moderate	moderate	moderate
Streams	high	High	High	high	high	high	high	high	moderate	high
Speculation	low	High	High	high	high	moderate	high	moderate	moderate	moderate
Adjacent	low	High	High	high	high	moderate	high	moderate	moderate	moderate
Buffer	low	Low	Low	low	high	low	low	low	low	low
Rating	low	High	High	high	high	moderate	high	moderate	moderate	moderate

Factor	Study Areas									
	41	42	43	44	45	46	47	48	49	50
Traffic	high	Moderate	Moderate	low	high	high	high	high	moderate	high
Nuisances	moderate	High	Moderate	low	moderate	high	high	high	moderate	moderate
Streams	high	High	Moderate	low	high	high	high	moderate	moderate	high
Speculation	moderate	High	Moderate	low	moderate	high	high	high	moderate	moderate
Adjacent	moderate	High	moderate	low	moderate	high	high	high	moderate	moderate
Buffer	high	High	moderate	low	low	low	low	low	low	low
Rating	moderate	High	moderate	low	moderate	high	high	high	moderate	moderate

Factor	Study Areas									
	51	52	53	54	55	56	57	58	59	60
Traffic	low	Moderate	low	high	moderate	high	high	moderate	low	moderate
Nuisances	low	Low	low	moderate	moderate	moderate	moderate	moderate	low	low
Streams	moderate	Moderate	low	moderate	moderate	low	high	high	moderate	moderate
Speculation	low	Low	moderate	moderate	moderate	moderate	high	moderate	moderate	low
Adjacent	low	Low	low	moderate	moderate	moderate	high	moderate	low	low
Buffer	low	Low	low	low	moderate	moderate	low	moderate	low	low
Rating	low	Low	low	moderate	moderate	moderate	high	moderate	low	low

Factor	Study Areas									
	61	62	63	64	65	66	67	68	69	70
Traffic	high	High	moderate	moderate	moderate	high	high	low	low	moderate
Nuisances	moderate	High	moderate	low	moderate	high	high	low	low	moderate
Streams	high	High	moderate	moderate	moderate	high	high	low	moderate	moderate
Speculation	high	High	moderate	low	moderate	high	high	low	low	moderate
Adjacent	moderate	High	moderate	low	moderate	high	high	low	low	moderate
Buffer	low	High	low	low	low	low	low	low	low	low
Rating	high	High	moderate	low	moderate	high	high	low	low	moderate

Factor	Study Areas									
	71	72	73	74	75	76	77	78	79	80
Traffic	high	High	high	moderate	high	high	high	high	low	high
Nuisances	high	High	high	moderate	moderate	moderate	moderate	low	low	moderate
Streams	high	High	high	moderate	moderate	moderate	moderate	moderate	moderate	moderate
Speculation	high	High	high	moderate	moderate	moderate	high	low	low	moderate
Adjacent	high	High	high	moderate	moderate	moderate	high	low	low	moderate
Buffer	high	Low	low	low	low	low	high	low	low	moderate
Rating	high	High	high	moderate	moderate	moderate	high	low	low	moderate

Factor	Study Areas									
	81	82	83	84	85	86	87	88	89	90
Traffic	high	Moderate	low	moderate	moderate	moderate	low	low	moderate	moderate
Nuisances	moderate	Moderate	low	moderate	moderate	moderate	low	moderate	high	moderate
Streams	moderate	Moderate	high	moderate	high	moderate	moderate	low	moderate	moderate
Speculation	moderate	Moderate	low	moderate	moderate	moderate	moderate	low	moderate	moderate
Adjacent	moderate	Moderate	low	moderate	moderate	moderate	low	low	high	moderate
Buffer	low	Moderate	low	low	low	low	low	low	moderate	low
Rating	moderate	Moderate	low	moderate	moderate	moderate	low	low	moderate	moderate

	91	92	93	94
Traffic	moderate	High	high	high
Nuisances	low	Moderate	high	high
Streams	moderate	High	high	high
Speculation	low	Moderate	high	high
Adjacent	moderate	Moderate	high	high
Buffer	low	Low	low	low
Rating	low	Moderate	high	high

Appendix B

****Note: Study Area identification numbers used in Phase 1 were changed to better integrate the Phase I and Phase II studies. ****

Phase I Water, Sanitary, Stormwater Services Feasibility Methodology

GENERAL APPROACH

Domestic water, sanitary sewer, and stormwater serviceability for each Study Area has been rated as "easy", "moderately difficult" or "difficult" based on a number of factors determined from readily available information.

Most of the information was taken from Metro GIS data. In addition calls were made to each of the water, sanitary, and stormwater service providers that were logically in a position to serve the Study Areas to determine their policies and capacities regarding service to each Study Area.

The primary approach to determining each service area rating was to apply weighted-numerical scoring matrices to each service area. The ratings were then assigned based on the relative numerical scores of all the Service Areas. The scores per se are intended only for study team use in determining the ratings.

WATER SERVICE MATRIX

Provider Policy (total=10 points)

- 10 = Clear policies to provide service
- 5 = Implied desire to provide service
- 0 = Explicit policy not to provide service

The potential providers were contacted and asked about their desire to serve the area (specific or implied).

Internal System Construction Ease (total = 20 points; multiply 1 to 10 by 2)

- 10 = No unusual design/construction constraints
- 3 if more than one drainage area is included in the SA
Based on RLIS data.
- 3 if NWI lands or hydric soils create system barriers
Based on RLIS data
- 3 if rocky soils or depth to rock could potentially increase cost
Partial/informal information from the providers
- 1 if > 50% of the SA has slopes >25%
Based on RLIS data.

Determined by calling service providers

Distance to Connection Point (total = 30 points; multiply 1 to 10 by 3)

- 10 = Adequate capacity line $\leq 1/4$ mile away
- 9 = Adequate capacity line $\leq 1/4$ mile away, but inadequate treatment
- 8 = Adequate capacity line $\leq 1/4$ mile away but pump station required
- 7 = Adequate capacity line $\leq 1/4$ mile away but pump station and treatment required
- 6 = Adequate capacity line $> 1/4$ mile away but < 2 miles
- 5 = (revision of 9)
- 4 = (revision of 8)
- 3 = (revision of 7)
- 2 = Adequate capacity line > 2 & < 5 miles away, treatment OK

1 = Adequate capacity line < 2 & < 5 miles away, treatment not OK
0 = Adequate capacity line > 5 miles away
Based on RLIS data.

Net Service Area Size (total = 40 points; multiply 1 to 10 by 4)

10 = >= 1000 acres
9 = 900 to 1000
8 = 800 to 900
7 = 700 to 800
6 = 600 to 700
5 = 500 to 600
4 = 400 to 500
3 = 300 to 500
2 = 200 to 300
1 = 100 to 200
0 = < 100

Based on RLIS data.

SANITARY SERVICE MATRIX

Provider Policy (total=10 points)

10 = Clear policies to provide service
5 = Implied desire to provide service
0 = Explicit policy not to provide service

The potential providers were contacted and asked about their desire to serve the area (specific or implied).

Internal System Construction Ease (total = 20 points; multiply 1 to 10 by 2)

10 = No unusual design/construction constraints
-2 if more than one drainage area is included in the SA
Information from RLIS data.
-2 if NWI lands or hydric soils create system barriers
Information from RLIS data.
-2 if rocky soils or depth to rock could potentially increase cost
Partial/informal information from the providers
-1, -2, -3 or -4 depending on slope
◆ -1 if < 1% slope over > 33% of SA
◆ -2 if >= 25% slope over > 33% of SA
◆ -1 if >= 10% slope over >= 33 % of SA
Information from RLIS data.

Distance to Connection Point (total = 30 points; multiply 1 to 10 by 3)

10 = Adequate capacity line <=1/4 mile away
9 = Adequate capacity line <=1/4 mile away, but inadequate treatment
8 = Adequate capacity line <=1/4 mile away but pump station required
7 = Adequate capacity line <=1/4 mile away but pump station and treatment required
6 = Adequate capacity line >1/4 mile away but <2 miles
5 = (revise 9)
4 = (revise 8)
3 = (revise 7)
2 = Adequate capacity line > 2 & < 5 miles away, treatment OK

- 1 = Adequate capacity line < 2 & < 5 miles away, treatment not OK
 - 0 = Adequate capacity line > 5 miles away
- Based on RLIS data and conversations with providers.

Net Service Area Size (total = 40 points; multiply 1 to 10 by 4)

- 10 = >= 1000 acres
- 9 = 900 to 1000
- 8 = 800 to 900
- 7 = 700 to 800
- 6 = 600 to 700
- 5 = 500 to 600
- 4 = 400 to 500
- 3 = 300 to 500
- 2 = 200 to 300
- 1 = 100 to 200
- 0 = < 100

Based on RLIS data.

STORMWATER SERVICE

Provider Policy (total=10 points)

- 10 = Clear policies to provide service
- 5 = Implied desire to provide service
- 0 = Explicit policy not to provide service

The potential providers were contacted and asked about their desire to serve the area (specific or implied).

Internal System Construction Ease (total = 20 points; multiply 1 to 10 by 2)

- 10 = No unusual design/construction constraints
- 2 if more than one drainage area is included in the SA
Information from RLIS data.
- 2 if NWI lands or hydric soils create system barriers
Information from RLIS data.
- 2 if rocky soils or depth to rock could potentially increase cost

The potential providers were contacted and asked about their desire to serve the area (specific or implied).

- 1, -2, -3 or -4 depending on slope
 - ◆ -1 if < 1% slope over > 33% of SA
 - ◆ -2 if >= 25% slope over > 33% of SA
 - ◆ -1 if >= 10% slope over >= 33 % of SA
- Information from RLIS data.

Distance to Safe Discharge Point (total = 30 points; multiply 1 to 10 by 3)

- 10 = Adequate* discharge point <=1/4 mile away
- 9 = Adequate discharge point <=1/4 mile away, but inadequate treatment
- 8 = Adequate discharge point <=1/4 mile away but pump station required

- 7 = Adequate discharge point <=1/4 mile away but pump station and treatment required
- 6 = Adequate discharge point >1/4 mile away but <2 miles
- 5 = (revise 9)
- 4 = (revise 8)

3 = (revise 7)

2 = Adequate discharge point > 2 & < 5 miles away, treatment OK

1 = Adequate discharge point < 2 & < 5 miles away, treatment not OK

0 = Adequate discharge point > 5 miles away

* = Subjective determination based on flooding problems/capacity, ESA impacts and other environmental factors.

Based on RLIS data and conversations with providers.

Net Service Area Size (total = 40 points; multiply 1 to 10 by 4)

10 = >= 1000 acres

9 = 900 to 1000

8 = 800 to 900

7 = 700 to 800

6 = 600 to 700

5 = 500 to 600

4 = 400 to 500

3 = 300 to 500

2 = 200 to 300

1 = 100 to 200

0 = < 100

Based on RLIS data.

Bonus

Add one point if it appears that good detention sites are available in the SA

Table B1 - Water Services Assessments					
Study Area Number	Provider Policy	Ease of Construction	Distance to Connection Point	Net Service Area Size	Total Score *
	(10 points)	(20 points)	(30 points)	(40 points)	(100 Points)
1(N)	5	18	18	0	41
1(S)	5	20	18	0	43
2	5	20	27	24	76
6	10	14	30	40	94
12	8	14	27	40	89
13	5	14	18	40	77
14	10	20	30	40	100
15	10	14	18	36	78
16	10	18	30	0	58
17,18	10	14	24	32	80
19	5	14	18	40	77
23	8	20	24	40	92
24	8	14	24	36	82
25	8	18	24	24	74
26	8	14	24	40	86
28	8	14	24	40	86
32	8	14	30	24	76
35	3	20	12	36	71
37	8	20	18	12	58
38	5	14	18	40	77
41	5	14	30	20	69
42	5	20	6	24	55
43	5	14	18	40	77
45	5	20	21	4	53
46(E)	6	20	30	0	56
46(W)	4	20	18	4	46
47	5	14	27	40	86
48	5	8	30	40	83
49	8	8	24	40	80
50	8	14	30	4	56
52	5	20	18	12	55
54	8	14	30	4	56
55	8	20	30	36	94
59	8	14	30	40	92
61	5	20	30	0	55
62	10	18	30	8	66
63	10	18	30	8	66
64	10	12	30	8	60
65	8	14	30	16	68
67	8	14	30	20	72
69	8	14	30	12	64
71(E)	8	20	30	0	58

Study Area Number	Provider Policy	Ease of Construction	Distance to Connection Point	Net Service Area Size	Total Score *
71(W)	8	14	30	0	52
75	10	20	30	0	60
76	10	20	30	4	64
77	10	14	30	4	58
78	5	20	30	4	59
79	8	20	30	4	62
80	8	20	30	0	58
81	8	20	18	0	46
82	8	14	30	4	56
84(N)	8	14	30	0	52
84(M)	8	14	30	0	52
84(S)	8	20	18	4	50
86	8	14	30	8	60
89	8	18	30	16	72
91	8	14	30	4	56
92	8	18	30	0	56
93(E)	8	20	30	0	58
93(W)	8	14	30	12	64
94	6	12	30	12	60
Ranking: Easy(E) > 70, Moderate(MD) 53-69, Difficult(D) < 52					

Table B2 – Sanitary Sewer Services Assessments					
Study Area Number	Provider Policy	Ease of Construction	Distance to Connection Point	Net Service Area Size	Total Score *
	(10 points)	(20 points)	(30 points)	(40 points)	(100 Points)
1(N)	5	18	18	0	41
1(S)	5	20	18	0	43
2	5	20	27	24	76
6	10	14	30	40	94
12	8	14	27	40	89
13	5	14	18	40	77
14	10	20	30	40	100
15	10	14	18	36	78
16	10	18	30	0	58
17,18	10	14	24	32	80
19	5	14	18	40	77
23	8	20	24	40	92
24	8	14	24	36	82
25	8	18	24	24	74
26	8	14	24	40	86
28	8	14	24	40	86
32	8	14	30	24	76
35	3	20	12	36	71
37	8	20	18	12	58
38	5	14	18	40	77
41	5	14	30	20	69
42	5	20	6	24	55
43	5	14	18	40	77
45	8	20	21	4	53
46(E)	6	20	30	0	56
46(W)	4	20	18	4	46
47	5	14	27	40	86
48	5	8	30	40	83
49	8	8	24	40	80
50	8	14	30	4	56
52	5	20	18	40	83
54	8	14	30	4	56
55	8	20	30	36	94
59	8	14	30	40	92
61	5	20	30	0	55
62	10	18	30	8	66
63	10	18	30	8	66
64	10	12	30	8	60
65	8	14	30	16	68
67	8	14	30	20	72

Study Area Number	Provider Policy	Ease of Construction	Distance to Connection Point	Net Service Area Size	Total Score *
69	8	14	30	12	64
71(E)	8	20	30	0	58
71(W)	8	14	30	0	52
75	10	20	30	0	60
76	10	20	30	4	64
77	10	14	30	4	58
78	5	20	30	4	59
79	8	20	30	4	62
80	8	20	30	0	58
81	8	20	18	0	46
82	8	14	30	4	56
84(N)	8	14	30	0	52
84(M)	8	14	30	0	52
84(S)	8	20	18	4	50
86	8	14	30	8	60
89	8	18	30	16	72
91	8	14	30	4	56
92	8	18	30	0	56
93(E)	8	20	30	0	58
93(W)	8	14	30	12	64
94	6	12	30	12	60
Ranking: Easy(E) > 70, Moderate(MD) 53-69, Difficult(D) < 52					

Table B3 - Stormwater Services Assessments					
Study Area Number	Provider Policy	Ease of Construction	Distance to Connection Point	Net Service Area Size	Total Score*
	(10 points)	(20 points)	(30 points)	(40 points)	(100 Points)
1(N)	5	16	30	0	51
1(S)	5	20	30	0	55
2	5	18	27	24	74
6	5	16	27	40	88
12	5	16	27	40	88
13	5	10	27	40	82
14	7	20	27	40	94
15	7	14	27	36	84
16	10	14	27	0	51
17/18	7	16	30	32	85
19	7	12	30	40	89
23	5	20	27	40	92
24	5	12	27	36	80
25	5	14	24	24	67
26	5	10	24	40	79
28	5	16	15	40	76
32	5	14	15	24	58
35	3	14	21	36	74
37	8	14	18	12	52
38	5	12	21	40	78
41	5	14	30	20	69
42	5	20	30	24	79
43	5	14	27	40	86
45	8	20	27	4	59
46(E)	6	20	27	0	53
46(W)	4	20	27	4	55
47	5	16	27	40	88
48	5	10	27	40	82
49	8	10	27	40	85
50	8	16	27	4	55
52	5	20	27	12	64
54	8	10	27	4	49
55	8	14	27	36	85
59	8	14	27	40	89
61	5	20	30	0	55
62	5	18	30	8	61
63	5	16	27	8	56
64	5	14	27	8	54
65	5	14	27	16	62
67	5	16	27	20	68
69	5	14	27	12	58
71(E)	5	18	27	0	50

Study Area Number	Provider Policy	Ease of Construction	Distance to Connection Point	Net Service Area Size	Total Score*
71(W)	5	14	27	0	46
75	10	20	27	0	57
76	10	20	27	4	61
77	10	16	27	4	57
78	5	18	27	4	54
79	5	18	27	4	54
80	5	20	27	0	52
81	5	20	27	0	52
82	5	16	27	4	52
84(N)	8	16	27	0	51
84(M)	5	16	27	0	48
84(S)	5	20	27	4	56
86	5	16	27	8	56
89	5	14	27	16	62
91	5	16	27	4	52
92	5	14	27	0	46
93(E)	5	14	27	0	46
93(W)	5	12	27	12	56
94	5	10	27	12	54
Ranking: Easy (E) > 70, Moderate (MD) 53-69, Difficult (D) < 52					

Phase I Transportation Services Feasibility: Methodology and Findings

The evaluation of transportation service feasibility for this study has considered three measures: relative intensity of trip activity, connectivity and serviceability. The composite scores give guidance to how readily and cost effectively each group can be served by urban transportation. Primary modes of travel including auto, bike, pedestrian and transit were considered. Where appropriate, the analysis groups the individual areas conditions into the 28 numerical groups based on proximity and similarity of transportation (i.e., study area 6A and study area 6B were combined into a single Group 6).

1) *Travel Activity*: The two-hour peak period vehicle trip generation was determined based on the housing supply estimate provided for each alternative area. The Metro travel demand model regional average trip generation for housing was used to calculate future travel activity (0.62 trips per household in a single peak hour). In addition, the equivalent number of arterial lanes was estimated based on the peak direction of travel (two-third inbound), and the nominal capacity for an arterial facility (750 vehicles per lane per hour).

The off-site trip generation was ranked on a scale of 1 (low) to 3 (high) based on the total trip generation for all candidate sites. In addition, the equivalent number of inbound arterial lanes was indicated.

2) *Connectivity*: The location of the study area was reviewed as to its proximity to higher-level transportation facilities identified in the Metro transportation system plans. A qualitative evaluation was made as to the potential for extending the existing system to service the study area (or group of study areas).

A rating on a scale of 1 (excellent) to 3 (poor) was assigned to each study area. A poor score indicates that transit, pedestrian, and bicycle regional corridors and facilities are remote from the site. An excellent score indicates that the RTP already provides these services immediately adjacent to these areas or it includes the extension of services as growth occurs.

3) *Potential Auto System Serviceability*: The potential off-site impacts on the regional transportation system were assessed at a preliminary level by considering the above two factors and reviewing current travel demand forecast for 2020 without the study areas. The latest EMME/2 data includes Round 4 projects identified within the Draft Regional Transportation Plan. These plots were used to identify in a general sense the available system capacity near the study areas. The volume-to-capacity plot was used in assessing regional auto travel.

A rating on a scale of 1 (low) to 3 (high) will be assigned to each area to indicate the magnitude of additional system improvements. In some cases there are significant constraints to providing the required services and these cases were identified in the next chapter. The table on the following page shows individual study area assessments for transportation serviceability.

Findings

The table on the previous page summarizes the transportation rating for each of the study areas. A low composite score indicates that the area would be relatively easy to service, and a high composite score shows that substantial constraints exist and investments would be required.

In general, Washington County is far more capable of serving additional housing development than Clackamas and Multnomah County. However, the allocation of housing size and quantity provided by the productivity analysis was contrary to this observation. Many of the sites located in Damascus, Clackamas, Oregon City, West Linn, and the Stafford Basin face very difficult problems in extending system service and in expanding facilities to meet peak period demands. From a transportation perspective, the more favorable sites were found in Sherwood, Forest Grove, and areas north of Highway 26 in Hillsboro.

APPENDIX C

Phase II Water, Sewer and Stormwater Services Feasibility

Introduction

This part of the productivity analysis evaluates the feasibility of providing three types of public facilities: water, sanitary sewer and stormwater services to each study area. It has been conducted in two parts.

The first part, which aims to characterize general serviceability issues for each study area, is based on telephone interviews conducted with close to 30 different representatives from cities, counties and local/regional service districts. These interviews have pulled together a considerable amount of local and anecdotal information about each area.

The second part of this study, which aims to provide more concise ratings for each area as “easy,” “moderate,” or “difficult” to serve, has relied on additional technical information. Some comes from the interviews, and some from other sources, such as GIS data, topographic maps and local facilities plans.

Both of these studies are important, but neither can paint a complete picture. While interviews are critical for gathering local information and policies regarding service provision, a shortcoming is that each respondent may have their own definition of “easy,” “moderate” or “difficult”, which is not relative to the level-of-difficulty of serving other areas. The ratings generated in the second part of this study help to standardize these assessments, though they also cannot capture all local considerations. As these two studies have different aims, there are small differences between the general assessments gained through interviews and the ratings generated from more technical data. These differences are not dramatic, since “Willingness to Serve” was weighted more heavily than other criteria (see discussion below).

Finally, it must be noted that the level of analysis conducted for this study aims only to provide a general comparison of serviceability. More detailed site-specific evaluations, which would involve field checking, are beyond the scope provided for this effort. The methodology used for scoring study areas was proposed by Parametrix and reviewed and approved by Metro. It has been necessary to rely primarily on available data, and on information that could be gathered directly from possible service providers. A log of all service provider contacts for the Phase II Analysis is provided for reference in Appendix F.

Service Provider Interviews

During the months of March through June 2002, Parametrix contacted and interviewed nearly 30 persons from cities, counties and local/regional service districts to gather knowledge about serviceability issues for each of the study areas.

To define the likely providers, each study area was first examined with respect to boundaries of service providers, city limits or county lines. An examination of natural features such as topography, roads and streams, also helped to identify likely service providers by pointing out possible utility easements and drainage flow directions.

Letters were first sent to each identified provider.¹⁹ These letters explained the purpose of the study, and outlined specific information requested. The letters also included 8.5" x 11" black and white maps, generated from Metro's GIS data, of the study area(s) they might serve. Following the mailing, service providers were contacted by telephone. Questions focused on the following:

- Future service area expansion plans,
- Current water production capacity and wastewater treatment capacity,
- Build-out water production capacity and wastewater treatment capacity,
- Willingness to provide projected water demand or accept projected wastewater load from the expansion areas, and
- Stormwater policies or regulations that might limit expansion²⁰
- Study area characteristics such as topography and rocky soils that could impact service.

Initial telephone discussions often pointed to secondary contacts for a particular service area. For some areas, more than one possible provider was identified and interviewed.

Qualitative information collected from these discussions has been summarized, and appears in the study area descriptions in **Section 3** of this report.

Study Area Ratings

The second part of this study has focused on developing a more concise rating of each study area as "easy", "moderate", or "difficult" to serve.

This part of the study relied on other sources of information, such as GIS data, topographic maps, and local facilities plans, and was supplemented by the information collected from telephone interviews. The following steps outline the method for developing and assigning ratings for each study area.

Evaluation Criteria

The following evaluation criteria were first established for rating the study areas as "easy", "moderately difficult", or "difficult" to serve.

1. Study Area Size. The size of the study area is directly related to the population it can support and the amount of potable water needed, wastewater to be treated, and stormwater to be managed.
2. Distance. The distance from the nearest service connection to new node in linear feet along likely pathway (roadway). The node would be the branch point to distribute water or collect wastewater. In some cases, the exact distance cannot be determined, and is

¹⁹ A copy of the letter sent to service providers, as well as the log of service provider contacts, is provided in Appendix F.

²⁰ One additional modification from the Phase I study, the stormwater assessments in the Phase II study most often rated as "easy" to serve. This is based on the fact that most service provider policies place responsibility for stormwater treatment and detention on the developer. So from the standpoint of the governing body, stormwater treatment is not difficult. Issues such as topography and environmental impacts were still part of the scoring system, which gave some areas a "moderate" rating for stormwater.

estimated from the center of the study area to the nearest border of the service provider area or city limits.

3. **Topography.** Relative elevation difference between new area and service connection. For potable water, this will identify feasibility of providing water service from existing mains or reservoirs or if new reservoirs are needed. For sanitary sewer service, this will also identify if gravity service connections are possible or if pumping stations are needed.
4. **Obstacles.** These include physical obstacles, like geology and natural resources, as well as human obstacles.
 - “Geology” includes location of shallow rock, which might inhibit pipeline or new facility construction.
 - “Natural resources or wetlands” or environmentally sensitive areas, which might inhibit pipeline or facility construction.
 - “Human obstacles” include interstate highways or jurisdictional restrictions.
5. **Willingness to Serve.** Ability or willingness of existing service providers to expand their facilities to produce the needed water or treat wastewater produced.
 - “Ability” reflects the size of nearby pipelines to accept added flows, available excess capacity of treatment facilities to produce water or treat wastewater, or the ease with which these facilities could expand.
 - “Willingness” reflects both the service policies of the provider and their willingness to provide service. By providing service to these areas, providers may be giving up capacity to serve their own areas in favor of surrounding areas.

Importance Factors

Each criterion is first assigned an importance factor (or weight), between 1 and 5. This is used for weighting the criteria independent of the study areas. A higher weight indicates that the criterion is of greater importance.

The criterion “Willingness to Serve”, for example, has the highest weight of 5. This is because a provider’s policy towards serving an area (or not serving an area) influences its likelihood of urbanizing, and may override factors such as topographic constraints and distance to service.

There are some areas with topographic constraints, for example, that have less difficult ratings because providers indicated a clear willingness to serve it. There are also some areas rated as more difficult to serve, in spite of the fact that they lack major infrastructure or environmental issues.

The criteria of “Distance to Service” and “Obstacles” were given importance factors of 3. The remaining criteria of “Size” and “Topography” were both given importance factors of 2.

Raw Scores

Next, the study areas receive a raw score for each criterion on a scale of 0 through 10, depending upon the difficulty of providing service. For each criterion, values closer to 0 equate with a greater level of difficulty in providing service.

The scorings used in this analysis are very similar to those used in the Phase I analysis. A few refinements have been added for the scores on Phase II study areas; they are noted, where present, for each criterion.

1. Net Service Area Size

Net vacant buildable acres were used for this score. Smaller areas are more difficult to serve, due to economies of scale. Scores based on size were assigned as follows:

10	Greater than or equal to 1000 acres
9	900 to 1000 acres
8	800 to 900 acres
7	700 to 800 acres
6	600 to 700 acres
5	500 to 600 acres
4	400 to 500 acres
3	300 to 400 acres
2	200 to 300 acres
1	100 to 200 acres
0	Less than or equal to 100 acres

2. Distance to Service, or Connection Point

In some cases, where the exact distance to a service area cannot be estimated (due to the large size of the area) the distance is estimated from the center of the study area to the border of the service provider area or respective city limits. Scores for this criterion have been assigned as follows:

10	Adequate capacity line \leq ¼ mile away
9	Adequate capacity line \leq ¼ mile away, but inadequate treatment
8	Adequate capacity line \leq ¼ mile away, but pump station required
7	Adequate capacity line \leq ¼ mile away, but pump station and treatment required
6	Adequate capacity line $>$ ¼ mile away, but $<$ 2 miles away
5	Inadequate capacity line \leq ¼ mile away, inadequate treatment
4	Inadequate capacity line \leq ¼ mile away, pump station required
3	Inadequate capacity line \leq ¼ mile away, pump station and treatment required
2	Adequate capacity line between 2 - 5 miles away, treatment okay
1	Adequate capacity line between 2 - 5 miles away, treatment not okay
0	Adequate capacity line $>$ 5 miles away

3. Topography

Topography has been defined as the percent of land in each study area encumbered by steep slopes (slopes above 25 percent). Not many study areas have more than 25 percent of their land encumbered by steep slopes:

- 10 Less than 10 percent of the area contains steep slopes (above 25 percent)
- 5 Between 10 and 25 percent of the area contains steep slopes
- 0 More than 25 percent of the area contains steep slopes

This is an additional criterion that was not used in the Phase I analysis.

4. Obstacles (Internal System Construction Ease)

This criterion includes geology, natural resources, and other human obstacles.

- 10 No unusual design or construction constraints.

The points below are then removed from 10 if any of the following conditions exist. More than one condition may count against the total.

- 3 if more than one drainage area is included in the study area
- 3 if wetlands or hydric soils create system barriers
- 3 if rocky soils or depth to rock could potentially increase cost
- 1 if more than 50 percent of the study area has slopes above 25 percent

For this Phase II study, the same scoring system above was used for water, wastewater and stormwater serviceability. In the Phase I study, the scores for wastewater and stormwater subtracted 2 points, instead of 3, in instances above, and subtracted an additional 1 to 4 points depending upon the amount of steep slopes. The Phase II analysis has made topography a separate criterion.

5. Willingness to Serve (Provider Policy)

- 10 Clear policy to provider service
- 7 Implied desire to provide service
- 5 Policy to provide service, but possible political obstacles
- 3 Implied desire not to provide service, possible political obstacles
- 0 Explicit policy not to provide service

For this criterion, the range of possible scores has been expanded to five, instead of the three that were used for the Phase I analysis (0, 5, 10).

Final Scores

After raw scores have been generated for each criterion, they are multiplied by the importance factor to determine a weighted assessment, as shown below, in Table 3-1.

Table C-1: Final Scores For Serviceability (Example)

Criteria	Importance Factor	Raw Score 1-10	Weighted Assessment
Study Area Size	2	6	12
Distance	3	6	12
Topography	2	9	18
Obstacles	3	1	3
Willingness to Serve	5	8	40
Total			85

The total scores are then summarized for each type of service for each study area, and comparatively given the following ratings:

- Easy
- Moderate
- Difficult

Total scores may range from 0 to 150. For this study, final scores between 0 and 70 are considered "difficult"; 71 and 120 are "moderately difficult"; and 120 to 150 are considered "easy" to serve.

The table below shows an example of ratings for each service. Raw scores, final scores and ratings for water, wastewater and stormwater appear in the tables on the following pages. A fourth table summarizes final scores and ratings for all three services. Specific ratings for each study area have been also been cited with more detailed descriptions of serviceability issues, appearing in **Section 3** of this report.

Table C-2: Study Area Service Summary (Example)

Study Area	Water		Wastewater		Stormwater	
	Score	Rating	Score	Rating	Score	Rating
X	62	D	62	D	130	E
Y	120	E	75	MD	121	E
Z	73	MD	100	MD	143	E

Table C-3: Serviceability Assessments for Water – Phase II Study Areas

Study Area Number	Net Vacant Buildable Acres	Study Area Size	Distance to Service	Importance Factors			Total Score	Rating
				2	3	5		
03	186	2	12	20	21	25	80	Moderate
04	153	2	9	20	21	25	77	Moderate
05	825	16	9	20	30	25	100	Moderate

Study Area Number	Net Vacant Buildable Acres	Study Area Size	Distance to Service	Topography	Obstacles	Willingness to Serve	Total Score	Rating
08	351	6	9	20	21	50	106	Moderate
09	738	14	9	20	30	50	123	easy
10	2473	20	12	10	21	50	113	Moderate
11	438	8	12	20	30	50	120	Moderate
19-2	4	0	9	0	18	50	77	Moderate
20	117	2	9	10	12	50	83	Moderate
21	638	12	21	20	12	50	115	Moderate
22	918	18	12	10	12	50	102	Moderate
23	315	6	30	10	30	50	126	easy
24	385	6	30	10	21	50	117	Moderate
26	706	14	30	10	21	50	125	easy
27	1180	20	9	10	21	35	95	Moderate
28	541	10	27	20	21	35	113	Moderate
29	704	14	15	10	30	35	104	Moderate
30	941	18	21	20	30	35	124	easy
31	713	14	9	10	21	25	79	Moderate
33	257	4	9	0	12	25	50	difficult
34	76	0	9	10	12	15	46	difficult
36	272	4	9	10	3	25	51	difficult
39	224	4	9	20	21	15	69	difficult
40	180	2	9	20	21	15	67	difficult
44	367	6	9	20	21	15	71	Moderate
51	918	18	9	20	12	0	59	difficult
53	609	12	9	10	12	0	43	difficult
56	36	0	9	10	21	35	75	Moderate
57a	3	0	15	20	30	15	80	Moderate
57b	9	0	15	10	30	15	70	difficult
57c	6	0	15	20	30	15	80	Moderate
58	227	4	12	10	12	15	53	difficult
60	84	0	18	0	27	50	95	Moderate
61-2	3	0	15	20	30	15	80	Moderate
62	77	0	15	20	30	35	100	Moderate

Study Area Number	Net Vacant Buildable Acres	Study Area Size	Distance to Service	Topography	Obstacles	Willingness to Serve	Total Score	Rating
66	42	0	30	20	30	50	130	easy
68	609	12	30	20	30	50	142	easy
69-2	56	0	30	20	30	50	130	easy
70	237	4	30	20	30	50	134	easy
72	33	0	18	20	30	50	118	Moderate
73	2	0	15	20	30	50	115	Moderate
74	180	2	9	0	9	35	55	difficult
76-2	0	0	30	20	21	50	121	easy
78-2	0	0	18	20	21	50	109	Moderate
79-2	81	0	18	20	21	50	109	Moderate
81	100	2	30	20	30	50	132	easy
83-2	831	16	18	20	12	50	116	Moderate
85	162	2	15	20	30	50	117	Moderate
86	64	0	30	20	30	50	130	easy
87	157	2	18	20	21	50	111	Moderate
88	579	10	9	10	21	35	85	Moderate
90	423	8	9	0	15	35	67	difficult
94-2	30	0	9	0	15	35	59	difficult

0 - 70 = "difficult"; 71 - 120 = "moderate"; 121-150 = "easy"

Table C-4: Serviceability Assessments for Sanitary Sewer – Phase II Study Areas

Study Area Number	Net Vacant Buildable Acres	Study Area Size	Distance to Service	Importance Factors			Total Score	Rating
				2	3	5		
03	186	2	0	20	30	50	102	moderate
04	153	2	3	20	21	0	46	difficult
05	825	16	3	20	18	0	57	difficult
08	351	6	0	20	24	0	50	difficult
09	738	14	0	20	24	0	58	difficult
10	2473	20	0	10	18	50	98	moderate
11	438	8	0	20	30	50	108	moderate
19-2	4	0	18	0	18	50	86	moderate
20	117	2	0	10	24	50	86	moderate
21	638	12	0	20	18	50	100	moderate
22	918	18	0	10	18	50	96	moderate
23	315	6	9	10	18	50	93	moderate
24	385	6	9	10	21	50	96	moderate
26	706	14	0	10	15	25	64	difficult
27	1180	20	0	10	12	25	67	difficult
28	541	10	6	20	12	25	73	moderate
29	704	14	0	10	12	25	61	difficult
30	941	18	0	20	24	25	87	moderate
31	713	14	0	10	12	25	61	difficult
33	257	4	0	0	3	50	57	difficult
34	76	0	0	10	12	35	57	difficult
36	272	4	0	10	9	35	58	difficult
39	224	4	3	20	30	25	82	moderate
40	180	2	3	20	30	25	80	moderate
44	367	6	0	20	24	35	85	moderate
51	918	18	3	20	30	0	71	moderate
53	609	12	3	10	24	0	49	difficult
56	36	0	0	10	30	50	90	moderate
57a	3	0	0	20	30	50	100	moderate

Study Area Number	Net Vacant Buildable Acres	Study Area Size	Distance to Service	Topography	Obstacles	Willingness to Serve	Total Score	Rating
57b	9	0	0	10	30	35	75	moderate
57c	6	0	0	20	30	35	85	moderate
58	227	4	0	10	30	50	94	moderate
60	84	0	0	0	30	50	80	moderate
61-2	3	0	0	20	24	50	94	moderate
62	77	0	0	20	24	50	94	moderate
66	42	0	0	20	30	50	100	moderate
68	609	12	0	20	30	50	112	moderate
69-2	56	0	0	20	24	50	94	moderate
70	237	4	0	20	24	50	98	moderate
72	33	0	18	20	30	50	118	moderate
73	2	0	21	20	24	50	115	moderate
74	180	2	0	0	18	50	70	difficult
76-2	0	0	0	20	24	50	94	moderate
78-2	0	0	18	20	24	50	112	moderate
79-2	81	0	18	20	24	50	112	moderate
81	100	2	18	20	30	50	120	moderate
83-2	831	16	3	20	24	50	113	moderate
85	162	2	0	20	30	50	102	moderate
86	64	0	18	20	30	50	118	moderate
87	157	2	9	20	18	50	99	moderate
88	579	10	0	10	12	50	82	moderate
90	423	8	0	0	12	50	70	difficult
94-2	30	0	0	0	12	35	47	Difficult

0 - 70 = "difficult"; 71 - 120 = "moderate"; 121-150 = "easy"

Table C-5: Serviceability Assessments for Stormwater – Phase II Study Areas

Study Area Number	Net Vacant Buildable Acres	Study Area Size	Distance to Service	Importance Factors			Willingness to Serve	Total Score	Rating
				2	3	5			
03	186	2	30	20	30	50	132	Easy	
04	153	2	30	20	30	50	132	Easy	
05	825	16	30	20	30	50	146	Easy	
08	351	6	30	20	30	50	136	Easy	
09	738	14	30	20	30	50	144	Easy	
10	2473	20	30	10	30	50	140	Easy	
11	438	8	30	20	30	50	138	Easy	
19-2	4	0	30	0	30	50	110	Moderate	
20	117	2	30	10	30	50	122	Easy	
21	638	12	30	20	30	50	142	Easy	
22	918	18	30	10	30	50	138	Easy	
23	315	6	30	10	30	50	126	Easy	
24	385	6	30	10	30	50	126	Easy	
26	706	14	30	10	30	50	134	Easy	
27	1180	20	30	10	30	50	140	Easy	
28	541	10	30	20	30	50	140	Easy	
29	704	14	30	10	30	50	134	Easy	
30	941	18	30	20	30	50	148	Easy	
31	713	14	30	10	30	50	134	Easy	
33	257	4	30	0	30	50	114	Moderate	
34	76	0	30	10	30	50	120	Moderate	
36	272	4	30	10	30	50	124	Easy	
39	224	4	30	20	30	50	134	Easy	
40	180	2	30	20	30	50	132	Easy	
44	367	6	30	20	30	50	136	Easy	
51	918	18	30	20	30	50	148	Easy	
53	609	12	30	10	30	50	132	Easy	
56	36	0	30	10	30	50	120	Moderate	
57a	3	0	30	20	30	50	130	Easy	

Study Area Number	Net Vacant Buildable Acres	Study Area Size	Distance to Service	Topography	Obstacles	Willingness to Serve	Total Score	Rating
57b	9	0	30	10	30	50	120	Moderate
57c	6	0	30	20	30	50	130	Easy
58	227	4	30	10	30	50	124	Easy
60	84	0	30	0	30	50	110	Moderate
61-2	3	0	30	20	30	50	130	Easy
62	77	0	30	20	30	50	130	Easy
66	42	0	30	20	30	50	130	Easy
68	609	12	30	20	30	50	142	Easy
69-2	56	0	30	20	30	50	130	Easy
70	237	4	30	20	30	50	134	Easy
72	33	0	30	20	30	50	130	Easy
73	2	0	30	20	30	50	130	Easy
74	180	2	30	0	30	50	112	Moderate
76-2	0	0	30	20	30	50	130	Easy
78-2	0	0	30	20	30	50	130	Easy
79-2	81	0	30	20	30	50	130	Easy
81	100	2	30	20	30	50	132	Easy
83-2	831	16	30	20	30	50	146	Easy
85	162	2	30	20	30	50	132	Easy
86	64	0	30	20	30	50	130	Easy
87	157	2	30	20	30	50	132	Easy
88	579	10	30	10	30	50	130	Easy
90	423	8	30	0	30	50	118	Moderate
94-2	30	0	30	0	30	50	110	Moderate

0 - 70 = "difficult"; 71 - 120 = "moderate"; 121-150 = "easy"

Phase II Transportation Services Feasibility

The transportation methodology used in this analysis is similar to that used in the Phase I study. For Phase II, the evaluation of transportation service focused on four criteria:

- Potential trip generation,
- Impact to the existing transportation system,
- Availability of transportation facilities, and
- Environmental factors such as steep slopes and sensitive lands.

Criteria were first assigned a relative rating of 1 to 3. Each criterion was then assigned a qualitative weight, also ranging from 1 to 3. Impact to the existing system was assigned the greatest weight (3), followed by environmental factors and availability of transportation facilities (2), while potential trip generation was assigned the lowest weight of 1. The resulting composite scores (determined by multiplying rating times weight) ranged from 9 (best) to 22 (worst) out of the possible range of 8 to 24.

These composite scores are intended to indicate the relative ability to serve potential future transportation demand resulting from buildout of each of the study areas. As this is a general analysis, each study area has been evaluated independently. Factors such as development sequencing, costs of improving and/or extending existing transportation infrastructure, availability of mitigation areas to offset environmental factors such as wetlands and habitat areas, or the feasibility of combining multiple study areas to reduce development costs have not been incorporated into this analysis.

This analysis focuses on regional transportation facilities, rather than local and collector streets or individual intersections. As part of an actual development proposal for any of the study areas included in this analysis, a more detailed analysis of potential transportation impacts, mitigation measures, mitigation timing and mitigation funding would be expected.

The following sections outline the process used to develop transportation ratings for each criterion used to evaluate the study areas. In each component of the transportation assessment, a score of '1' corresponds to easiest to serve, a score of '2' means moderate, and a '3' indicates the study area would be difficult to serve in comparison to the others. The table at the end of this section summarizes the overall ratings from the transportation analysis.

Potential Off-Site Trip Generation

Future two-hour peak period travel demand was calculated using the buildout estimates for Inner Neighborhoods, Outer Neighborhoods and Corridors that were generated for the productivity study. Trip generation rates were then developed and applied based on the Metro regional travel demand forecasting model and standard transportation references. For residential uses, a two-hour peak trip generation rate of 1.201 trips/household was used. The small portion of industrial acreage was assigned a peak period rate of 5.7 trips/acre, a midpoint between the rates for heavy and light industrial use.

All three other land use location designations (Inner Neighborhood, Outer Neighborhood, and Corridor) were assigned the same trip generation rates; potential differences among the three location types were identified through other variables such as availability of existing facilities. In general, the location designations did not noticeably affect the transportation analysis, as areas

designated as Corridors typically represent less than 10 percent of the net buildable acreage in each study area.

Potential Impact to the Committed Transportation System

This criterion provides an initial look at how developing the study area could affect the regional transportation system, by considering potential trip generation in light of projected future traffic conditions on the committed regional network.

Arterial lane capacity needed to serve each study area's travel demand was estimated based on trip generation. Arterial lane capacity is meant to provide a proxy measure of off-site impacts and the capacity that would be necessary to serve that impact. Arterial capacity demand was calculated assuming a planning level capacity of 900 vehicles per hour per lane (1,800 vehicles per lane over the two-hour peak period)²¹. Residential development was assumed to generate 2/3 of peak period travel in the peak direction, while industrial traffic was assigned a 50/50 directional split. A 50/50 split for industrial traffic is a conservative assumption in that it reflects multiple shifts in the four study areas that include industrial acreage. With only one daytime shift there would be less industrial traffic added in the peak direction of residential traffic; however, the effect of the 50/50 split is small because there was only 184 total acres analyzed as potential industrial use. A rating of '1' was assigned to study areas generating an arterial capacity demand of 0.5 lanes or less, while a rating of '2' corresponds to demand of 0.6 lanes to 2.0 lanes. A rating of '3' was assigned to study areas with potential trip generation equivalent to more than 2.0 arterial lanes.

Potential off-site impacts on the transportation system were assessed using the above information together with Metro's latest horizon year travel demand volume-to-capacity plots that incorporate Regional Transportation Plan network improvements. Each study area was ranked from '1' (projected capacity available on adjacent regional network facilities, or low level of additional capacity need generated by the study area) to '3' (no projected capacity available, and high level of additional capacity needed to serve the study area). A study area was assigned a rating of '2' if it was judged to generate a high traffic volume but had available capacity, or vice-versa.

For this part of the assessment, "adjacent facility" applies to the city or county arterial, state highway or freeway that most directly connects the study area to the regional transportation system. Capacity availability was determined based on the volume-to-capacity (v/c) plots from the regional model. The volume-to-capacity ratio indicates the degree to which the traffic volume on a given roadway consumes the roadway's capacity, or its ability to accommodate traffic. A v/c ratio of 0.00 means there is no traffic on the roadway, while a v/c ratio of 1.00 means the traffic volume is equivalent to the facility's theoretical maximum capacity. If the adjacent facility serving a study area had a plotted v/c ratio greater than 1.00, it was assigned a '3' or most difficult; a v/c of 0.80 to 1.00 was assigned a '2' rating, and a v/c ratio less than 0.80 was assigned a '1' rating.

²¹ The Phase II analysis assumes a higher hourly capacity for arterial roadways, 900 vehicles per hour per lane (vpl) as compared to 750 vpl in the Phase I analysis. This increase is based on the assumption that new roadways will be built to standards and serve all modes of travel, whereas many of the existing roadways in the outlying metropolitan area lack sidewalks and bicycle lanes or shoulders.

Availability of Transportation Facilities ²²

Each study area's proximity to higher-level transportation facilities included in Metro's regional transportation plans was reviewed. The analysis assumes improvements for each transportation mode as shown in the current Regional Transportation Plan. Each type of travel (vehicle, bicycle, pedestrian, transit) was assigned a qualitative ranking ranging from '1' (facilities available and readily accessible) to '3' (few or no facilities in the area, or facilities would be difficult to reach). Non-auto travel was more likely to receive a '3' rating because, while roadways serve many of the study areas, most are not served by sidewalks, bike lanes or transit service.

Rankings for each type of travel were combined using a subjective weighting factor for each mode. Based on the outlying location of most of the study areas, the greatest weight was assigned to the auto ranking, (0.5), followed by transit (0.25), bicycle (0.15) and pedestrian travel (0.1). It should be noted that the evaluation of available facilities does not account for the potential of mixed-use communities to develop over the long term in some of the study areas, particularly in areas with acreage designated as corridors. Mixed use development could potentially reduce the demand for facilities serving the study area, as more of the study area's travel demand could be served internally, without needing to use external transportation facilities.

Environmental Factors

Environmental factors potentially affecting future transportation facilities were given a qualitative rating ranging from '1' to '3' corresponding to the degree of difficulty the environmental factor could create. A rating of '3' was assigned to study areas that were estimated to have ¼ or more of the area comprised of wetlands, steep slopes or other environmentally sensitive Title 3 areas. A moderate rating of '2' was assigned to study areas appearing to have a smaller portion that could be affected by environmental factors, and a '1' was assigned to areas that did not appear to have any noticeable environmental constraints. The rating of environmental factors was determined using a preliminary review of topographic, environmental and wetlands maps and does not represent any level of environmental assessment.

Criteria Weight (Relative Importance)

Two options for scoring each study area were explored. The first option took a neutral approach, with all criteria assigned an equal importance. The second option assigned weighting factors to each of the criteria ranging from 1 to 3, based on the degree of control an individual study area would have on the factor and the degree of impact the factor would have on the broader region. This second approach was ultimately selected, and the resulting score [rating x weight] is summarized in the matrix at the end of this section ²³. Weighting factors were selected based on the rationale that a potential developer would control the density, land use mix, internal employment, and resulting external trip generation. Therefore trip generation was assigned the least significant weight.

²² In the Phase I Analysis, this criterion was called "connectivity". This new criterion is similar to the former one, though it generally addresses the number of connections, rather than whether connections are there at all.

²³ The approach of using weights is a slight modification from the Phase I analysis, which made no distinction as to the relative importance of individual criteria.

Availability of transportation facilities to serve the site and environmental factors were assigned the mid-range weight of '2.' These concerns could be addressed through techniques like clustering development, incorporating context-sensitive design, or building transportation facilities to connect to the study area. Exploring these avenues would depend on the economic feasibility analysis and other factors that are largely under the ability of a potential development to control. Impacts on the existing (i.e. committed) transportation system were assigned the greatest weight, as they would involve larger scale improvements and would tend to be the most difficult for an individual study area to address. For example, building or upgrading an interchange would be likely to require regional funding, as opposed to being a condition of development approval issued by a local jurisdiction. As a result it would be a greater difficulty to overcome. The final relative scores are assigned qualitative overall ratings of "easy", "moderate" or "difficult" to serve.

SUMMARY

Each of the study areas was evaluated for potential transportation service and assigned a rating, as shown in the summary table below. Lower scores indicate the area would face fewer constraints to transportation service, and be relatively less expensive to serve. Higher scores indicate increasing constraints, greater impacts to the existing system, and higher costs of providing transportation services to serve the study area.

As with the Phase I analysis, Washington County contains the majority of higher value sites that are capable of serving additional residential development. More than half the sites in Washington County, the majority of which are located in western Washington County, received the highest overall rating.

By contrast, overall transportation assessment ratings of the sites in Clackamas County were about evenly split between good, fair and poor. Many Clackamas County sites are in areas that will be very difficult and expensive to provide the additional capacity needed to serve new development.

Only five study areas are in Multnomah County. The two sites in eastern Multnomah County southeast of Gresham generally rated more favorable than the three in western Multnomah County, which are located north of the Sunset Highway in areas with few existing roadways.

APPENDIX D

A memorandum from ECONorthwest, addressing redevelopment assumptions used in the build out study, described in Section 2.

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5 June 2002

TO: Jennifer Bradford, Parametrix
FROM: Bob Parker and Terry Moore
SUBJECT: REDEVELOPMENT ASSUMPTIONS FOR URA PRODUCTIVITY ANALYSIS

SUMMARY

This memorandum describes potential approaches for addressing three issues related to the productivity of lands identified as developed in Phase II Urban Reserve Areas:

- Estimating the developed portion of parcels that fall outside the Metro vacant lands coverage;
- Identifying parcels likely to redevelop over a 20-year period; and
- Estimating the land productivity of parcels likely to redevelop over a 20-year period.
-

These three methods are related and should be accomplished sequentially. The first method addresses tax lots that are not within the Metro vacant land coverage. The second identifies which tax lots should be considered redevelopable, and the third addresses how many dwelling units should be allocated to those tax lots. Employment capacity is not being estimated as part of this analysis.

Following is a summary of the methods proposed by ECONorthwest and implemented by Parametrix. The body of the memorandum provides additional detail behind the rationale for these methods.

1. Estimate the developed portion of parcels that fall outside the Metro vacant lands coverage

- b. Identify all lands that fall outside the Metro vacant land coverage. Our analysis of the Phase II data shows 3,450 of the 12,603 tax lots are outside of the Metro vacant land coverage.
- c. Identify whether any improvement value exists on the tax lot. Filter tax lots with \$0 improvement value and with no data in the improvement value field out of the database. These tax lots are assumed to be fully vacant.
- c. Apply a percent-developed assumption to each of the remaining parcels. This study uses the algorithms shown in Table 3 for estimating the developed portion of tax lots

with improvements that fall outside Metro's vacant land coverage. Some tax lots identified as "Vacant" in the land use assessment codes have an improvement value; in these instances we recommended assuming the developed portion of these tax lots to be 25 percent.

2 Identify residential parcels likely to redevelop over a 20-year period.

- a. Identify all parcels that are classified as fully developed or partially vacant (requires completion of the process described above).
- b. Identify constraints that exist on developed portions of developed or partially-vacant tax lots to the extent possible. Parcels that fall outside of Metro's vacant land coverage present a challenge. In the best scenario, none of the areas classified as developed would be in constrained areas. Observation suggests this is not the case. One approach would be to use the ratios from the areas that fall within the Metro coverage.
- c. Remove lands classified as public, parks, schools, and any other identifiable public use. This would include Federal, State, City and County-owned lands using, as well as the parks in Metro's parks layer. Additional land needed for future public facilities like parks, schools, fraternal organizations, is removed from gross acres as a global estimate.
- d. Flag tax lots within residential design types that have redevelopment potential. Identify redevelopment as a function of improvement value and developed area. Apply the data in Scenario 2 as shown in Table D-7.

3 Estimate the land productivity of parcels likely to redevelop over a 20-year period

The last step in the process is to estimate the productivity of parcels likely to redevelop. We recommend the application of densities by design type similar to what was used in the previous Alternatives Analysis. Following is one potential method (based on the 2000 analysis).

- For Inner Neighborhoods: $\{(\text{acres with redevelopment potential}) * 9.6 (\text{density}) * 80\%\}$ – (estimate of current dwelling units).
- For Outer Neighborhoods: $\{(\text{acres with redevelopment potential}) * 7.3 (\text{density}) * 80\%\}$ – (estimate of current dwelling units).
- For Land within Corridors: $\{(\text{acres with redevelopment potential}) * 14.1 (\text{density}) * 30\%$ (portion of residential land in corridors) $* 80\%\}$ – (estimate of current dwelling units)

We don't make a specific recommendation for the Industrial design type, but it would seem appropriate to classify most land in these areas that is in residential use as redevelopable for non-residential use. We draw the same conclusion for areas classified as Corridors, however, 30% of the land should be considered available for residential redevelopment based on the assumption described in the final bullet above.

BACKGROUND

Parametrix is under contract by Metro to conduct a land productivity analysis on 51 Urban Reserve Areas (URAs). The Phase II Alternatives Analysis is intended to determine where and by how much the Portland metropolitan urban growth boundary (UGB) could expand to accommodate future growth.

Parametrix is working on the land supply analysis and the assumptions that will drive land productivity. One of the key elements of the productivity analysis is classification of lands. A productivity analysis usually begins with a database of tax lots in the study area. Each tax lot is then classified with respect to its development status. Typically that classification includes the following categories: developed, vacant, partially-vacant, and undevelopable.

Some lands that are classified as developed will develop at higher densities during the planning period. Thus, redevelopable lands are a subset of lands classified as developed and the developed portion of partially-vacant lands. Two of the key issues are (1) what rules to use in identifying redevelopable lands, and (2) assumptions about the productivity of redevelopable lands.

METHODS

This analysis builds from the master tax lot file provided by Parametrix.²⁴ We identified parcels that are classified as vacant or partially vacant by joining the master file to the developed land coverage. Because this study intends to estimate development capacity in Phase II URAs, and this memo proposes a methodology for estimating development potential on areas classified as developed, our analysis uses data from only the Phase II URAs. Table D-1 summarizes Phase II URAs.

Table D-1. Summary of land in Phase II URAs by classification

Classification	Number of Tax Lots	Total Acres	Developed Acres	Vacant Acres
In Vacant Land Coverage				
Fully Developed	39	35	35	0
Partially Vacant	7,708	28,876	7,803	21,073
Vacant	1,405	6,310	0	6,310
Outside Vacant Land Coverage				
Unclassified	3,450	12,913	5	12,908
Total	12,602	48,134	7,842	40,292

Source: RLIS, February 2002; data processing by Parametrix; analysis by ECONorthwest

Some of the land in the Phase II URAs falls outside Metro's vacant land coverage. Table 1 classifies land in URAs by their development status and whether they fall inside or outside Metro's vacant land coverage. About 61% of all land in Phase II URAs that have been inventoried by Metro included developed area (developed area also includes parks). Only 16% of the 48,134 acres in the Phase II URAs were considered developed. These developed lands are the focus of this analysis.

The fact that some lands fall outside of Metro's vacant land coverage means the analysis must estimate the amount of developed land in these areas (areas identified as unclassified in Table 1). We describe a method to estimate the developed area of these parcels, based on analysis of lands within the Metro vacant land coverage, later in this memorandum.

²⁴ All of the land base data described in this memorandum are from the February 2002 Regional Land Information System (RLIS) provided by Metro.

Past studies have defined redevelopment potential as parcels that have improvement values significantly lower than surrounding parcels in similar designations. In general, one would expect that lands outside the UGB will have lower values than comparable lands inside the UGB because of policy constraints and lack of infrastructure outside UGBs. Moreover, over a 20-year planning horizon one would expect future land values to rise relative to the future value of existing improvements. Thus, applying this definition to lands outside the UGB is probably not as representative of redevelopment potential.

POTENTIAL METHODS

This section describes potential approaches for addressing three issues related to the productivity of lands identified as developed:

- Estimating the developed portion of parcels that fall outside the Metro vacant lands coverage;
- Identifying parcels likely to redevelop over a 20-year period; and
- Identifying the land productivity of parcels likely to redevelop over a 20-year period.

1. Estimate the developed portion of parcels that fall outside the Metro vacant lands coverage

- a. Identify all lands that fall outside the Metro land coverage (Phase II tax lots with a “no data” flag in the master data file).
- b. Identify whether any improvement value exists on the tax lot. Filter tax lots with \$0 improvement value and with no data in the improvement value field out of the database.
- c. Apply a percent developed assumption to each of the remaining parcels. This could be completed based on land use, or land use *and* tax lot size. Table D-2 shows the percent of all tax lots that fall outside the Metro vacant land coverage by land use classification.

Table D-2. Partially-vacant tax lots within the Metro vacant land coverage by land use

Land use	Number of tax lots	Total acres	Developed acres	Percent developed
Agriculture	1,077	12,563	942	8%
Commercial	87	571	498	87%
Forest	578	6,050	355	6%
Industrial	48	137	108	79%
Multifamily residential	10	60	19	32%
Public	16	238	207	87%
Rural Residential	1,187	5,824	1,253	22%
Single-family residential	5,080	6,408	3,647	57%
Vacant	988	3,038	756	25%
None Specified	75	330	51	15%
Total	9,146	35,218	7,836	22%

Source: RLIS, February 2002; data processing by Parametrix; analysis by ECONorthwest

The data in Table D-2 clearly show that land use impacts the amount of development on a parcel. To refine this analysis, we further broke down the amount of development by land use and tax lot size (see Table D-9). The refined analysis shows that lot size also makes a difference in the amount of land that is classified as developed in Metro's coverage; in general smaller lots have a greater percentage classified as developed than larger lots. This is particularly pronounced in residential lots where lots under 1 acre are largely classified as developed and the percentages decrease with tax lot size.

ECO recommends use of the algorithms shown in Table D-3 for estimating the developed portion of tax lots with improvements that fall outside Metro's vacant land coverage. As an alternative, but more complicated approach, the observed ratios shown in Table A-1 could be applied. While applying these assumptions will not necessarily provide an accurate estimate for each tax lot, averaged over individual URAs or all the URAs, they should lead to a reasonable estimate of the amount of developed land.

One anomaly in the land use data is that a lot of land classified in the assessment land use codes as vacant has developed areas identified on it. Because assessment codes contain some inaccuracies, and because some land identified as vacant contains developed areas, we recommend reducing this amount by 25%.

Table D-3. Recommended algorithms for estimating developed portions of partially-vacant tax lots outside of Metro's vacant land coverage

Land use/tax lot size	Estimated Percent Developed
Agriculture	
< 2.5 ac	30.0%
>= 2.5 ac	7.5%
Commercial	80.0%
Forest	
< 2.5 ac	20.0%
>= 2.5 ac	5.0%
Industrial	80.0%
Multifamily residential	50.0%
Public	100.0%
Rural Residential	
< 2.5 ac	60.0%
>= 2.5 ac	20.0%
Single-family residential	
< 2.5 ac	80.0%
>= 2.5 ac	50.0%
Vacant	25.0%
None Specified	20.0%

Source: RLIS, February 2002; data processing by Parametrix; analysis by ECONorthwest

2. Identify parcels with redevelopment potential

1. Identify all parcels that are classified as fully developed or partially vacant (requires completion of the process described above).
2. Identify constraints that exist on developed portions of developed or partially-vacant tax lots to the extent possible. Parcels that fall outside of Metro's vacant land coverage present a challenge. In the best scenario, none of the areas classified as developed would be in constrained areas. Observation suggests this is not the case. One approach would be to use the ratios from the areas that fall within the Metro coverage
3. Remove lands classified as public, parks, schools, and any other identifiable public use.
4. Flag tax lots with redevelopment potential. There are many options for this step. Unfortunately, little empirical work is available to build from on the issue of redevelopment. Moreover, most of the work that does exist has focused on redevelopment in areas that are already urbanized. The issue at question for this study is productivity in areas that are largely developed at rural densities.

ECO completed considerable analysis using the databases provided by Parametrix to help develop a more refined approach to identifying tax lots with redevelopment potential. Following is a summary of the key conclusions of that analysis and the data tables:

- *Rate of parcelization.* ECO reviewed data for all parcels within 1 mile of the Metro UGB in 1997 and 2002. This analysis allowed us to determine the rate of parcelization that occurred in these areas between 1997 and 2002.²⁵ The results show that the rate of parcelization was faster for parcels within 1 mile outside the UGB than those inside (see Table D-4, and Tables D-10 and D-11). In absolute terms, however, nearly 32,000 new tax lots were created inside the UGB compared to about 6,500 outside the UGB.

Table D-4. Rate of parcelization for tax lots within 1 mile of the Metro UGB, 1997-2002

Location	1997	2002	New tax	
			lots 1997-2000	Percent increase
1 mile inside UGB	102,548	134,534	31,986	31%
1 mile outside UGB	13,242	19,730	6,488	49%

Source: RLIS, February 2002; data processing by Parametrix; analysis by ECONorthwest

²⁵ Some anomalies exist in the data. ECO used the spatial join function in ArcView to assign 2002 parcels to the 1997 coverage. The resulting database included more parcels and acres in the 2002 data than the original 2002 database. This can be explained in part by the fact that some 2002 parcels were likely assigned to more than one 1997 parcel. Despite these limitations, the analysis is useful to get a general sense of the rate of parcelization that occurred immediately inside and outside the Metro UGB during the five-year period between 1997 and 2002.

While the data presented above provided a general sense of how fast parcels are being created, they are not very useful for identifying redevelopment potential.

- *Area in UGAs by land use.* This indicator is relevant because redevelopment assumptions can vary by land use. About 61% of land within the Phase II URAs is in rural residential or single-family residential use. About 17% is in farm or forest uses, and 7% is in commercial or industrial uses (see Table D-12). It is probable that most of the developed area in farm and forest uses is for residences.
- *Area in UGAs by lot size.* About 61% of all of the developed land in the Phase II URAs is in lots smaller than 5 acres and 46% is in lots smaller than 2.5 acres (see Table D-13). This reinforces the conclusion that we are generally dealing with relatively small pieces of land.
- *Lot size by land use.* Use affects the amount of area classified as developed. For example, the average lot size for parcels classified in agricultural uses was 12.7 acres; the average developed area was 1.2 acres (see Table D-14). The average lot size for tax lots classified as single-family residential was 1.3 acres; the average developed area was 0.8 acres. In summary, the developed areas of tax lots we are working with are generally very small.
- *Lot size by total assessed value.* This distribution shows some interesting characteristics. About 13% of the total developed area of tax lots in Phase II URAs has a total assessed value of under \$50,000 (see Table D-15). The other interesting characteristic this distribution shows is that surprisingly little variation exists in the average developed lot size for these tax lots. While these low-value lots are generally small, they can be considered tax lots with high redevelopment potential. One would expect the redevelopment potential of parcels to decrease as total value increases. When we include only residential tax lots in this analysis, we see similar results (Table D-16).
- *Lot size by assessed value of improvements.* This analysis shows a somewhat different picture than the analysis of total value. Nearly one-third of the developed acres have total improvement values of less than \$50,000, and one-half have improvement values of less than \$100,000 (see Table D-17). Thus, a large amount of the developed acreage has relatively low improvement value.
- *Lot size by improvement-to-land value ratio.* Despite a large number of tax lots that did not have data, this analysis shows that improvement to land value for the developed acres follows a normal distribution with the largest clusters of tax lots between 0.75 and 2.00 (see Table D-18). Many studies use a threshold of 1.0 for improvement to land value. This analysis suggests that 0.75 or 0.5 might be a more appropriate upper bound.

ECO ran crosstab analysis to evaluate the relationship between some of the variables described above. Tables D-19 and D-20 show crosstabulation of total lot size and assessed value. The results suggest an approach that would identify redevelopment potential based on these variables. Table D-21 shows a crosstabulation of total lot size by improvement to land value

ratio. These tables are useful for illustrating the relationship between the variables, but do not illustrate the *developed* lot area by other measures.

Table 5 shows a crosstabulation of *developed* lot area by *improvement* value. It also shows three potential methods for classifying potentially redevelopable land. Implicit in this approach is the assumption that there is a correlation between improvement value, lot size, and redevelopment potential. While we do not have empirical data from URAs or comparable areas to support this assumption, it intuitively makes sense: the larger the tax lot and the lower the improvement value the more likely it is that redevelopment will occur.

The three scenarios are not that much different in terms of the number of cells that are included as potentially redevelopable, but there is a big difference in the amount of land that gets classified with redevelopment potential. The darkest areas represent scenario 1, those combined with the middle shade represent scenario 2, and all the shaded cells represent scenario 3.

Table D-5. Developed acres in developed and partially-vacant tax lots in Phase II URAs by developed area size and improvement value

Improvement Value	Developed Acres						Total	Scenario 1	Scenario 2	Scenario 3
	<0.25 acre	0.25-0.49 ac	.50-1.00 ac	1.00-2.49 ac	2.50-4.99 ac	5.00 + ac				
<\$50,000	22.5	102.5	102.5	102.5	102.5	102.5	2,452.9	2,270.6	2,430.4	2,452.9
\$50,000-\$99,999	29.9	138.7	496.3	529.9	53.2	244.4	1,498.8		304.1	1,330.3
\$100,000-\$149,999	20.1	138.3	516.4	593.9	91.3	659.6	1,919.7		559.6	1,244.8
\$150,000-\$199,999	10.2	70.8	285.4	320.9	41.9	169.9	899.1			211.8
\$200,000-\$249,999	3.1	37.8	128.6	153.5	20.9	54.6	398.5			54.6
\$250,000-\$299,999	1.6	21.3	83.2	50.1	16.2	33.3	205.8			
\$300,000-\$349,999	0.9	11.7	33.2	37.7	16.4	24.3	124.2			
\$350,000-\$399,999	0.5	3.8	25.9	40.5	10.6	19.2	100.6			
\$400,000-\$499,999	0.8	6.6	33.7	33.1	3.1	18.4	95.7			
\$500,000 or more	1.2	11.9	49.0	56.4	12.4	0.0	130.9			
Total	90.8	600.9	2,373.1	2,618.8	416.0	1,726.5	7,826.2	2,270.6	3,294.2	5,294.4
<\$50,000	0.3%	2.0%	2.0%	2.0%	2.0%	2.0%	31.3%	29.0%	31.1%	31.3%
\$50,000-\$99,999	0.4%	1.8%	6.3%	6.8%	0.6%	3.1%	19.2%		3.9%	17.0%
\$100,000-\$149,999	0.3%	1.8%	6.6%	7.6%	1.2%	7.2%	24.5%		7.2%	15.9%
\$150,000-\$199,999	0.1%	0.9%	3.6%	4.1%	0.5%	2.2%	11.5%			2.7%
\$200,000-\$249,999	0.0%	0.5%	1.6%	2.0%	0.3%	0.7%	5.1%			0.7%
\$250,000-\$299,999	0.0%	0.3%	1.1%	0.6%	0.2%	0.4%	2.6%			
\$300,000-\$349,999	0.0%	0.1%	0.4%	0.5%	0.2%	0.3%	1.6%			
\$350,000-\$399,999	0.0%	0.0%	0.3%	0.5%	0.1%	0.2%	1.3%			
\$400,000-\$499,999	0.0%	0.1%	0.4%	0.4%	0.0%	0.2%	1.2%			
\$500,000 or more	0.0%	0.2%	0.6%	0.7%	0.2%	0.0%	1.7%			
Total	1.2%	7.7%	30.3%	33.5%	5.3%	22.1%	100.0%	29.0%	42.1%	67.6%

Source: RLIS, February 2002; data processing by Parametrix; analysis by ECONorthwest

The question of which is the most appropriate scenario is an important one. While these are largely rural areas, it seems unlikely that nearly half the land classified as developed would redevelop at higher densities. Conversely, it also seems reasonable that market pressures would result in redevelopment of more than 10% of the developed area. We think a reasonable range would be between 15% and 35%; however, we suggest comparing this assumption to assumptions used in previous productivity analyses.

Earlier we concluded that a relationship exists between land use and average lot size. An alternate approach would be to use land use and property values as the two key variables. Table D-6 shows three scenarios based on this relationship.

Table D-6. Developed acres in tax lots classified as developed or partially-vacant by land use and improvement value

Improvement Value	AGR	COM	FOR	IND	MFR	PUB	RUR	SFR	VAC	None	Total	Scenario	Scenario	Scenario
												1	2	3
<\$50,000						120					1,036	917	917	917
\$50,000-\$99,999						2					370		368	368
\$100,000-\$149,999	85		36		13	20	129	361	68	9	776		54	756
\$150,000-\$199,999	210	195	70	8	2	2	230	741	174	13	1,646			202
\$200,000-\$249,999	210	29	51	32	1		283	791	167	2	1,567			
\$250,000-\$299,999	106	96	47	14	2	46	156	337	119	3	926			
\$300,000-\$349,999	69	4	29	4			74	260	49		488			
\$350,000-\$399,999	40	3	19	1		7	48	143	20	2	283			
\$400,000-\$499,999	29	1	22	5		9	38	139	30	2	275			
\$500,000 or more	52	2	18	12		2	82	227	58	5	458			
Total	944	498	357	98	19	207	1,254	3,642	756	51	7,826	917	1,339	2,243
<\$50,000	1.2%	1.0%	0.6%	0.1%		1.5%	2.1%	6.0%	0.6%	0.1%	13.2%	11.7%	11.7%	11.7%
\$50,000-\$99,999	0.6%	0.5%	0.2%	0.1%		0.0%	0.7%	2.2%	0.3%	0.1%	4.7%		4.7%	4.7%
\$100,000-\$149,999	1.1%	0.7%	0.5%	0.0%	0.2%	0.3%	1.7%	4.6%	0.9%	0.1%	9.9%		0.7%	9.7%
\$150,000-\$199,999	2.7%	2.5%	0.9%	0.1%	0.0%	0.0%	2.9%	9.5%	2.2%	0.2%	21.0%			2.6%
\$200,000-\$249,999	2.7%	0.4%	0.7%	0.4%	0.0%		3.6%	10.1%	2.1%	0.0%	20.0%			
\$250,000-\$299,999	1.4%	1.2%	0.6%	0.2%	0.0%	0.6%	2.0%	4.3%	1.5%	0.0%	11.8%			
\$300,000-\$349,999	0.9%	0.0%	0.4%	0.0%			0.9%	3.3%	0.6%		6.2%			
\$350,000-\$399,999	0.5%	0.0%	0.2%	0.0%		0.1%	0.6%	1.8%	0.3%	0.0%	3.6%			
\$400,000-\$499,999	0.4%	0.0%	0.3%	0.1%		0.1%	0.5%	1.8%	0.4%	0.0%	3.5%			
\$500,000 or more	0.7%	0.0%	0.2%	0.2%		0.0%	1.0%	2.9%	0.7%	0.1%	5.9%			
Total	12.1%	6.4%	4.6%	1.3%	0.2%	2.7%	16.0%	46.5%	9.7%	0.6%	100.0%	11.7%	17.1%	28.7%

Source: RLIS, February 2002; data processing by Parametrix; analysis by ECONorthwest

This approach has limitations in that it does not consider lot size. An alternative to this approach would be to apply different value/lot size thresholds for different land uses. Using different assumptions for each of the 10 land use categories in the Metro database would be overly cumbersome. A more manageable approach would be to split out residential and non-residential uses. Tables D-7 and D-8 illustrate this approach.

The advantage of this approach is that it would allow application of different assumptions for residential and non-residential lands. For example, it is not unreasonable to assume that market forces are more likely to lead to redevelopment of non-residential lands than of residential lands. This implies that a higher redevelopment assumption would be appropriate for non-residential lands.

Table D-7. Developed residential acres in developed and partially-vacant tax lots in Phase II URAs by developed area size and improvement value

Improvement Value	Developed Acres						Total	Scenario 1	Scenario 2	Scenario 3
	0.25-0.49	0.25-0.49	0.25-0.49	0.25-0.49	0.25-0.49	0.25-0.49				
	<0.25 acre	ac	ac	ac	ac	5.00 + ac				
<\$50,000	18.2	18.2	18.2	18.2	18.2	18.2	1,893.2	1,721.9	1,875.0	1,893.2
\$50,000-\$99,999	27.6	135.1	487.5	514.3	457.7	79.5	1,289.8		125.3	1,127.1
\$100,000-\$149,999	17.7	133.1	501.6	589.0	62.8	184.2	1,448.4		164.2	796.0
\$150,000-\$199,999	8.0	66.6	274.4	306.2	30.3	0.0	685.5			30.3
\$200,000-\$249,999	2.7	36.4	126.5	146.6	15.9	23.2	351.4			23.2
\$250,000-\$299,999	1.2	20.6	82.0	45.6	16.2	0.0	165.4			
\$300,000-\$349,999	0.9	10.6	32.4	35.6	10.2	0.0	89.7			
\$350,000-\$399,999	0.5	3.6	24.8	36.2	10.6	0.0	75.7			
\$400,000-\$499,999	0.7	5.8	33.7	31.8	0.0	0.0	72.0			
\$500,000 or more	1.1	10.8	48.2	54.6	12.4	0.0	127.1			
Total	78.6	575.7	2,318.3	2,497.5	312.0	416.3	6,198.3	1,721.9	2,164.5	3,869.9
<\$50,000	0.2%	2.4%	2.4%	2.4%	2.4%	2.4%	24.2%	22.0%	24.0%	24.2%
\$50,000-\$99,999	0.4%	1.7%	6.2%	6.6%	0.8%	0.8%	16.5%		0.6%	13.4%
\$100,000-\$149,999	0.2%	1.7%	6.4%	7.3%	0.8%	2.1%	18.5%		2.1%	10.2%
\$150,000-\$199,999	0.1%	0.9%	3.5%	3.9%	0.4%		8.8%			0.4%
\$200,000-\$249,999	0.0%	0.5%	1.6%	1.9%	0.2%		4.5%			0.0%
\$250,000-\$299,999	0.0%	0.3%	1.0%	0.6%	0.2%		2.1%			
\$300,000-\$349,999	0.0%	0.1%	0.4%	0.5%			1.1%			
\$350,000-\$399,999	0.0%	0.0%	0.3%	0.5%	0.1%	0.0%	1.0%			
\$400,000-\$499,999	0.0%	0.1%	0.4%	0.4%	0.0%		0.9%			
\$500,000 or more	0.0%	0.1%	0.6%	0.7%	0.2%	0.0%	1.6%			
Total	1.0%	7.4%	29.6%	31.9%	4.0%	5.3%	79.2%	22.0%	26.6%	48.1%

Source: RLIS, February 2002; data processing by Parametrix; analysis by ECONorthwest
 Note: residential includes lands classified SFR, RUR, and MFR, Farm and Forest

Table D-8. Developed non-residential acres in developed and partially-vacant tax lots in Phase II URAs by developed area size and improvement value

Improvement Value	Developed Acres						Total	Scenario 1	Scenario 2	Scenario 3
	0.25-0.49	0.25-0.49	0.25-0.49	0.25-0.49	0.25-0.49	0.25-0.49				
	<0.25 acre	ac	ac	ac	ac	5.00 + ac				
<\$50,000	4.2	4.2	4.2	4.2	4.2	4.2	538.1	527.1	533.9	538.1
\$50,000-\$99,999	2.2	3.1	8.7	14.3	12.1	15.0	194.3		166.0	189.0
\$100,000-\$149,999	2.4	4.9	13.8	23.5	28.4	395.5	468.6		395.5	447.4
\$150,000-\$199,999	2.1	3.5	9.4	14.7	11.5	152.1	193.3			163.7
\$200,000-\$249,999	0.4	1.0	2.1	5.0	5.0	31.4	45.0			31.4
\$250,000-\$299,999	0.5	0.8	0.7	3.4		33.3	38.6			
\$300,000-\$349,999	0.1	1.1	0.7	2.2	6.2	19.0	29.2			
\$350,000-\$399,999	0.0	0.3	1.1	4.3		19.2	24.9			
\$400,000-\$499,999	0.0	0.8		1.3	3.1	18.4	23.6			
\$500,000 or more	0.1	1.2	0.8	1.7	0.0	0.0	3.8			
Total	12.0	23.3	50.4	113.2	101.3	1,259.3	1,559.5	527.1	1,095.4	1,369.6
<\$50,000	0.1%	0.1%	0.1%	0.2%	0.2%	1.9%	6.9%	6.7%	6.8%	6.9%
\$50,000-\$99,999	0.0%	0.0%	0.1%	0.2%	0.2%	1.9%	2.5%		2.1%	2.4%
\$100,000-\$149,999	0.0%	0.1%	0.2%	0.3%	0.4%	5.1%	6.0%		5.1%	5.7%
\$150,000-\$199,999	0.0%	0.0%	0.1%	0.2%	0.1%	1.9%	2.5%			2.1%
\$200,000-\$249,999	0.0%	0.0%	0.0%	0.1%	0.1%	0.4%	0.6%			0.4%
\$250,000-\$299,999	0.0%	0.0%	0.0%	0.0%	#VALUE!	0.4%	0.5%			
\$300,000-\$349,999	0.0%	0.0%	0.0%	0.0%	0.1%	0.2%	0.4%			
\$350,000-\$399,999	0.0%	0.0%	0.0%	0.1%	#VALUE!	0.2%	0.3%			
\$400,000-\$499,999	0.0%	0.0%	#VALUE!	0.0%			0.3%			
\$500,000 or more	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
Total	0.2%	0.3%	0.6%	1.4%	1.3%	16.1%	19.9%	6.7%	14.0%	17.5%

Source: RLIS, February 2002; data processing by Parametrix; analysis by ECONorthwest
 Note: Non-residential land includes all lands not classified as residential (see notes for Table 7)

A final consideration is the relationship between present use and design type. Metro has assigned design types for all tax lots in the Phase II URAs. In short, the issue is whether all land uses that are inconsistent with design types should be considered redevelopable. For example, should all tax lots that are presently in industrial use but within an outer neighborhood design type be considered redevelopable?

For the purpose of this analysis we recommend that all lands designated as residential in industrial design types be considered unavailable for residential redevelopment. This amounts to about 40 acres total. We also recommend that a portion of parcels in corridors be considered unavailable for residential redevelopment.

In summary, an approach that uses the relationship between developed area and improvement value (as those shown in Tables D-7 and D-8) seems most appropriate. Further breaking this down by residential and non-residential land uses would address some differences between these land use types.

3. Identifying the land productivity of parcels likely to redevelop over a 20-year period.

The last step in the process is to estimate the productivity of parcels likely to redevelop. We recommend the application of densities by design type similar to what was used in the previous productivity analysis. Following is one potential method (based on the 2000 analysis).

- For Inner Neighborhoods: $\{(\text{acres with redevelopment potential}) * 9.6 (\text{density}) * 80\%\}$ – (estimate of current dwelling units).
- For Outer Neighborhoods: $\{(\text{acres with redevelopment potential}) * 7.3 (\text{density}) * 80\%\}$ – (estimate of current dwelling units).
- For Land within Corridors: $\{(\text{acres with redevelopment potential}) * 14.1 (\text{density}) * 30\% (\text{residential land in Corridors}) * 80\%\}$ – (estimate of current dwelling units).

We don't make a specific recommendation for the Industrial design type, but it would seem appropriate to classify most land in these areas that is in residential use as redevelopable for non-residential uses only. We draw the same conclusion for non-residential areas within Corridors.

APPENDIX D: DATA ANALYSIS

Table D-9. Partially Vacant Tax Lots Within The Metro Vacant Land Coverage By Land Use And Tax Lot Size

Land use/lot size	Number of tax lots	Total acres	Developed acres	Percent developed
Rural Residential				
<1 acre	117	54	42	78.4%
1-2.49 acre	102	194	77	39.9%
2.5-4.99 acre	570	2,247	572	25.6%
5.0-7.49 acre	245	1,433	276	19.4%
7.5-9.99 acre	83	75	117	16.2%
10.0-14.99 acre	40	467	47	10.0%
15.0-19.99 acre	14	236	33	14.0%
20.0-49.99 acre	15	421	88	21.0%
50.0 + acre	1	57	1	1.0%
Subtotal	1,187	5,824	1,253	21.5%
Single-family residential				
<1 acre	2,883	1,705	1,555	91.2%
1-2.49 acre	1,874	2,855	1,644	57.6%
2.5-4.99 acre	262	789	243	30.8%
5.0-7.49 acre	20	117	24	20.8%
7.5-9.99 acre	9	81	15	18.8%
10.0-14.99 acre	8	95	24	25.7%
15.0-19.99 acre	9	164	22	13.3%
20.0-49.99 acre	13	388	42	10.9%
50.0 + acre	2	214	76	35.6%
Subtotal	5,080	6,408	3,647	56.9%
Vacant				
<1 acre	425	164	32	19.4%
1-2.49 acre	260	420	61	14.5%
2.5-4.99 acre	135	506	50	9.8%
5.0-7.49 acre	75	442	69	15.7%
7.5-9.99 acre	38	332	47	14.0%
10.0-14.99 acre	19	235	28	11.9%
15.0-19.99 acre	17	311	129	41.6%
20.0-49.99 acre	15	409	225	55.1%
50.0 + acre	4	218	115	52.8%
Subtotal	988	3,038	756	24.9%
None Specified				
<1 acre	19	7	2	24.5%
1-2.49 acre	21	31	5	17.3%
2.5-4.99 acre	11	41	4	8.8%
5.0-7.49 acre	11	61	13	21.5%
7.5-9.99 acre	7	64	12	18.6%
10.0-14.99 acre	1	12	0	0.0%
15.0-19.99 acre	2	35	1	1.9%
20.0-49.99 acre	3	79	14	17.9%
50.0 + acre	78	39	12	29.7%
Subtotal	153	369	62	16.8%
Total	9,146	35,218	7,836	22.2%

Table D-10. Parcelization rate of all tax lots within 1 mile of the Metro UGB, 1997-2002

Area/Land Use	1997			2002		Number of new tax lots, 1997-2002	Percent Increase
	Number of Tax Lots	Total Acres	Average Tax Lot Size	2002 Tax Lots	Average Tax Lot Size		
1 mile inside UGB							
Agriculture	193	2,026	10.5	222	9.1	29	15%
Commercial	2,847	7,154	2.5	3,059	2.3	212	7%
Forest	111	651	5.9	120	5.4	9	8%
Industrial	1,025	4,300	4.2	1,097	3.9	72	7%
Multifamily residential	2,384	1,487	0.6	2,754	0.5	370	16%
Public	1,160	3,700	3.2	1,239	3.0	79	7%
Rural Residential	385	2,810	7.3	483	5.8	98	25%
Single-family residential	78,885	25,413	0.3	79,542	0.3	657	1%
Vacant	11,758	20,896	1.8	13,387	1.6	1,629	14%
None Specified	3,800	11,150	2.9	32,631	0.3	28,831	759%
Subtotal	102,548	79,587	0.8	134,534	0.6	31,986	31%
1 mile outside UGB							
Agriculture	1,049	12,388	11.8	1,140	10.9	91	9%
Commercial	93	1,117	12.0	105	10.6	12	13%
Forest	684	7,875	11.5	793	9.9	109	16%
Industrial	32	241	7.5	34	7.1	2	6%
Multifamily residential	6	6	1.1	6	1.1	0	0%
Public	97	1,063	11.0	136	7.8	39	40%
Rural Residential	1,582	7,635	4.8	1,636	4.7	54	3%
Single-family residential	6,074	14,656	2.4	6,295	2.3	221	4%
Vacant	1,983	11,970	6.0	2,202	5.4	219	11%
None Specified	1,642	30,961	18.9	7,383	4.2	5,741	350%
Subtotal	13,242	87,912	6.6	19,730	4.5	6,488	49%

Source: RLIS; Parametrix, Inc.; data analysis by ECONorthwest

Table D-11. Parcelization rate of tax lots with land divisions between 1997 and 2002 within 1 mile of the Metro UGB

Area/Land Use	1997			2002		Number of new tax lots 1997-2002	Percent Increase
	Number of Tax Lots	Total Acres	Average Tax Lot Size	2002 Tax Lots	Average Tax Lot Size		
1 mile inside UGB							
Agriculture	21	472	22.5	50	9.4	29	138%
Commercial	138	1,593	11.5	350	4.5	212	154%
Forest	9	35	3.9	18	1.9	9	100%
Industrial	50	526	10.5	122	4.3	72	144%
Multifamily residential	73	65	0.9	443	0.1	370	507%
Public	61	428	7.0	140	3.1	79	130%
Rural Residential	48	378	7.9	146	2.6	98	204%
Single-family residential	566	407	0.7	1,223	0.3	657	116%
Vacant	726	4,325	6.0	2,355	1.8	1,629	224%
None Specified	289	1,031	3.6	29,120	0.0	28,831	9976%
Subtotal	1,981	9,250	4.7	33,967	0.3	31,986	1615%
1 mile outside UGB							
Agriculture	70	925	13.2	161	5.7	91	130%
Commercial	6	16	2.7	18	0.9	12	200%
Forest	66	741	11.2	175	4.2	109	165%
Industrial	2	7	3.7	4	1.8	2	100%
Multifamily residential	22	277	12.6	61	4.5	39	177%
Public	48	286	6.0	102	2.8	54	113%
Rural Residential	190	835	4.4	411	2.0	221	116%
Single-family residential	182	991	5.4	401	2.5	219	120%
Vacant	0	0		0		0	
None Specified	213	4,423	20.8	5,954	0.7	5,741	2695%
Subtotal	799	8,502	10.6	7,287	1.2	6,488	812%

Source: RLIS; Parametrix, Inc.; data analysis by ECONorthwest

Table D-12. Developed and partially-vacant land by land use

Land Use	Tax lots		Total Acres		Developed Acres	
	Number	Percent	Number	Percent	Number	Percent
Agriculture	814	10%	10,352	35%	944	12%
Commercial	85	1%	550	2%	498	6%
Forest	413	5%	4,428	15%	357	5%
Industrial	48	1%	175	1%	108	1%
Multifamily residential	11	0%	66	0%	19	0%
Public	12	0%	222	1%	207	3%
Rural Residential	1,123	14%	5,573	19%	1,254	16%
Single-family residential	4,840	62%	6,169	21%	3,647	47%
Vacant	380	5%	1,621	6%	756	10%
None	40	1%	212	1%	51	1%
Total	7,766	100%	29,368	100%	7,841	100%

Source: RLIS; Parametrix, Inc.; data analysis by ECONorthwest

Table D-13. Developed and partially-vacant land by tax lot size

Parcel Size	Tax Lots		Total Acres		Developed Acres	
	Number	Percent	Number	Percent	Number	Percent
<1 acre	3,106	40%	1,805	6%	1,076	21%
1-2.49 acre	2,123	27%	3,331	11%	1,973	25%
2.5-4.99 acre	1,156	15%	4,373	15%	1,153	15%
5.0-7.49 acre	552	7%	3,218	11%	652	8%
7.5-9.99 acre	242	3%	2,138	7%	397	5%
10.0-14.99 acre	178	2%	2,159	7%	291	4%
15.0-19.99 acre	153	2%	2,702	9%	368	5%
20.0-49.99 acre	214	3%	6,300	21%	749	10%
50.0 + acre	44	1%	3,342	11%	634	8%
Total	7,768	100%	29,370	100%	7,842	100%

Source: RLIS; Parametrix, Inc.; data analysis by ECONorthwest

Table D-14. Average lot size and developed area by land use

Land Use	Average lot size	Average developed area
Agriculture	12.7	1.2
Commercial	6.5	5.9
Forest	10.7	0.9
Industrial	3.6	2.2
Multifamily residential	6.0	1.7
Public	18.5	17.3
Rural Residential	5.0	1.1
Single-family residential	1.3	0.8
Vacant	4.3	2.0
None	5.3	1.3
Average	3.8	1.0

Source: RLIS; Parametrix, Inc.; data analysis by ECONorthwest

Table D-15. Developed and partially-vacant tax lots by total assessed value

Total Value	Number of tax lots	Total acres	Developed Acres	Average Lot Size	Avg Dev Lot Size
<\$50,000	1,001	3,495	1,036	3.5	1.0
\$50,000-\$99,999	384	1,532	370	4.0	1.0
\$100,000-\$149,999	819	3,013	776	3.7	0.9
\$150,000-\$199,999	1,607	6,028	1,646	3.8	1.0
\$200,000-\$249,999	1,501	5,592	1,567	3.7	1.0
\$250,000-\$299,999	846	3,358	927	4.0	1.1
\$300,000-\$349,999	510	2,189	488	4.3	1.0
\$350,000-\$399,999	302	1,505	283	5.0	0.9
\$400,000-\$499,999	320	1,195	275	3.7	0.9
\$500,000 or more	471	1,447	458	3.1	1.0
Total	7,761	29,354	7,828	3.8	1.0

Source: RLIS; Parametrix, Inc.; data analysis by ECONorthwest

Table D-16. Developed and partially-vacant residential tax lots by total value

Total Value	Number of tax lots	Total acres	Developed Acres	Average Lot Size	Avg Dev Lot Size
<\$50,000	631	736	469	1.2	0.7
\$50,000-\$99,999	235	324	173	1.4	0.7
\$100,000-\$149,999	541	612	361	1.1	0.7
\$150,000-\$199,999	1,064	1,373	741	1.3	0.7
\$200,000-\$249,999	923	1,286	791	1.4	0.9
\$250,000-\$299,999	467	563	337	1.2	0.7
\$300,000-\$349,999	313	413	260	1.3	0.8
\$350,000-\$399,999	172	288	143	1.7	0.8
\$400,000-\$499,999	188	249	139	1.3	0.7
\$500,000 or more	300	318	227	1.1	0.8
Total	4,834	6,163	3,642	1.3	0.8

Source: RLIS; Parametrix, Inc.; data analysis by ECONorthwest

Table D-17. Developed and partially-vacant residential tax lots by improved value

Improvement Value	Number of tax lots	Total acres	Developed Acres	Average Lot Size	Avg Dev Lot Size
<\$50,000	2,321	9,263	2,453	4.0	1.1
\$50,000-\$99,999	1,669	5,506	1,499	3.3	0.9
\$100,000-\$149,999	1,720	6,499	1,921	3.8	1.1
\$150,000-\$199,999	934	3,756	899	4.0	1.0
\$200,000-\$249,999	428	2,064	399	4.8	0.9
\$250,000-\$299,999	231	856	206	3.7	0.9
\$300,000-\$349,999	123	398	124	3.2	1.0
\$350,000-\$399,999	85	323	101	3.8	1.2
\$400,000-\$499,999	94	229	96	2.4	1.0
\$500,000 or more	156	460	131	2.9	0.8
Total	7,761	29,354	7,828	3.8	1.0

Source: RLIS; Parametrix, Inc.; data analysis by ECONorthwest

Table D-18. Developed and partially-vacant tax lots by improvement/land value ratio

Imp/Land Value Ratio	Number of tax lots	Total acres	Developed Acres	Average Lot Size	Avg Dev Lot Size
No Data	1,613	5,956	1,640	3.7	1.0
<.25	389	1,755	384	4.5	1.0
.25-.49	434	2,056	575	4.7	1.3
.50-.74	670	2,472	630	3.7	0.9
.75-.99	981	3,701	1,046	3.8	1.1
1.00-1.49	1,668	5,787	1,513	3.5	0.9
1.50-1.99	991	4,130	1,089	4.2	1.1
2.00-2.99	791	2,964	789	3.7	1.0
3.00 +	231	548	178	2.4	0.8
Total	7,768	29,370	7,842	3.8	1.0

Table D-19. Number of developed and partially-vacant residential tax lots by tax lot size and total value

Total Value	<1 acre	1-2.49 acre	2.5-4.99 acre	5.0-7.49 acre	7.5-9.99 acre	10.0-14.99 acre	15.0-19.99 acre	20.0-49.99 acre	50.0 + acre	Total Tax Lots
<\$50,000	399	285	150	61	33	26	18	26	3	1,001
\$50,000-\$99,999	144	110	53	27	14	10	11	14	1	384
\$100,000-\$149,999	360	216	106	52	24	18	23	15	5	819
\$150,000-\$199,999	690	434	213	98	54	30	30	46	12	1,607
\$200,000-\$249,999	570	440	230	108	38	38	25	46	6	1,501
\$250,000-\$299,999	305	225	160	67	31	19	11	20	8	846
\$300,000-\$349,999	188	144	70	45	14	8	9	18	5	510
\$350,000-\$399,999	114	63	55	22	5	5	12	13	3	302
\$400,000-\$499,999	125	82	48	29	10	9	6	10	1	320
\$500,000 or more	207	122	62	33	18	15	8	6	0	471
Total	3,102	2,121	1,156	552	241	178	153	214	44	7,761
<\$50,000	5.1%	3.7%	1.9%	0.8%	0.4%	0.3%	0.2%	0.3%	0.0%	12.9%
\$50,000-\$99,999	1.9%	1.4%	0.7%	0.3%	0.2%	0.1%	0.1%	0.2%	0.0%	4.9%
\$100,000-\$149,999	4.6%	2.8%	1.4%	0.7%	0.3%	0.2%	0.3%	0.2%	0.1%	10.6%
\$150,000-\$199,999	8.9%	5.6%	2.7%	1.3%	0.7%	0.4%	0.4%	0.6%	0.2%	20.7%
\$200,000-\$249,999	7.3%	5.7%	3.0%	1.4%	0.5%	0.5%	0.3%	0.6%	0.1%	19.3%
\$250,000-\$299,999	3.9%	2.9%	2.1%	0.9%	0.4%	0.2%	0.1%	0.3%	0.1%	10.9%
\$300,000-\$349,999	2.4%	1.9%	1.0%	0.6%	0.2%	0.1%	0.1%	0.2%	0.1%	6.6%
\$350,000-\$399,999	1.5%	0.8%	0.7%	0.4%	0.1%	0.1%	0.2%	0.2%	0.0%	3.9%
\$400,000-\$499,999	1.6%	1.1%	0.6%	0.4%	0.1%	0.1%	0.1%	0.1%	0.0%	4.1%
\$500,000 or more	2.7%	1.6%	0.8%	0.4%	0.2%	0.2%	0.1%	0.1%	0.0%	6.1%
Total	40.0%	27.3%	14.9%	7.1%	3.1%	2.3%	2.0%	2.8%	0.6%	100.0%

Source: RLIS; Parametrix, Inc.; data analysis by ECONorthwest

Table D-20. Developed acres in developed and partially-vacant residential tax lots by tax lot size and total value

Total Value	<1 acre	1-2.49 acre	2.5-4.99 acre	5.0-7.49 acre	7.5-9.99 acre	10.0-14.99 acre	15.0-19.99 acre	20.0-49.99 acre	50.0 + acre	Acres
<\$50,000	211	266	132	75	49	42	24	116	121	1,036
\$50,000-\$99,999	78	96	50	25	31	15	9	30	36	370
\$100,000-\$149,999	175	197	112	63	26	21	87	73	22	776
\$150,000-\$199,999	373	374	215	104	83	45	73	143	237	1,646
\$200,000-\$249,999	305	397	236	140	52	68	95	195	81	1,567
\$250,000-\$299,999	167	201	161	71	55	38	12	95	128	927
\$300,000-\$349,999	105	152	83	55	18	18	10	39	7	488
\$350,000-\$399,999	65	55	51	40	5	5	25	38	0	283
\$400,000-\$499,999	72	72	42	36	23	10	5	15	1	275
\$500,000 or more	123	111	72	44	45	29	29	6	0	458
Total	1,673	1,921	1,153	652	387	291	368	749	634	7,828
<\$50,000	2.7%	3.4%	1.7%	1.0%	0.6%	0.5%	0.3%	1.5%	1.5%	13.2%
\$50,000-\$99,999	1.0%	1.2%	0.6%	0.3%	0.4%	0.2%	0.1%	0.4%	0.5%	4.7%
\$100,000-\$149,999	2.2%	2.5%	1.4%	0.8%	0.3%	0.3%	1.1%	0.9%	0.3%	9.9%
\$150,000-\$199,999	4.8%	4.8%	2.7%	1.3%	1.1%	0.6%	0.9%	1.8%	3.0%	21.0%
\$200,000-\$249,999	3.9%	5.1%	3.0%	1.8%	0.7%	0.9%	1.2%	2.5%	1.0%	20.0%
\$250,000-\$299,999	2.1%	2.6%	2.1%	0.9%	0.7%	0.5%	0.2%	1.2%	1.6%	11.8%
\$300,000-\$349,999	1.3%	1.9%	1.1%	0.7%	0.2%	0.2%	0.1%	0.5%	0.1%	6.2%
\$350,000-\$399,999	0.8%	0.7%	0.7%	0.5%	0.1%	0.1%	0.3%	0.5%	0.0%	3.6%
\$400,000-\$499,999	0.9%	0.9%	0.5%	0.5%	0.3%	0.1%	0.1%	0.2%	0.0%	3.5%
\$500,000 or more	1.6%	1.4%	0.9%	0.6%	0.6%	0.4%	0.4%	0.1%	0.0%	5.9%
Total	21.4%	24.5%	14.7%	8.3%	4.9%	3.7%	4.7%	9.6%	8.1%	100.0%

Source: RLIS; Parametrix, Inc.; data analysis by ECONorthwest

Table D-21. Number of developed and partially-vacant residential tax lots by tax lot size and improvement/land value ratio

Imp/Land Value	<1 acre	1-2.49 acre	2.5-4.99 acre	5.0-7.49 acre	7.5-9.99 acre	10.0-14.99 acre	15.0-19.99 acre	20.0-49.99 acre	50.0 + acre	Total Tax Lots
<.25	153	105	58	27	16	11	7	7	5	389
.25-.49	140	120	74	38	15	17	9	17	4	434
.50-.74	236	209	112	48	15	15	13	20	2	670
.75-.99	372	267	157	85	23	17	18	38	4	981
1.00-1.49	732	417	248	110	53	41	23	36	8	1,668
1.50-1.99	402	269	136	67	36	16	23	31	11	991
2.00-2.99	338	223	103	47	21	15	18	20	6	791
3.00 +	115	67	29	10	4	1	2	2	1	231
No Data	614	444	239	120	58	45	40	43	3	1,606
Total	3,102	2,121	1,156	552	241	178	153	214	44	7,761
<.25	2.0%	1.4%	0.7%	0.3%	0.2%	0.1%	0.1%	0.1%	0.1%	5.0%
.25-.49	1.8%	1.5%	1.0%	0.5%	0.2%	0.2%	0.1%	0.2%	0.1%	5.6%
.50-.74	3.0%	2.7%	1.4%	0.6%	0.2%	0.2%	0.2%	0.3%	0.0%	8.6%
.75-.99	4.8%	3.4%	2.0%	1.1%	0.3%	0.2%	0.2%	0.5%	0.1%	12.6%
1.00-1.49	9.4%	5.4%	3.2%	1.4%	0.7%	0.5%	0.3%	0.5%	0.1%	21.5%
1.50-1.99	5.2%	3.5%	1.8%	0.9%	0.5%	0.2%	0.3%	0.4%	0.1%	12.8%
2.00-2.99	4.4%	2.9%	1.3%	0.6%	0.3%	0.2%	0.2%	0.3%	0.1%	10.2%
3.00 +	1.5%	0.9%	0.4%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	3.0%
No Data	7.9%	5.7%	3.1%	1.5%	0.7%	0.6%	0.5%	0.6%	0.0%	20.7%
Total	40.0%	27.3%	14.9%	7.1%	3.1%	2.3%	2.0%	2.8%	0.6%	100.0%

Source: RLIS; Parametrix, Inc.; data analysis by ECONorthwest

APPENDIX E

A log of service provider contacts for Phase II areas, as well as a copy of the letter sent to service providers for the water, sewer and stormwater assessments

Parametrix, Inc.

Consultants in Engineering and Environmental Sciences

700 NE Multnomah St., Suite 1160, Portland, OR 97232-2131
503-233-2400 • Vancouver: 360-694-5020 • Fax: 503-233-4825

March 28, 2002

Name
Title
Organization
Address
City, State, Zip

Dear Name:

Parametrix is assisting Metro Council in carrying out Phase II of the *Metro Alternatives Sites Study*. This study will evaluate 53 areas, totaling approximately 50,000 acres, for possible addition to the Metro urban growth boundary (UGB), and subsequent urbanization. To determine which of these areas can be most efficiently urbanized, Parametrix is assessing the build out potential and feasibility for serving possible future development with transportation, storm sewer, sanitary sewer, and domestic water. Following this assessment, Metro Council is expected to reach a final decision on which areas to add to the UGB by December 2002.

We have identified your district as proximate to one or more of the 53 Phase II study areas. This makes you a *possible* service provider if Metro Council selects an area near you for UGB inclusion. To ensure that Metro Council has the best information available to support its decision-making process, we are asking for your assistance. We would like to contact you by telephone within the next few weeks to get your personal input and assessment on the following items:

- ◆ The capacity and condition of current facilities within the study area(s) of interest,
- ◆ Any difficulty of extending services to the study area(s) of interest,
- ◆ Possible impacts on existing service areas surrounding the study area(s) of interest,
- ◆ Any additional information regarding serviceability that you believe is relevant to this decision-making process.

For your reference, we have attached individual maps of the study areas of interest to your district, as well as a table showing the total acreage for *all* of the 53 Phase II study areas. If you have any questions or would like to contact me in advance, please do not hesitate to call me at 503 233-2400. If there is a particular person to whom I should be placing my call, please let me know.

Thank you very much for your time and interest. I will be contacting you shortly.

Sincerely,

SERVICE PROVIDER CONTACT LOG

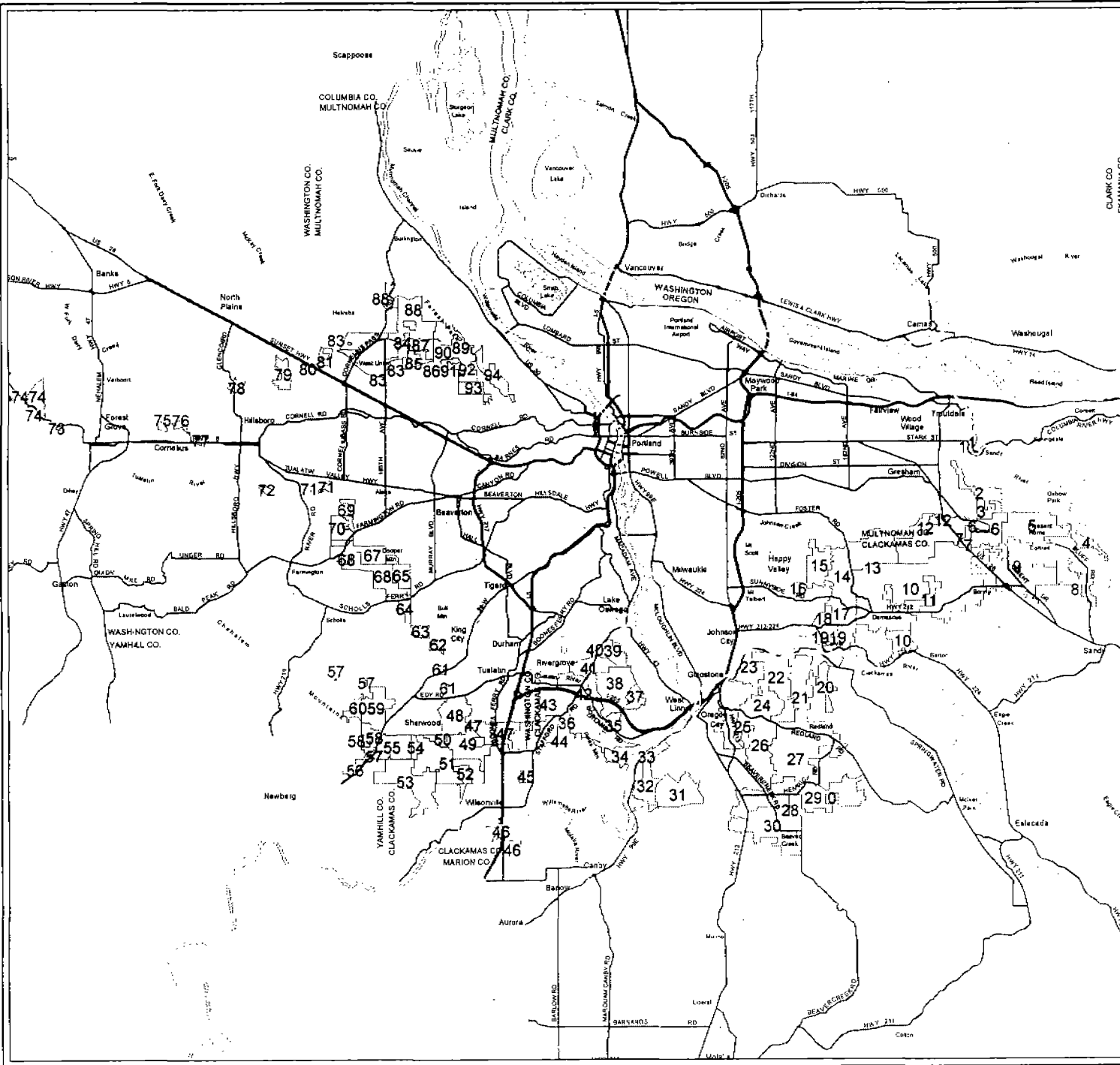
Last Name	First Name	Title	Organization/Agency	Dept.	Mail Address	City	State	Zip	Phone
Alexander	Larry	Manager	Boring Water District No. 24		P.O. Box 66	Boring	OR	97009	503-663-4594
Boguslawski	Mark		City of Beaverton		P.O. Box 4755	Beaverton	OR	97076-4755	503-526-2222
Winship	David		City of Beaverton		P.O. Box 4755	Beaverton	OR	97076-4755	503-526-2223
Crowell	Mark	Assistant City Director	City of Cornelius		P.O. Box 608	Cornelius	OR	97113	503-357-3011
Holand	John		City of Forest Grove		P.O. Box 326	Forest Grove	OR	97116	503-992-3200
Shell	Charlie		City of Hillsboro		1023 West Main	Hillsboro	OR	97123	503-681-6252
Hamerl	Mark		City of Hillsboro		1023 West Main	Hillsboro	OR	97123	503-615-6576
Noble	Son		City of Portland		1120 SW 5th Ave, Rm. 1120	Portland	OR	97204	503-823-5241
Re	Tony		City of Portland	Freshwater Division	1120 SW 5th Ave, Rm. 1120	Portland	OR	97204	503-823-7768
Wahab	Amin		City of Portland	Stormwater Division	1120 SW 5th Ave, Rm. 1120	Portland	OR	97205	503-823-7895
Carley	Bill	Sr. Project Mgr.	City of Sherwood		20 NW Washington Street	Sherwood	OR	97140	503-625-0546
Parkin	Gary		City of West Linn	Water and Streets Services	22500 Salamo Road, # 800	West Linn	OR	97068	503-722-5518
Grover	Kelli		City of West Linn	Sanitary Sewer Services	22501 Salamo Road, # 800	West Linn	OR	97068	503-722-5503
Collins	Maggie	Planning Director	City of Wilsonville		30000 SW Town Center Loop East	Wilsonville	OR	97070	503-570-1581

Last Name	First Name	Title	Organization/Agency	Dept.	Mail Address	City	State	Zip	Phone
Kyle	Ted		Clackamas County	Water Environment Services	9101 SE Sunnybrook Blvd., Ste 441	Clackamas	OR	97015-6612	503-353-4562
Dreschler	Greg		Clackamas River Water		16770 SE 82ND Drive	Clackamas	OR	97015	503-722-9225
Walker	Lee		Clean Water Services		155 N 1ST Ave.	Hillsboro	OR	97124	503-846-8621
Deja	Linna		Eastmont Water District		10351 SE Tower Dr.	Gresham	OR	97080	503-663-1333
Damon	Kathy		Lusted Water District		P.O. Box 2026	Gresham	OR	97030	503-663-3059
Dunn	Paul		Mountain Shadows Water District		14248 SE Eklund Ave.	Boring	OR	97009	503-826-8057
Zinser	Daryl	Manager	Pleasant Home Water District		32421 SE Pipeline Road	Gresham	OR	97080	503-761-0220
Pokorny	Tom		Powell Valley Road Water District		12350 SE Powell Blvd.	Portland	OR	97236	503-761-5011
Ezell	D.J.		Rivergrove Water District		17661 Pilkington Road	Lake Oswego	OR	97035	503-635-6041
Bradley	Dan	General Manager	South Fork Water District		15962 S.Hunter Ave.	Oregon City	OR	97045	503-657-5030
Anderson	Kim		Sunrise Water Authority		10602 SE 129TH Avenue	Portland	OR	97236	503-761-0220
Koellermeier	Dennis	Asst. Public Works Director	Tigard Water District		13125 SW Hall Blvd.	Tigard	OR	97223	503-639-4171
Davis	Stewart	Senior Engineer	Tualatin Valley Water District		P.O. Box 745	Beaverton	OR	97075	503-848-3025

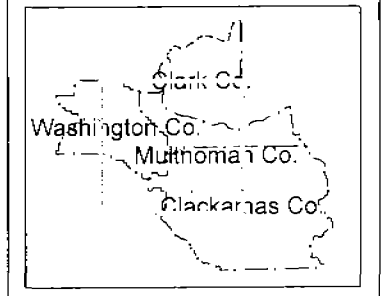
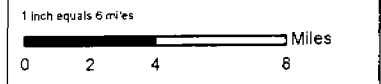
APPENDIX F

Study Area Maps and Aerial Photos

Alternatives Analysis Study Areas

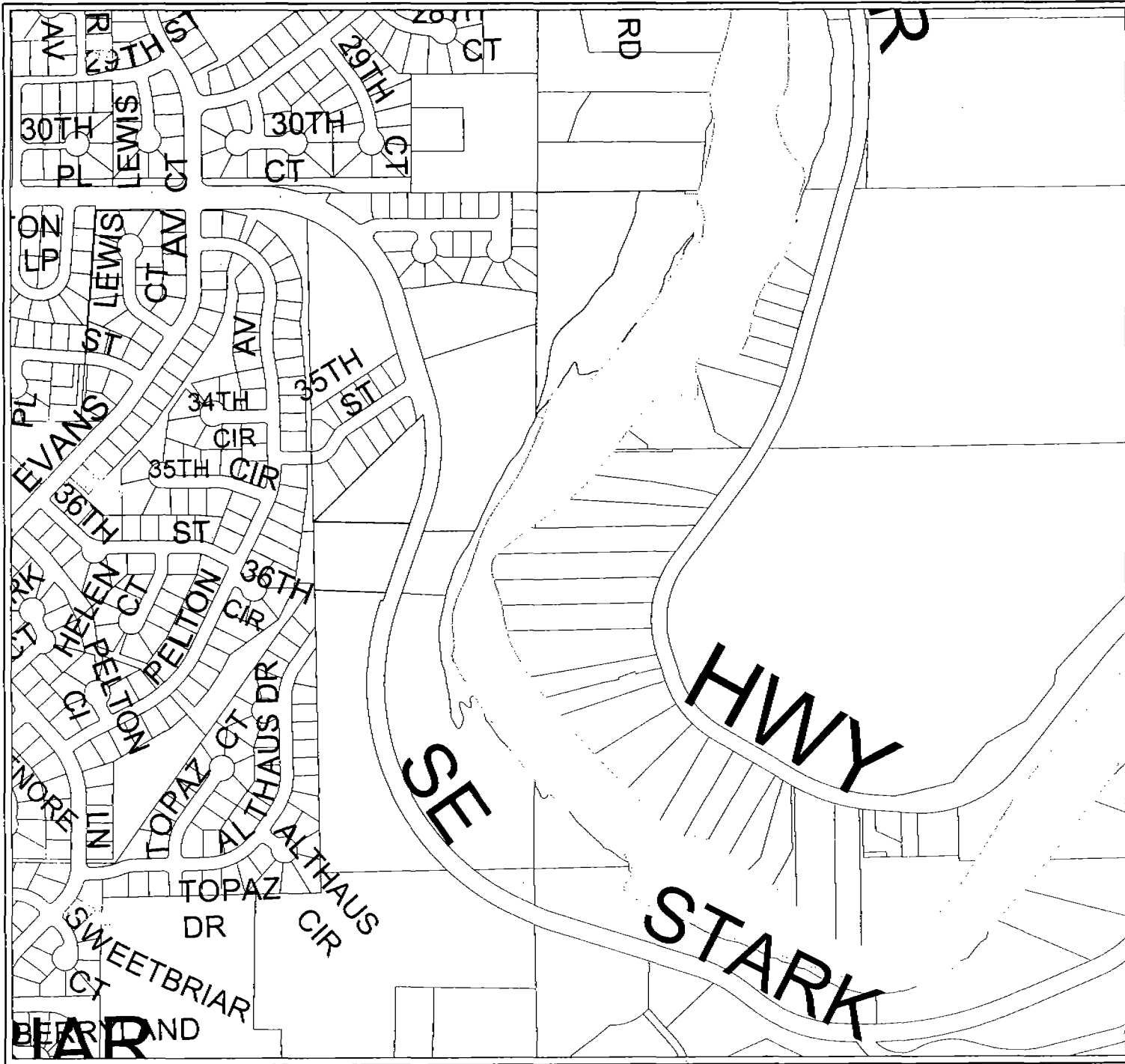


SOURCES:
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map

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Alternatives Analysis

Study Area 1

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Melro Code 3.01.025(j).

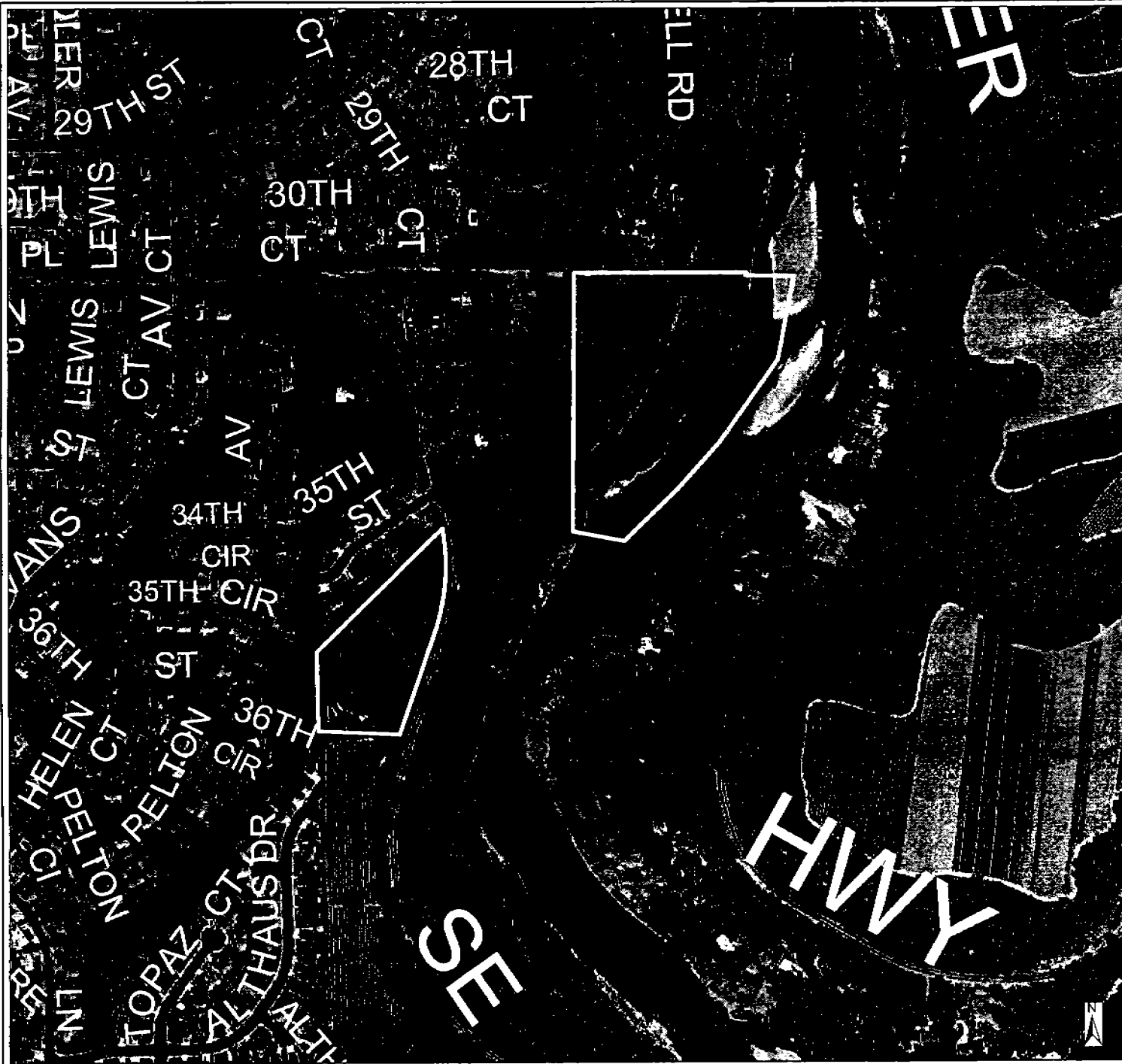
SOURCES

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

0 480 920 Feet

Location Map

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R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 1

SOURCES.

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

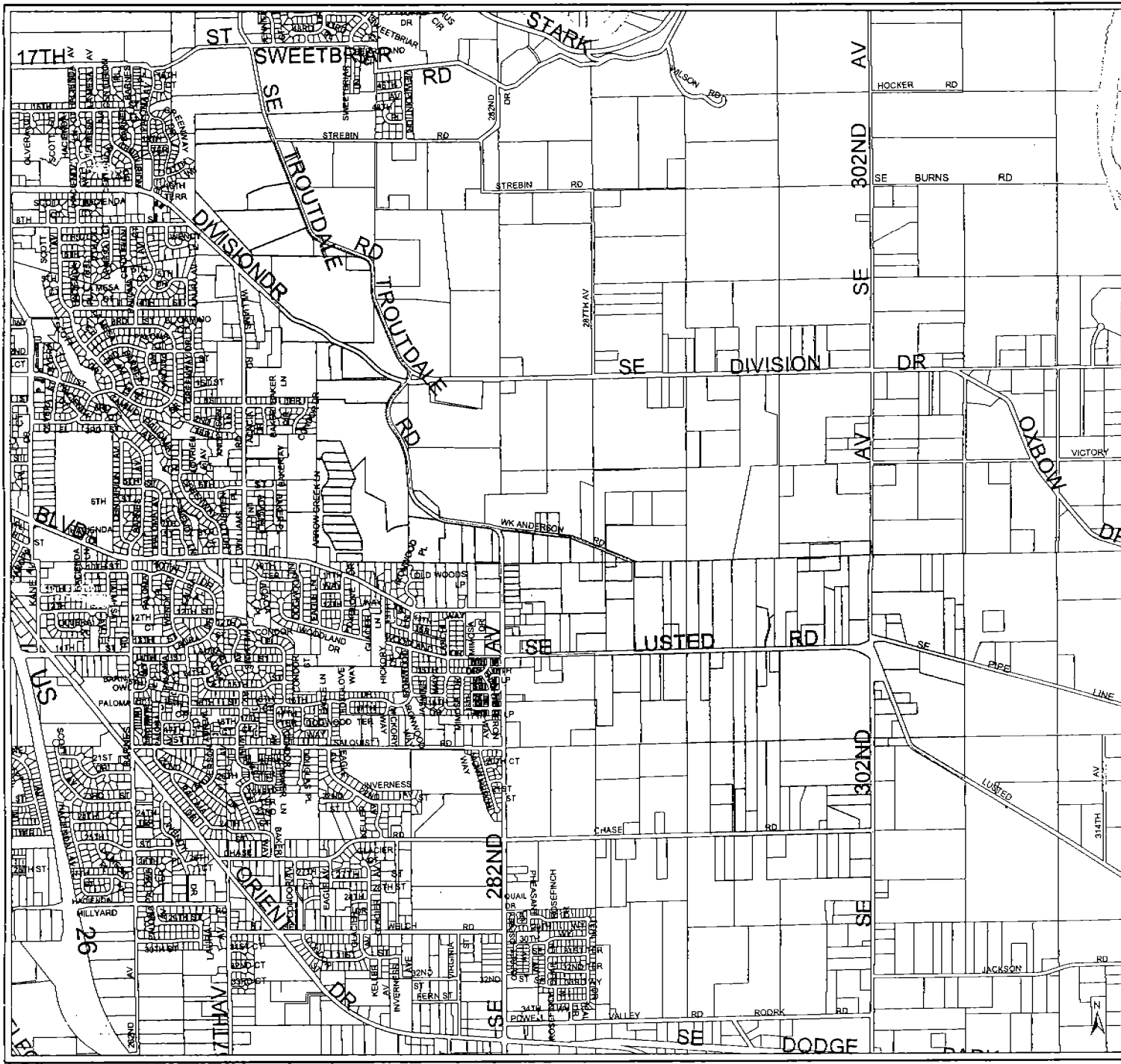
MAP DATA
Aerial photography, 2001. Digital elevation model (DEM) data, 2001. Digital orthophoto map (DOM) data, 2001. Digital street map (DSM) data, 2001. Digital parcel map (DPM) data, 2001. Digital utility map (DUM) data, 2001. Digital water map (DWM) data, 2001. Digital wetlands map (DWM) data, 2001. Digital flood map (DFM) data, 2001. Digital fire map (DFM) data, 2001. Digital fire map (DFM) data, 2001. Digital fire map (DFM) data, 2001.

0 350 700 Feet

Location Map

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R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 2

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

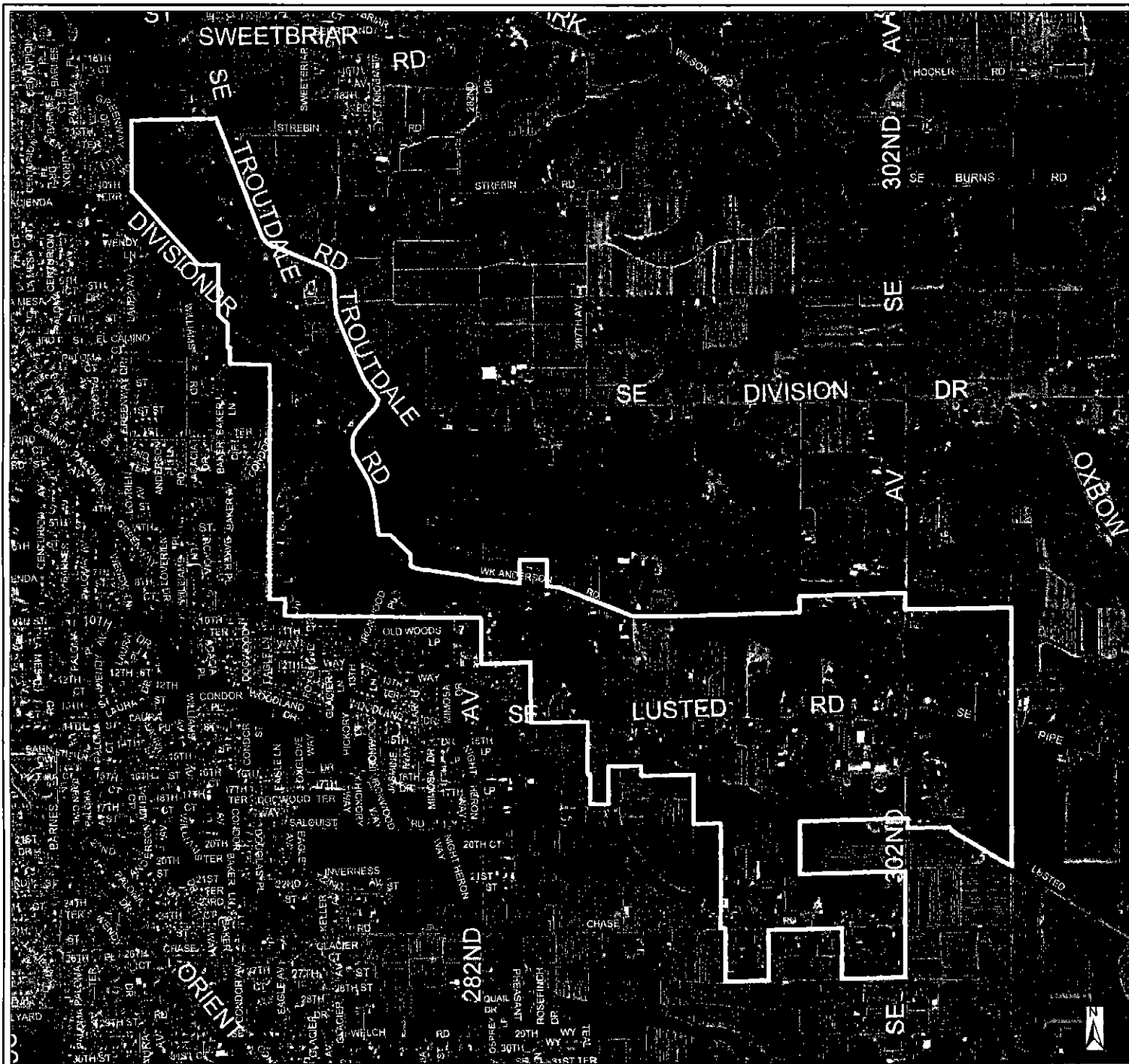
SOURCES:
 TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.
 The information on this map is derived from the Metro Regional Land Information System (RLIS) database. The RLIS database is a geospatial database that contains information on land parcels, street networks, and other geographic features. The information in this database is derived from a variety of sources, including aerial photography, ground surveys, and other data. The information in this database is subject to change without notice. The information in this database is provided for informational purposes only. It is not intended to be used for legal or other purposes. For more information, contact the Metro Regional Land Information System at (503) 797-1742.

Feet
 0 1,500 3,000

Location Map

Clark Co.
Washington Co.
Multnomah Co.
Clackamas Co.

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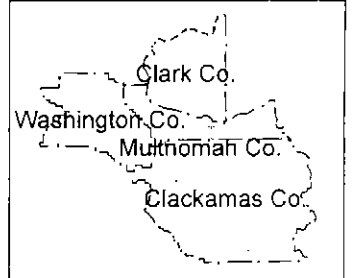
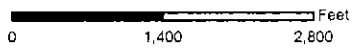


Alternatives Analysis

Study Area 2

SOURCES:

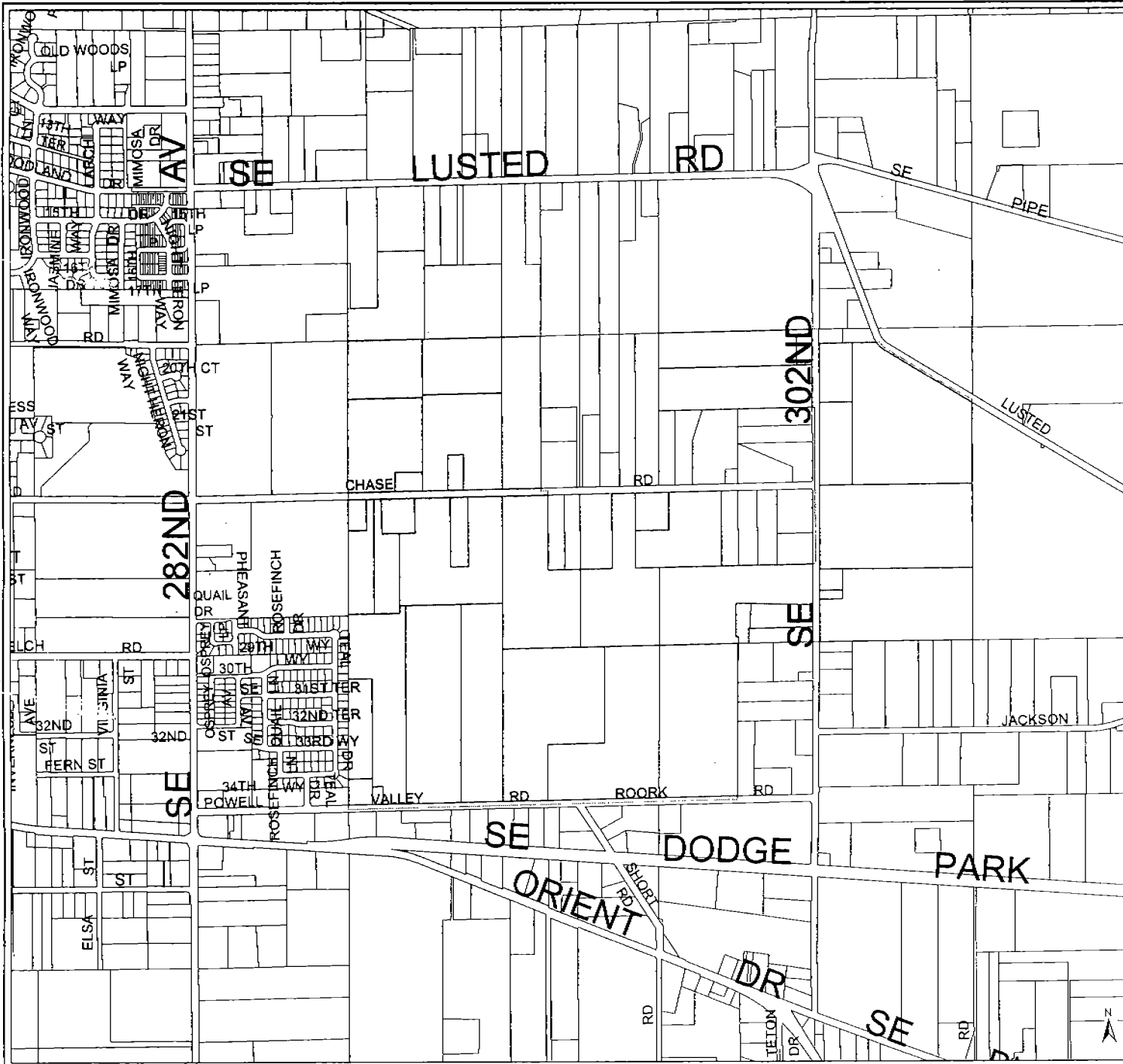
TAX LOT MAP
 County Assessment and Taxation eMaps, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.
 The information on this map is derived from the County Assessment and Taxation eMaps, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map



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Alternatives Analysis

Study Area 3

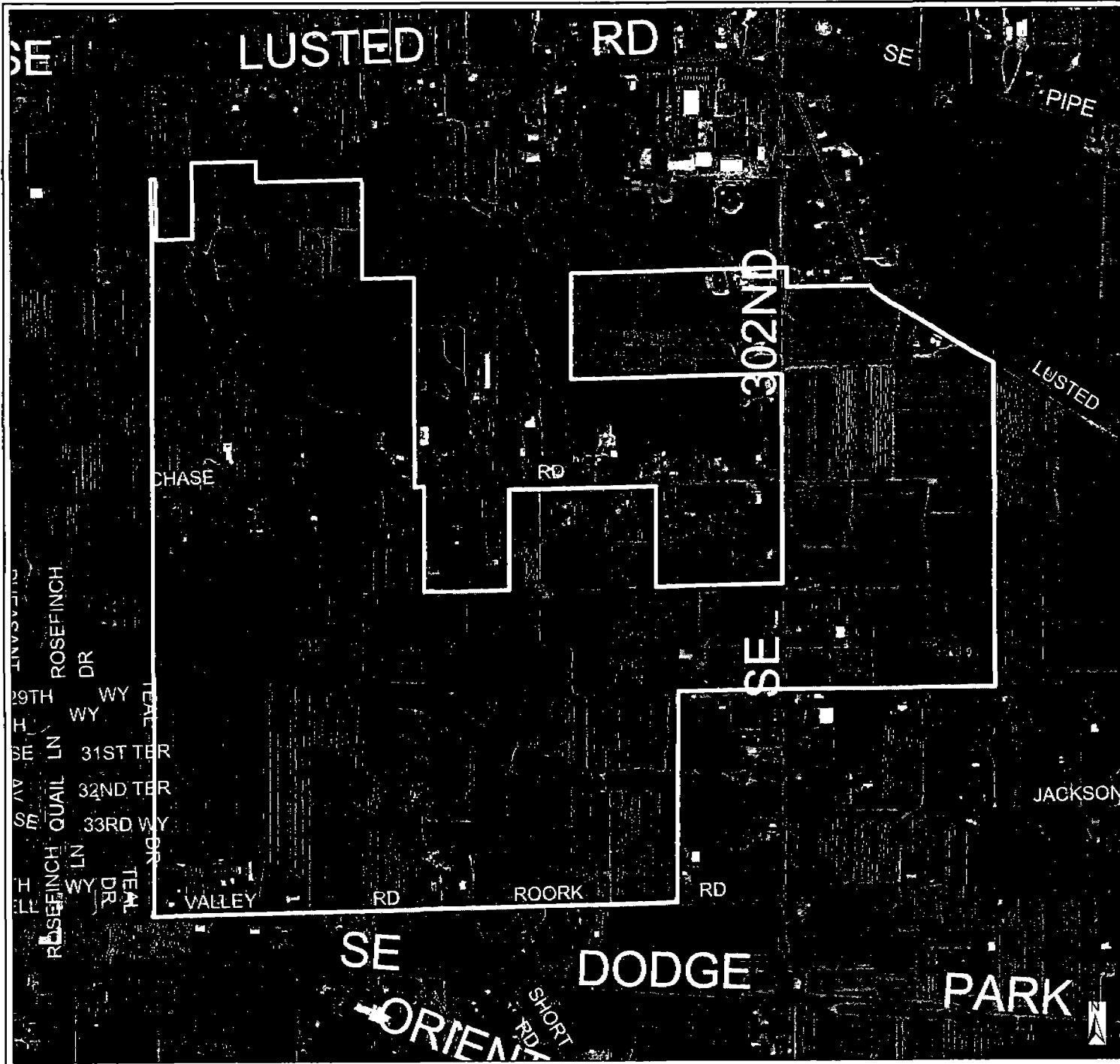
Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:
 TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.
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 drc@metro-dsl.or.us | www.metro-region.org

Feet
0 930 1,860

Location Map

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Alternatives Analysis

Study Area 3

SOURCES:

TAX LOT MAP
County Assessment and Taxation Office, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

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Feet
0 680 1,360


Location Map

METRO

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R L I S
REGIONAL LAND INFORMATION SYSTEM

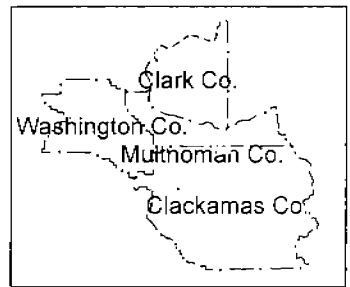
Alternatives Analysis

 Study Area 4


Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:
TAX LOT MAP
County Assessor and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Seavention, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

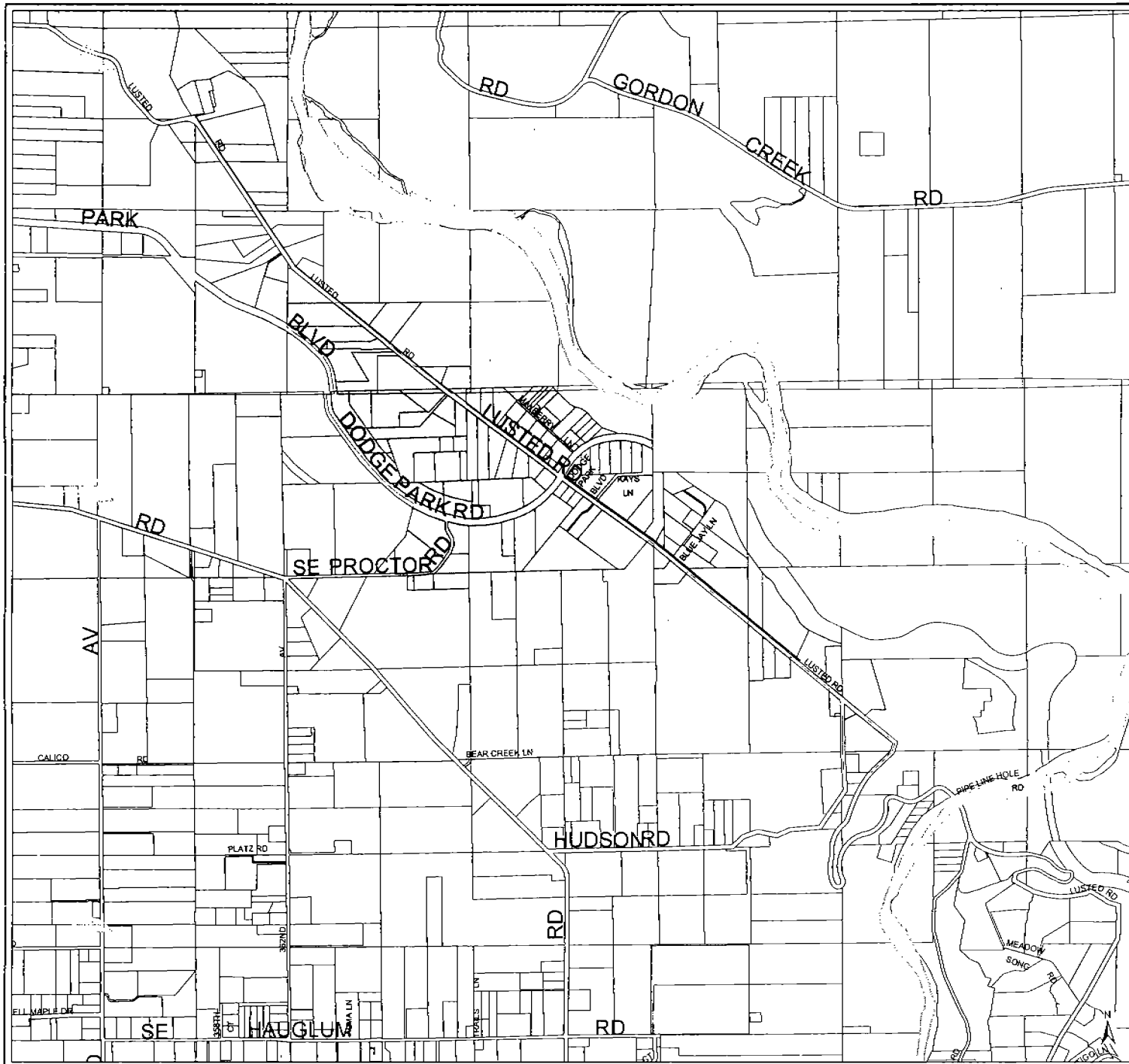
0 1,500 3,000 Feet

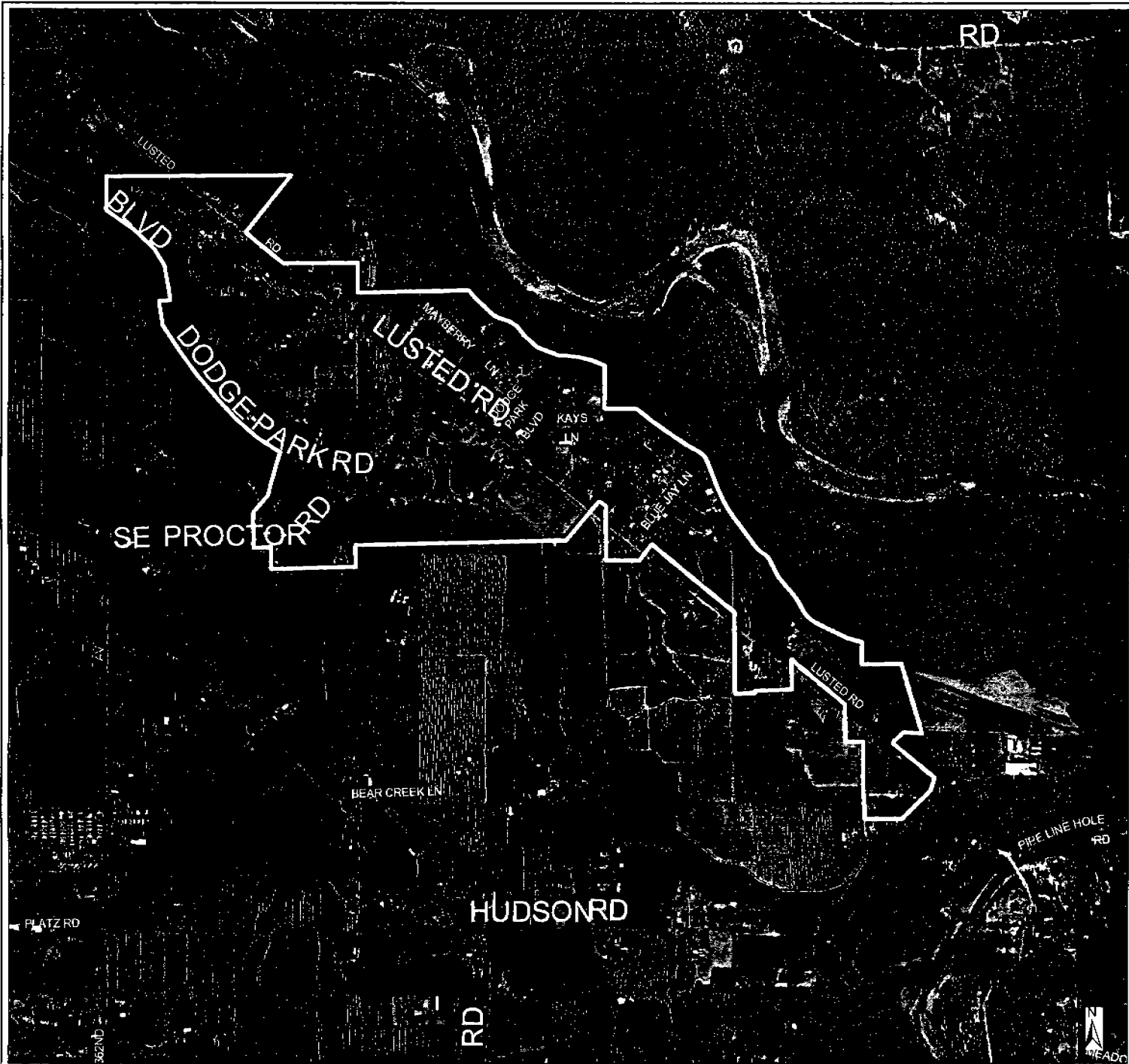


Location Map



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R L I S
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Alternatives Analysis

Study Area 4

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

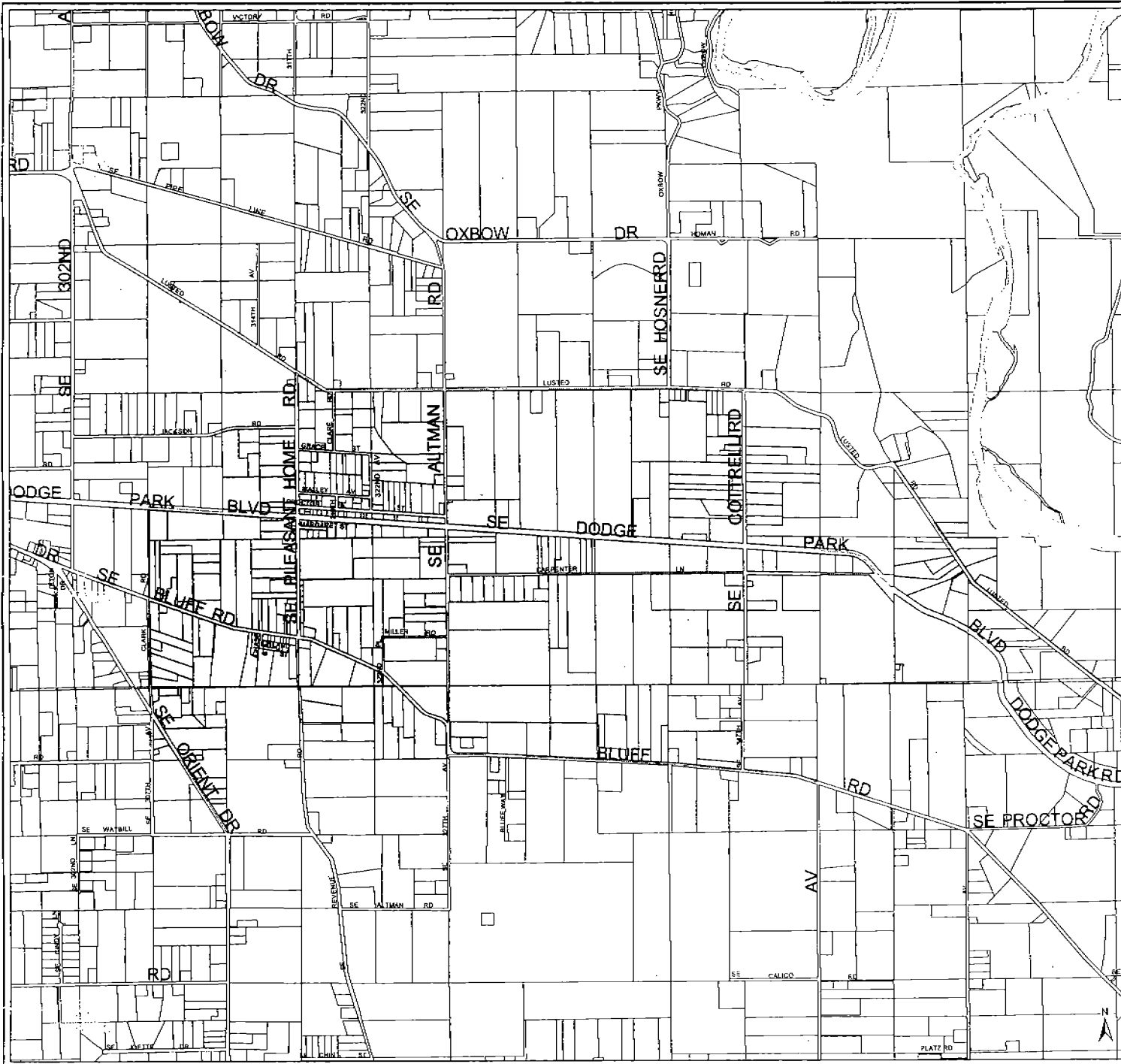
The above information is provided for informational purposes only. It is not intended to be used as a basis for any legal or financial decision. The user of this information should consult with a professional engineer or other qualified person for more information.

0 1,000 2,000 Feet

Location Map

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R L I S
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Alternatives Analysis

Study Area 5

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=400' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Newberg, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

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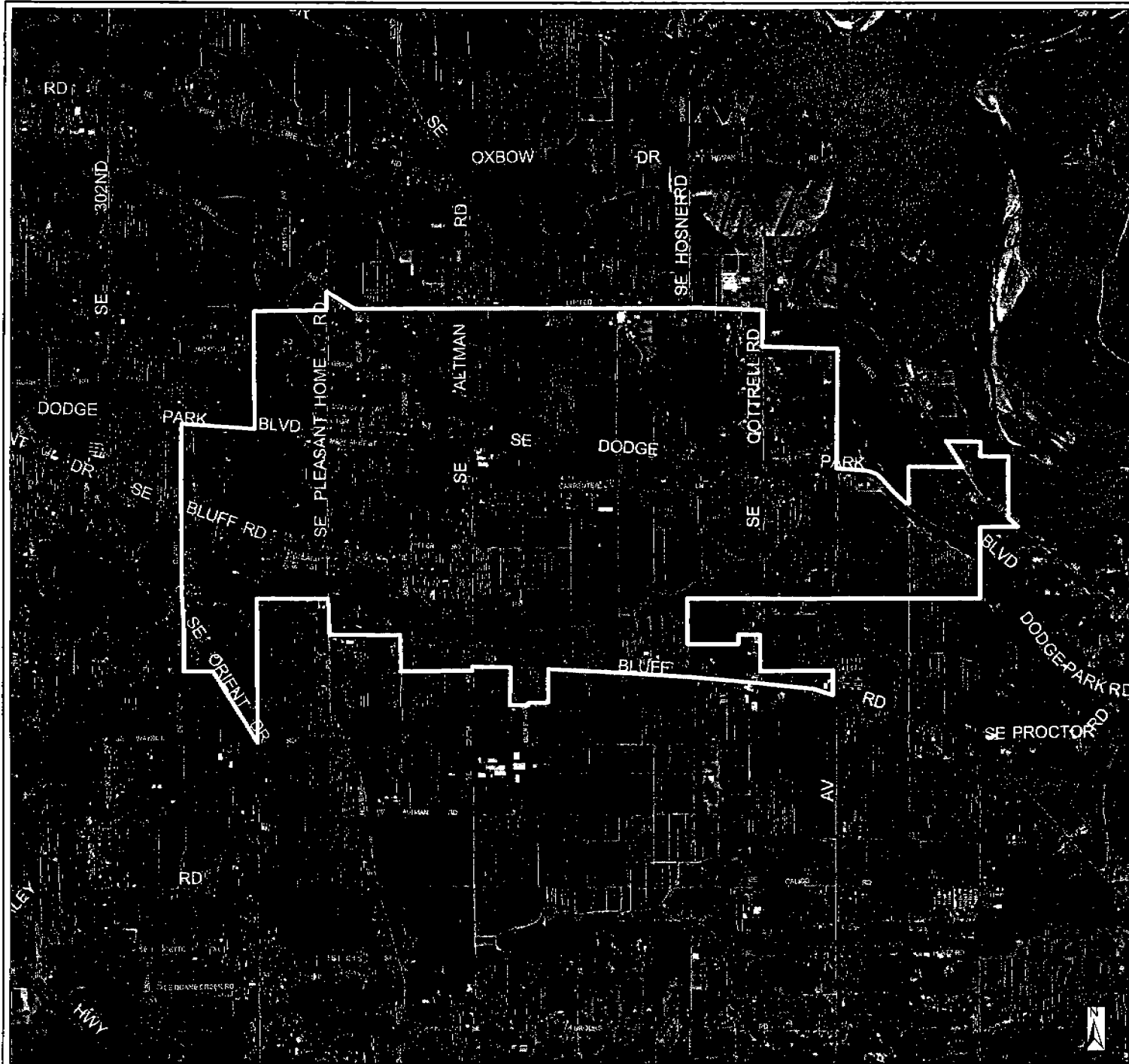
0 1,900 3,800
 Feet

Location Map

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 dr@metro.or.us | www.metro-regen.org

Alternatives Analysis

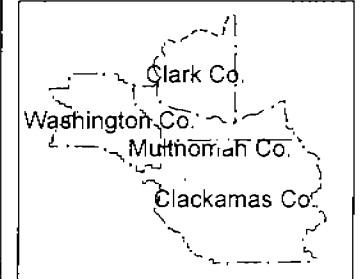
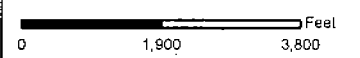
Study Area 5



SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Date collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Seaside, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

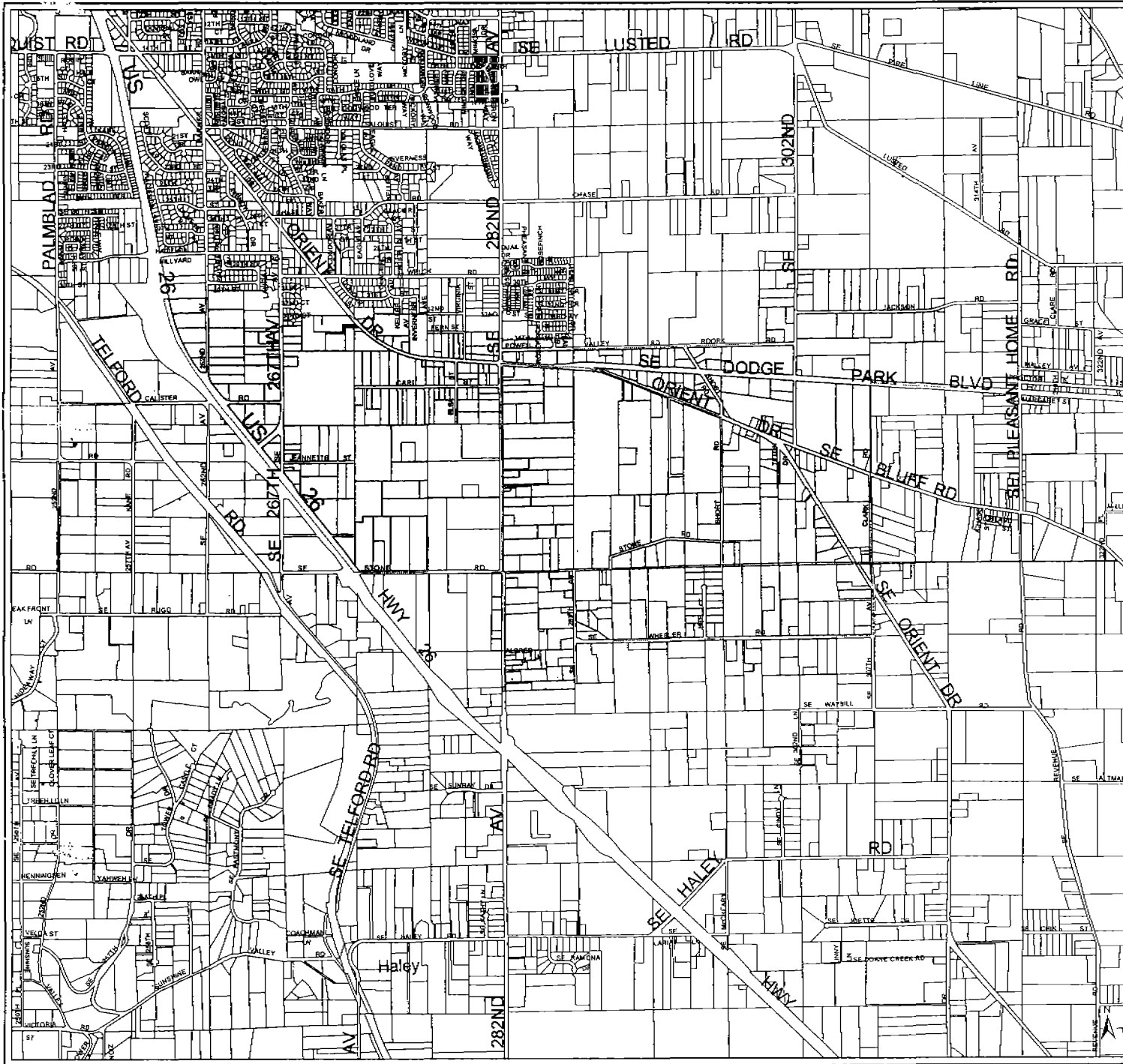
Topographic data was collected in May, June and July 2001. The data was collected using a Trimble 5600 GPS receiver and a Trimble 5600 data collector. The data was collected using a Trimble 5600 GPS receiver and a Trimble 5600 data collector. The data was collected using a Trimble 5600 GPS receiver and a Trimble 5600 data collector.



Location Map



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Alternatives Analysis

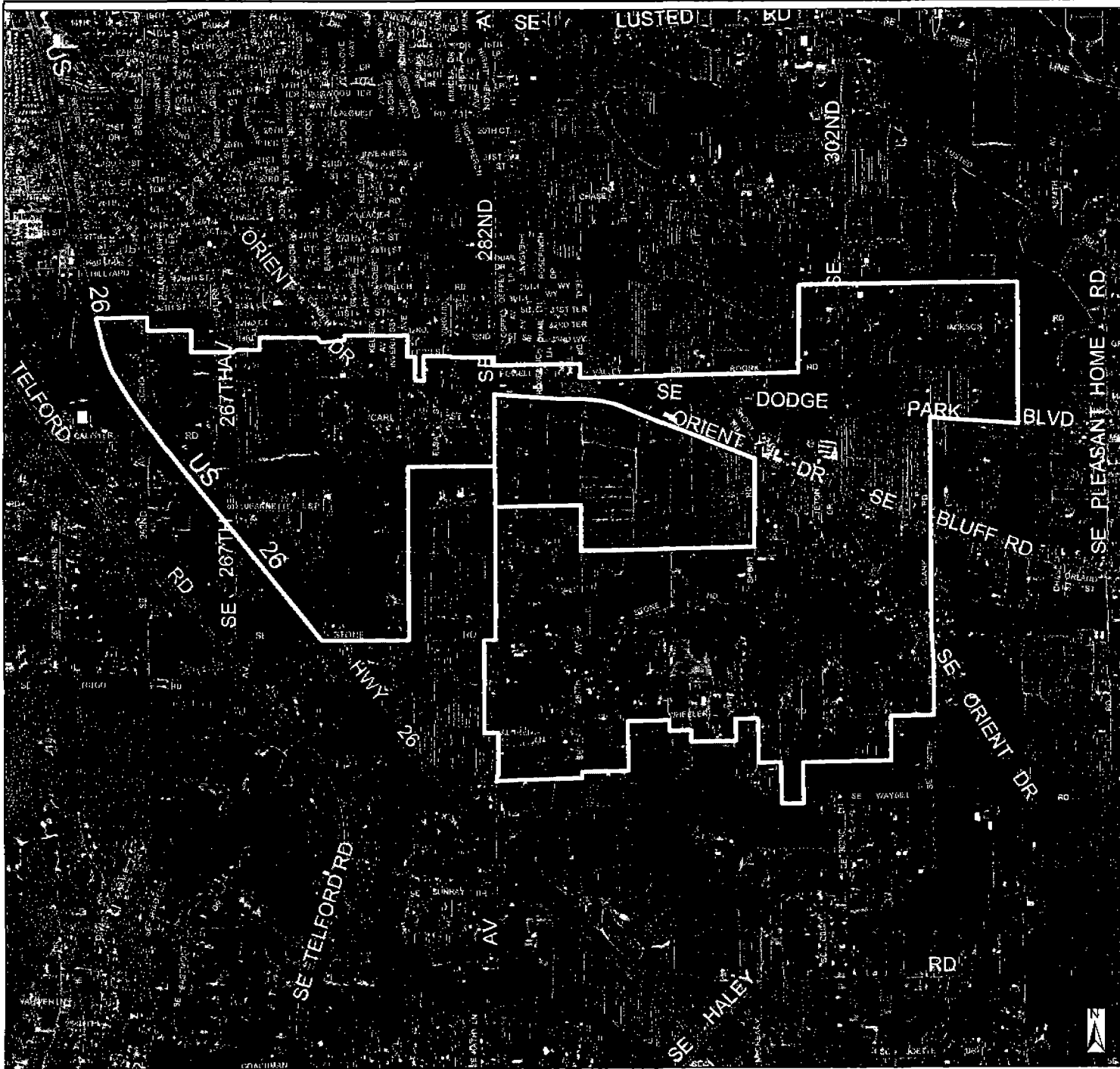
Study Area 6

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:
 TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=430' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

Location Map

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Alternatives Analysis

Study Area 6

SOURCES:


TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Gresham, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

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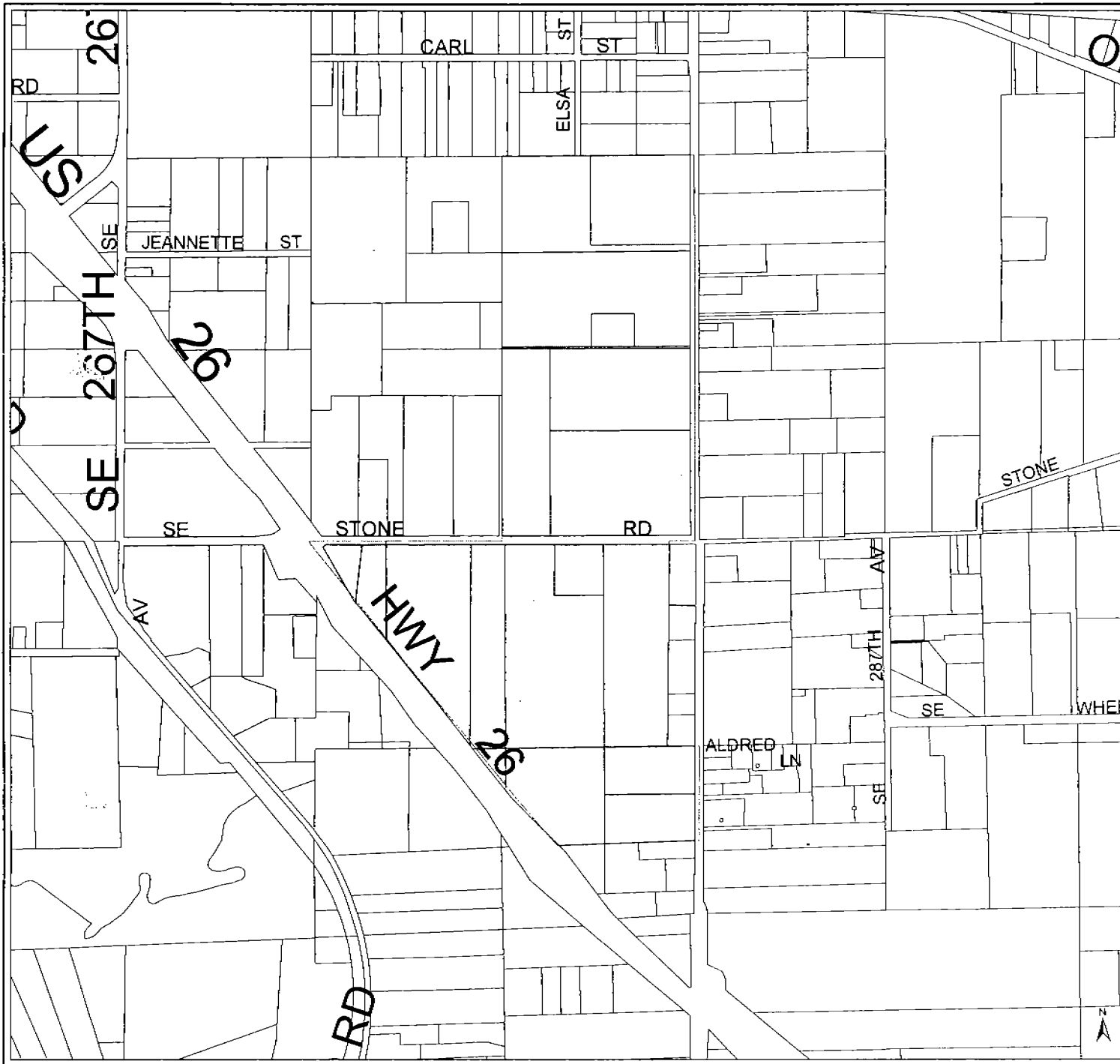
0 1,800 3,600 Feet

Clark Co.
Washington Co.
Multnomah Co.
Clackamas Co.

Location Map


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R L I S
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Alternatives Analysis

Study Area 7

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES

TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=400' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Mawukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

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0 760 1,520 Feet

Location Map

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Alternatives Analysis

Study Area 7

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

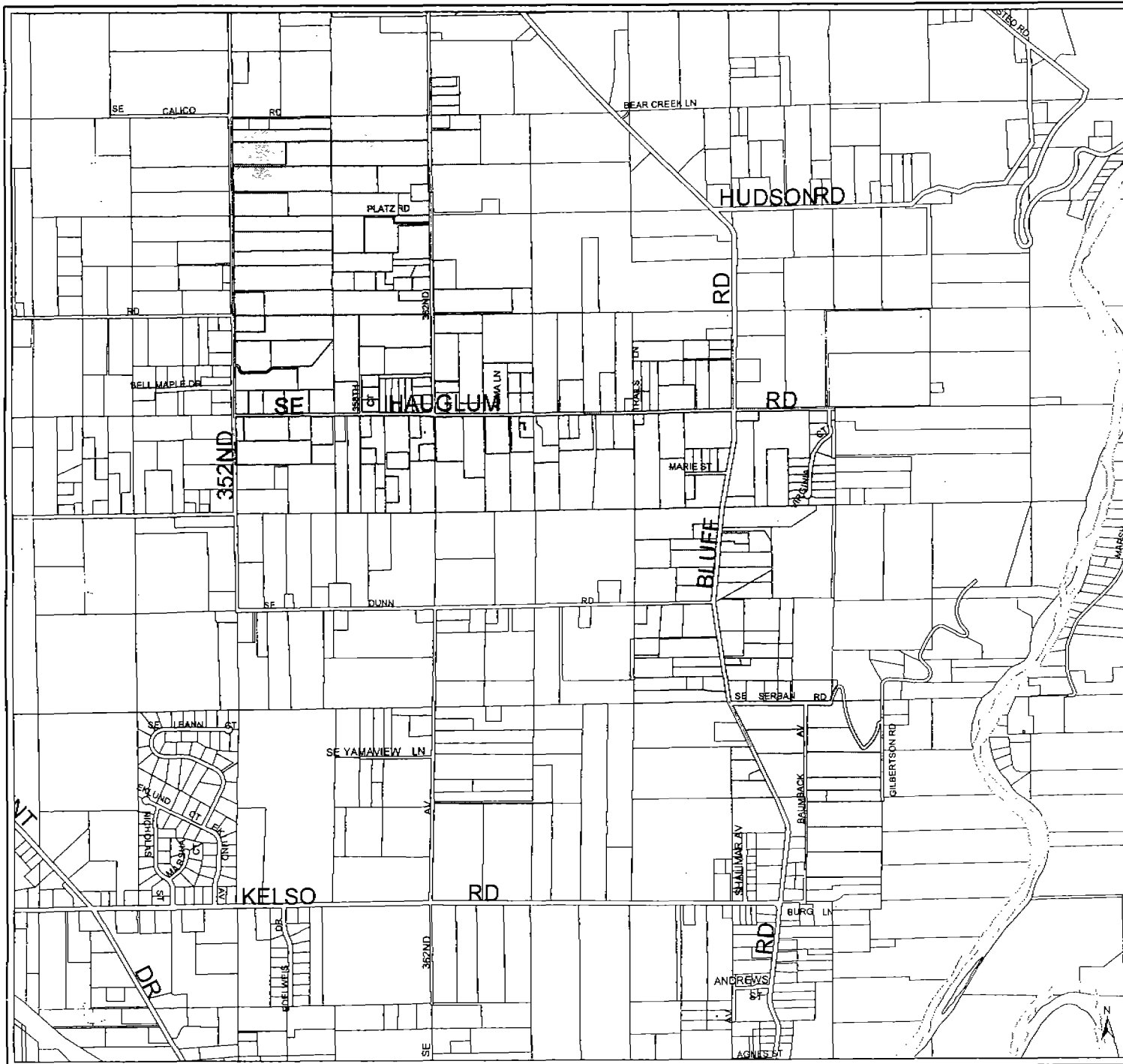
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Feet
0 660 1,320

Clark Co.
Washington Co.
Multnomah Co.
Clackamas Co.

Location Map

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Alternatives Analysis

Study Area 8

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

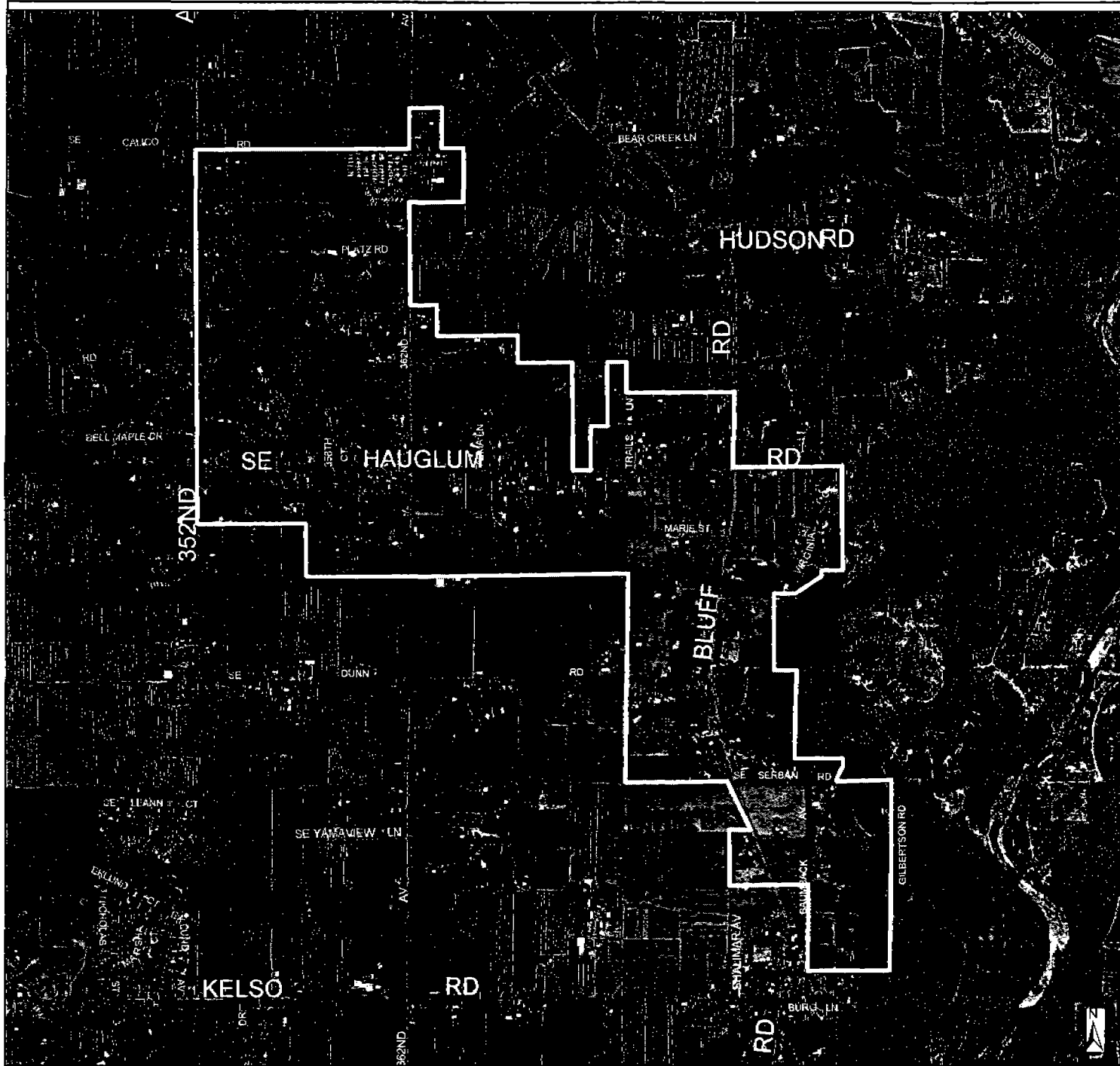
SOURCES:
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus four feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

This map is a technical drawing of the information shown. It is not a photograph or an aerial view. It is not intended to be used for navigation or to determine exact boundaries. It is intended to show the general location and relative positions of the features shown. It is not intended to be used for legal purposes. It is intended to be used for informational purposes only.

0 1,500 3,000 Feet

Location Map

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Alternatives Analysis

Study Area 8

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

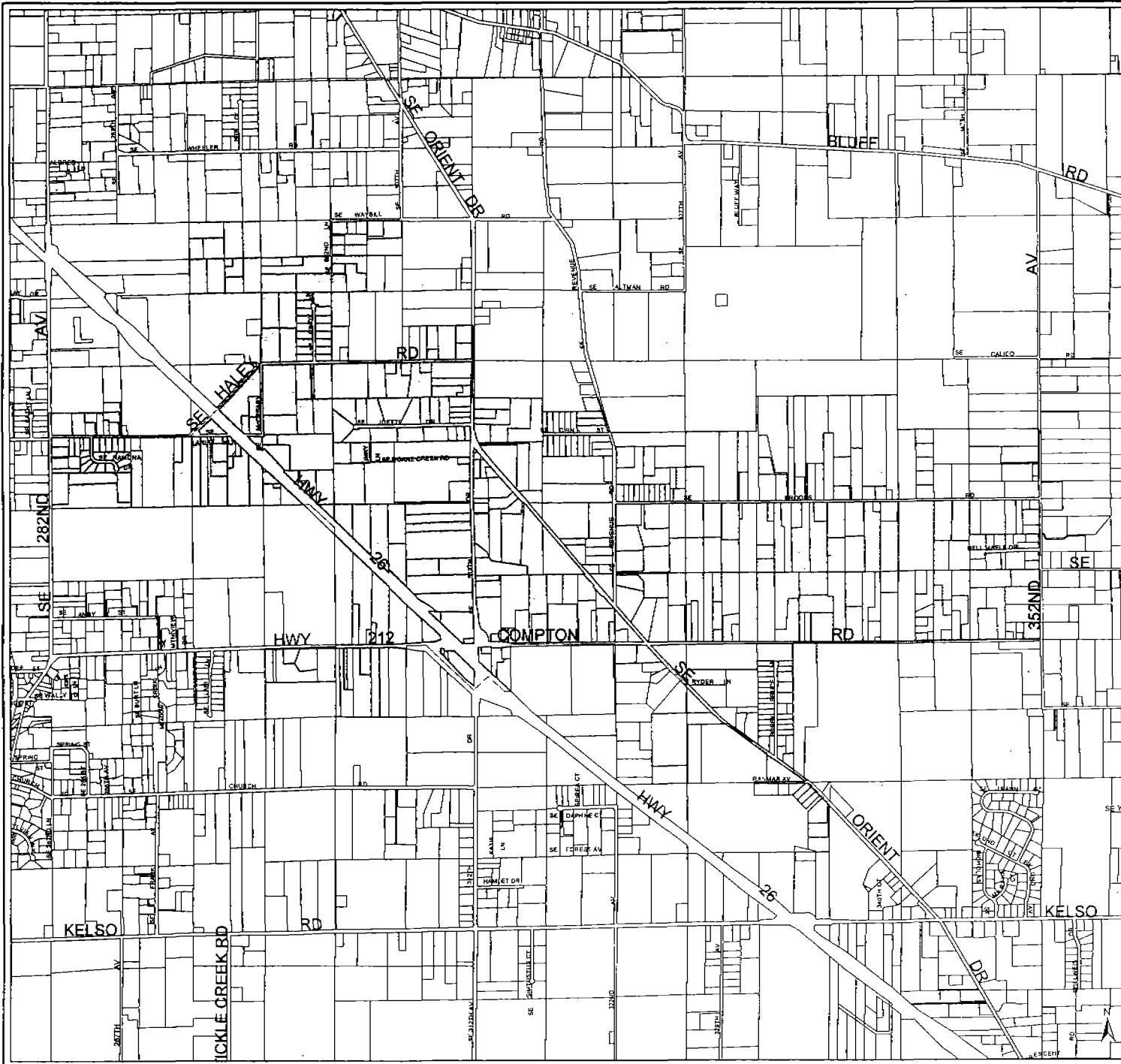
The subject of this map is the study area shown on the map. The map is not intended to be used for any other purpose. The map is not intended to be used for any other purpose. The map is not intended to be used for any other purpose.

0 1,300 2,600 Feet

Clark Co.
Washington Co.
Multnomah Co.
Clackamas Co.


Location Map

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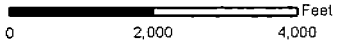
Alternatives Analysis

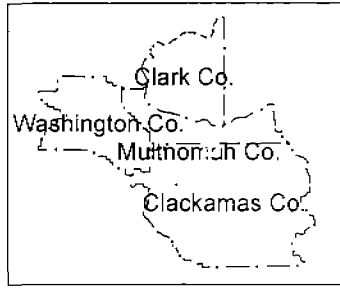
 Study Area 9

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).


SOURCES

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

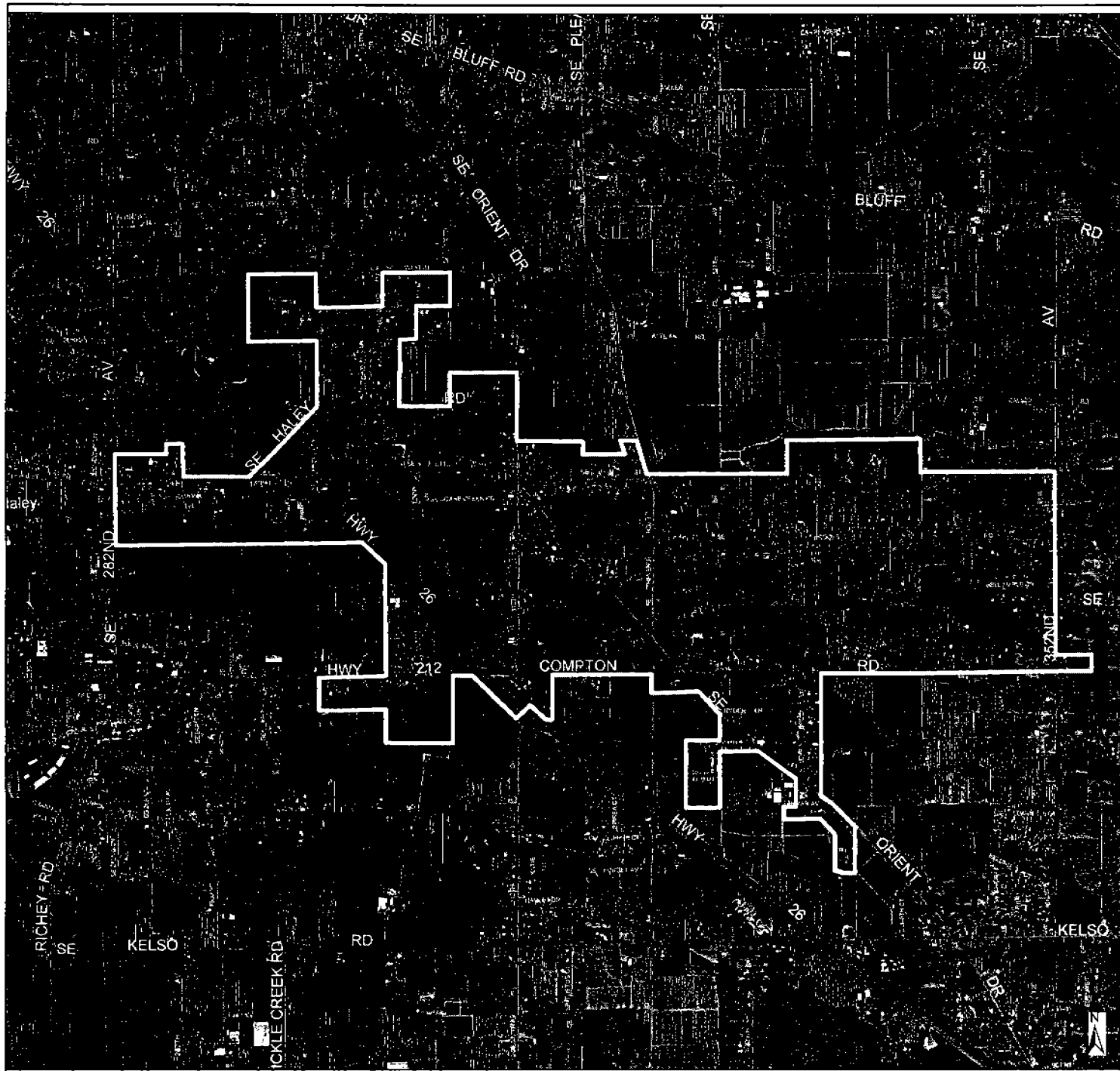




Location Map



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R L I S
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Alternatives Analysis

Study Area 9

SOURCES:

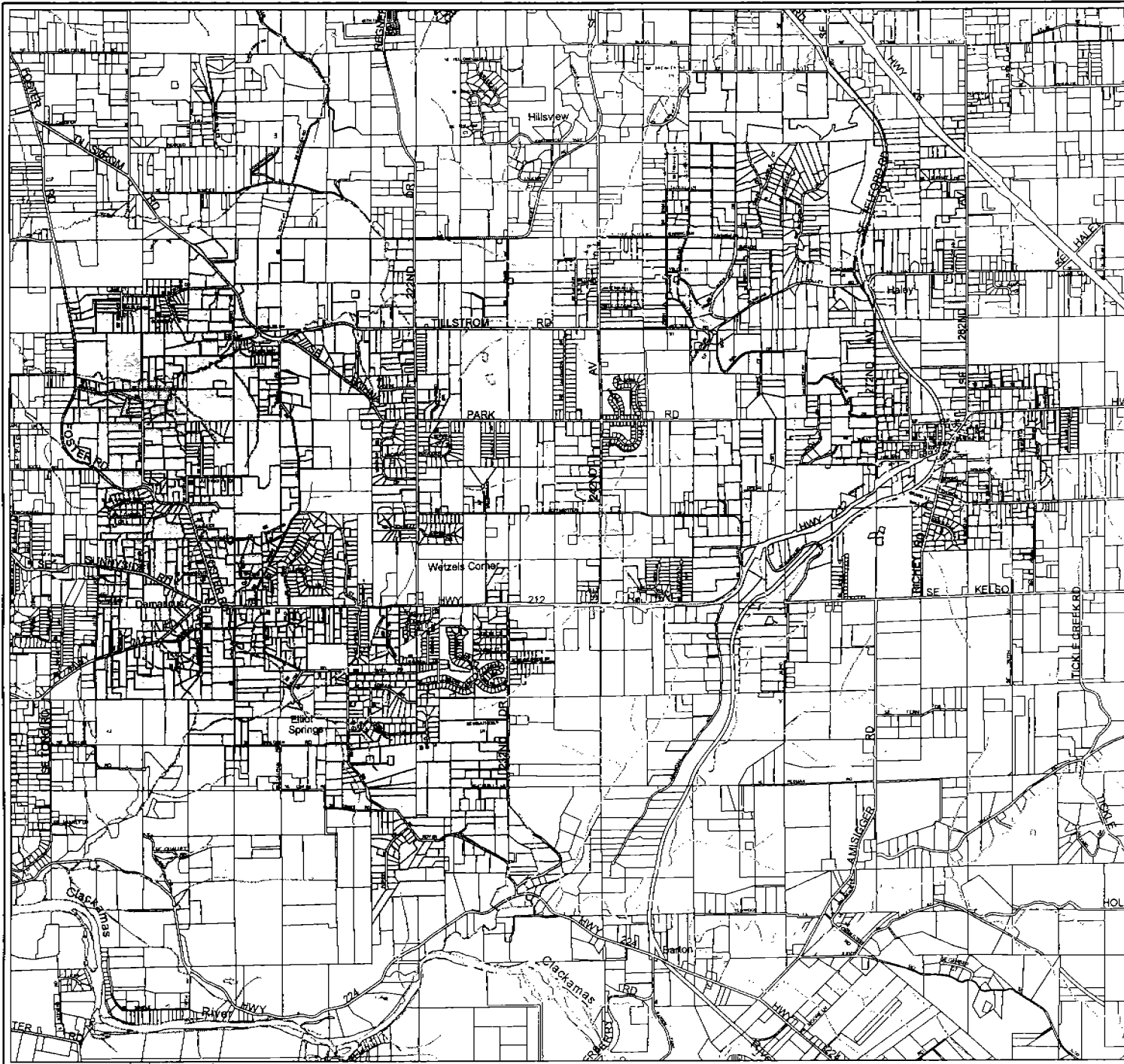
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

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0 1,900 3,800 Feet

Location Map

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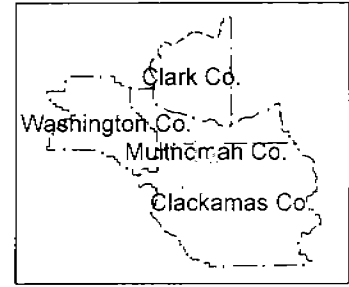


Alternatives Analysis

Study Area 10

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

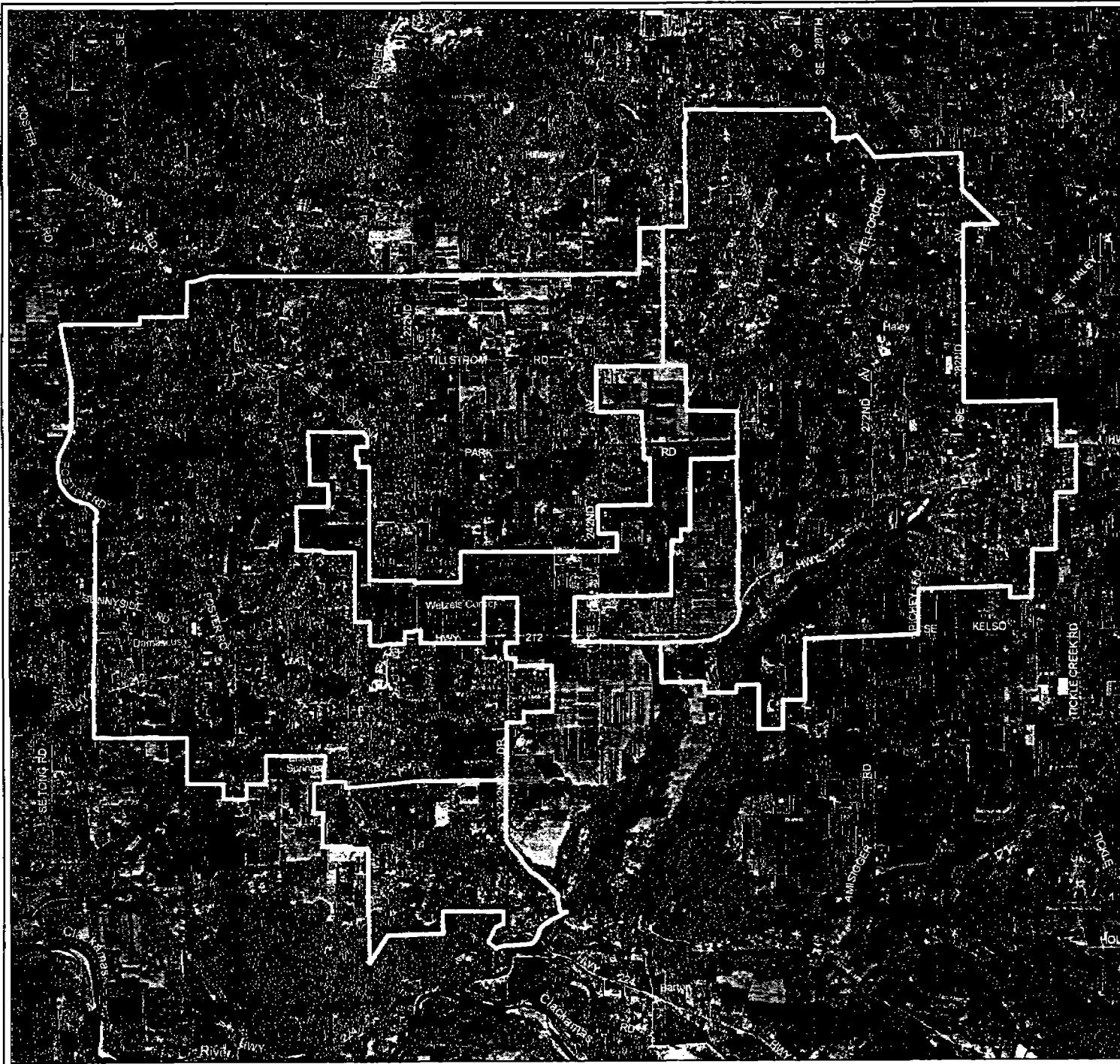
SOURCES:
TAX LOT MAP
 County Assessment and Taxation offices; 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tualatin and Multnomah County. Other areas are plus or minus ten feet.



Location Map



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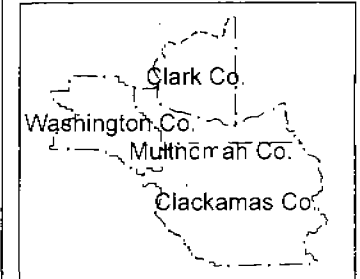
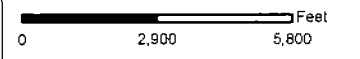


Alternatives Analysis

Study Area 10

SOURCES:

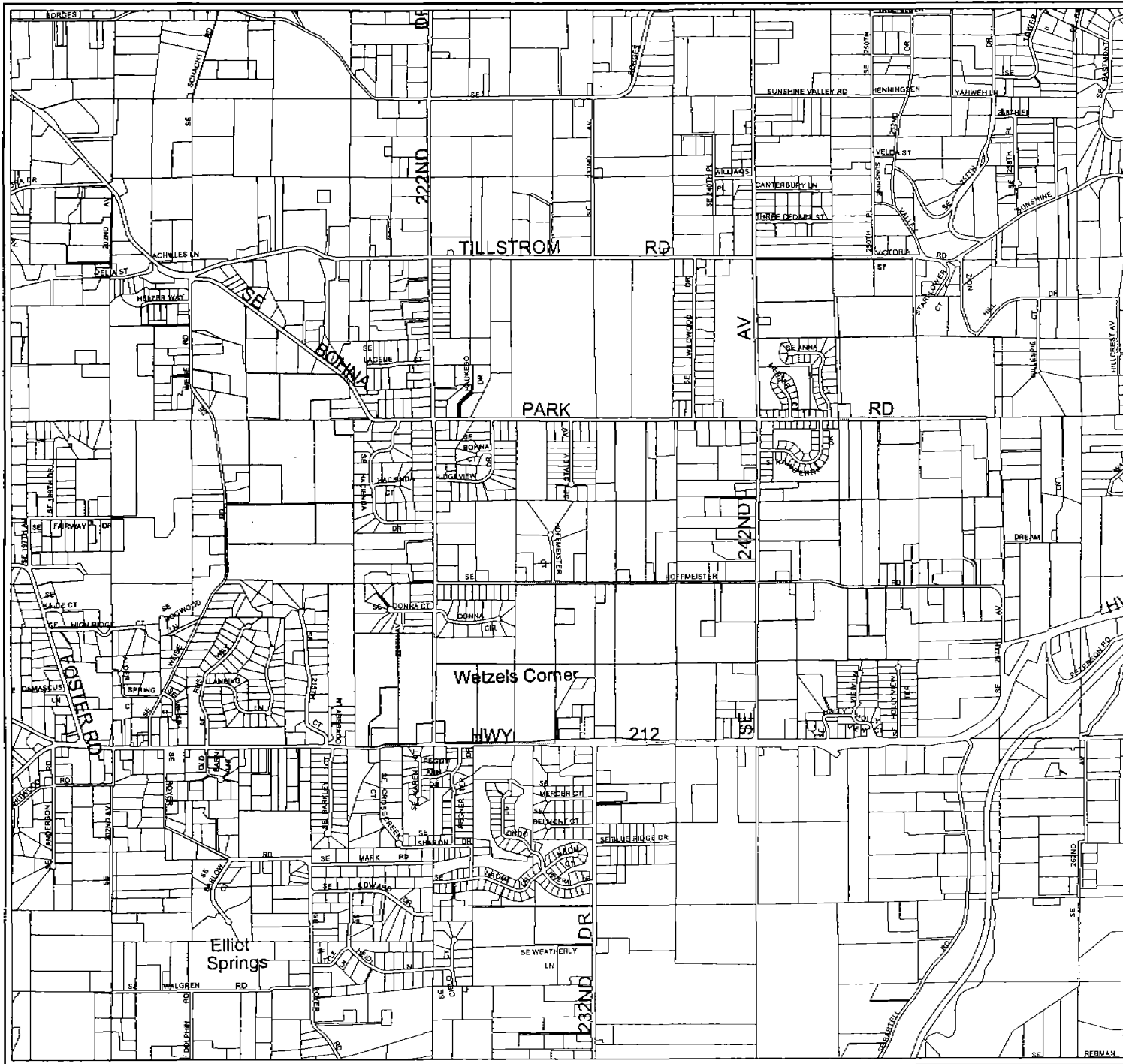
TAX LOT MAP
County Assessment and Taxation Offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map



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REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 11


Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

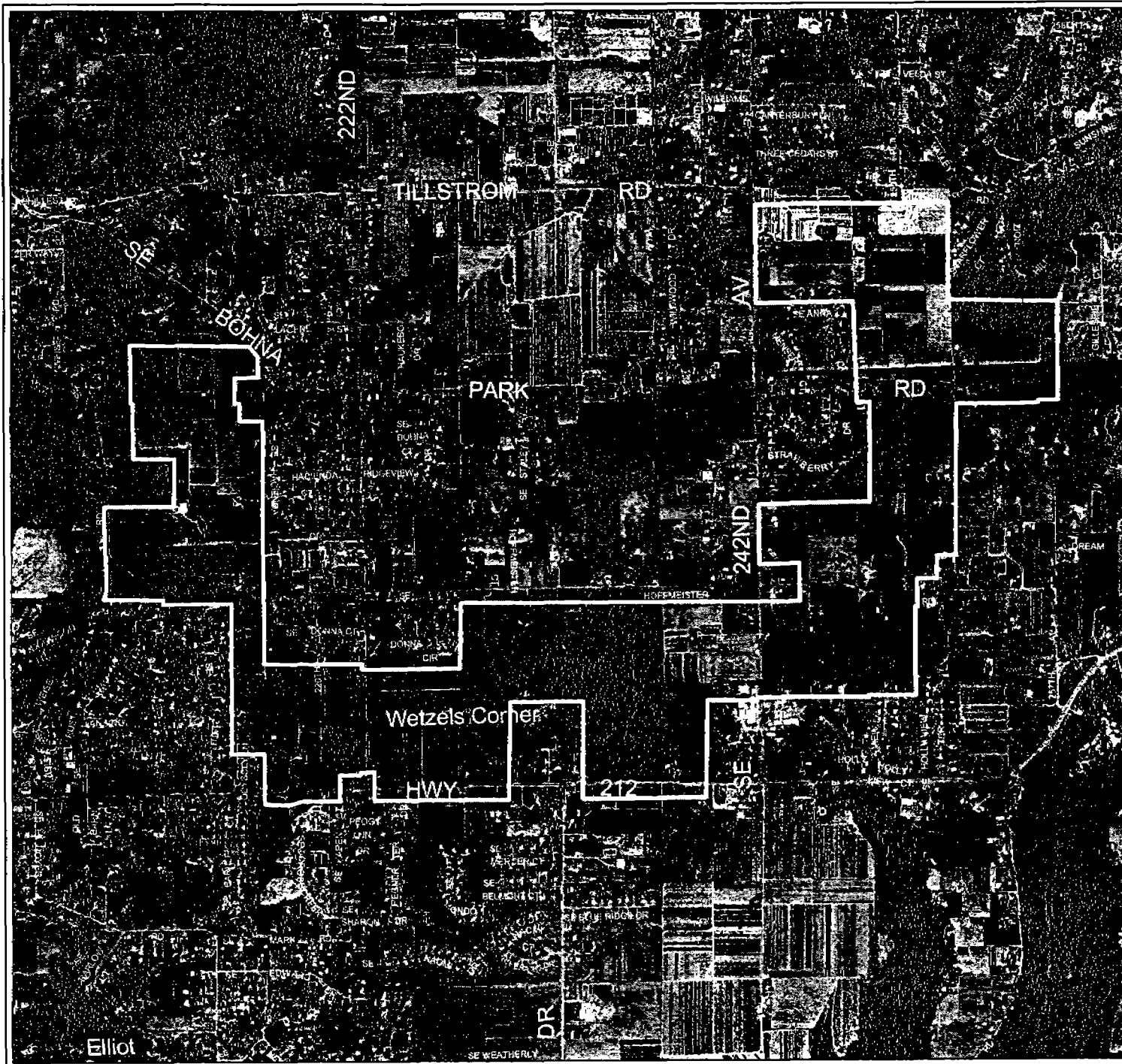
0 1,800 3,600 Feet

Clark Co.
Washington Co.
Multnomah Co.
Clackamas Co.

Location Map


METRO

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dlc@metro-ori.or.us www.metro-reg.or.us



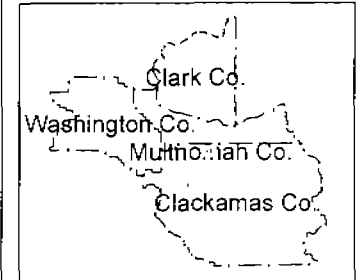
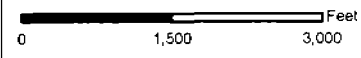
Alternatives Analysis

Study Area 11

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

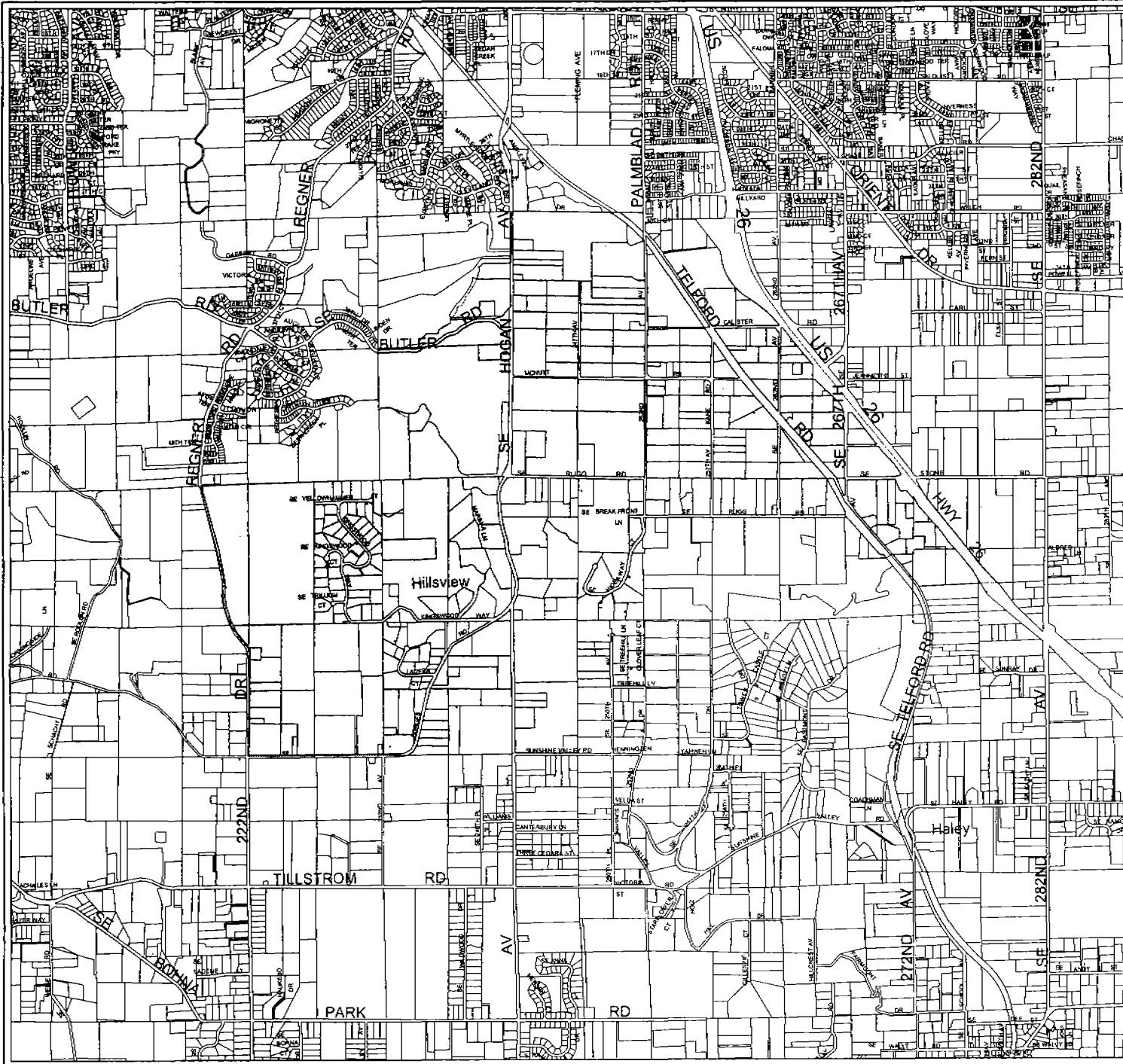
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Location Map



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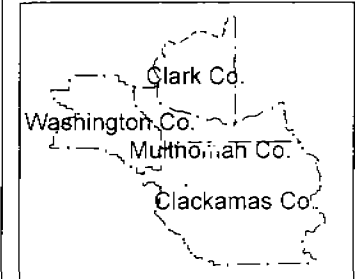
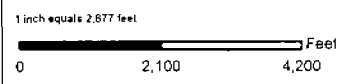


Alternatives Analysis

Study Area 12

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

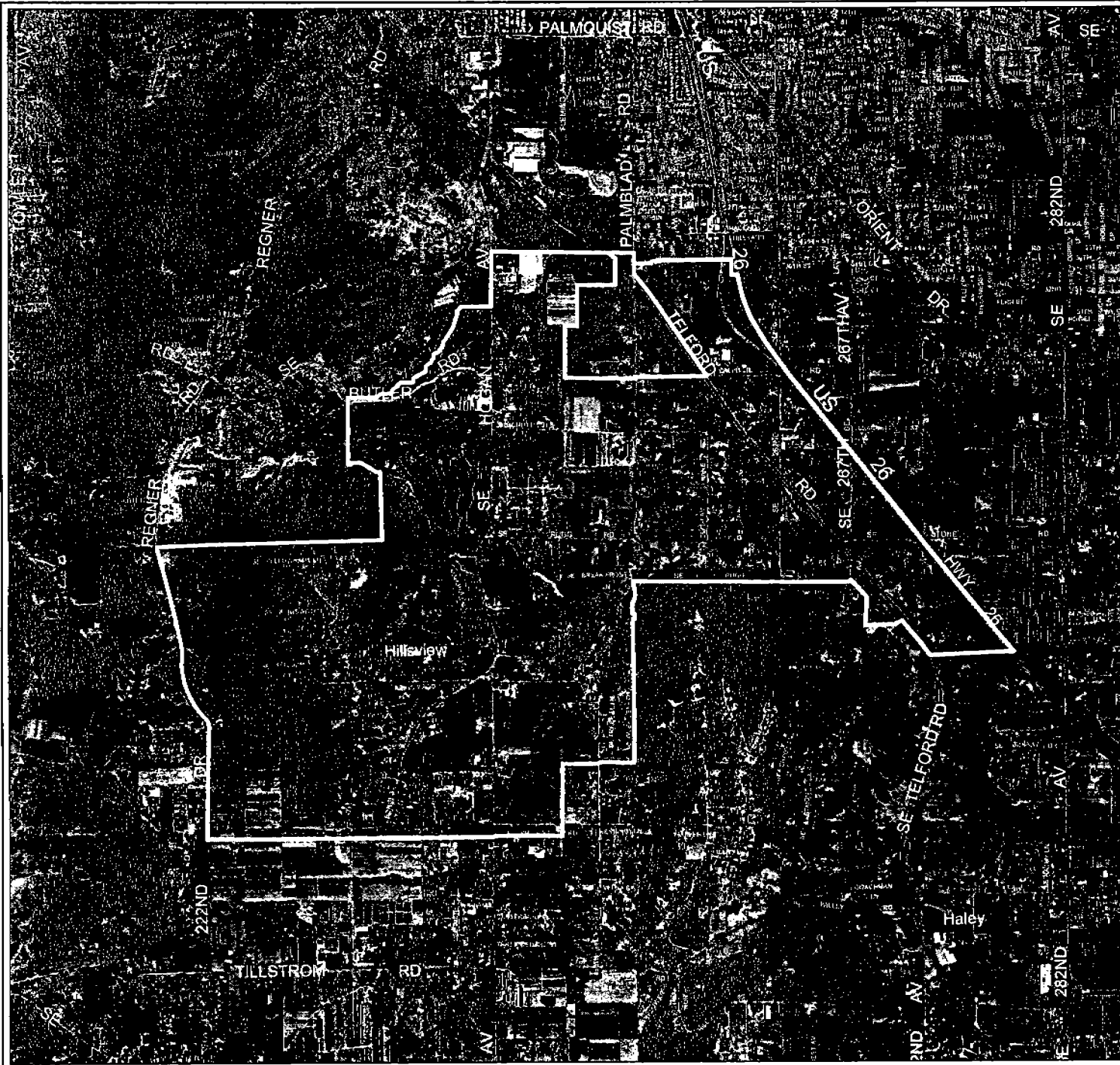
SOURCES:
TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map



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Alternatives Analysis

Study Area 12

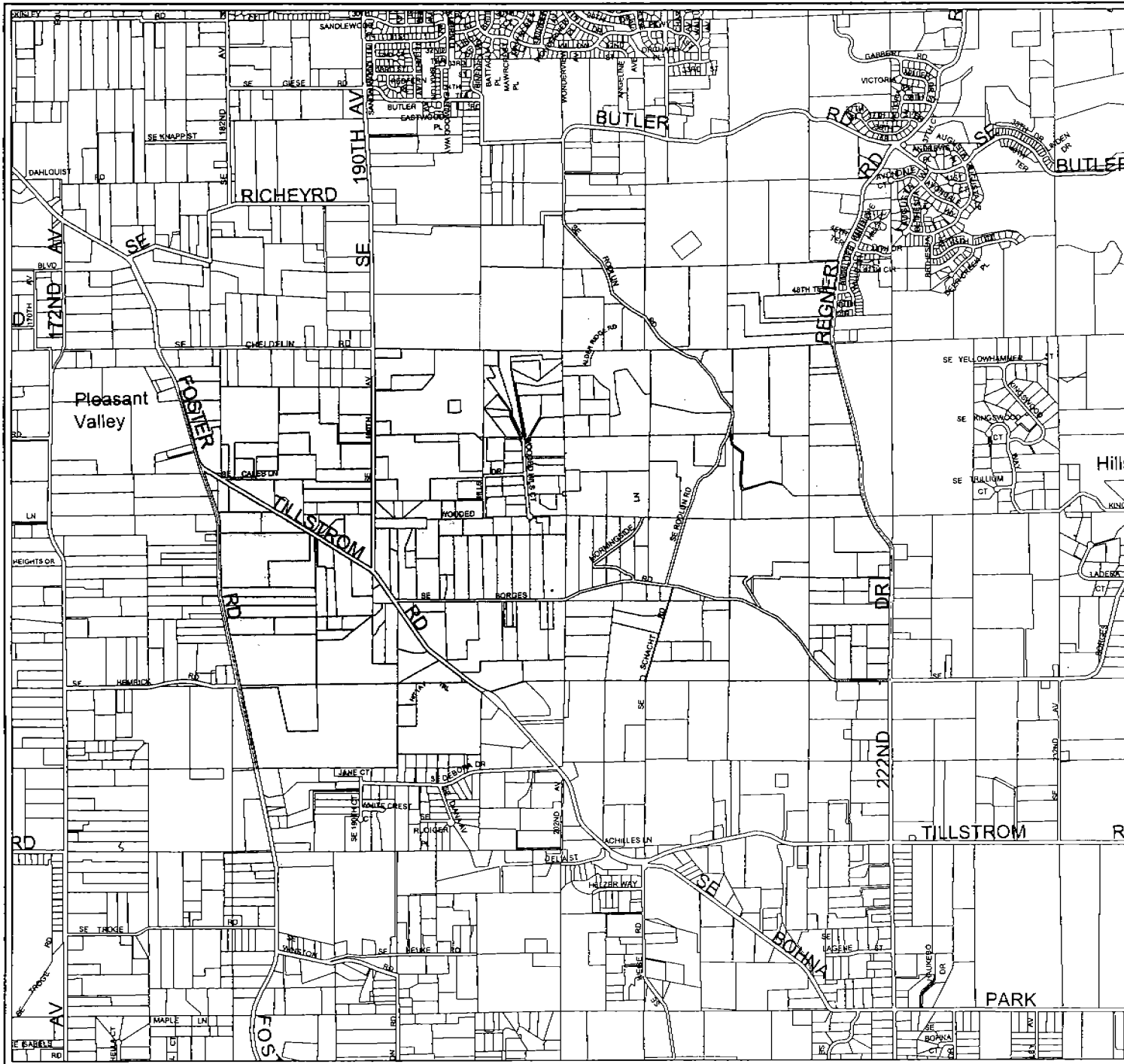
SOURCES:

TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

Location Map

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R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 13


Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:
TAX LOT MAP
 County Assessment and Taxation Offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.
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0 1,900 3,800 Feet

Clark Co.
 Washington Co.
 Multnomah Co.
 Clackamas Co.

Location Map


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 orc@metro.dst.or.us | www.metro.ti.gdn.org



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Alternatives Analysis

Study Area 13

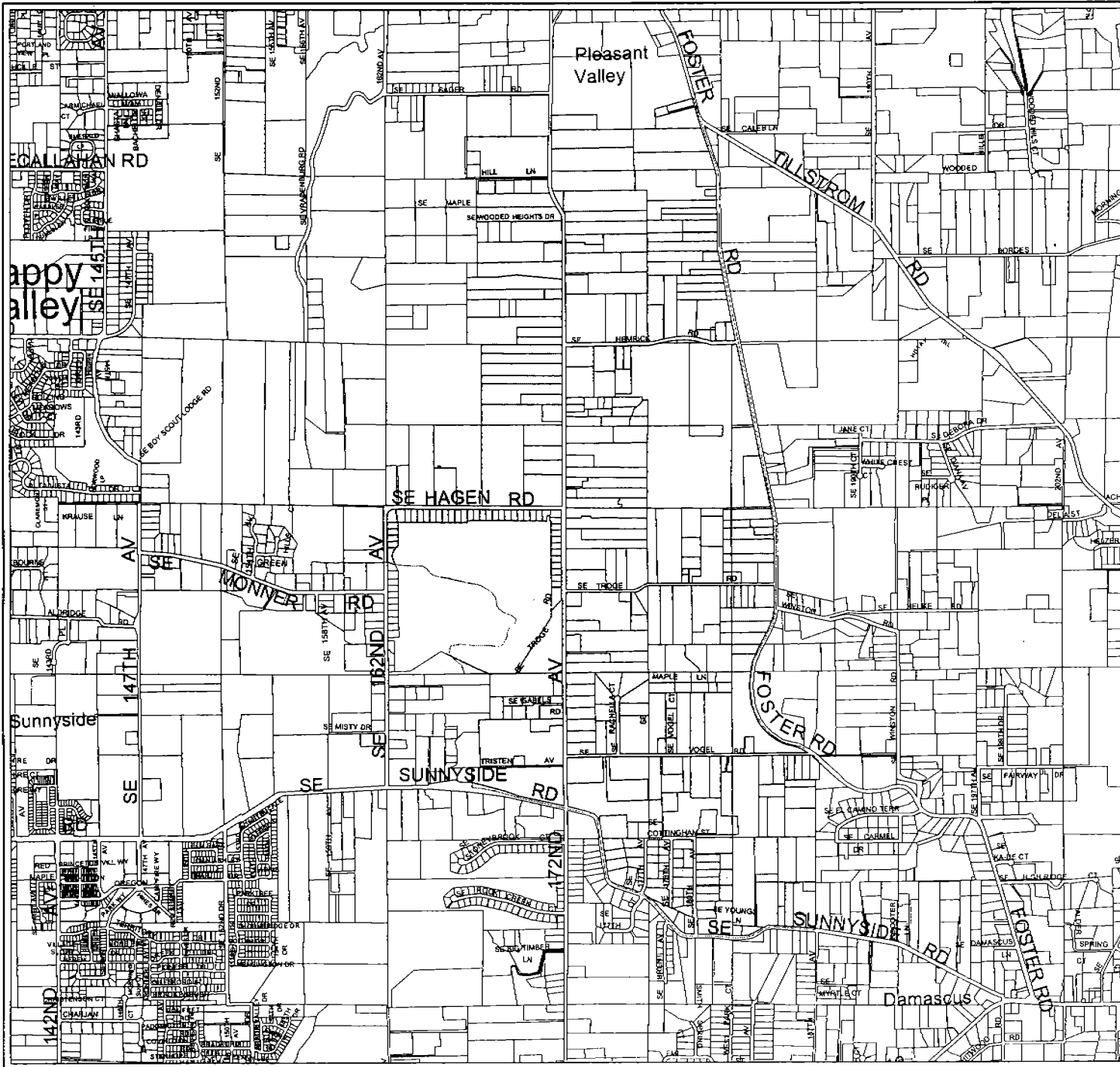
SOURCES:

TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

Scale:
 0 1,400 2,800 Feet

Location Map

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Alternatives Analysis

Study Area 14

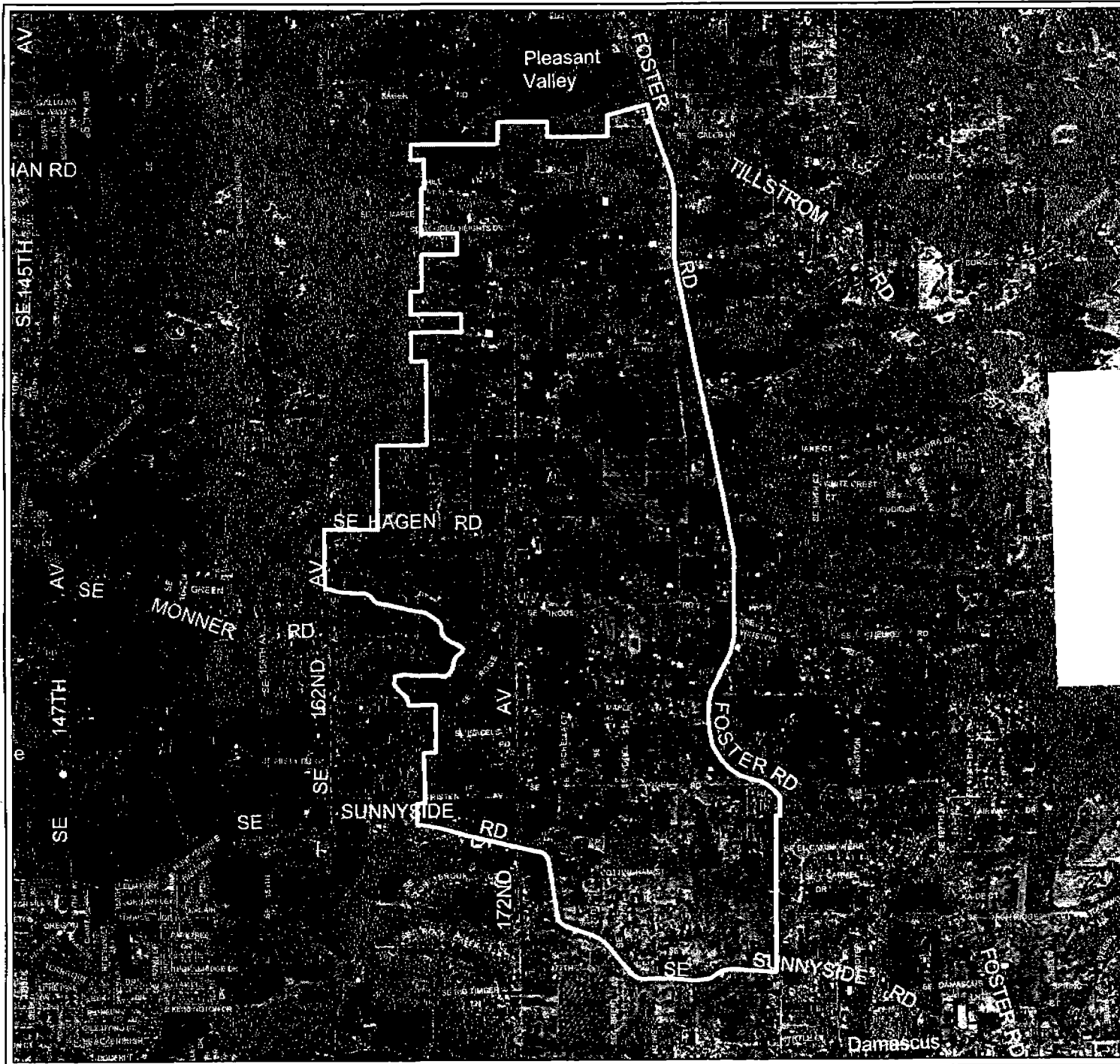
Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

Location Map

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dlr@metro-ols.or.us | www.metro-region.org



R L I S
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Alternatives Analysis

Study Area 14

SOURCES:

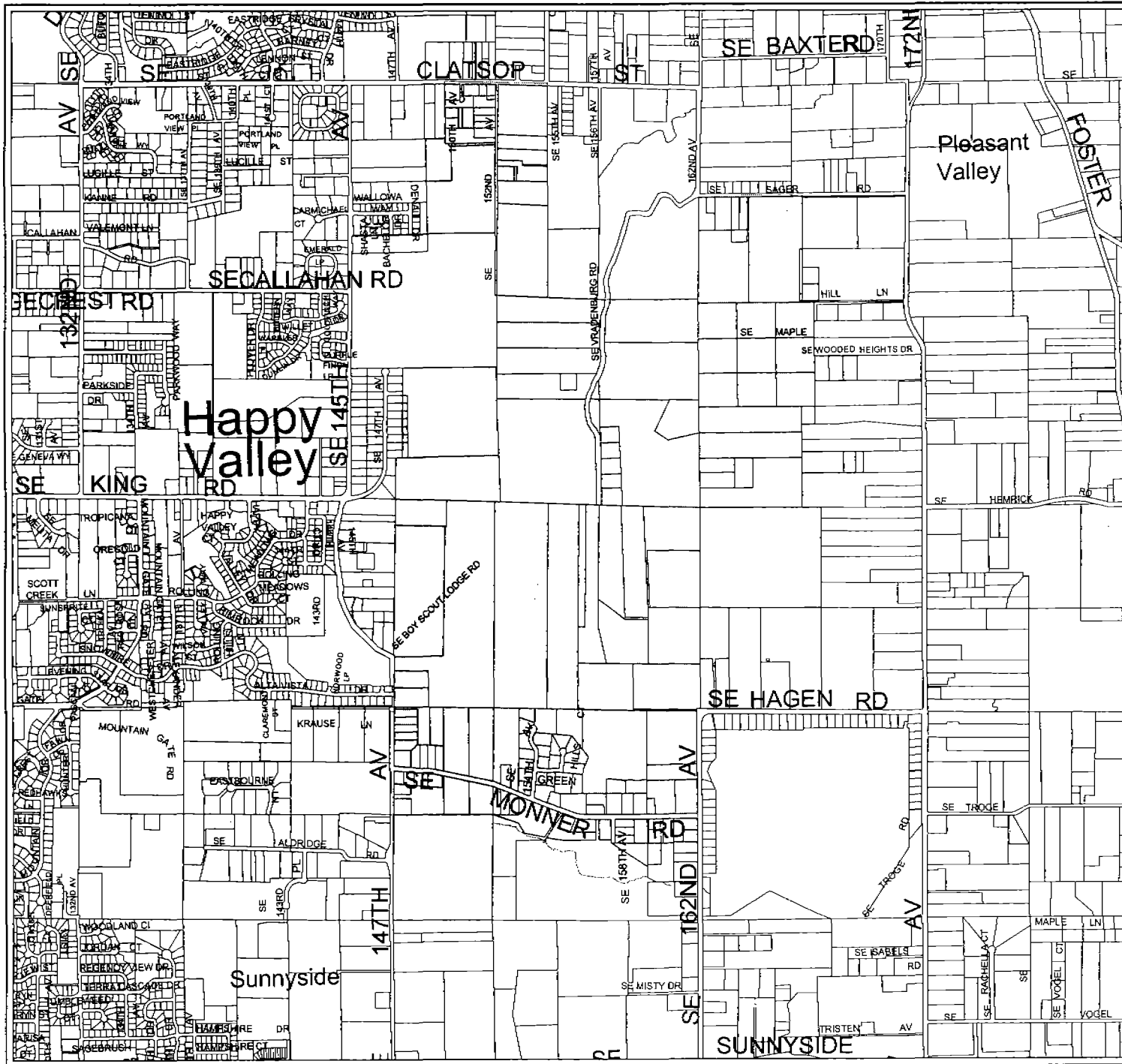
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=400' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

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Feet
0 1,750 3,500

Location Map

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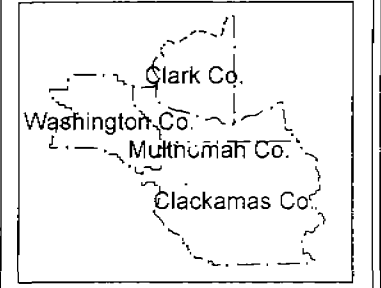
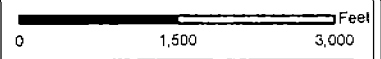


Alternatives Analysis

Study Area 15

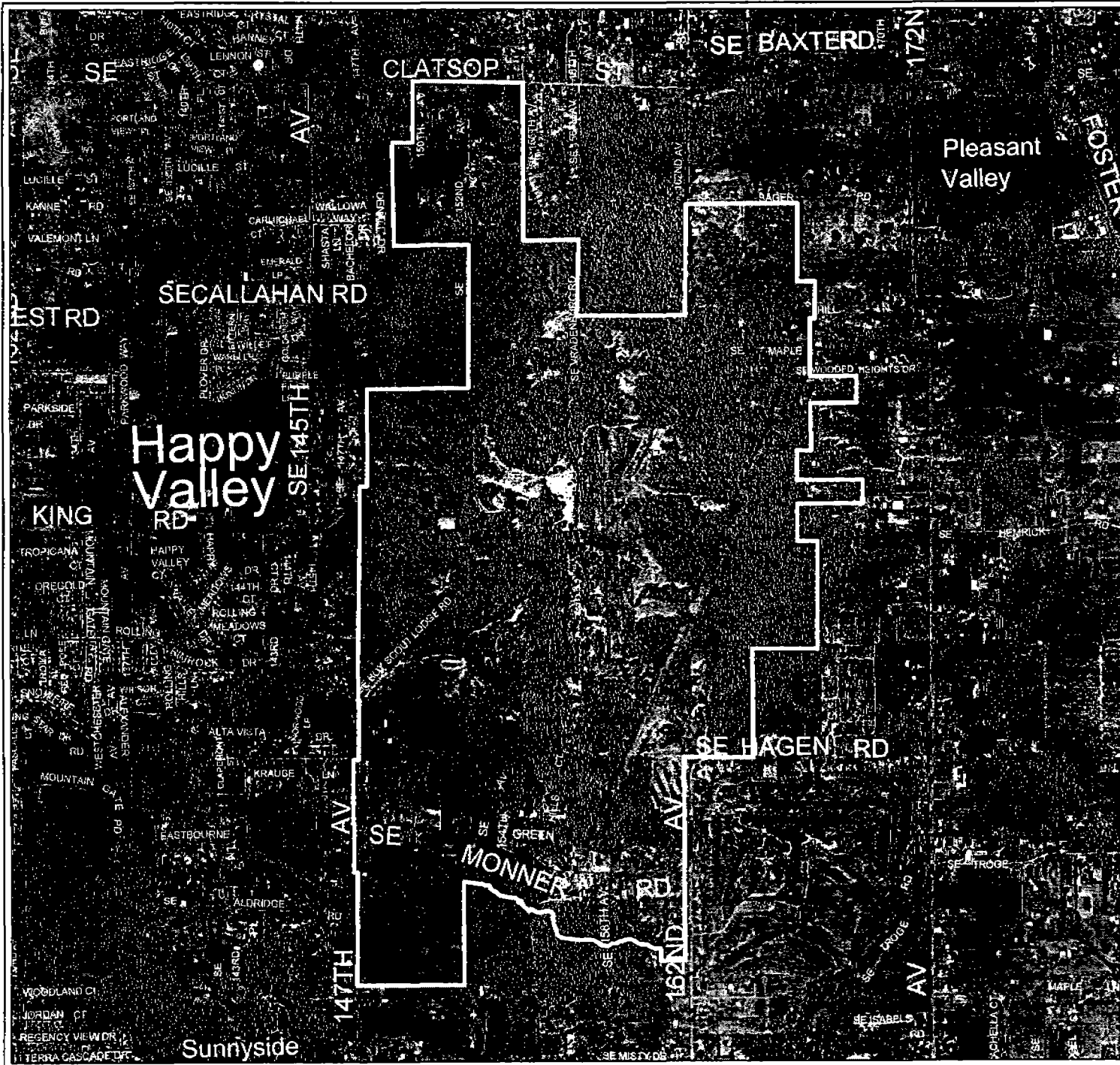
Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:
TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=400' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in built-up areas, 1/4 mile in open areas, 1/2 mile in rural areas, and 1/4 mile in urban areas. Other areas are plus or minus ten feet.
 The official tax lot map is available for purchase from the County Assessor's Office, 2001. Data collection scale is 1"=400' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in built-up areas, 1/4 mile in open areas, 1/2 mile in rural areas, and 1/4 mile in urban areas. Other areas are plus or minus ten feet.



Location Map

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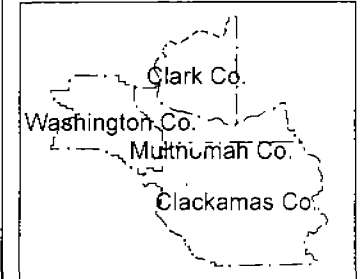
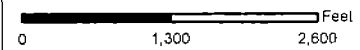
Alternatives Analysis

Study Area 15

SOURCES:

TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

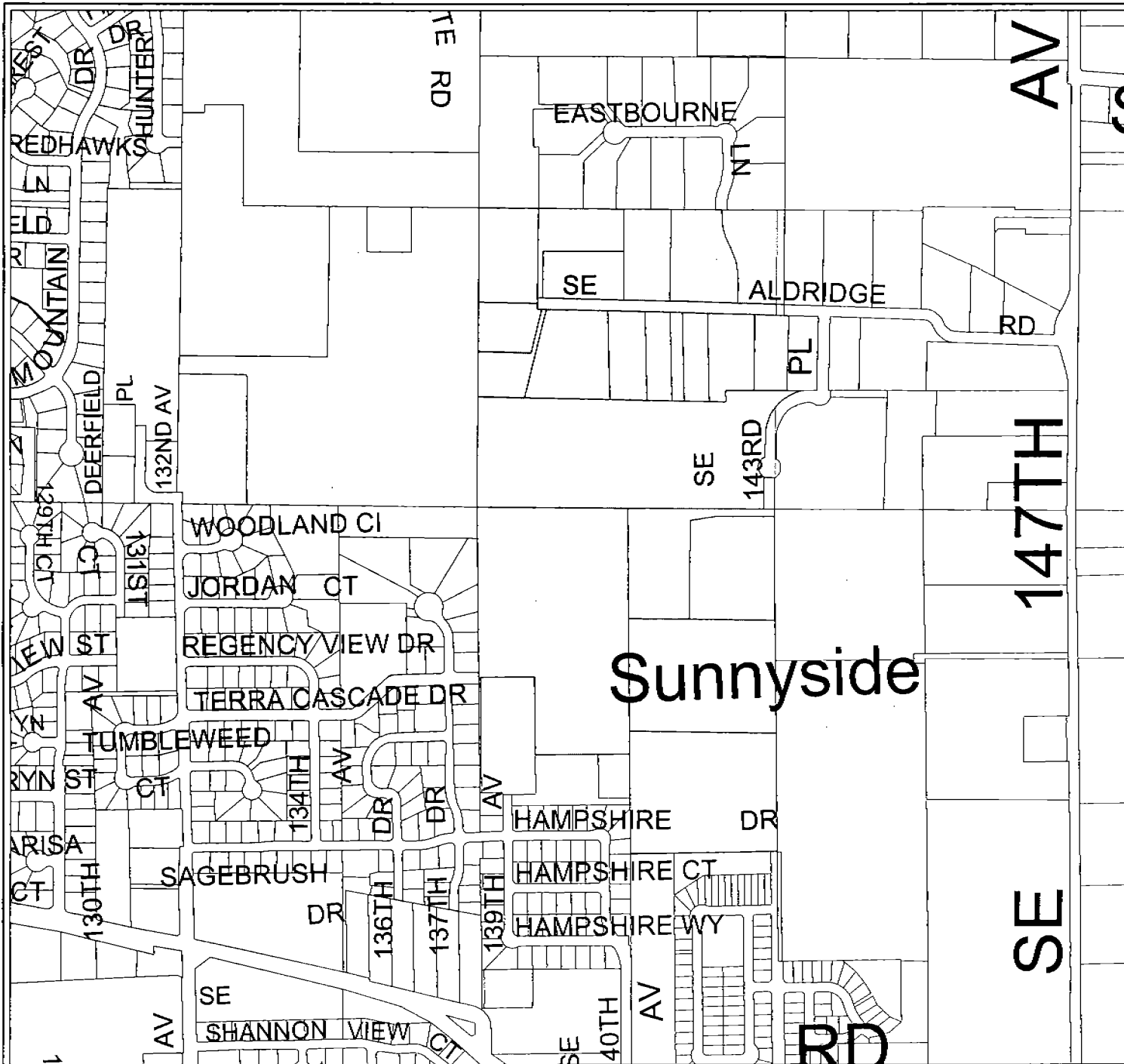
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R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 16

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tualatin and Multnomah County. Other areas are plus or minus ten feet.

CLARK COUNTY MAPS
Clark County, Oregon, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tualatin and Multnomah County. Other areas are plus or minus ten feet.

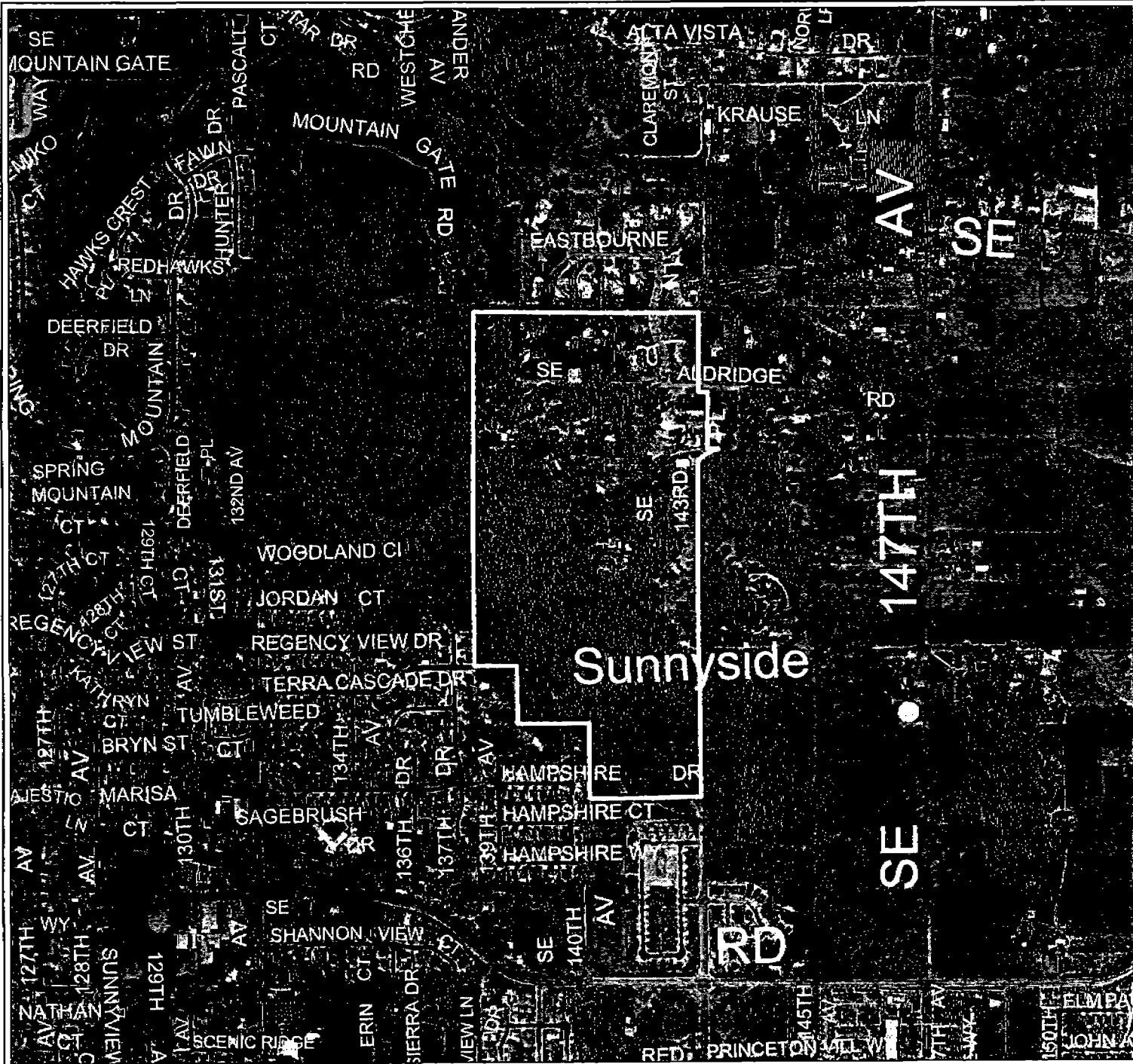
CLACKAMAS COUNTY MAPS
Clackamas County, Oregon, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tualatin and Multnomah County. Other areas are plus or minus ten feet.

0 475 950 Feet

Location Map

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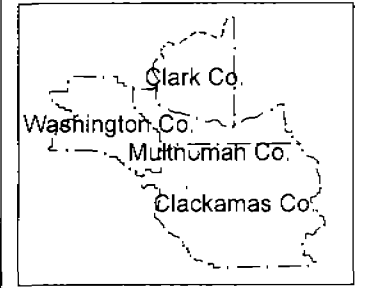
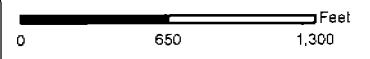
Alternatives Analysis

Study Area 16

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

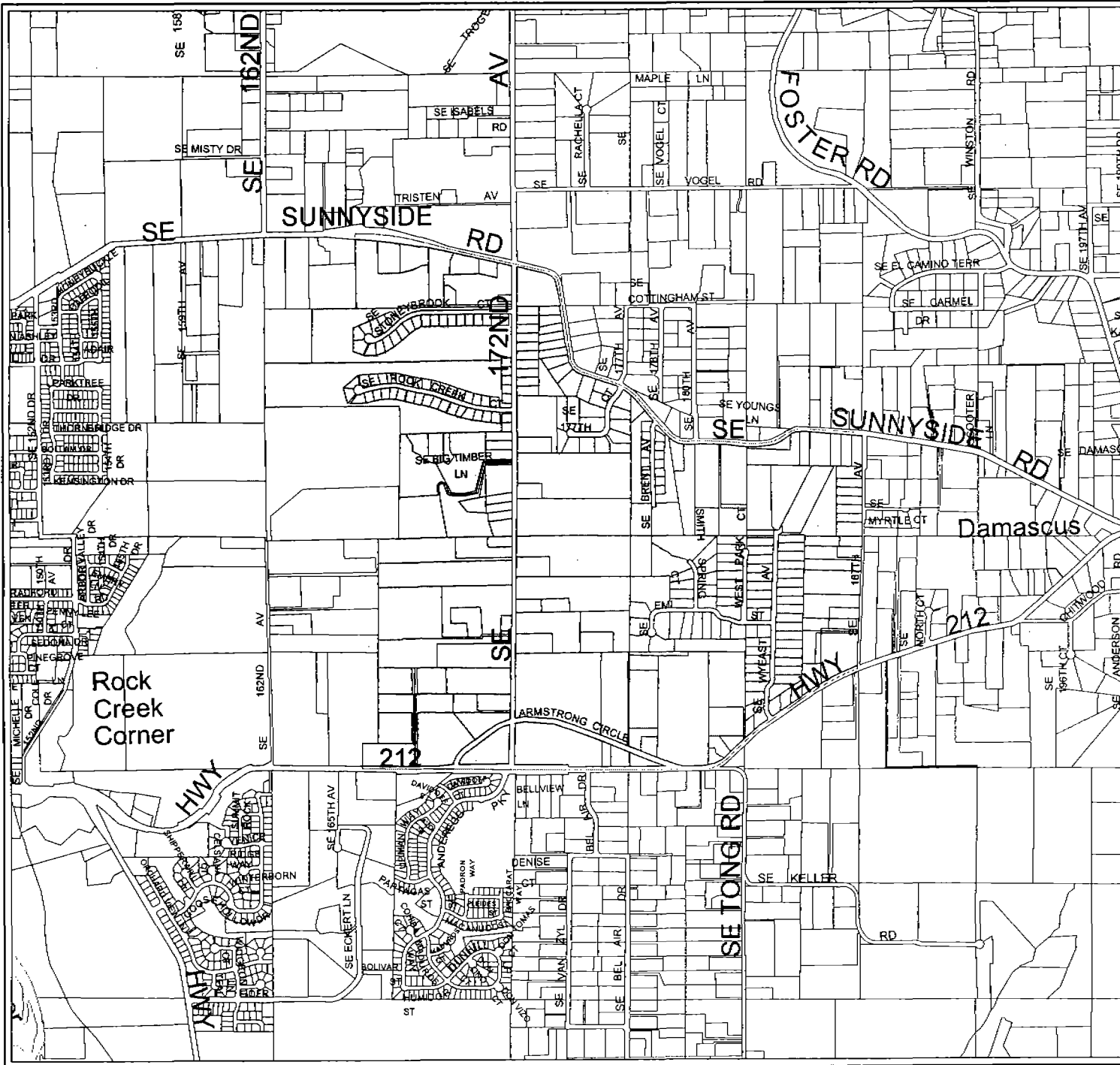
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Location Map



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R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 17

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

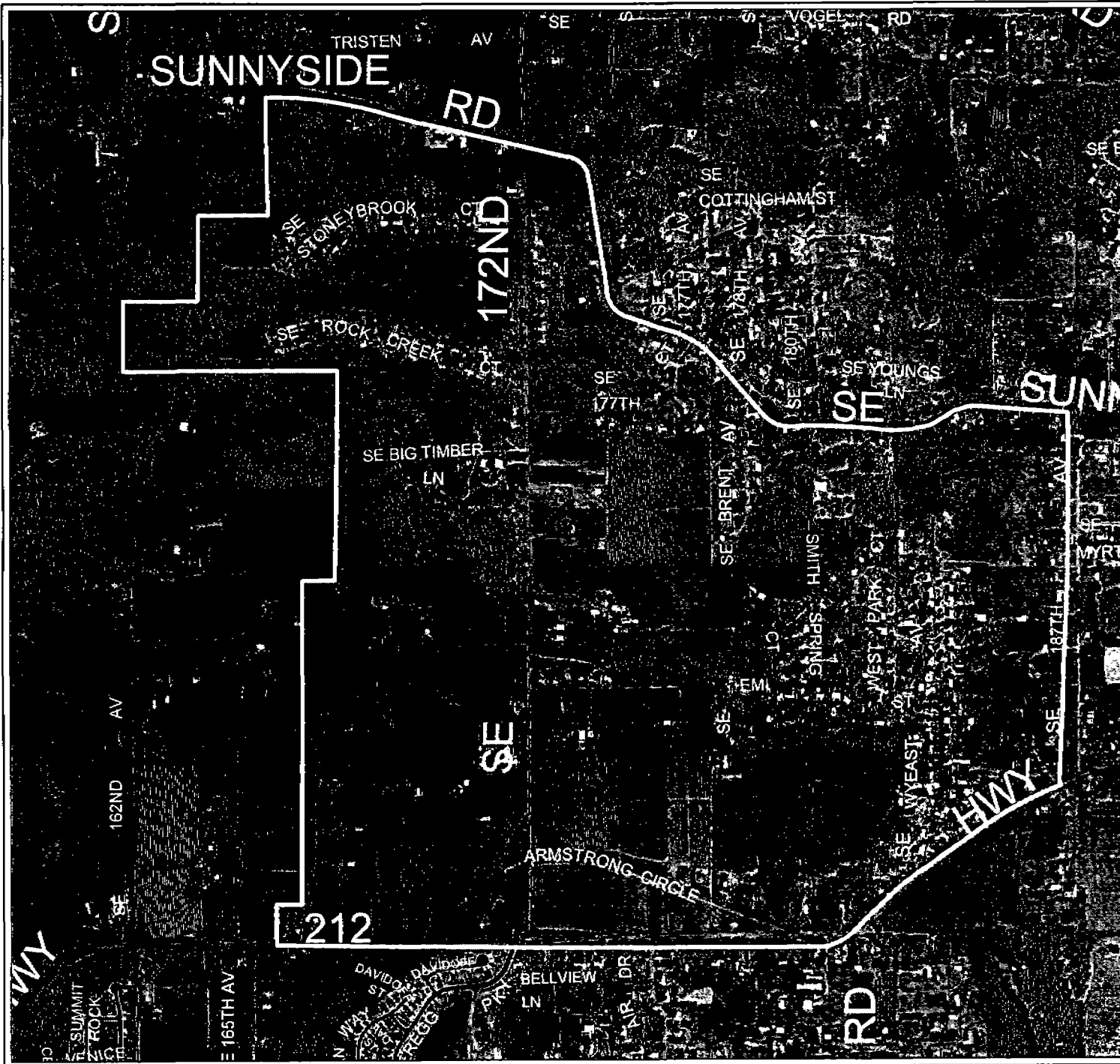
SOURCES

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

Feet
0 1,300 2,600

Location Map

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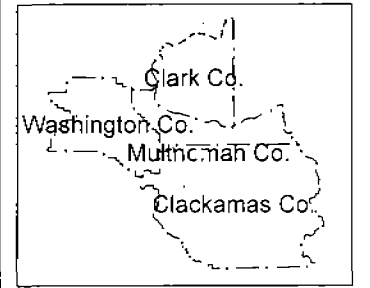
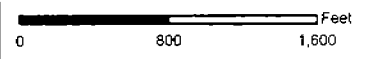
Alternatives Analysis

Study Area 17

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

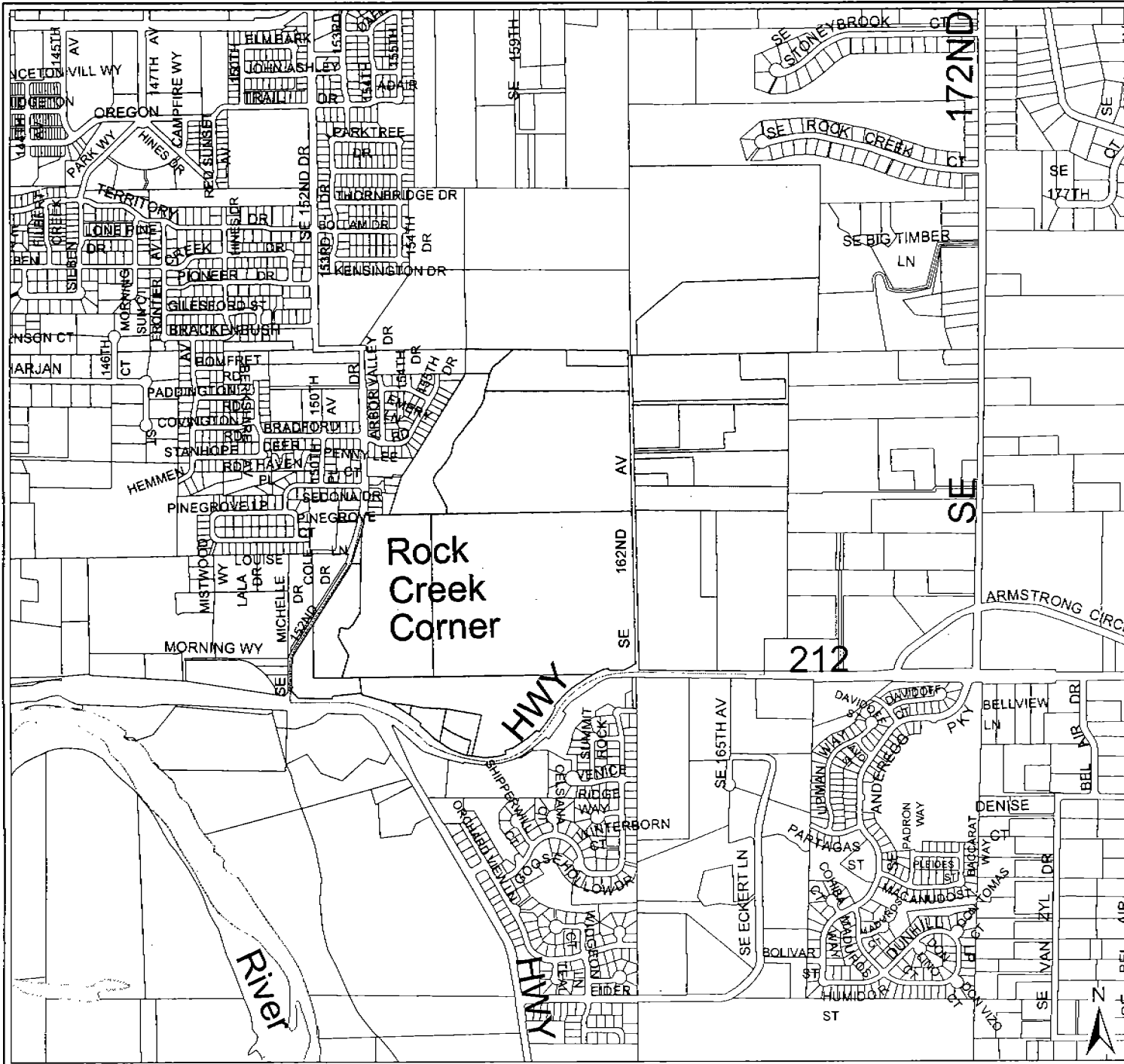
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Location Map



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R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 18

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).


SOURCES:
TAX LOT MAP
County Assessment and Taxation offices, 2001. Date collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

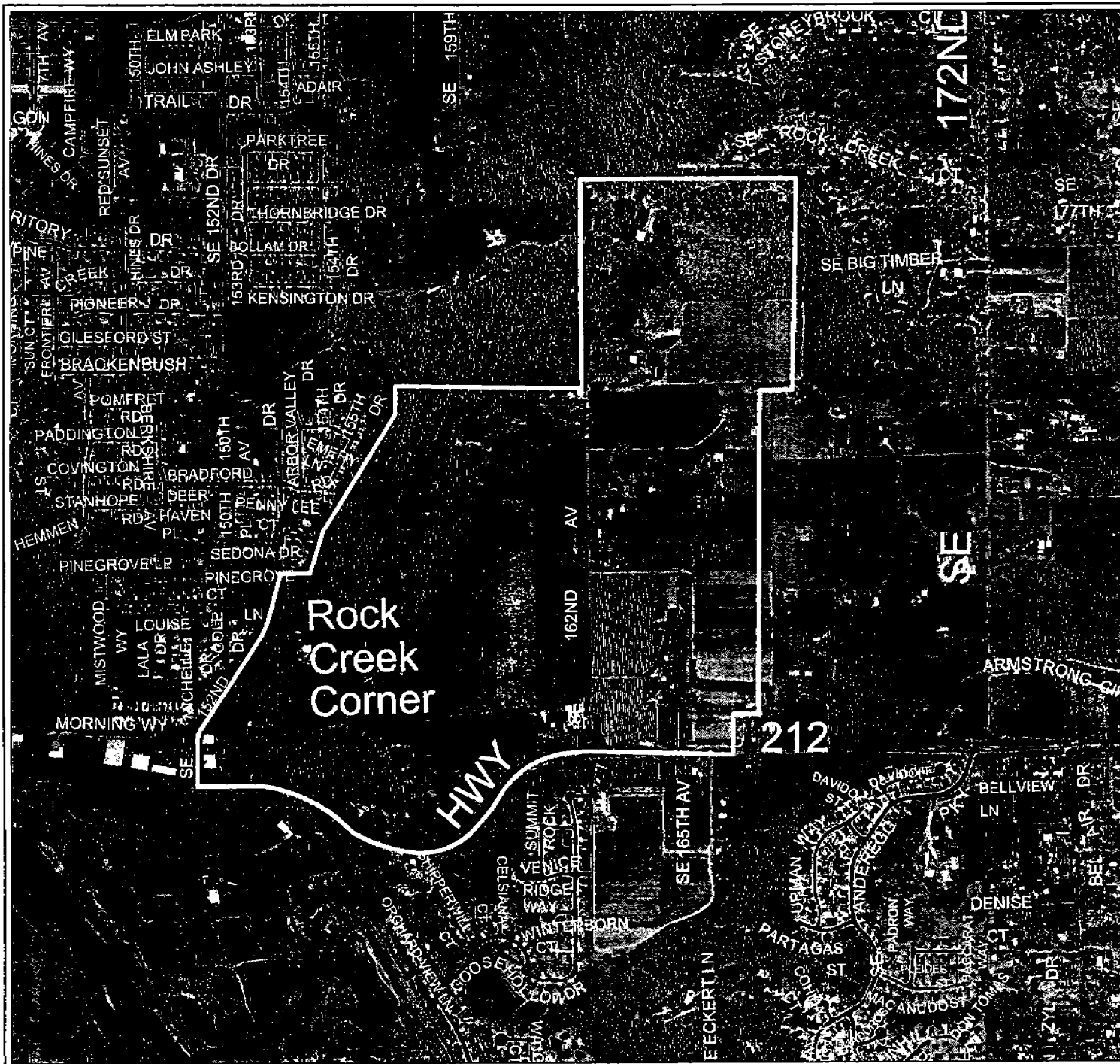
212

0 950 1,900 Feet

Clark Co.
Washington Co.
Multnomah Co.
Clackamas Co.

Location Map


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 drc@metro.dst.or.us www.metro-region.org



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REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis


Study Area 18

SOURCES:

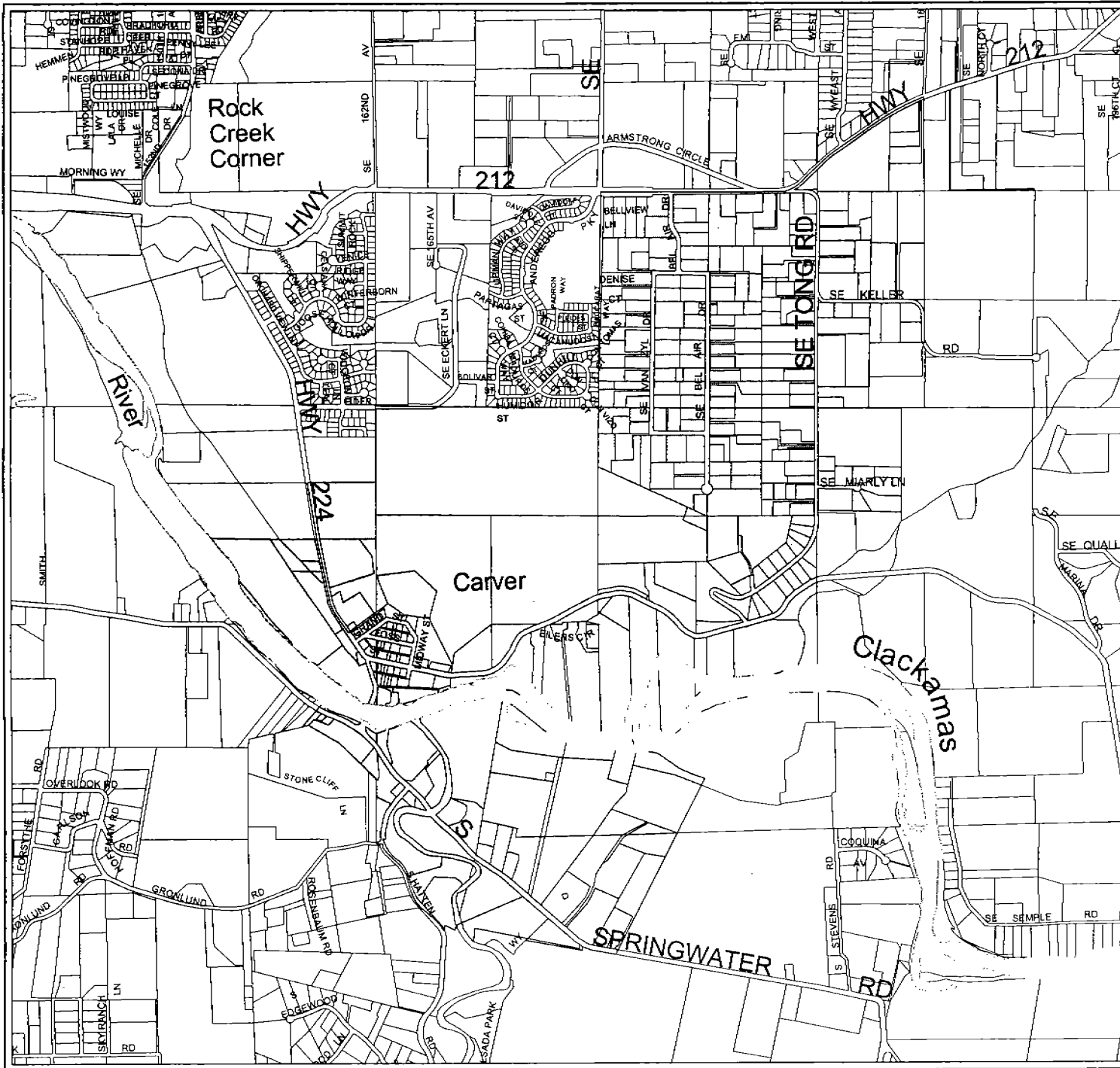
TAX LOT MAP
 County Assessment and Taxation Offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in description. Multnomah, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

LOCATION MAP
 Clark Co.
 Washington Co.
 Multnomah Co.
 Clackamas Co.

Location Map


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R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 19

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:
 TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

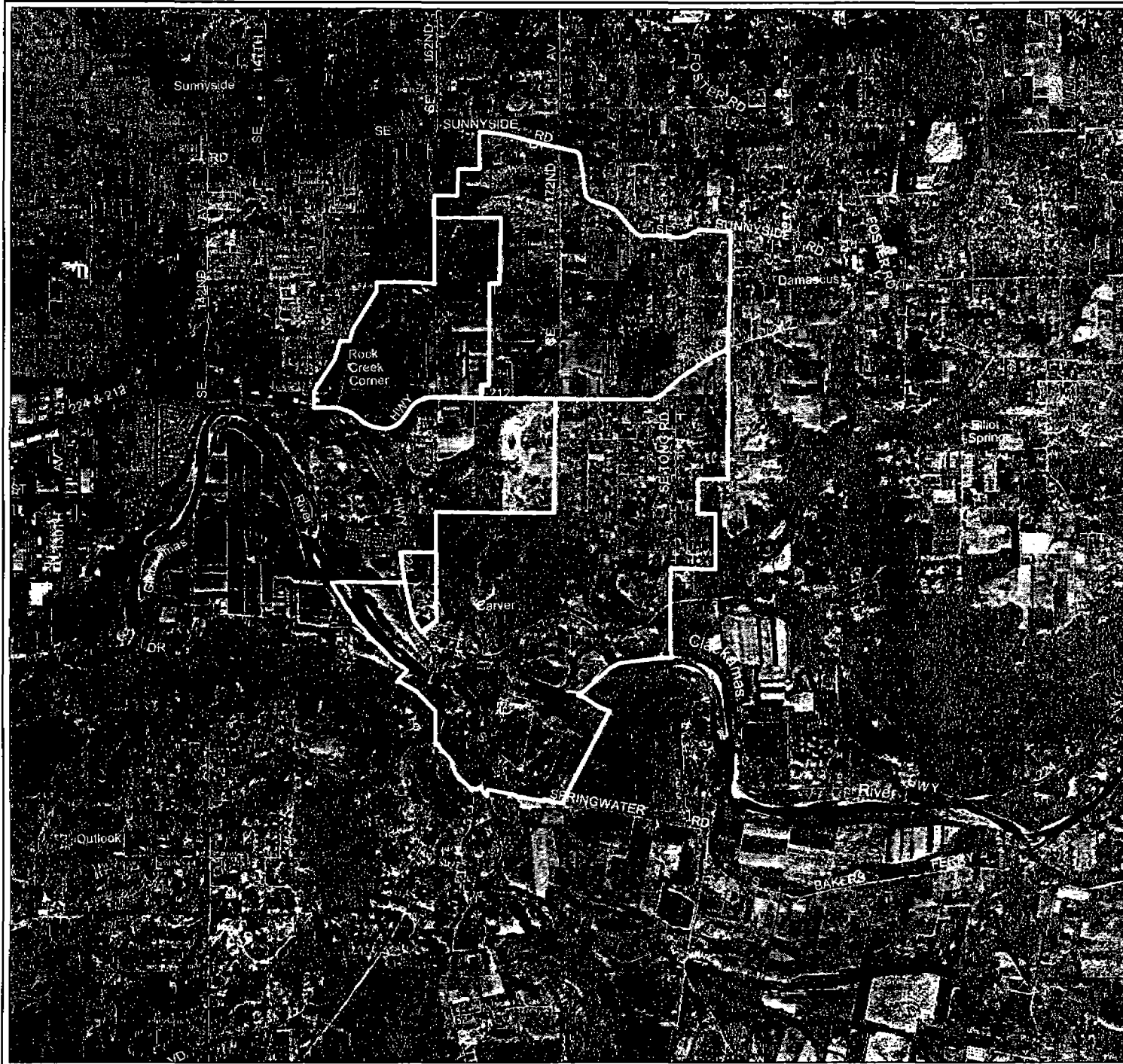
1 inch equals 1,772 feet

Feet
0 1,400 2,800

Location Map

METRO

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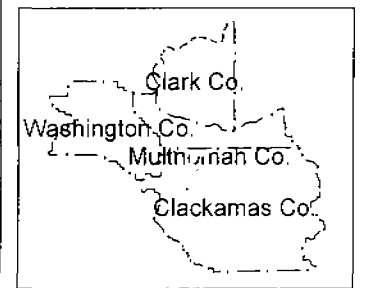
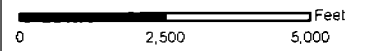
Alternatives Analysis

Study Area 19

SOURCES:

TAX LOT MAP:
County Assessment and Taxation Offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

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


Location Map



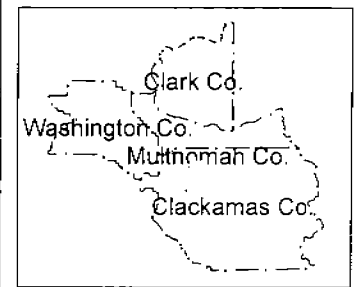
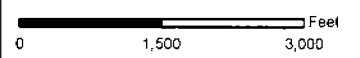
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Alternatives Analysis

 Study Area 20

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

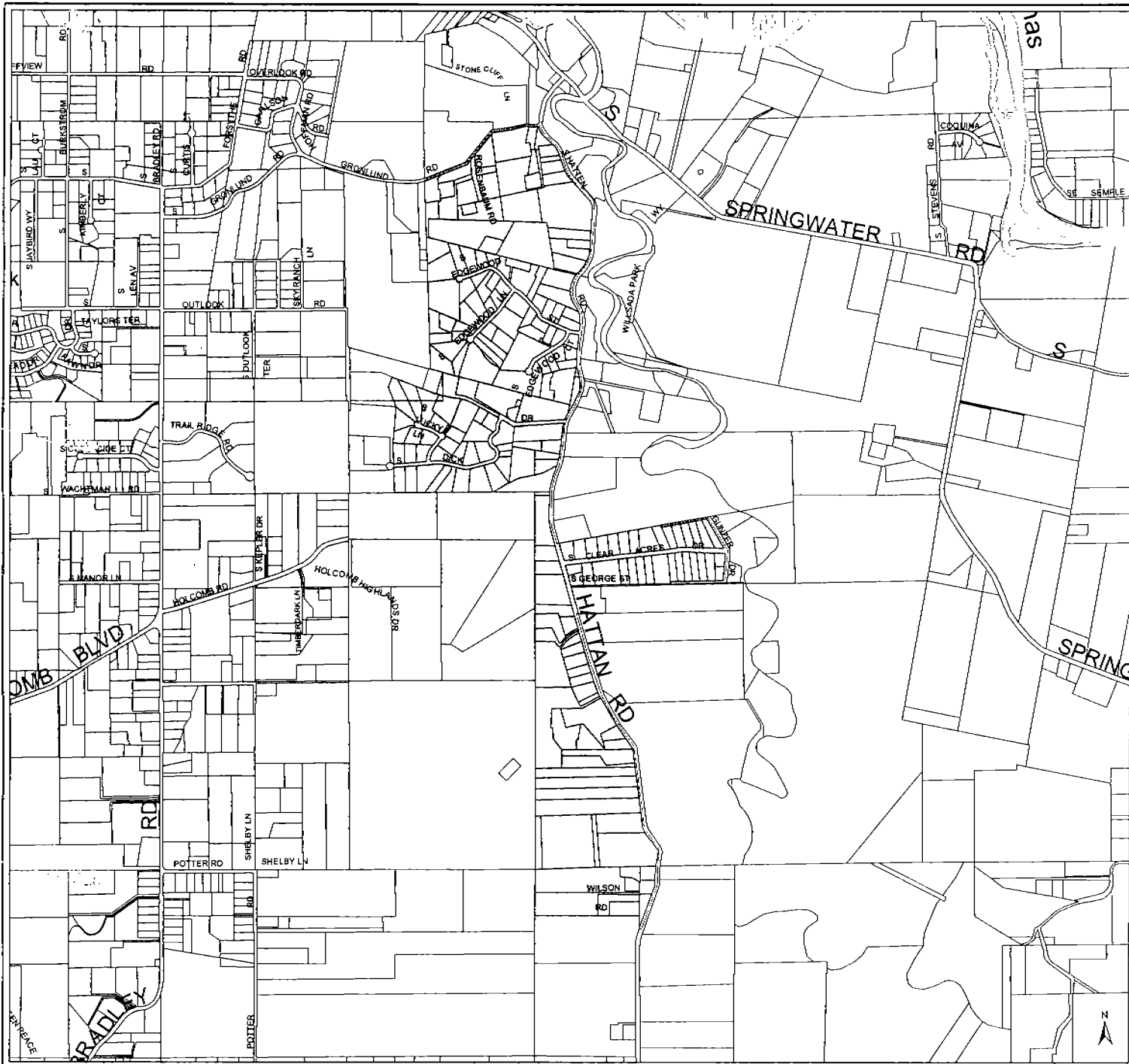
SOURCES:
TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.
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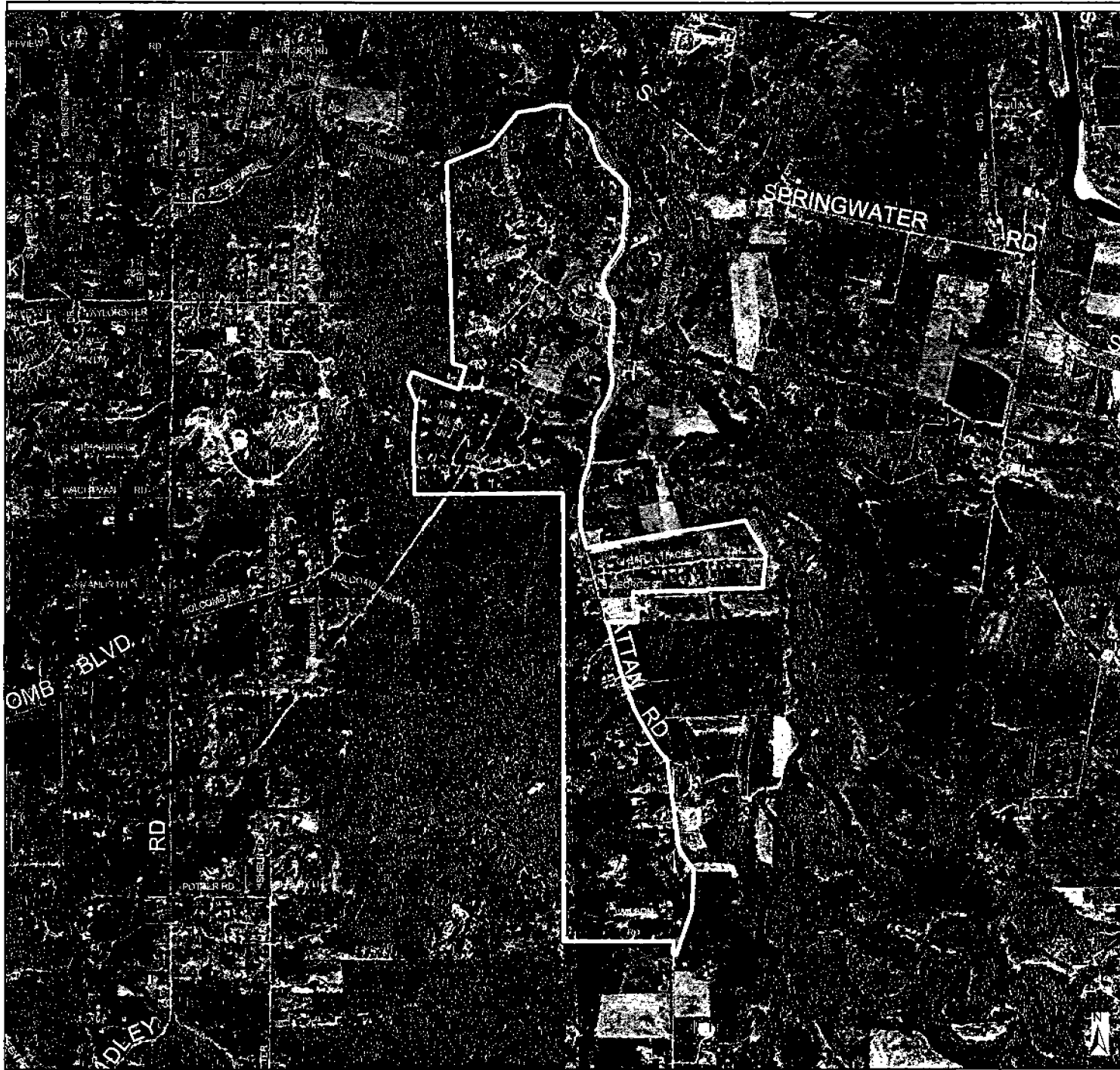


Location Map



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 dlc@metro.dst.or.us | www.metro-region.org





R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 20

SOURCES:


TAX LOT MAP
County Assessment and Taxation Offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=450' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

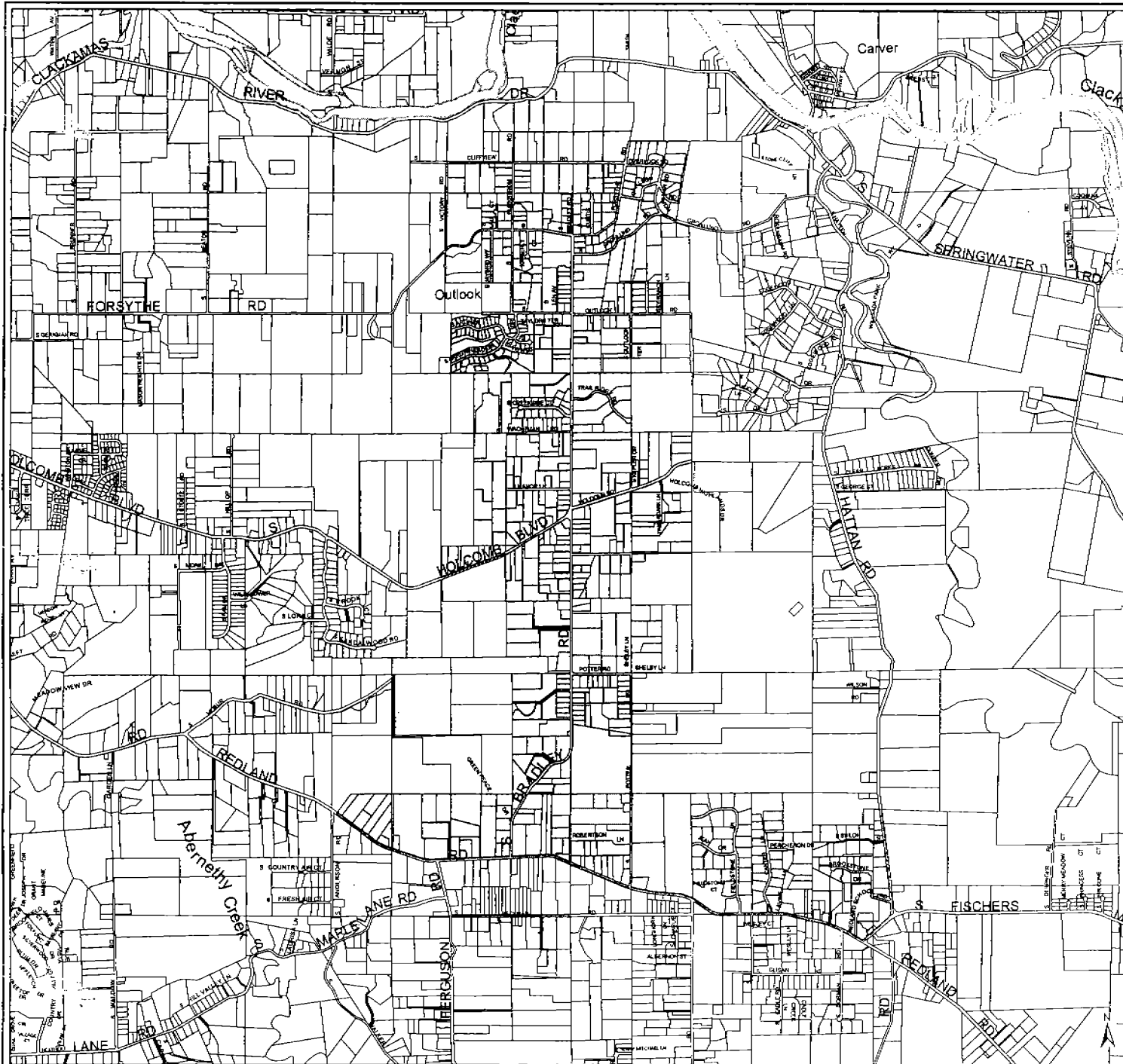
Special thanks to the various agencies and individuals who provided data for this project. The data provided for this project was collected from various sources and is not guaranteed to be 100% accurate. The data provided for this project was collected from various sources and is not guaranteed to be 100% accurate. The data provided for this project was collected from various sources and is not guaranteed to be 100% accurate.

0 1,400 2,800 Feet

Clark Co.
Washington Co.
Multnomah Co.
Clackamas Co.

Location Map


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R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 21

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).


SOURCES:
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

The information presented on this map is derived from the 2001 tax lot map of Clark County, Oregon, as provided by the Clark County Assessment and Taxation Office. The information is provided "as is" and is not intended to be used for any purpose other than that for which it was originally intended. The information is not to be used for any purpose other than that for which it was originally intended. The information is not to be used for any purpose other than that for which it was originally intended.

Feet
0 2,400 4,800

Clark Co.
Washington Co.
Multnomah Co.
Clackamas Co.

Location Map



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R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 21

SOURCES:

TAX LOT MAP
County Assessment and Taxation office, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

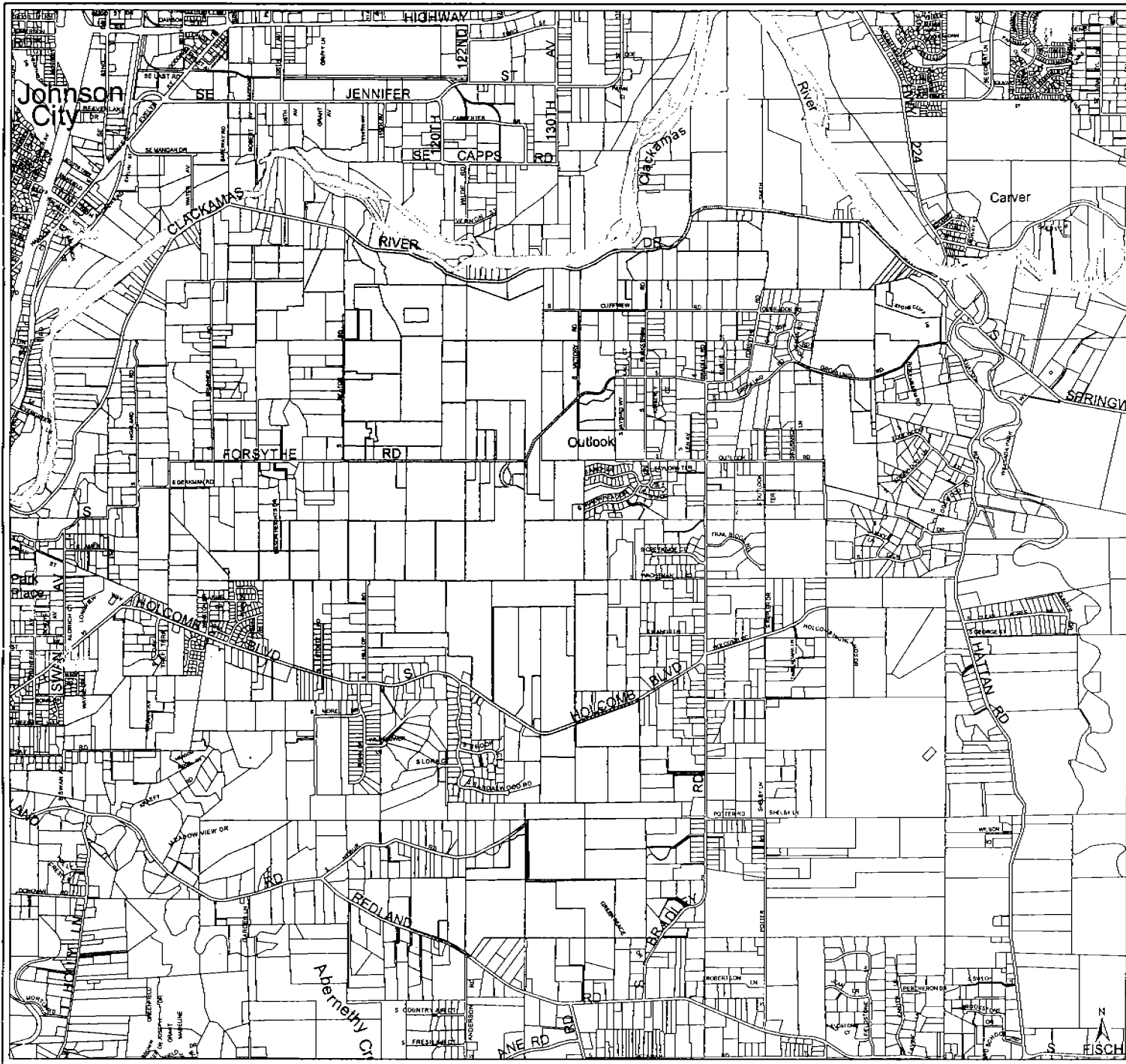
Other Sources: Metro Data Resource Center, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

Scale: 0 1,750 3,500 Feet

Location Map

METRO

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R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 22

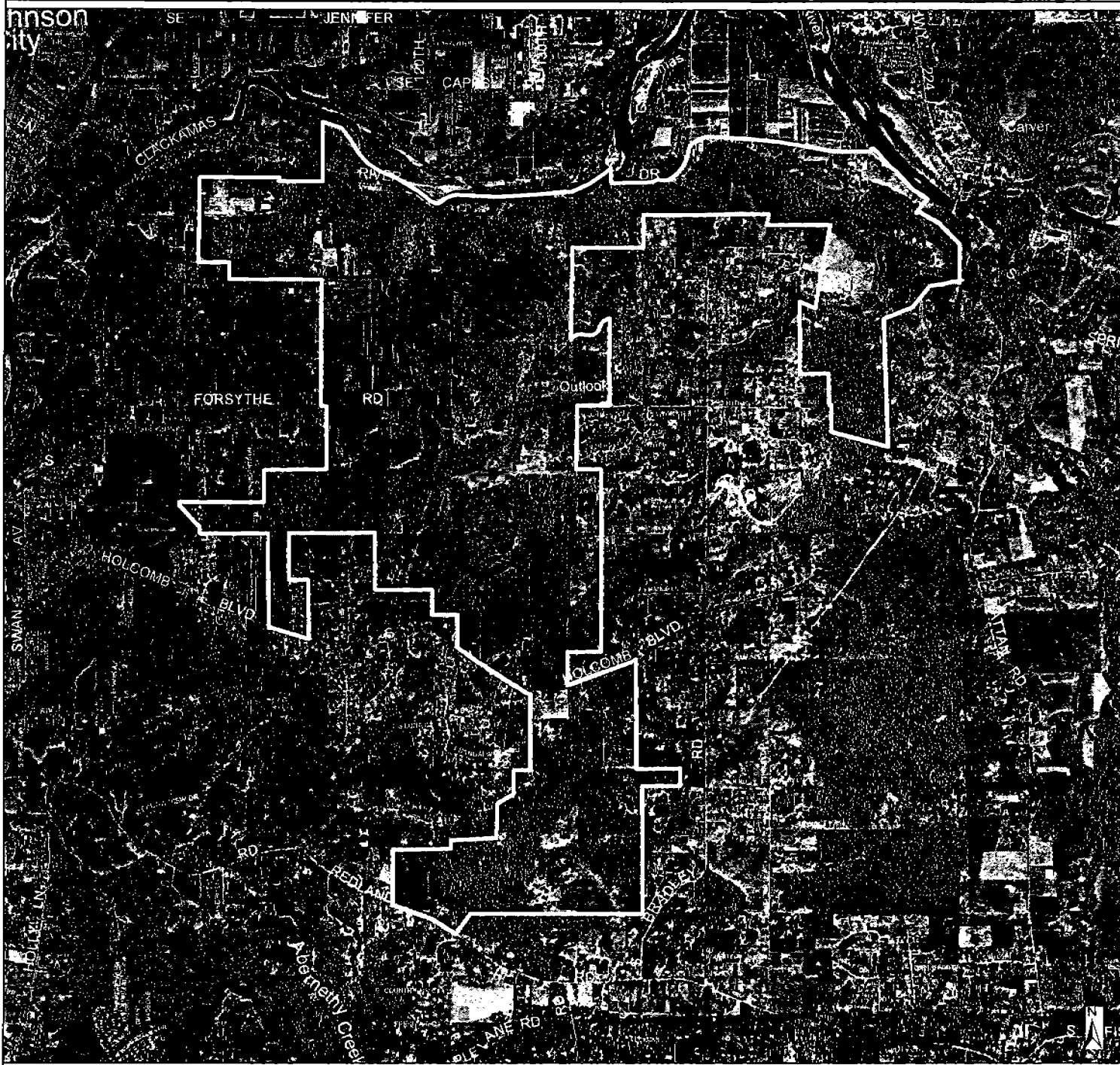
Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:
TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

Location Map

Clark Co.
Washington Co.
Multnomah Co.
Clackamas Co.

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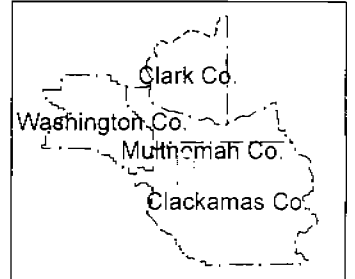
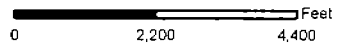


Alternatives Analysis

Study Area 22

SOURCES:

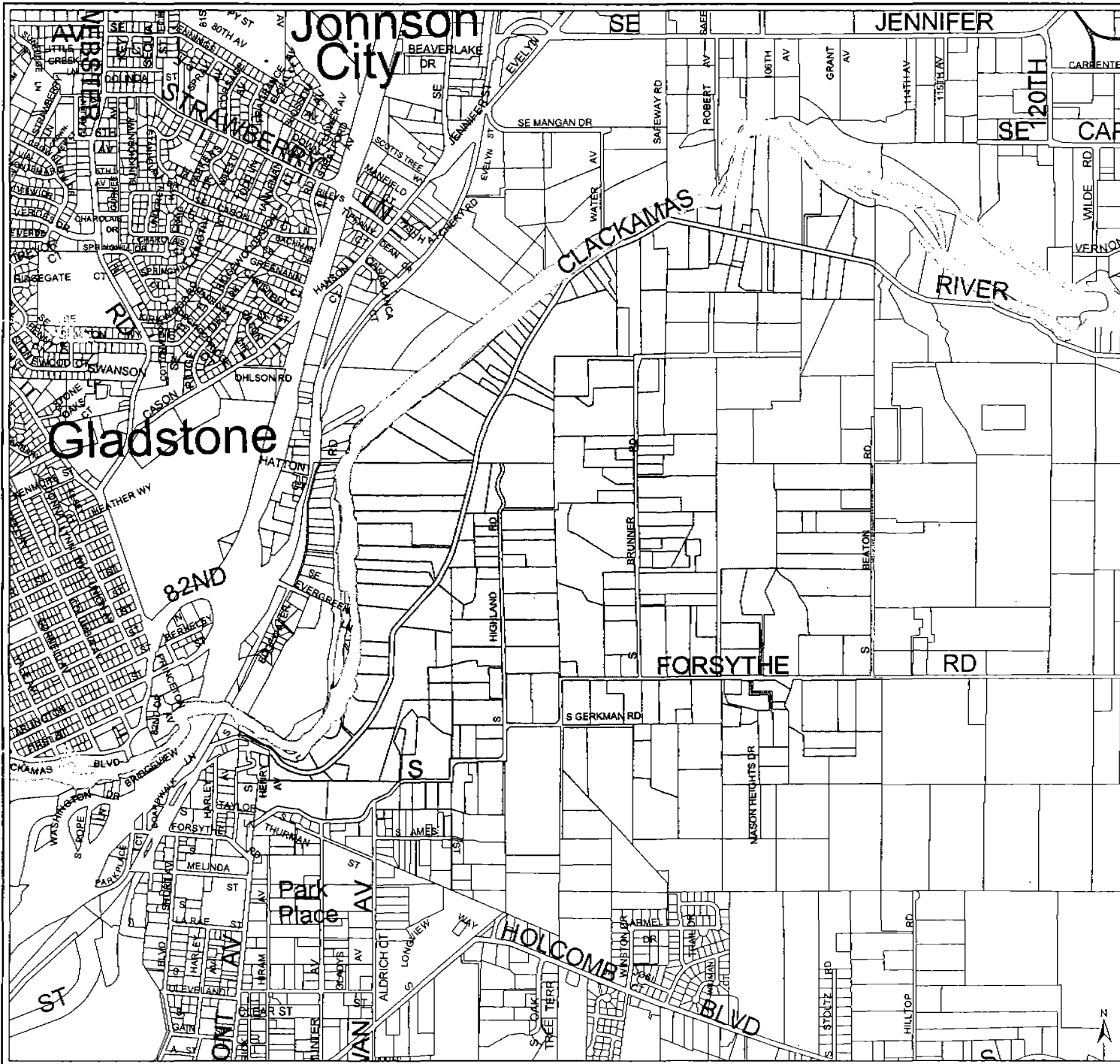
TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map



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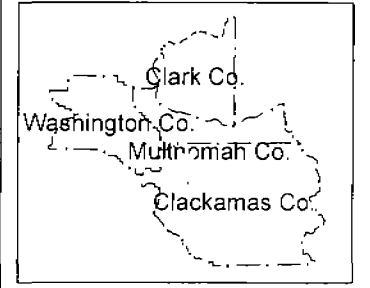
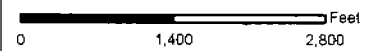


Alternatives Analysis

Study Area 23

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

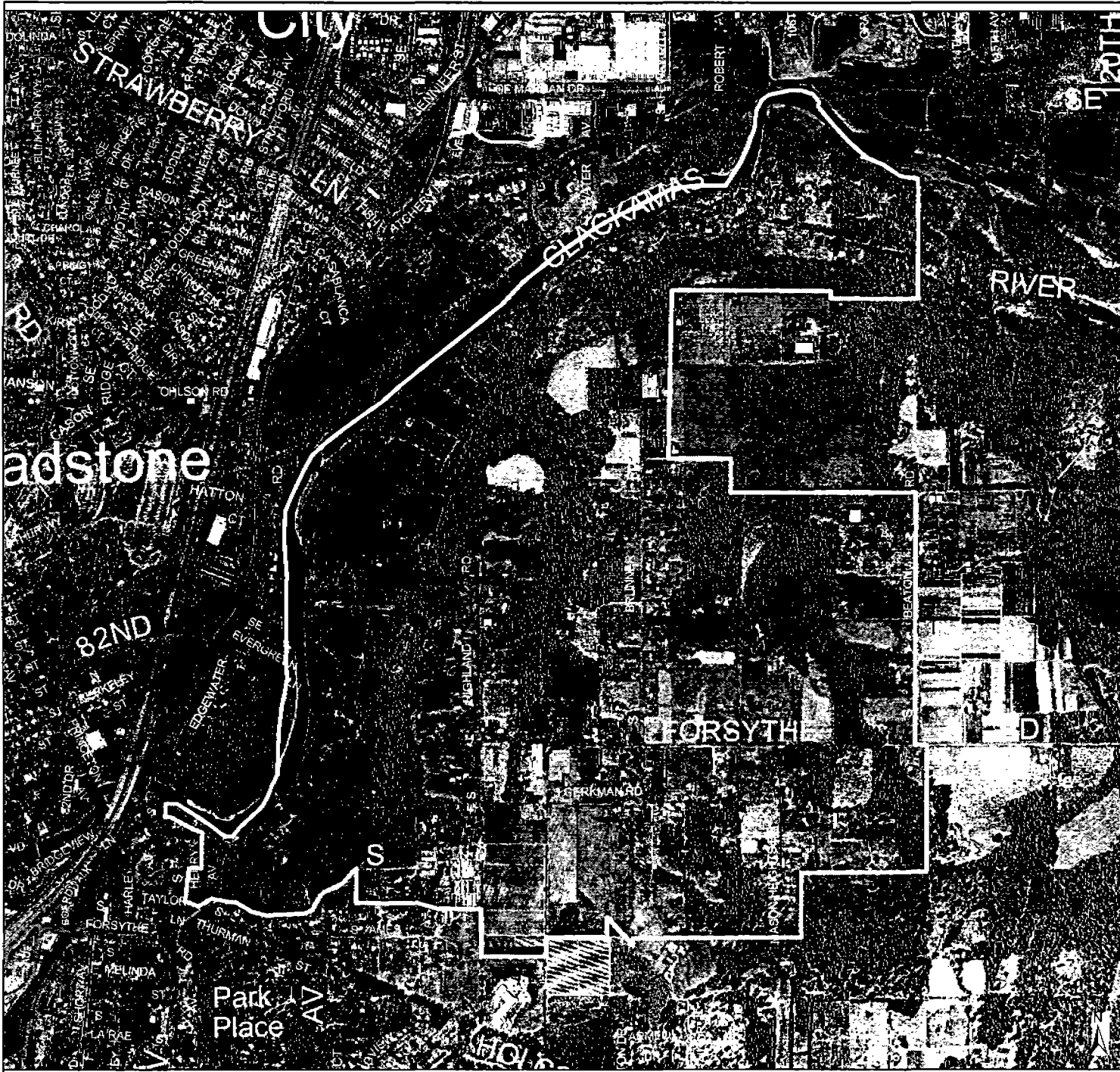
SOURCES:
TAX LOT MAP:
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.
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Location Map



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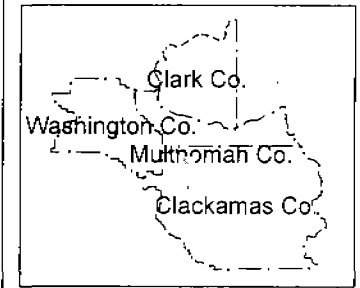
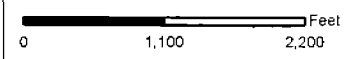
Alternatives Analysis

Study Area 23

SOURCES:

TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

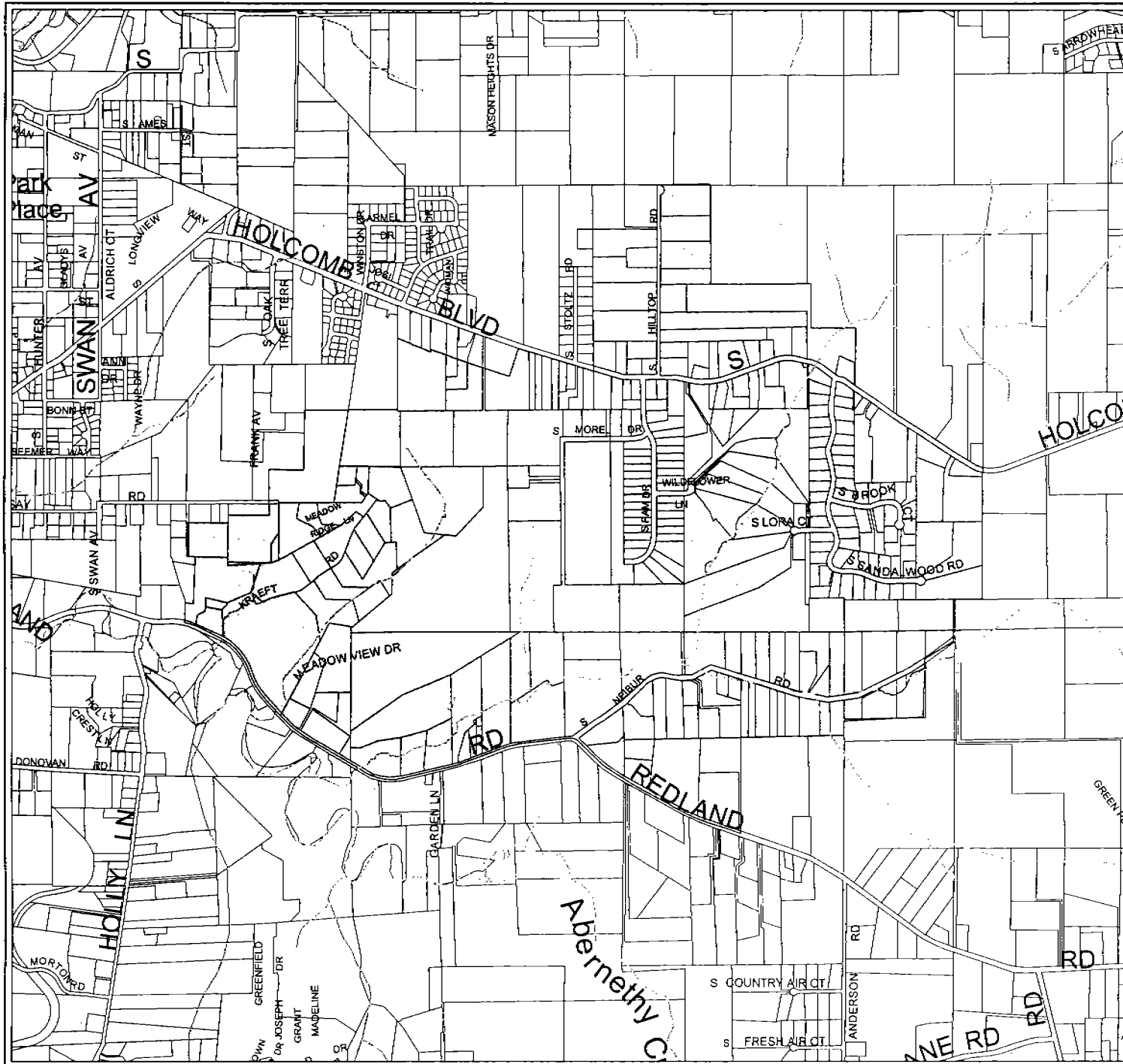
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R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 24

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2003. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Medvulle, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

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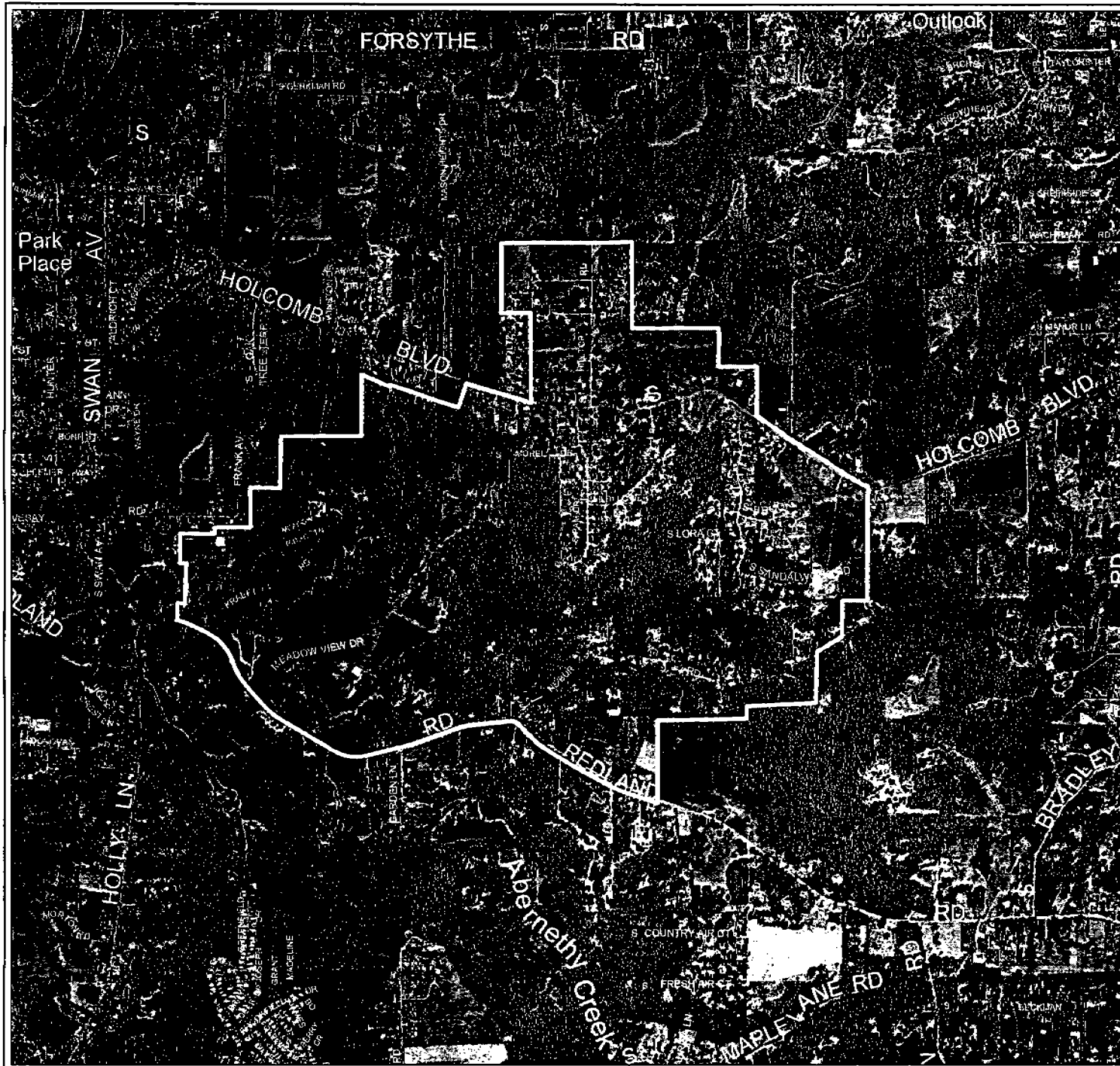
Feet
0 1,300 2,600

Clark Co.
Washington Co.
Multnomah Co.
Clackamas Co.

Location Map

METRO

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dlr@metro-dsl.or.us | www.metro-region.org



R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 24

SOURCES:


TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Multnomah, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

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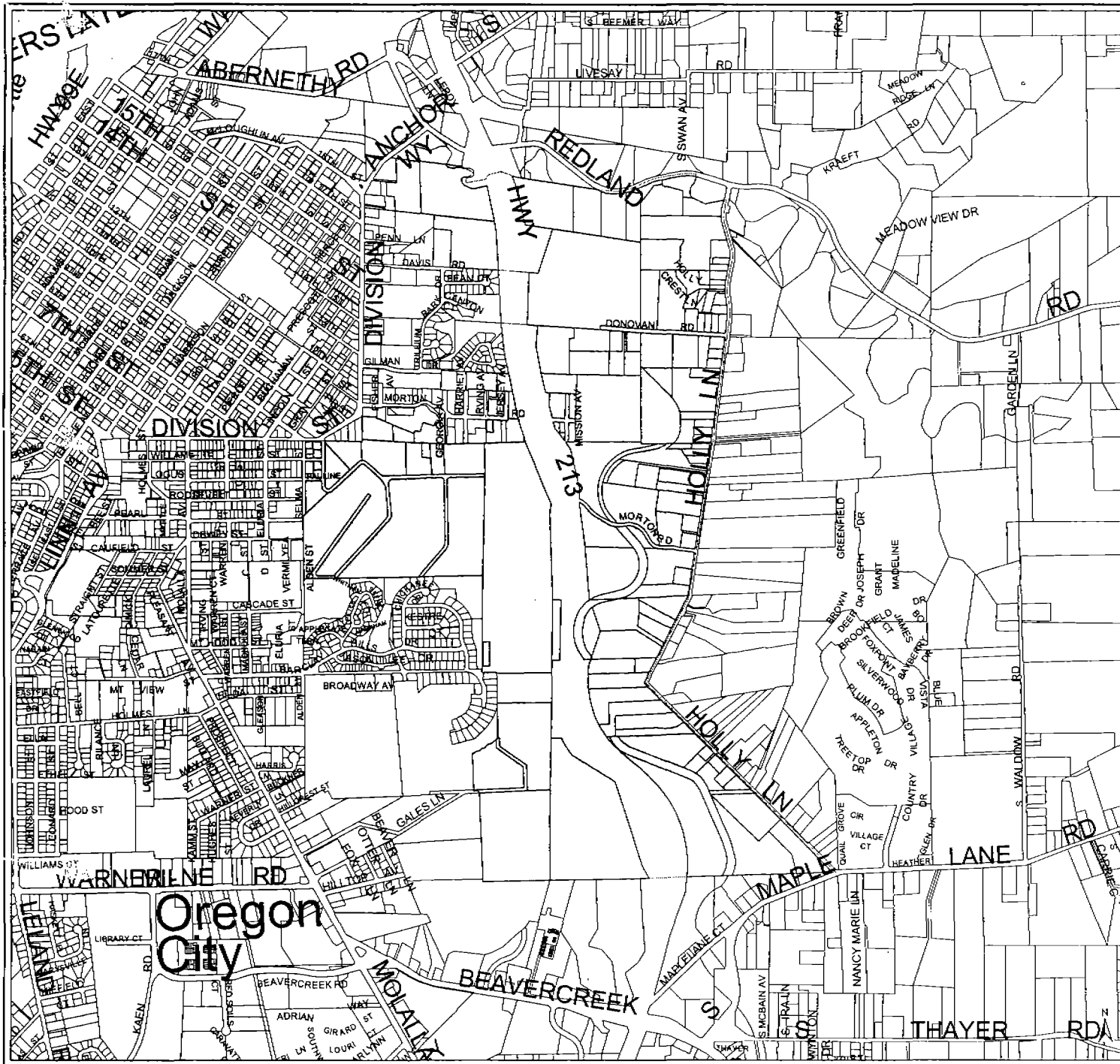
Feet
0 1,600 3,200

Clark Co.
Washington Co.
Multnomah Co.
Clackamas Co.


Location Map


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dic@metro-ol.org | www.metro-region.org

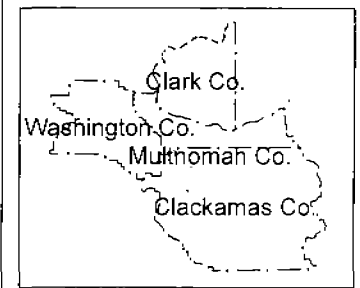
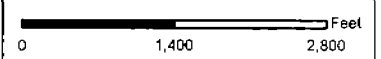


Alternatives Analysis

 Study Area 25

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map



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drc@metro.dcr.or.us www.metro-region.org



R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 25

SOURCES:

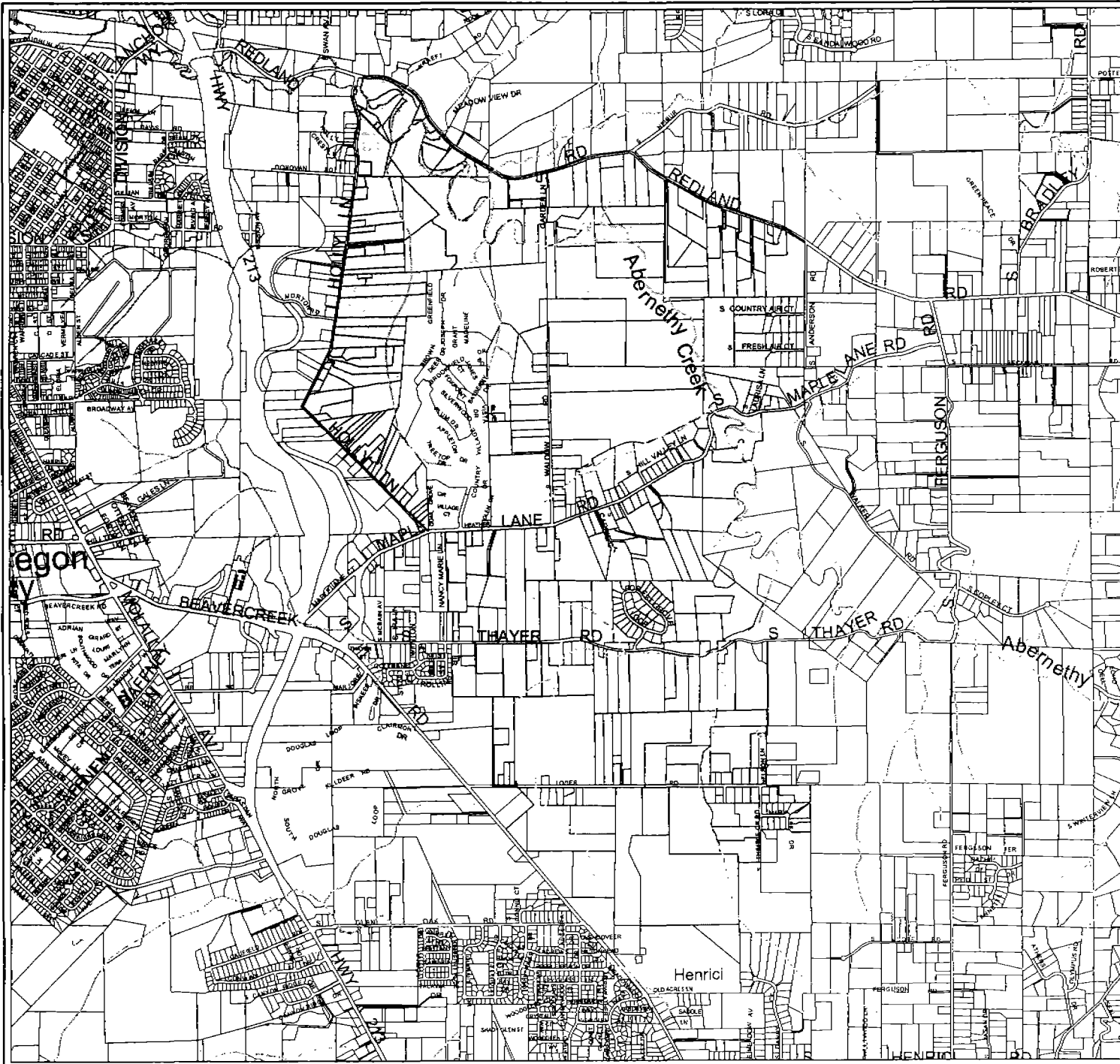
TAX LOT MAP:
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

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0 1,250 2,500 Feet

Location Map

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R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 26

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tualatin and Multnomah County. Other areas are plus or minus ten feet.

Feet
0 2,000 4,000

Clark Co.
Washington Co.
Multnomah Co.
Clackamas Co.

Location Map

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dlr@metro-ols.or.us | www.metro-region.org



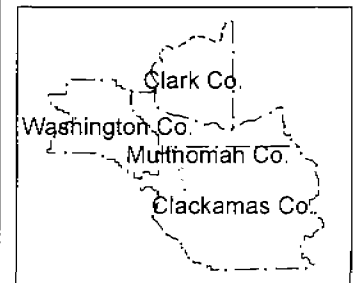
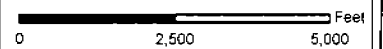
Alternatives Analysis

Study Area 26

SOURCES:

TAX LOT MAP:
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Multnomah, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

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


Location Map



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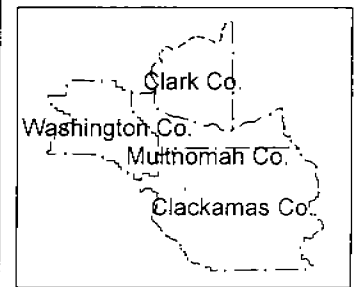
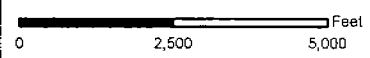
Alternatives Analysis

 Study Area 27

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:

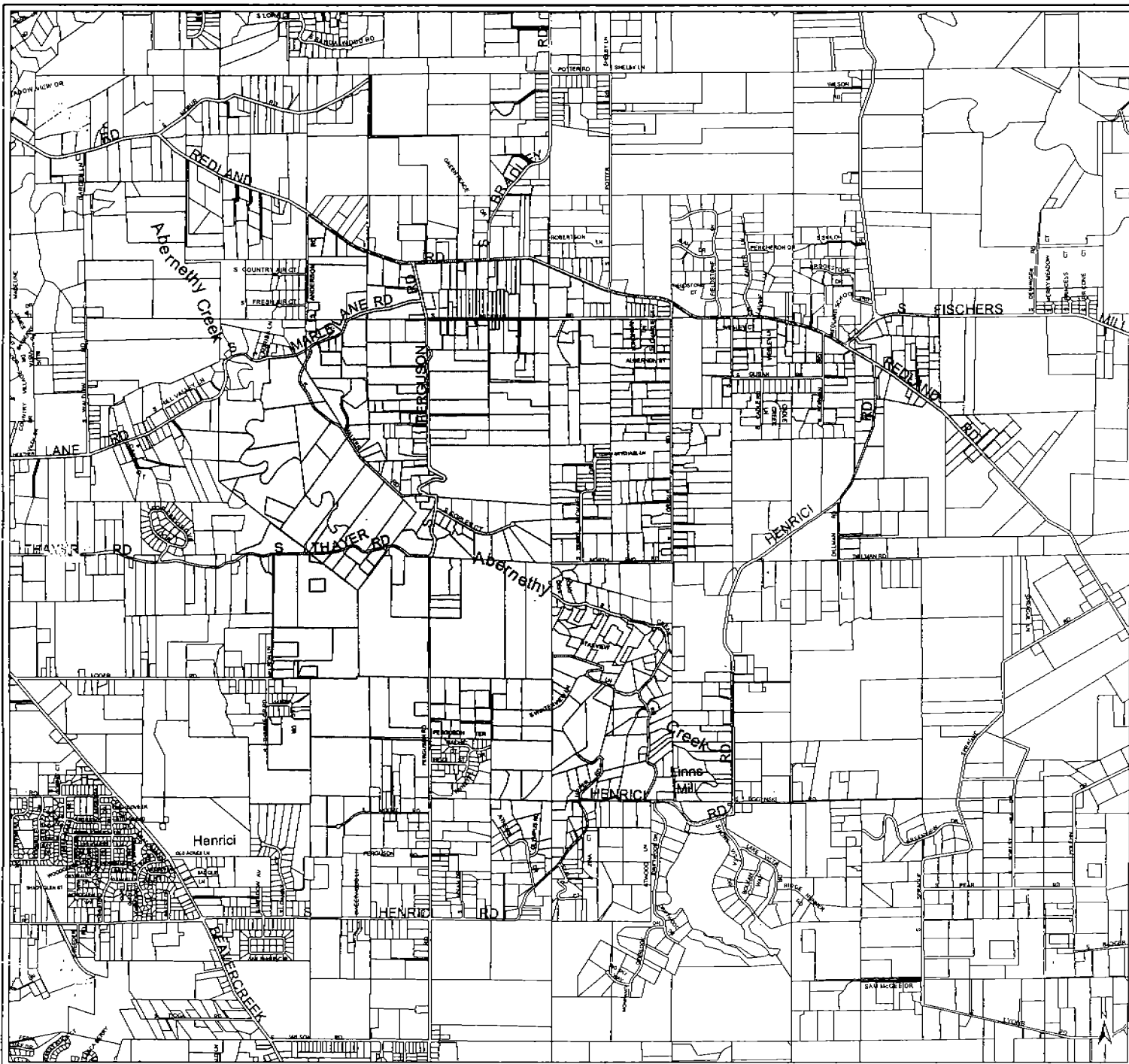
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tualum and Multnomah County. Other areas are plus or minus ten feet.

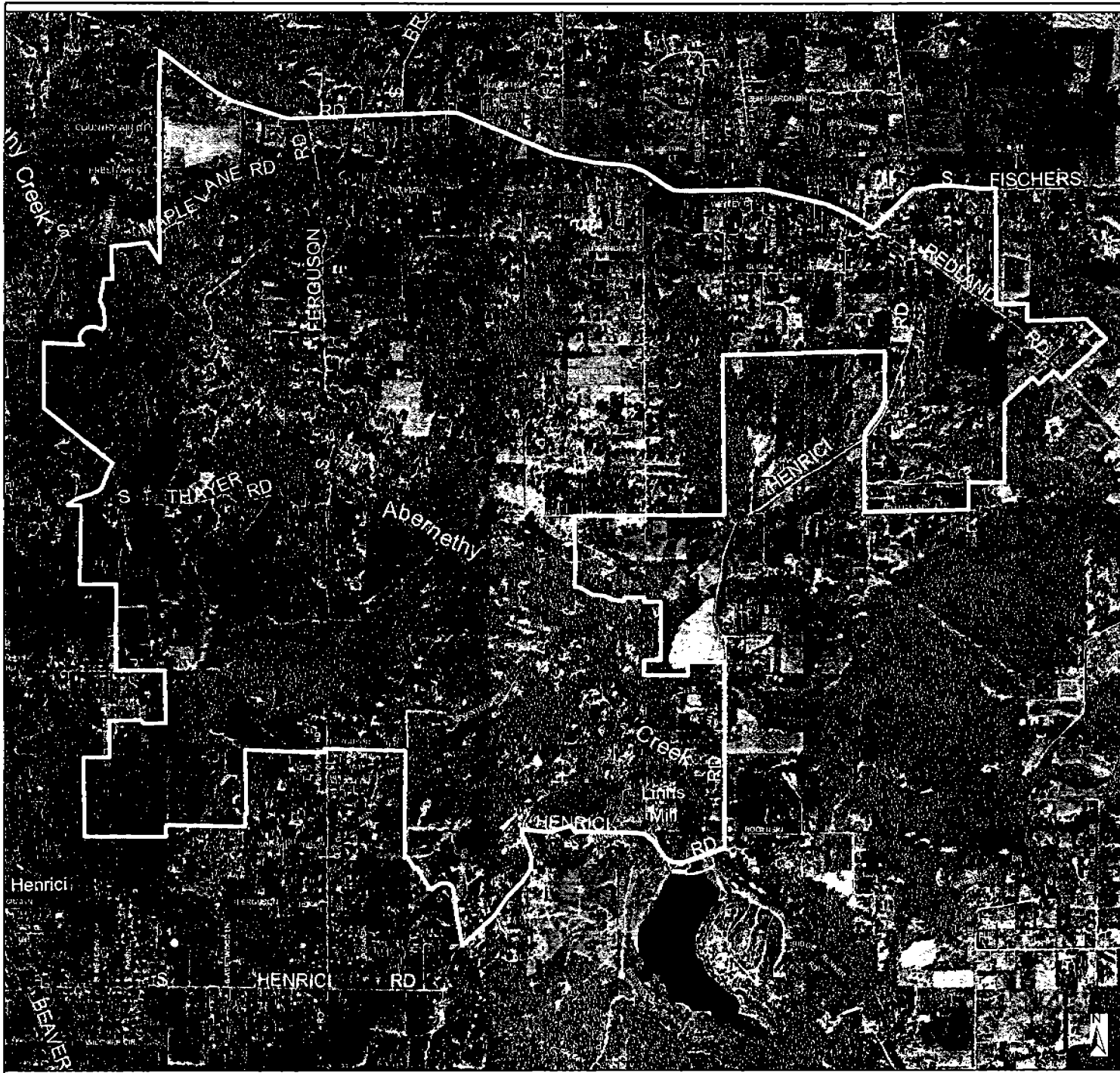


Location Map



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Alternatives Analysis

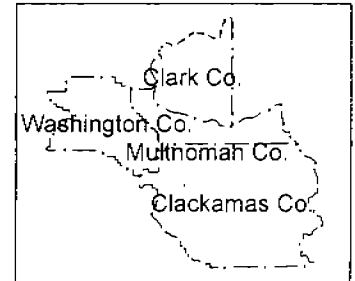
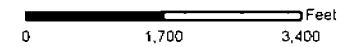
Study Area 27

SOURCES

TAX LOT MAP

County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tualatin and Multnomah County. Other areas are plus or minus ten feet.

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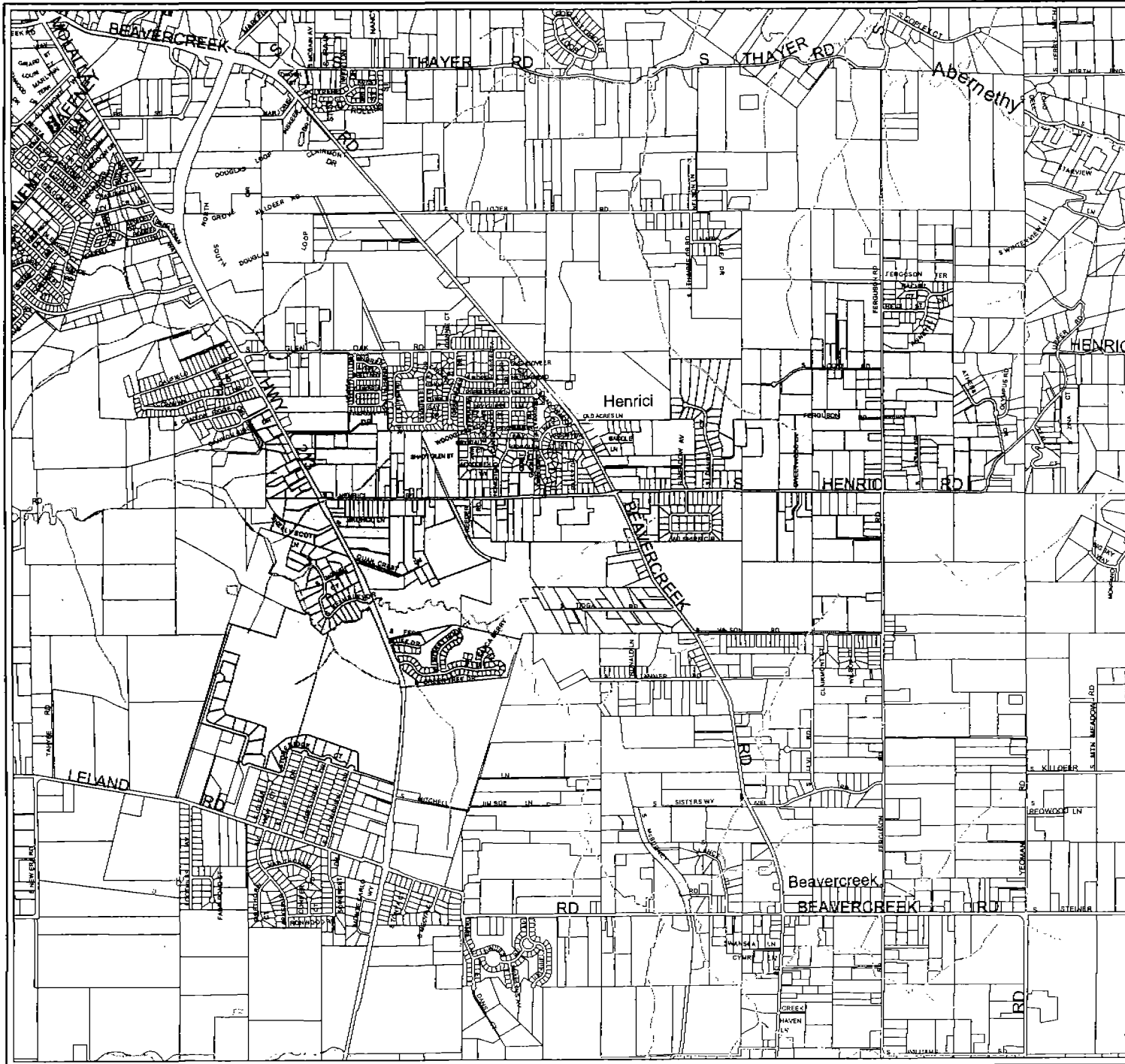


Location Map



METRO

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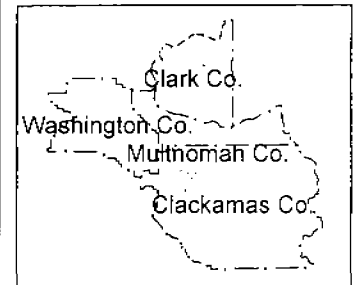
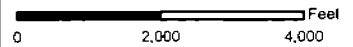
Alternatives Analysis

Study Area 28

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:

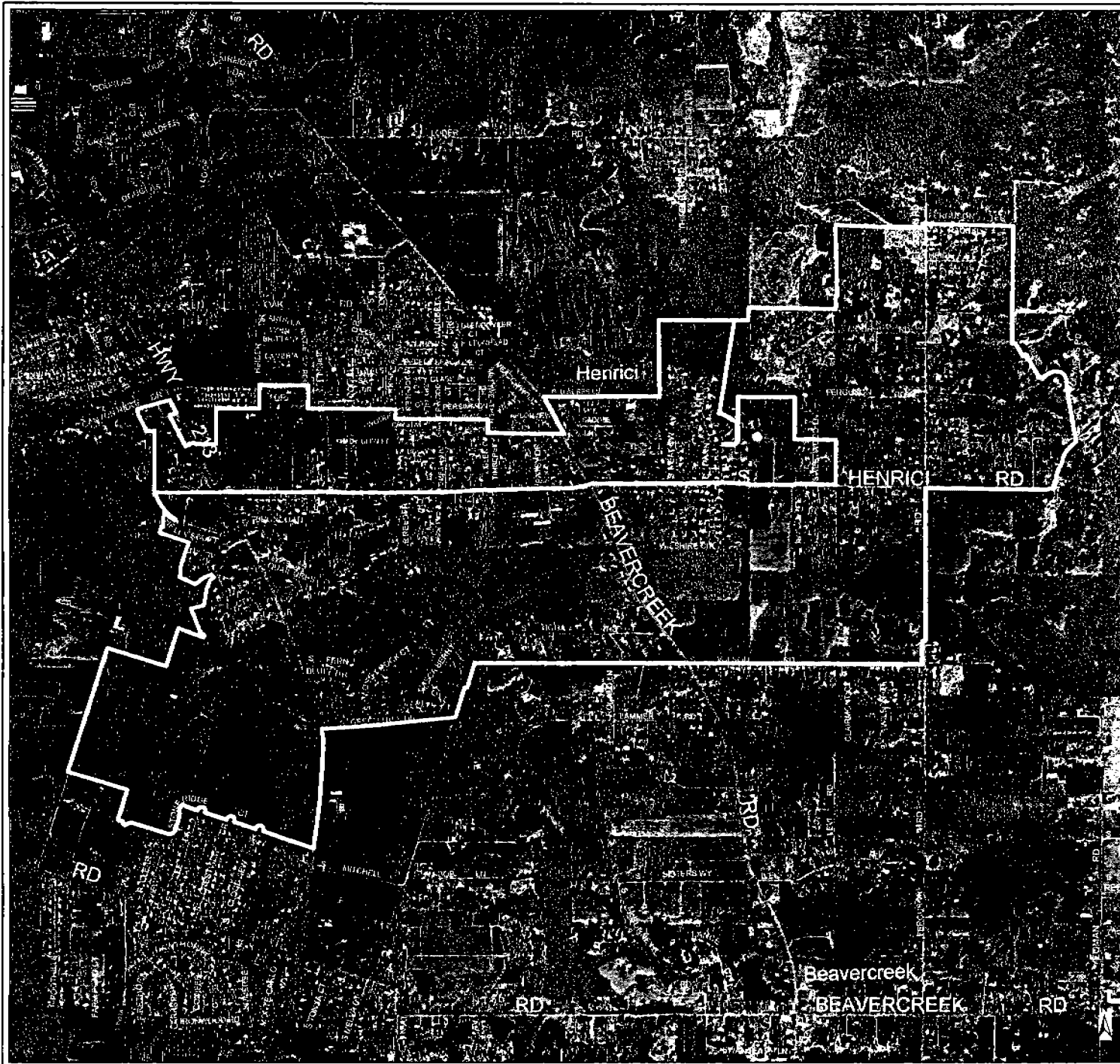
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.
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R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 28

SOURCES:


TAX LOT MAP
County Assessment and Taxation Offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

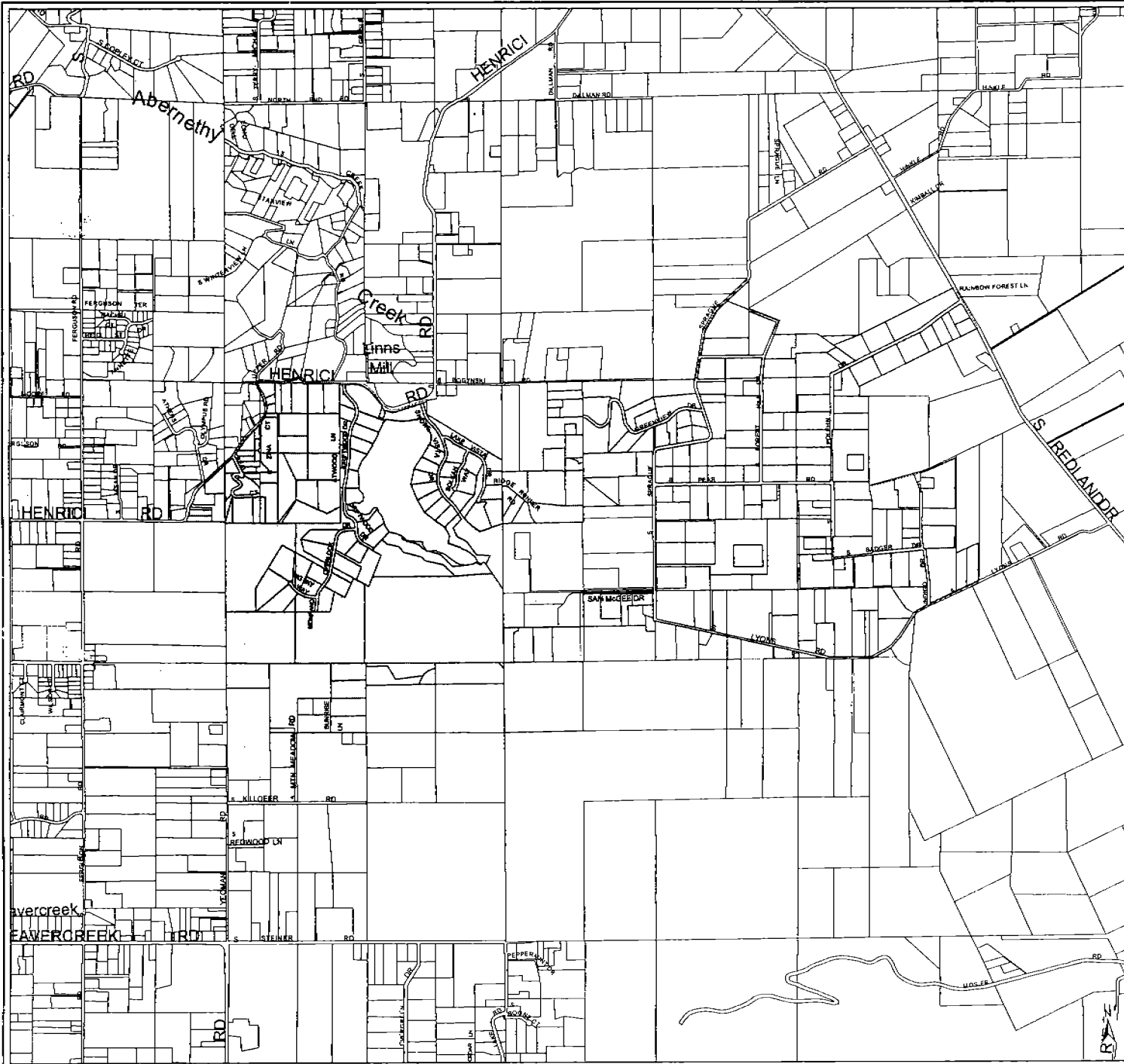
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0 1,800 3,600 Feet

Clark Co.
Washington Co.
Multnomah Co.
Clackamas Co.

Location Map


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R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 29

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

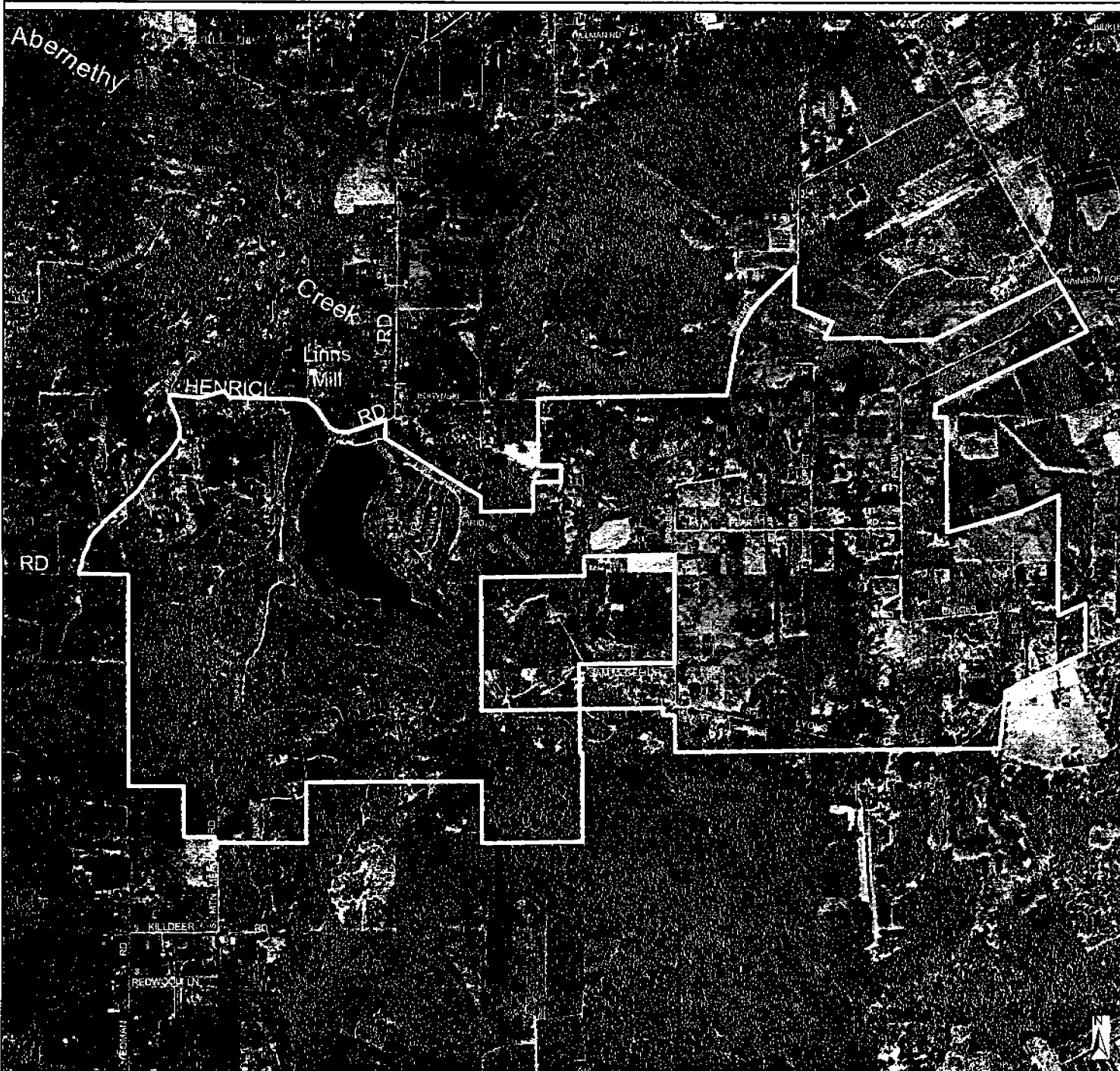
SOURCES:
 TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

Feet
 0 2,200 4,400

Location Map

METRO

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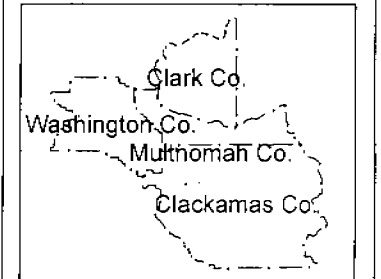
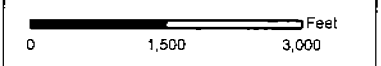
Alternatives Analysis

Study Area 29

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

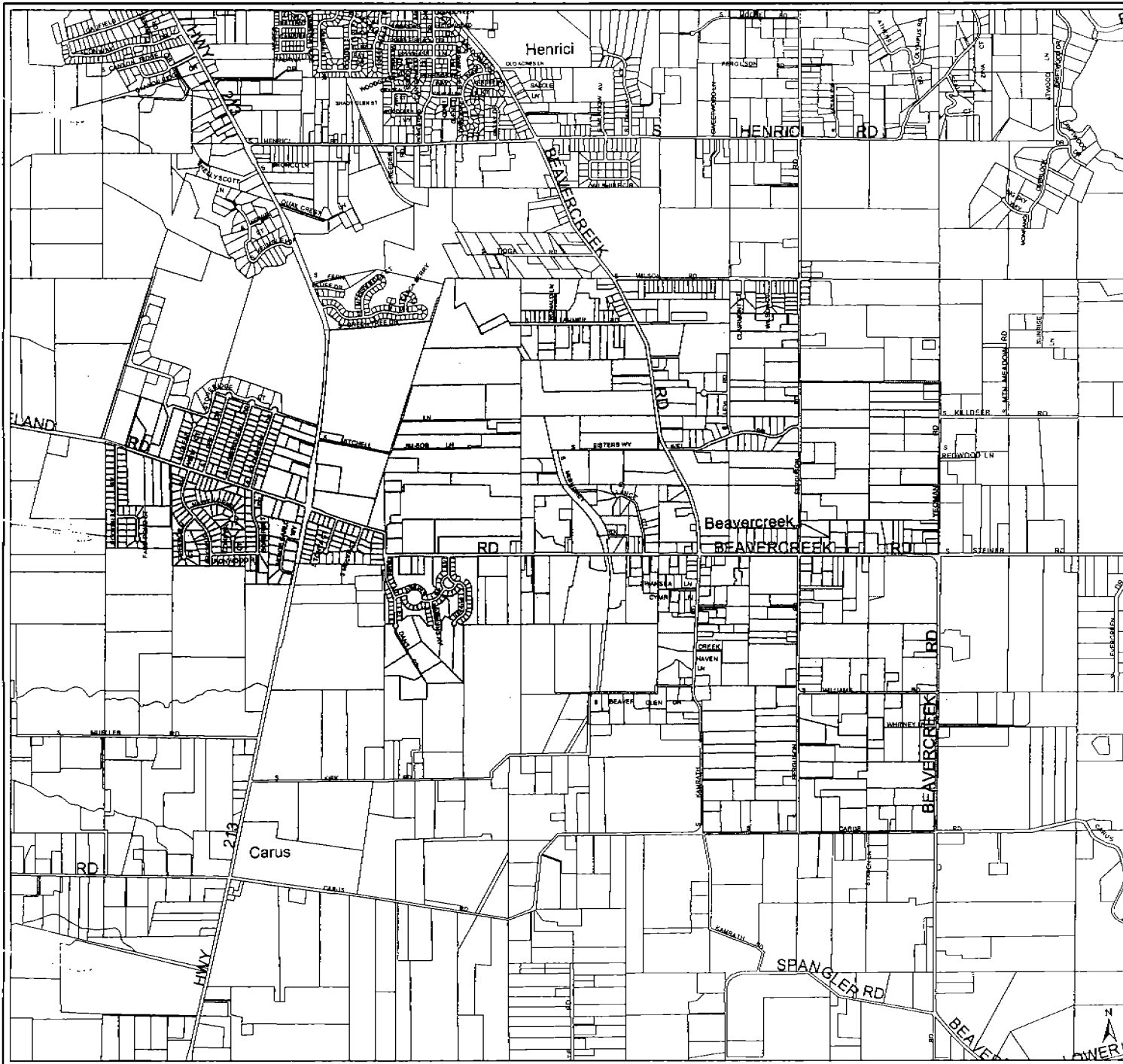
This report is based on the digital data provided by the above sources. It is not a warranty of accuracy or completeness. The user assumes all responsibility for the use of the information contained herein. The user agrees to hold METRO harmless for any and all claims, damages, losses, or expenses, including reasonable attorneys' fees, arising out of or in connection with the use of the information contained herein. METRO shall not be liable for any and all claims, damages, losses, or expenses, including reasonable attorneys' fees, arising out of or in connection with the use of the information contained herein.



Location Map



METRO DATA RESOURCE CENTER
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TEL (503) 797-1742 | FAX (503) 797-1809
drc@metro-ol.org | www.metro-ol.org



R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 30

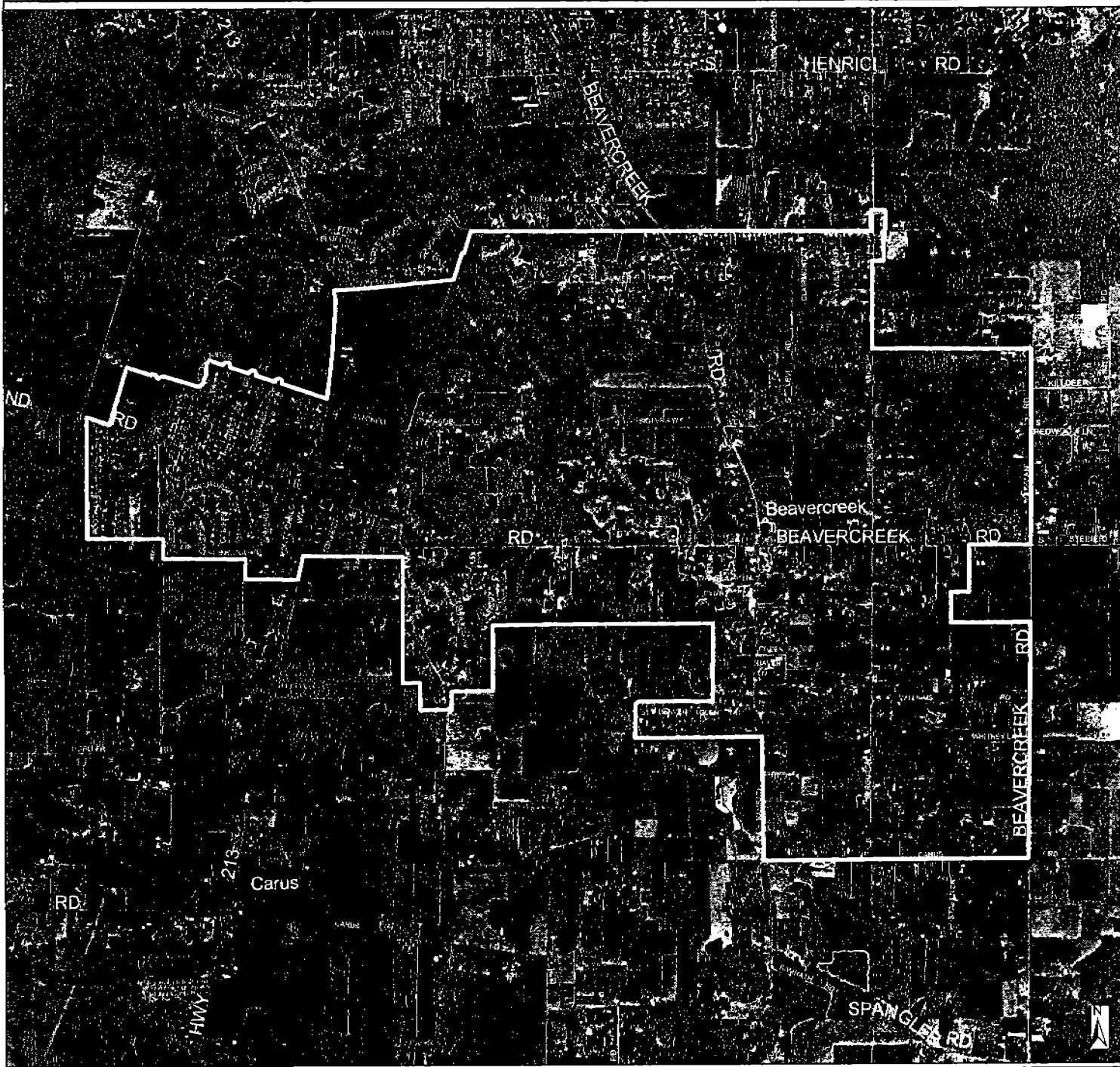
Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:
 TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.
 The above information is not intended to constitute a warranty of any kind, express or implied, by the Metro Region. The Metro Region is not responsible for any errors or omissions in this map. It is the user's responsibility to verify the accuracy of the information shown on this map. The Metro Region is not responsible for any damages, including consequential damages, arising from the use of this map. The Metro Region is not responsible for any damages, including consequential damages, arising from the use of this map.

Feet
 0 2,000 4,000

Location Map

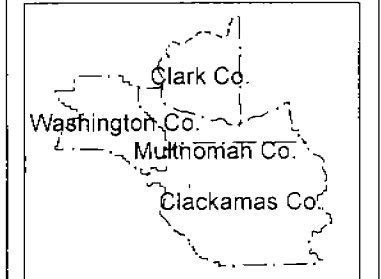
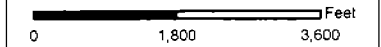
METRO DATA RESOURCE CENTER
 600 NORTHEAST GRAND AVENUE | PORTLAND, OREGON 97232-2756
 TEL (503) 797-1742 | FAX (503) 797-1909
 drc@metro.dsl.or.us | www.metro-region.org



Alternatives Analysis

Study Area 30

SOURCES:
TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200 or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map



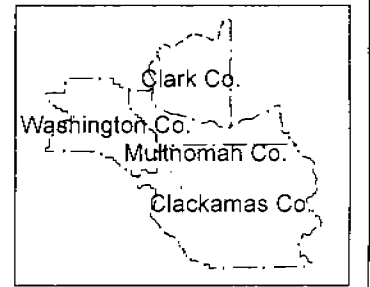
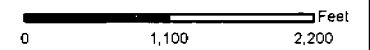
METRO DATA RESOURCE CENTER
 500 NORTHEAST GRAND AVENUE | PORTLAND, OREGON 97232-2735
 TEL (503) 797-1742 | FAX (503) 797-1539
 drc@metro.dstl.ct.us | www.metro-reg-on.org



Alternatives Analysis

Study Area 31

SOURCES:
FAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Multnomah, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map



METRO DATA RESOURCE CENTER
 600 NORTHEAST GRAND AVENUE - PORTLAND, OREGON 97232-2736
 TEL (503) 787-1742 FAX (503) 797-1906
 dro@metro.dst.or.us | www.metro-region.org

Alternatives Analysis

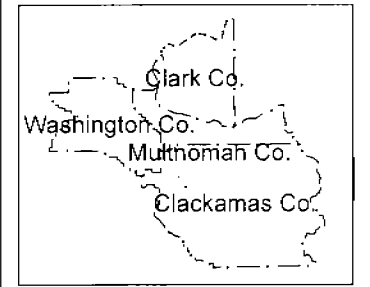
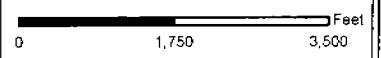
Study Area 32

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

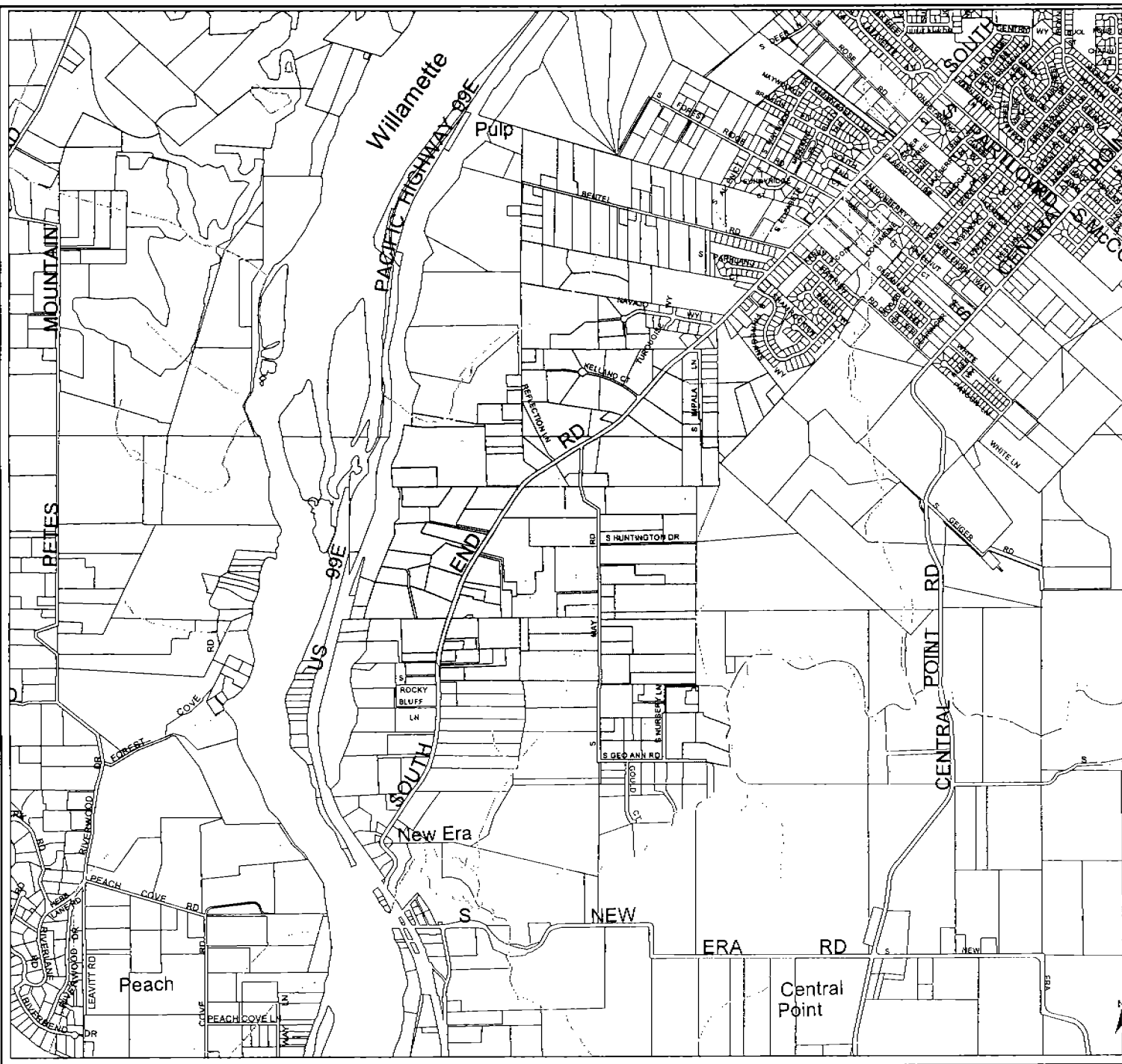
The official map shows the boundaries of the study area as shown on the map. The map is a tax lot map and does not show other features such as easements, utility lines, etc. The map is for informational purposes only and should not be used for legal purposes. The map is subject to change without notice.



Location Map



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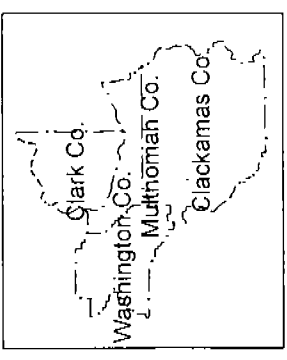
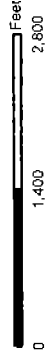
Alternatives Analysis

Study Area 32



SOURCES:

TAX LOT MAP
 County Assessor and Taxation Office, 2001. Data collection scale
 is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas.
 Horizontal accuracy is plus or minus five feet or better in better
 areas. Contouring digitized and Multnomah County. Other areas
 are not shown.




Location Map



METRO ORLANDO RESOURCE CENTER
 608 NORTH EAST GRAND AVENUE | PORTLAND, OREGON 97232-2748
 TEL (503) 797-1242 | FAX (503) 797-1529
 or @metro-oreg.org | www.metroregion.org

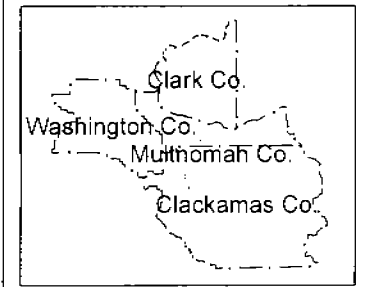
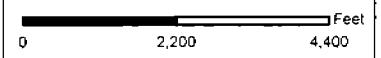
Alternatives Analysis

 Study Area 33

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:

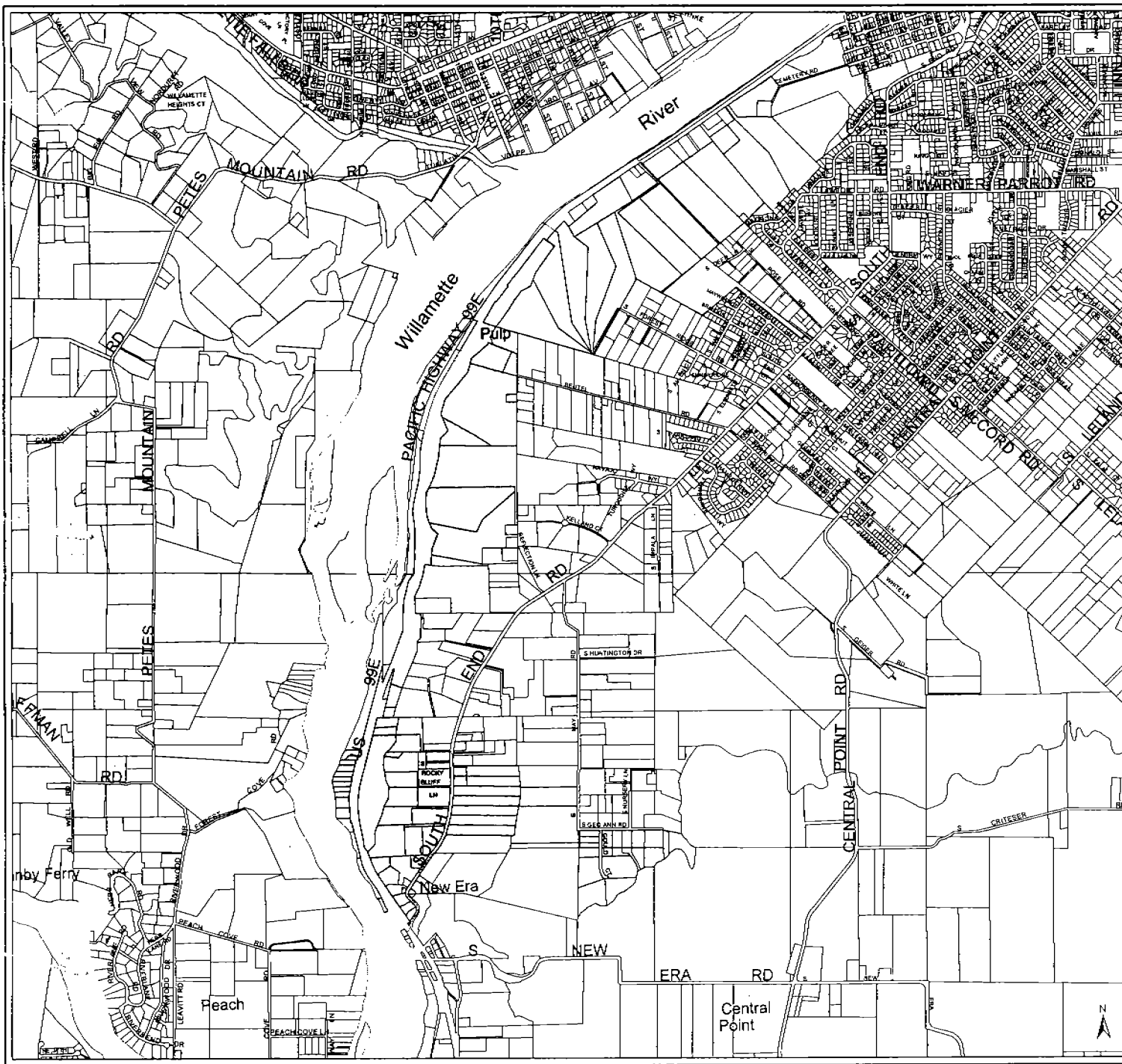
TAX LOT MAP
County Assessment and Taxation office, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map



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600 NORTHEAST GRAND AVENUE | PORTLAND, OREGON 97232-2736
TEL (503) 797-1742 | FAX (503) 787-1829
drc@metro.dst.or.us | www.metro-region.org



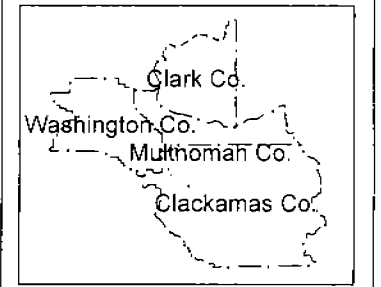
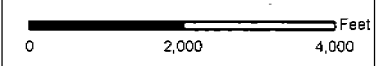


Alternatives Analysis

Study Area 33

SOURCES:

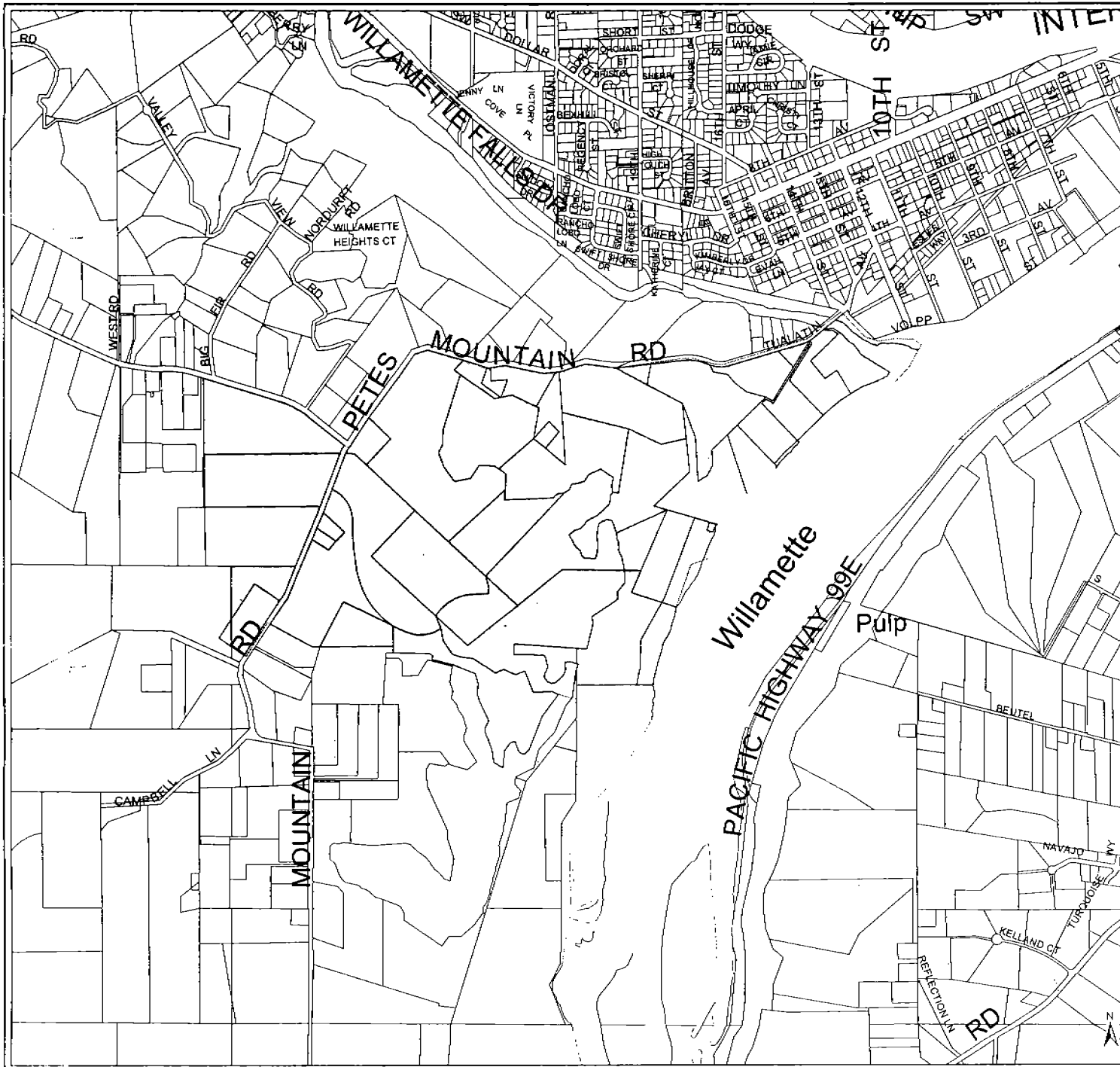
TAX LOT MAP
County Assessment and Taxation offices 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map



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R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 34

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale of 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

0 1,300 2,600
 Feet

Location Map

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 drc@metro.or.us | www.metro-reg.or.gov



R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 34

SOURCES:

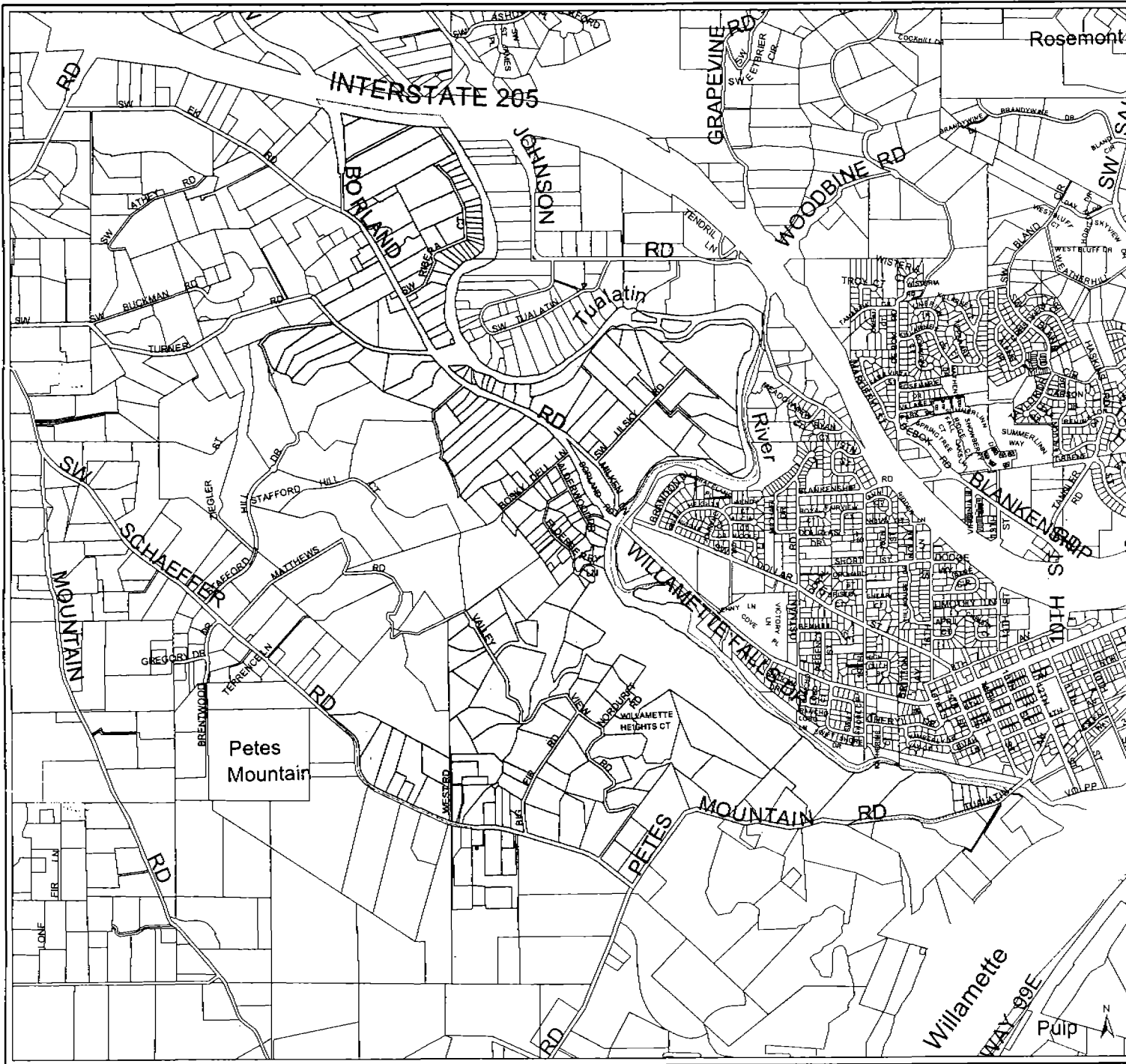
TAX LOT MAP
County Assessment and Taxation offices, 2001. Date collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

Map Scale: 0 980 1,960 Feet

Location Map: Clark Co., Washington Co., Multnomah Co., Clackamas Co.

MEIRO

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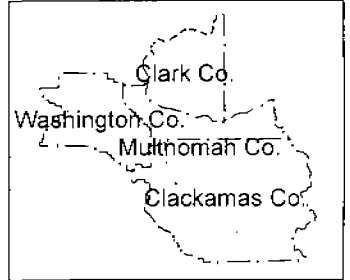
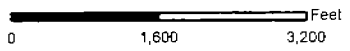
Alternatives Analysis

Study Area 35

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:

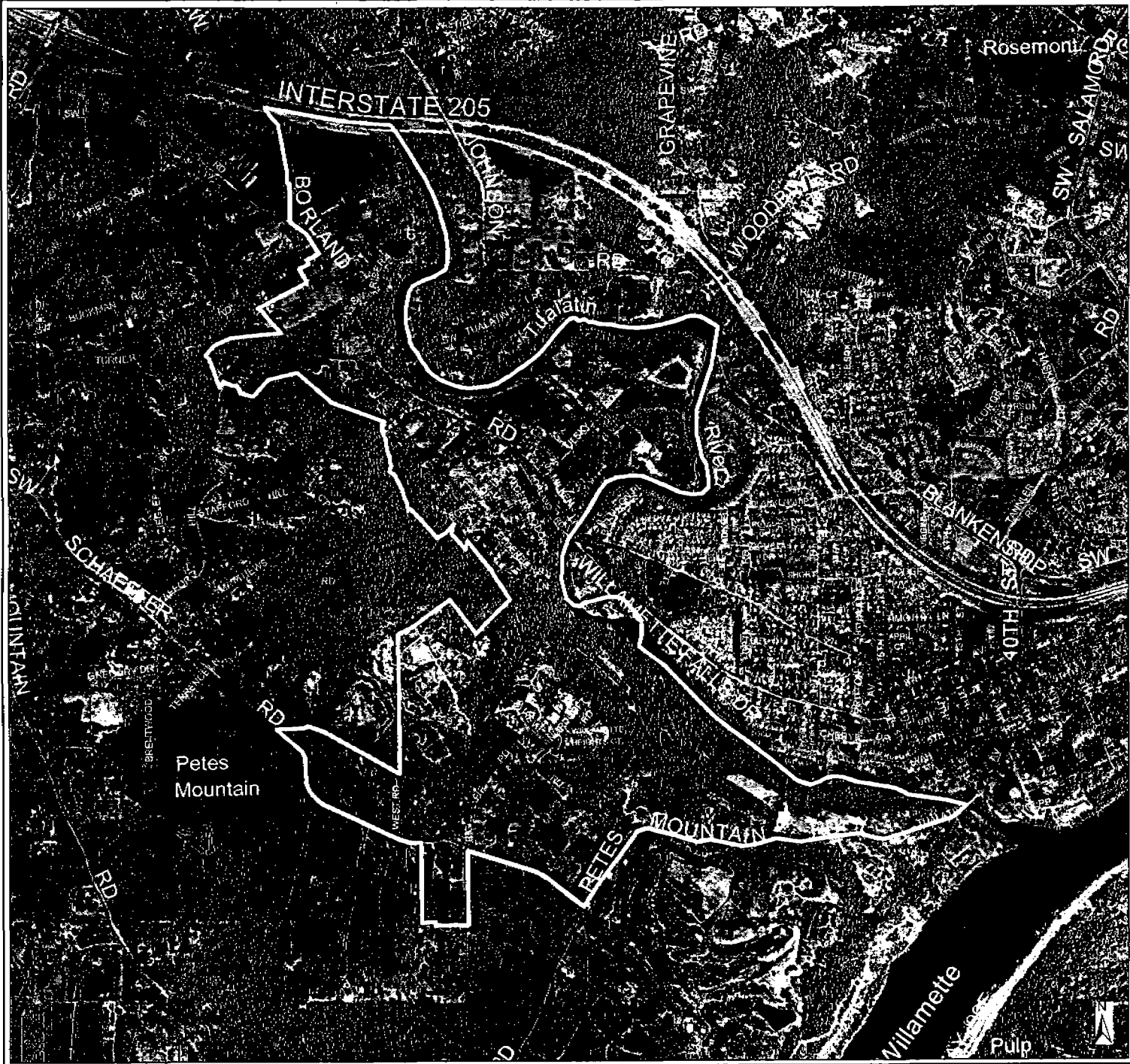
TAX LOT MAP:
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in Urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Hillsdale, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map



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R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 35

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

The official boundary between the City of Tigard and the City of Milwaukie is the centerline of the Willamette River. The official boundary between the City of Tigard and the City of Beaverton is the centerline of the Willamette River. The official boundary between the City of Tigard and the City of Clackamas is the centerline of the Willamette River. The official boundary between the City of Tigard and the City of Washington is the centerline of the Willamette River. The official boundary between the City of Tigard and the City of Multnomah is the centerline of the Willamette River. The official boundary between the City of Tigard and the City of Clackamas is the centerline of the Willamette River.

0 1,500 3,000 Feet


Clark Co.

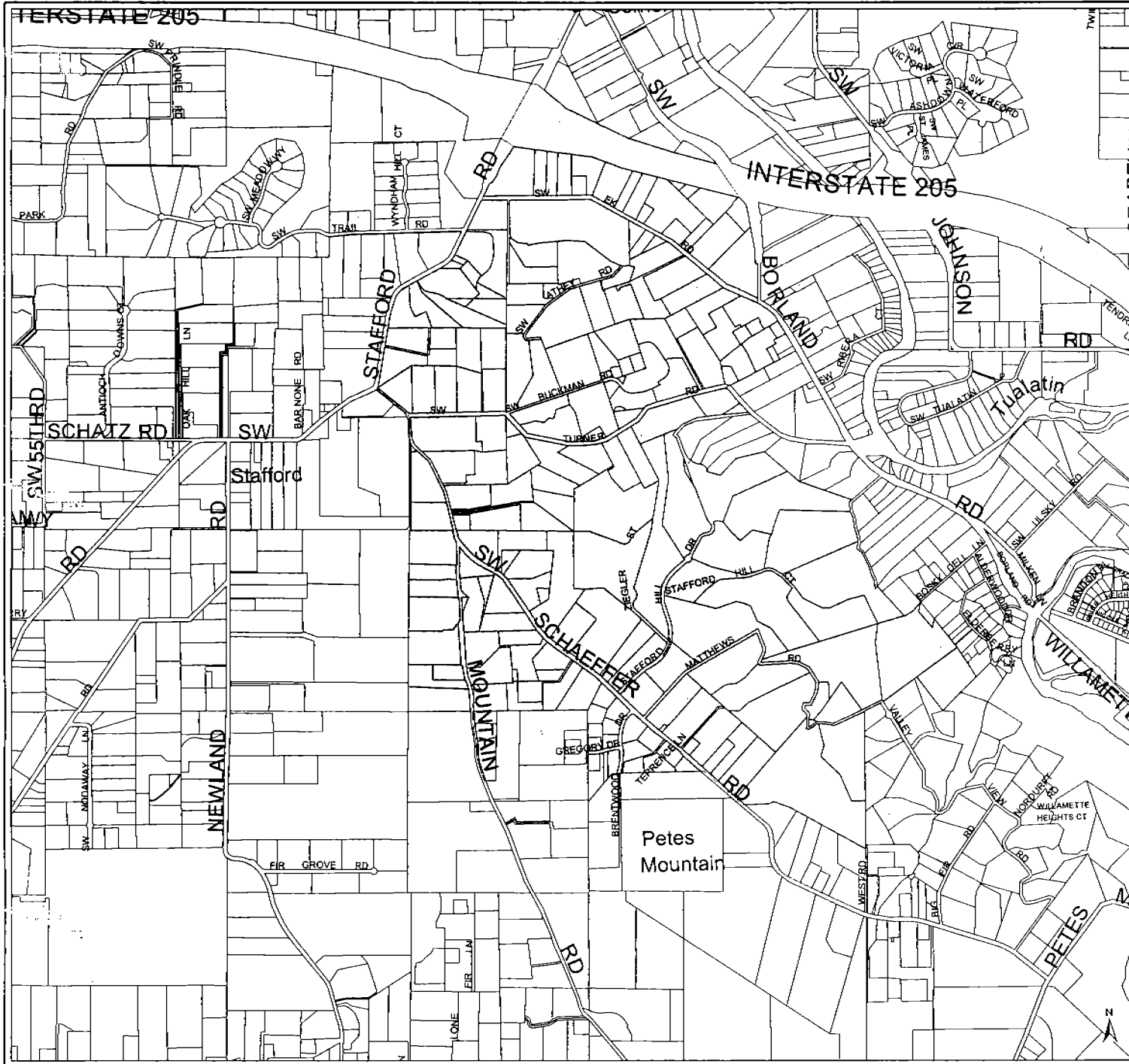
Washington Co.

Multnomah Co.

Clackamas Co.

Location Map


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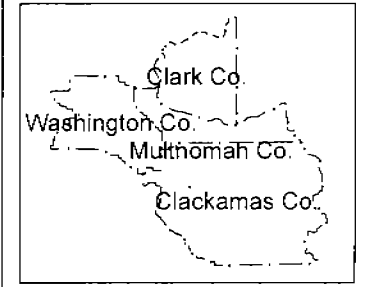
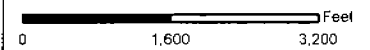
Alternatives Analysis

Study Area 36

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES

TAX LOT MAP
County Assessment and Taxation Offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



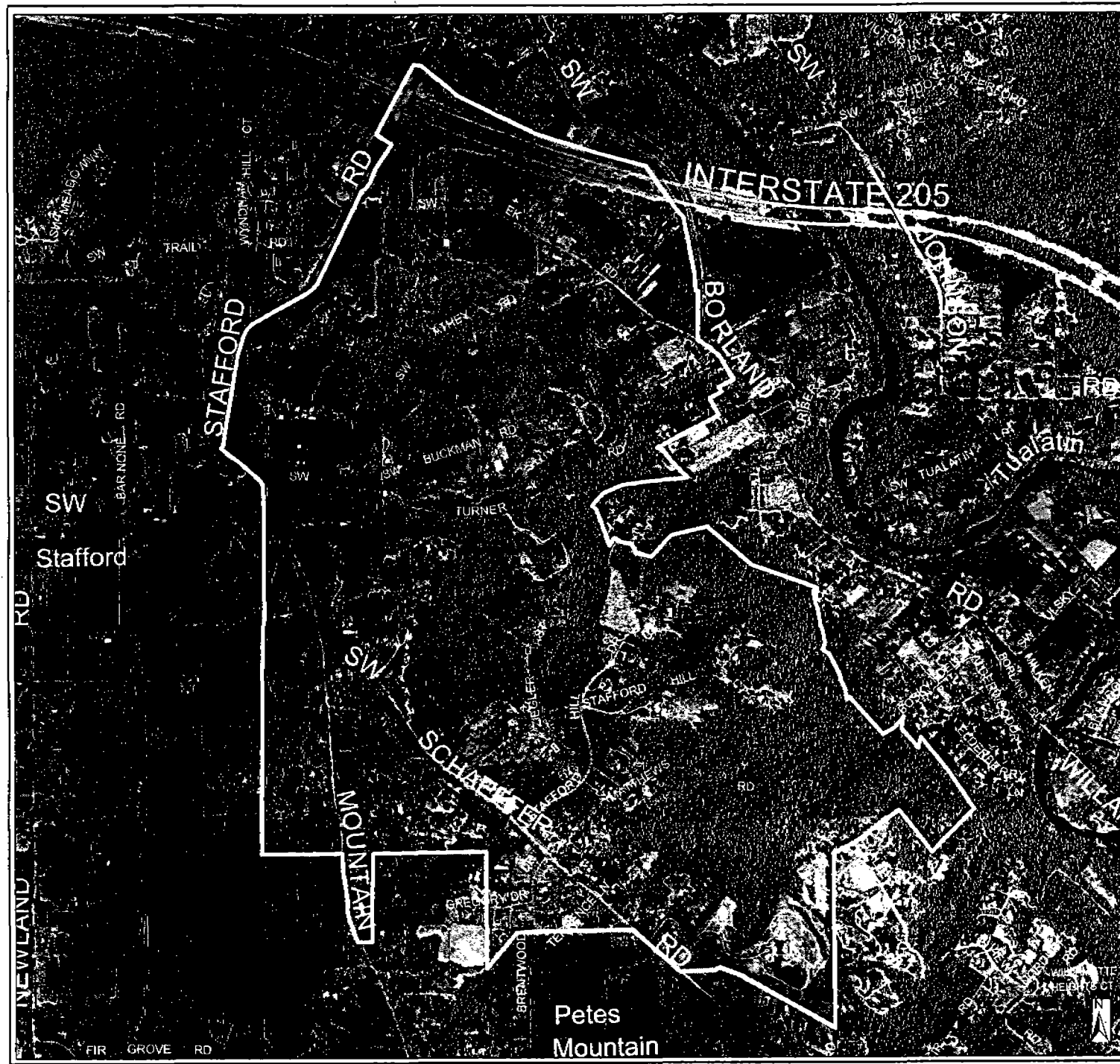
Location Map



METRO DATA RESOURCE CENTER
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TEL (503) 797-1742 FAX (503) 797-1909
drc@metro.dsi.or.us | www.metro-reg.org

Alternatives Analysis

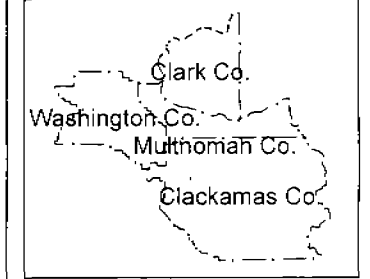
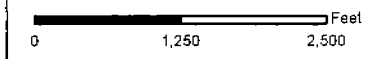
Study Area 36



SOURCES:

TAX LOT MAP
County Assessor and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200 or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

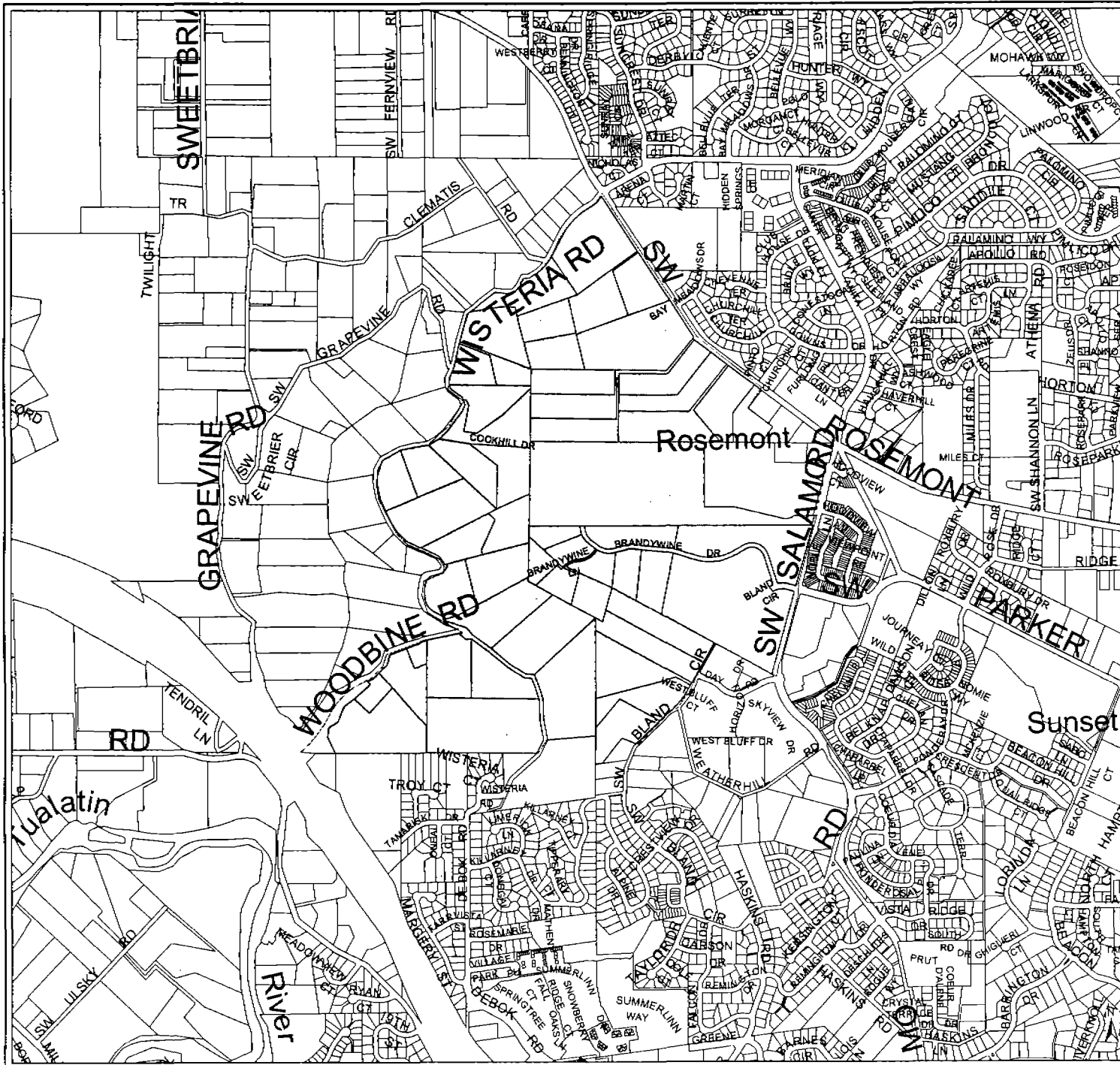
Topographic data provided by the Oregon Department of Geology and Mineral Industries. Data collection scale is 1"=100' in urban areas and 1"=200 or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.




Location Map



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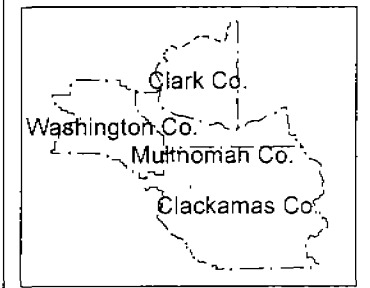
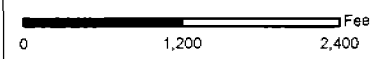


Alternatives Analysis

 Study Area 37

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

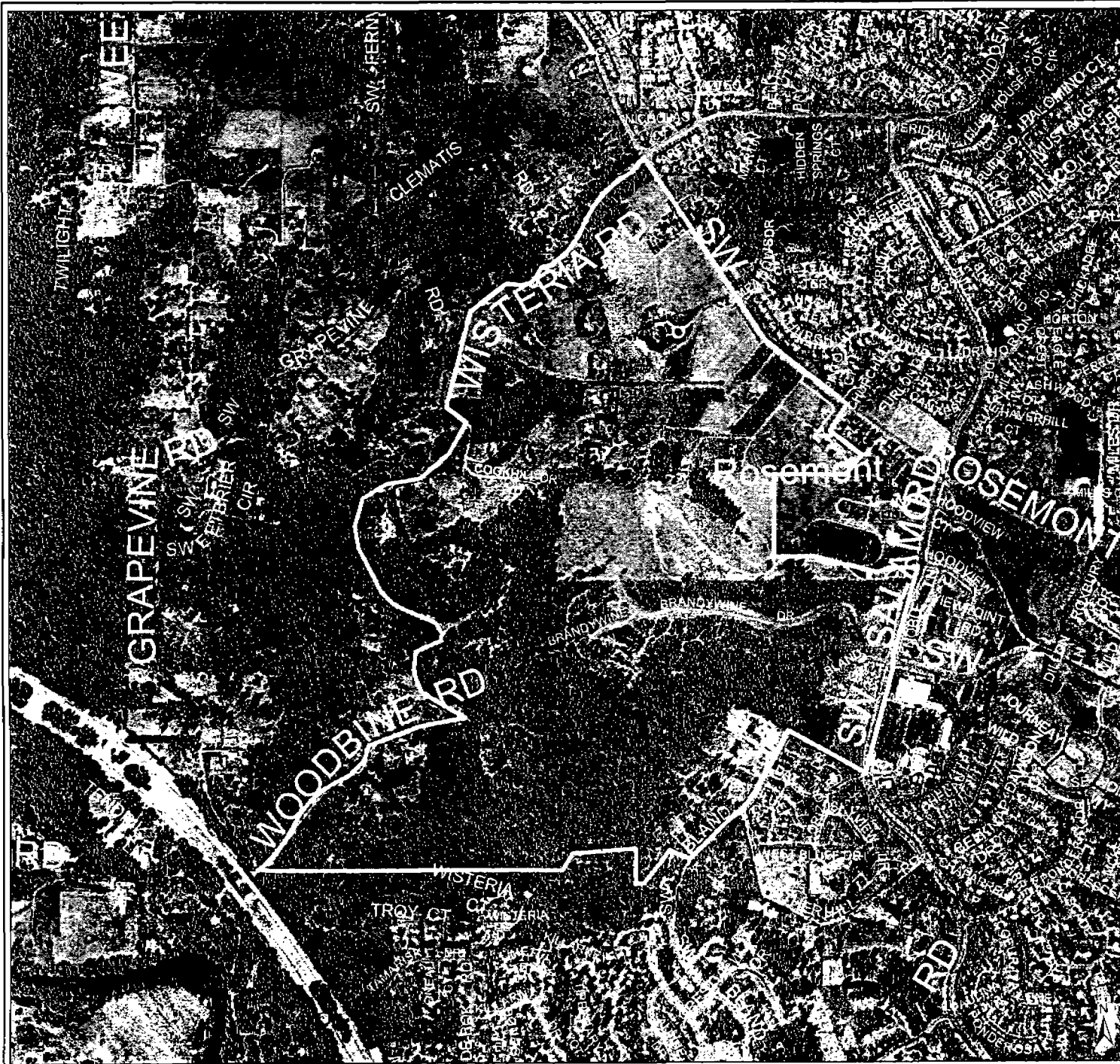
SOURCES:
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map



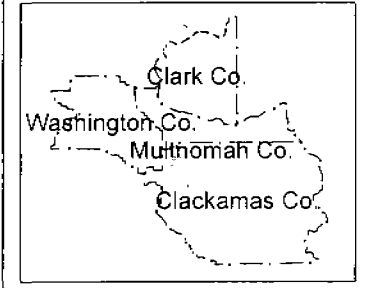
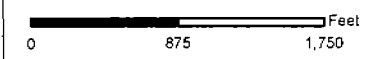
METRO DATA RESOURCE CENTER
600 NORTHEAST GRAND AVENUE | PORTLAND, OREGON 97232-3736
TEL (503) 797-1742 FAX (503) 797-1909
drc@metro-oregon.org www.metro-reg.org



Alternatives Analysis

Study Area 37

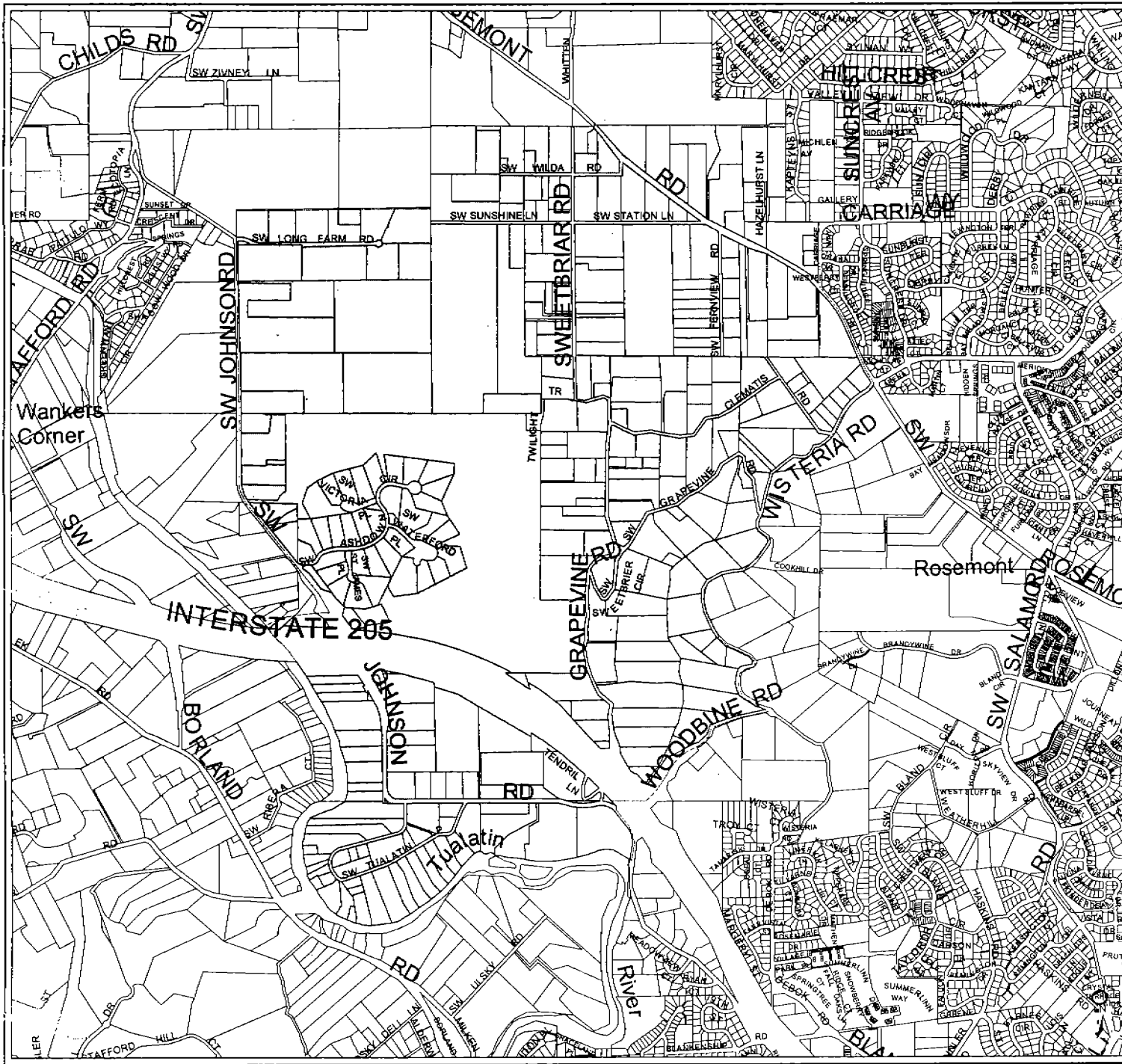
SOURCES:
TAX LOT MAP
 County Assessment and Taxation Offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.
 In 2001, the boundaries were updated to reflect the current boundaries of the Metro region. The boundaries were updated to reflect the current boundaries of the Metro region. The boundaries were updated to reflect the current boundaries of the Metro region. The boundaries were updated to reflect the current boundaries of the Metro region.



Location Map



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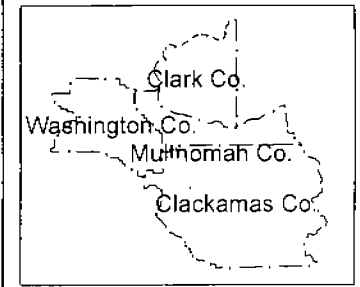
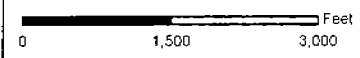


Alternatives Analysis

Study Area 38

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

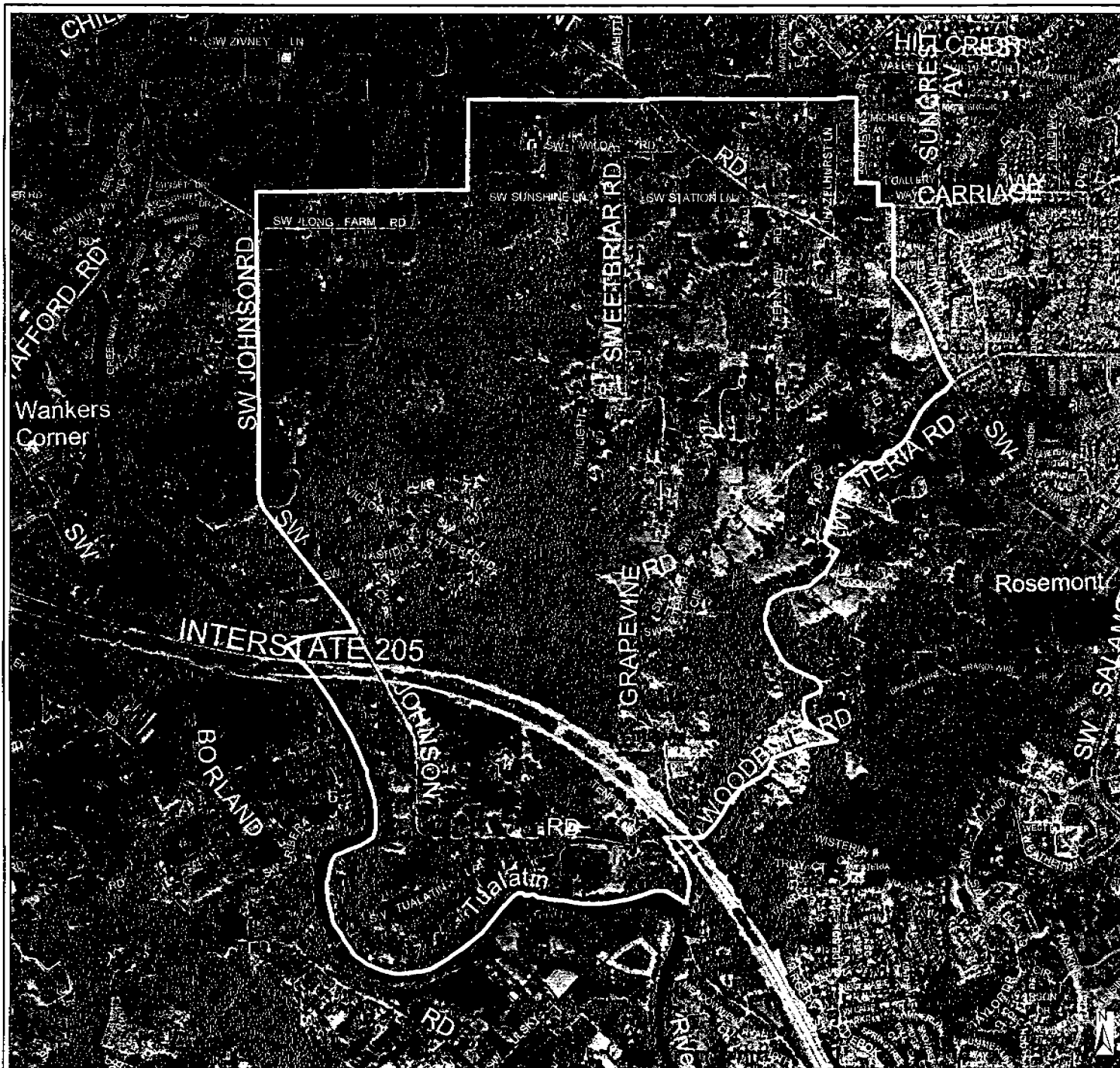
SOURCES:
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=430' in rural areas.
Horizontal accuracy is plus or minus five feet (center in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet).



Location Map



METRO DATA RESOURCE CENTER
603 NORTHEAST GRAND AVENUE | PORTLAND, OREGON 97232-2736
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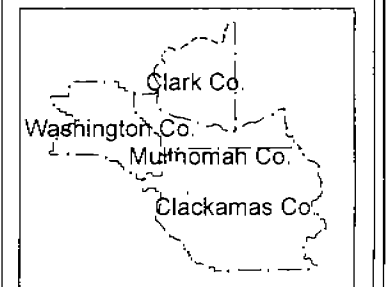
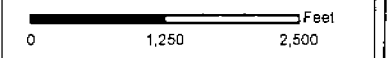
Alternatives Analysis

Study Area 38

SOURCES

TAX LOT MAP
County Assessment and Taxation offices, 2001. Date collection scale is 1"=400' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Deschutes, Multnomah, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

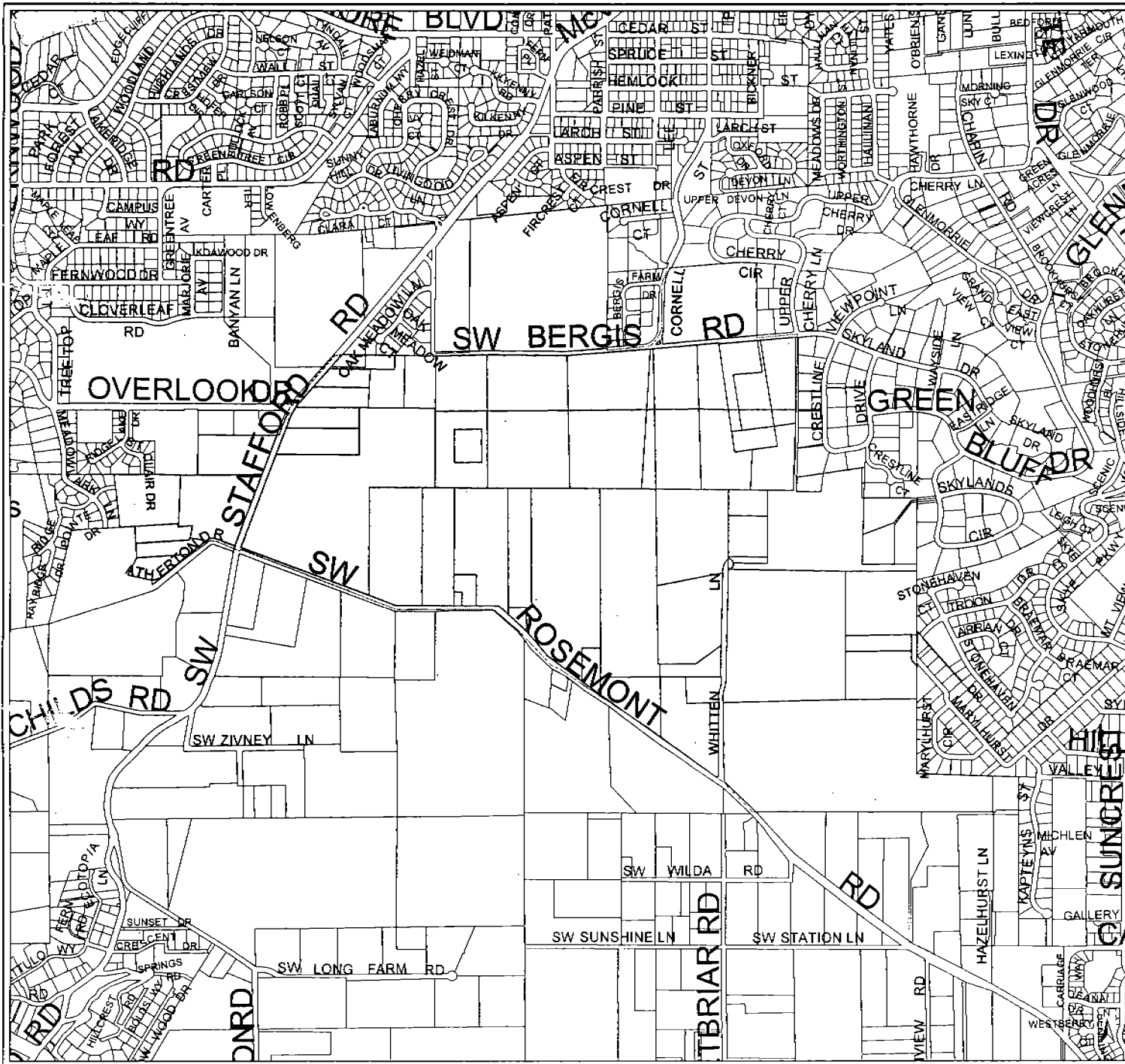
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Location Map



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R L I S
REGIONAL LAKE INFORMATION SYSTEM

Alternatives Analysis

Study Area 39

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

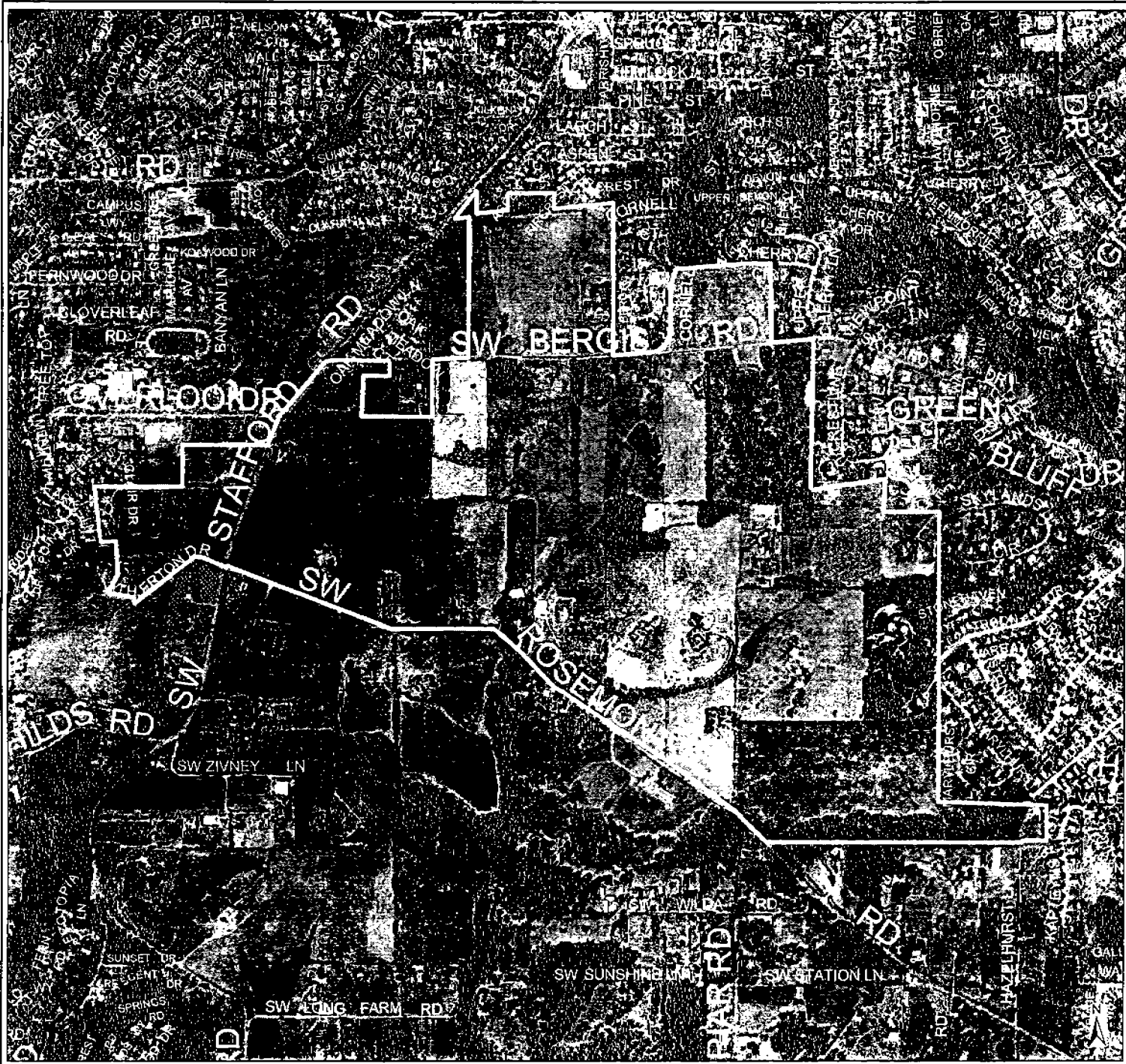
The information on this map was prepared by Metro for the purpose of providing information to the public. Metro does not warrant the accuracy or completeness of the information. Metro is not responsible for any errors or omissions. Metro is not liable for any damages, including consequential damages, arising from the use of this information.

0 1,100 2,200 Feet

Location Map

METRO

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drc@metro.or.us | www.metro-region.org

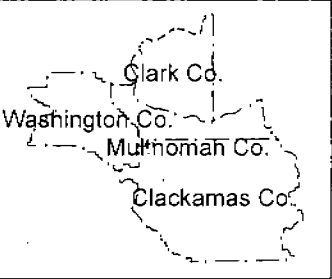
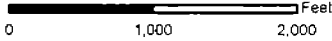


Alternatives Analysis

Study Area 39

SOURCES:
TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 5"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Medwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

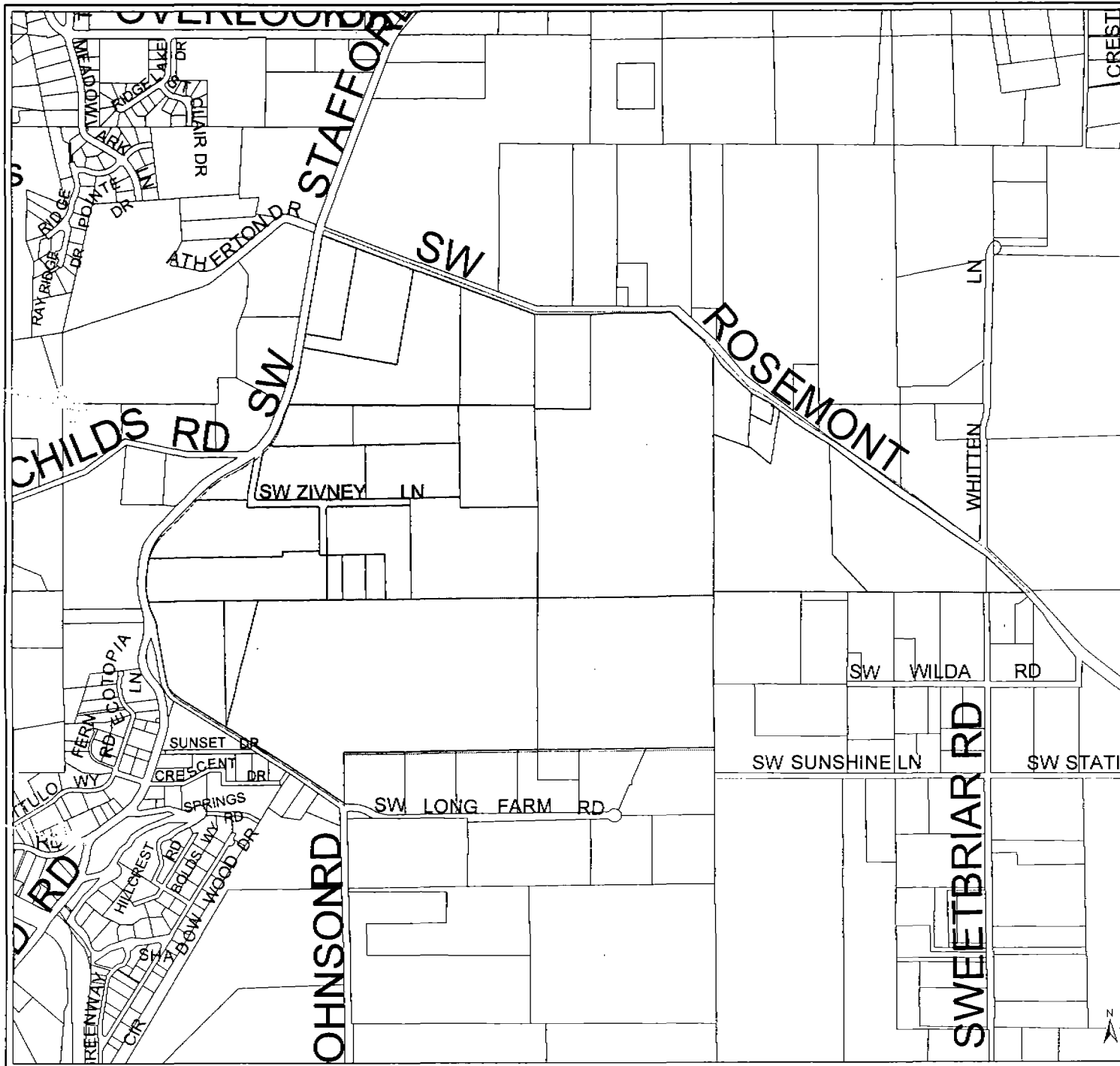
AIR PHOTOGRAPHY
 The aerial photograph was obtained from the Oregon Department of Transportation, Bureau of Aeronautics, and is a composite of several photographs taken in 1998. The photograph is a false color composite and is not a true color photograph. The photograph is a composite of several photographs taken in 1998. The photograph is a false color composite and is not a true color photograph.



Location Map



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 TEL (503) 787-1742 | FAX (503) 787-1905
 dir@metro-ds1.or.us | www.metro-region.ig

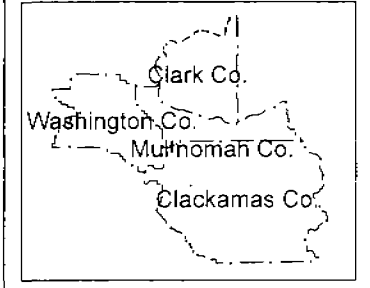
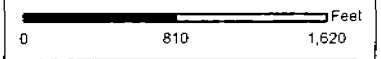


R L I S
 REGIONAL LAND INFORMATION SYSTEM
Alternatives Analysis

Study Area 40

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

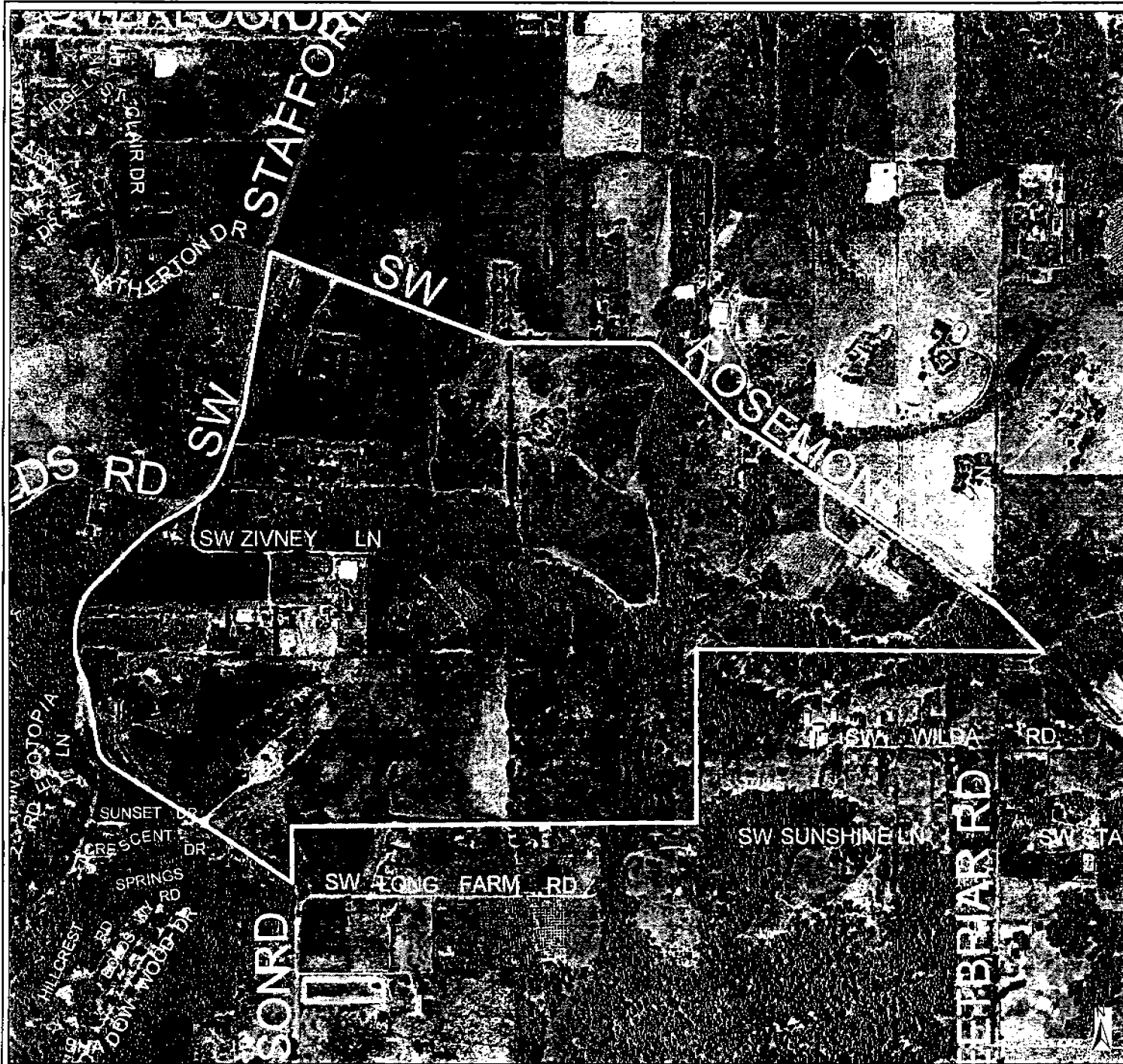
SOURCES:
 TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map



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 TEL (503) 797-1742 | FAX (503) 797-1909
 or@mtrd.org or us | www.metroregion.org



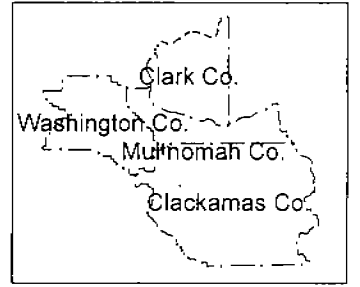
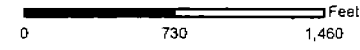
Alternatives Analysis

Study Area 40

SOURCES:

TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

In a Metro 2040 scenario, the study area is located in the Metro 2040 Urban Growth Boundary (UGB) for the Metro region. The UGB is a boundary that defines the area within which Metro expects to manage growth. The UGB is not a boundary that defines the area within which Metro expects to manage growth. The UGB is a boundary that defines the area within which Metro expects to manage growth.




Location Map



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 dic@metro.dstl.or.us www.metro-region.org

R L I S
REGIONAL LAND INFORMATION SYSTEM

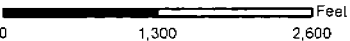
Alternatives Analysis

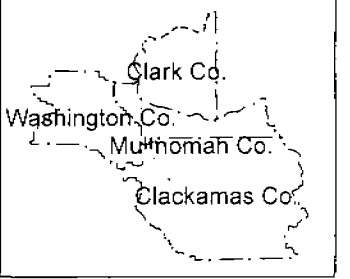
 Study Area 41

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).


SOURCES

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=250' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

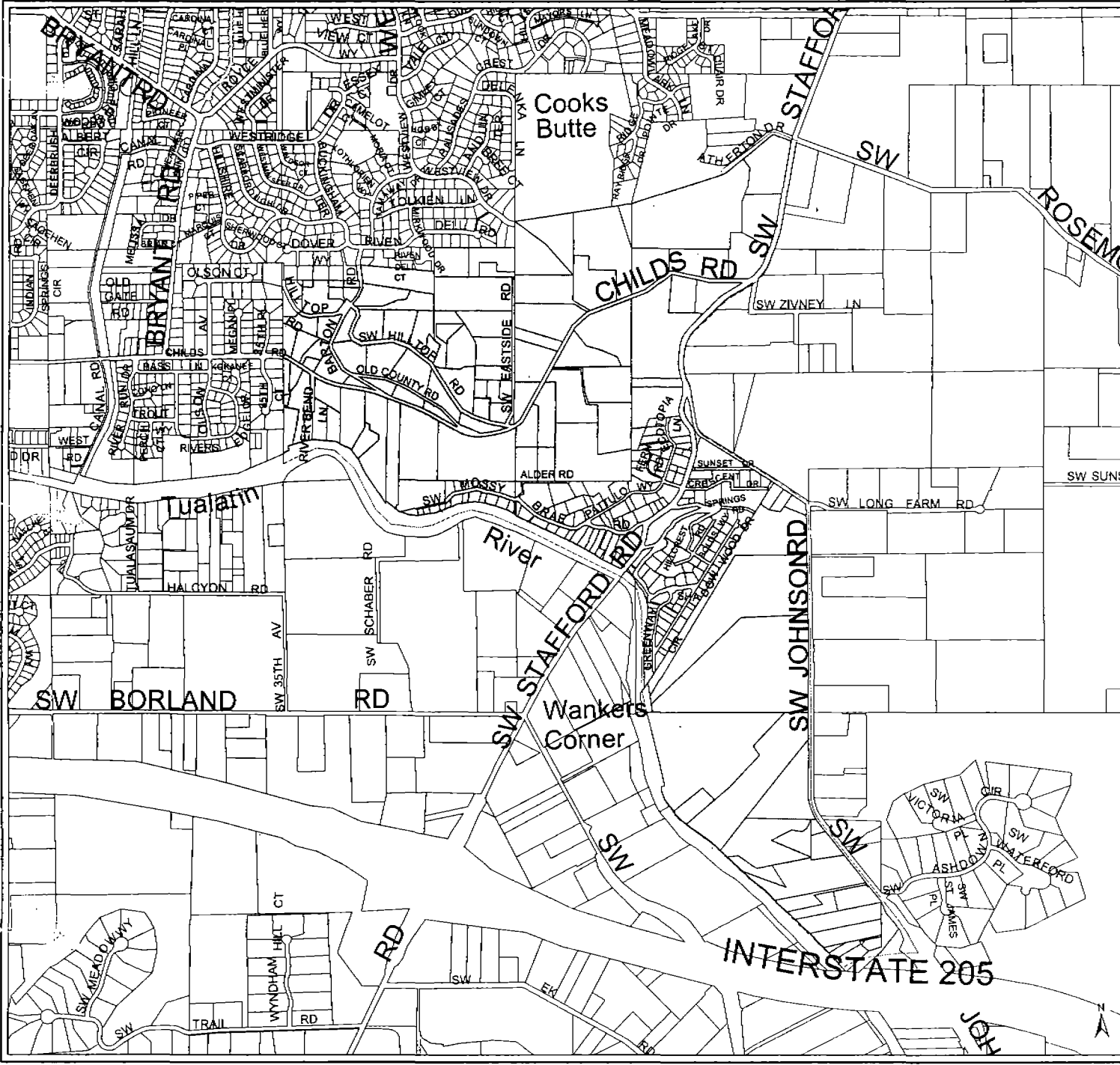


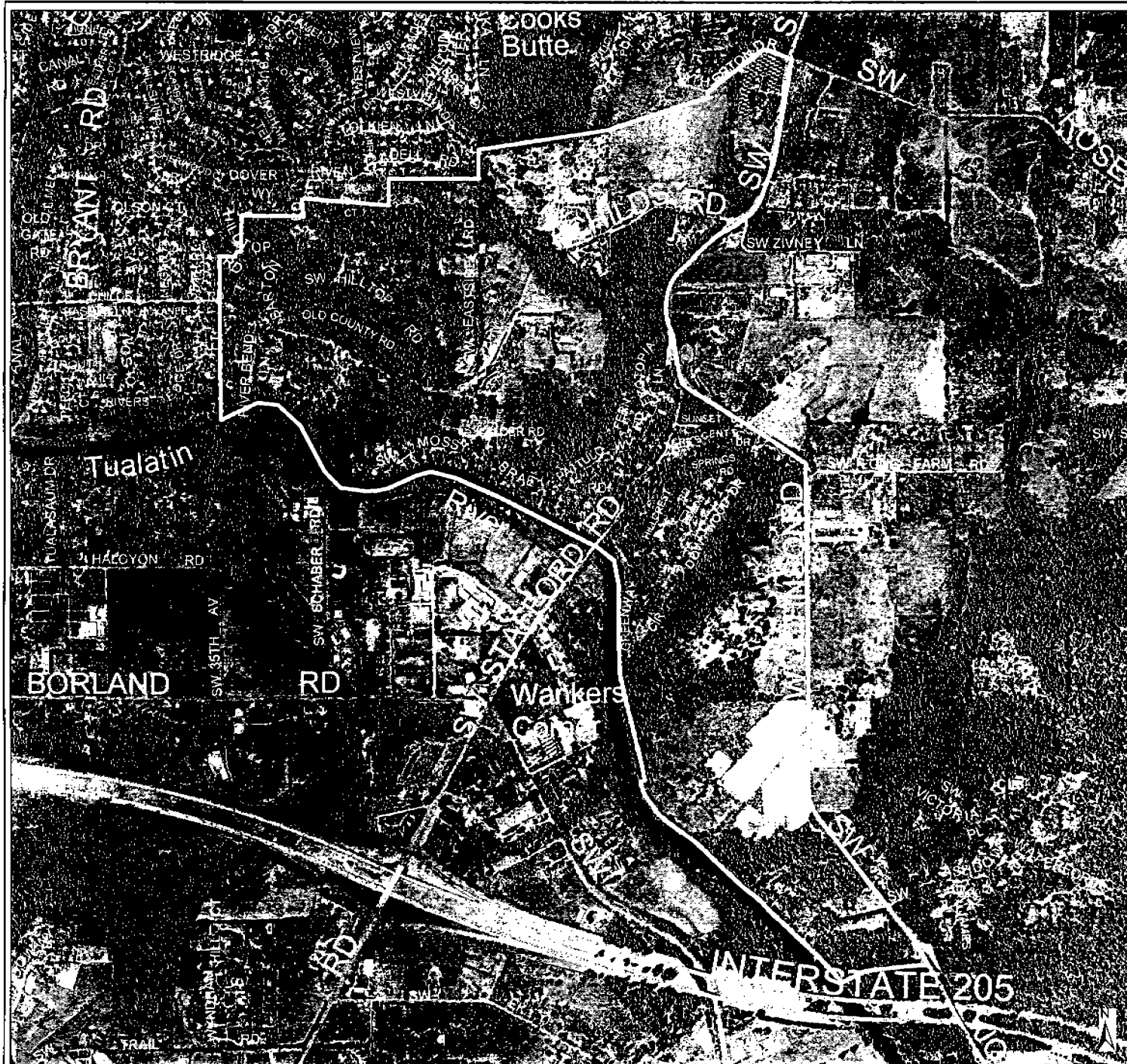


Location Map



METRO
METRO DATA RESOURCE CENTER
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TEL (503) 797-1742 FAX (503) 797-1909
erc@metro-dti.or.us | www.metro-region.org

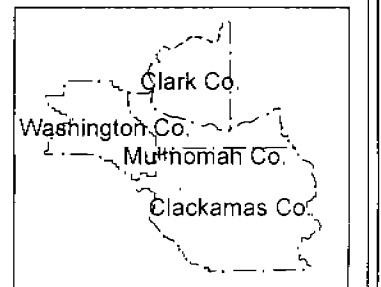
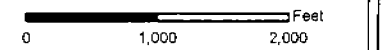




Alternatives Analysis

Study Area 41

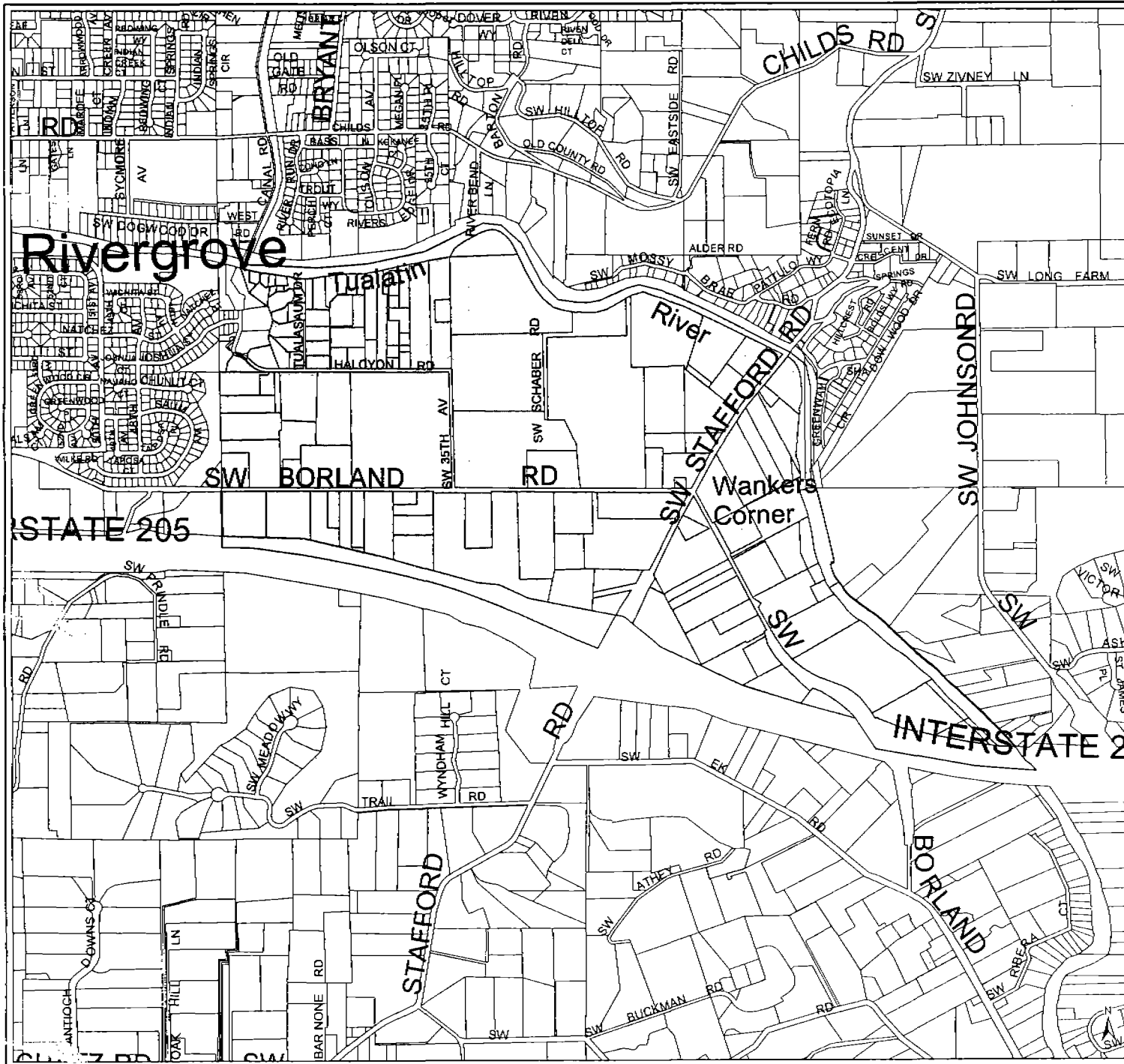
SOURCES:
TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.
 Other sources include aerial photography, GIS data, and other regional planning documents.



Location Map



METRO DATA RESOURCE CENTER
 600 NORTHEAST GRAND AVENUE | PORTLAND, OREGON 97232-2736
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R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 42

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).


SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Medwskie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

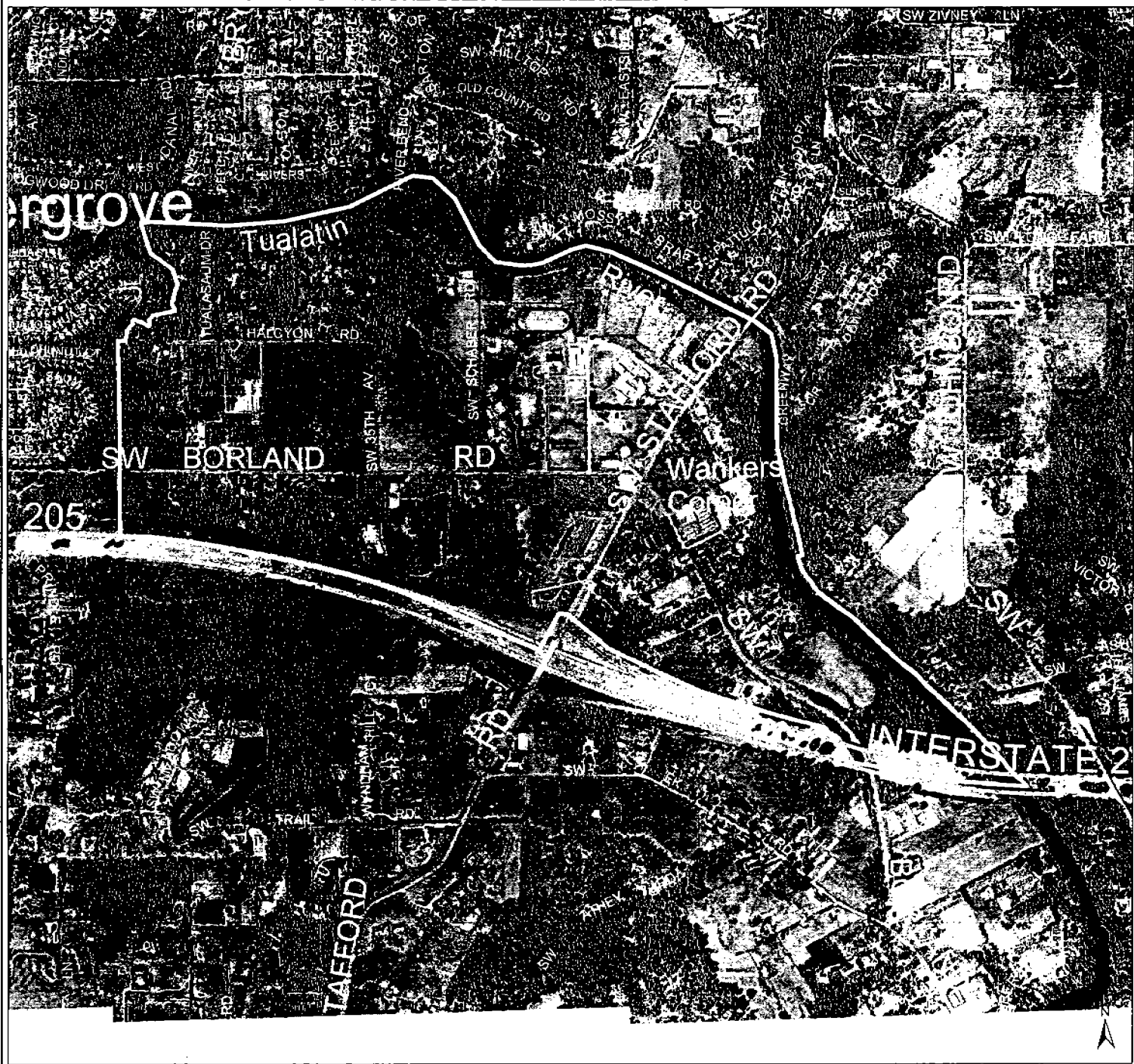
0 1,250 2,500 Feet

Clark Co.
 Washington Co.
 Multnomah Co.
 Clackamas Co.

Location Map


 METRO

METRO DATA RESOURCE CENTER
 600 NORTHEAST GRAND AVENUE PORTLAND, OREGON 97232-2736
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 dr@metro.dst.or.us www.metro-region.org



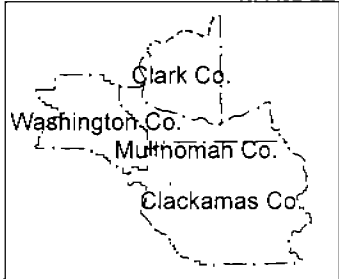
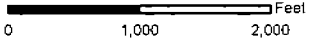
Alternatives Analysis

Study Area 42

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100 in urban areas and 1"=200 or 1"=400 in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

Other sources: Metro 2002. The information in this map is derived from the most current information available. Metro does not warrant the accuracy of the information. Metro is not responsible for any errors or omissions. Metro is not liable for any damages, including consequential damages, arising from the use of this information. Metro is not responsible for any damages, including consequential damages, arising from the use of this information.




Location Map



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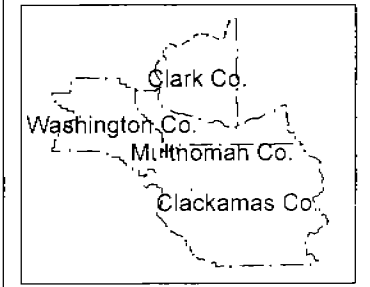
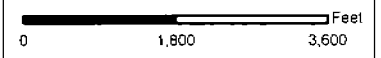
Alternatives Analysis

 Study Area 43

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:

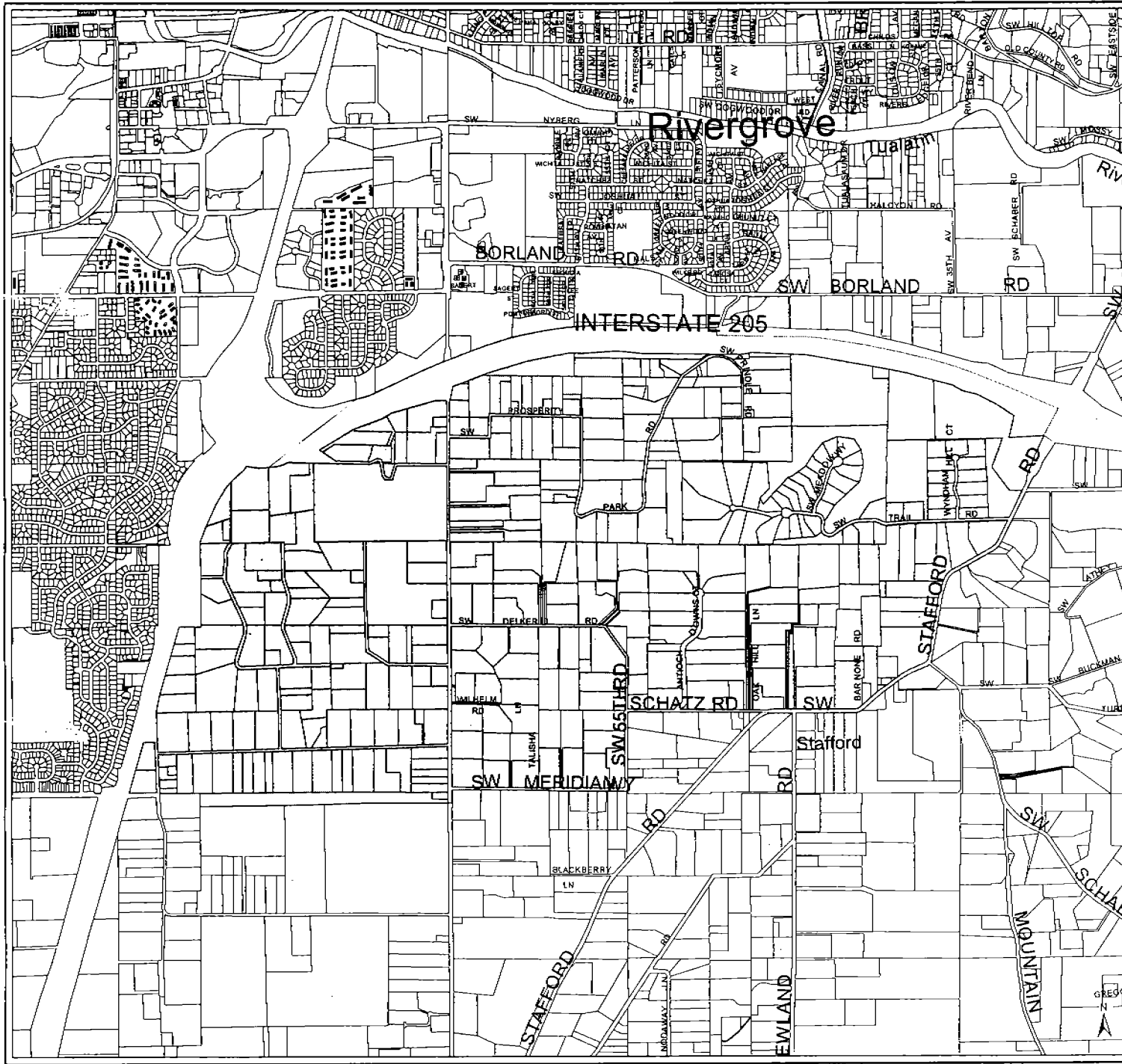
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

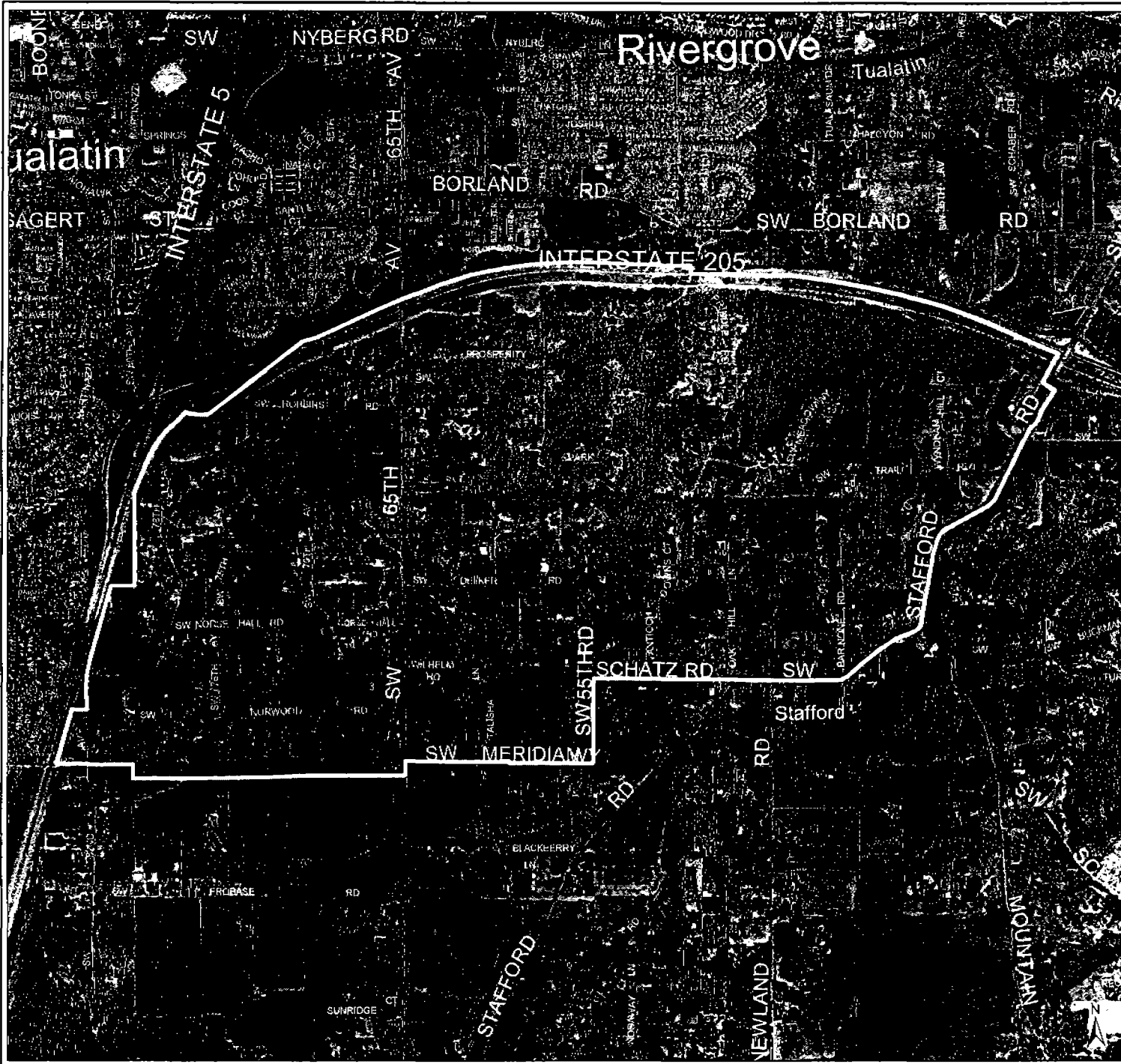


Location Map



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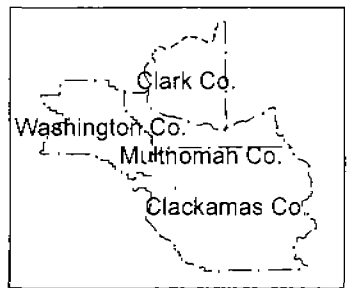
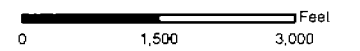


Alternatives Analysis

Study Area 43

SOURCES:

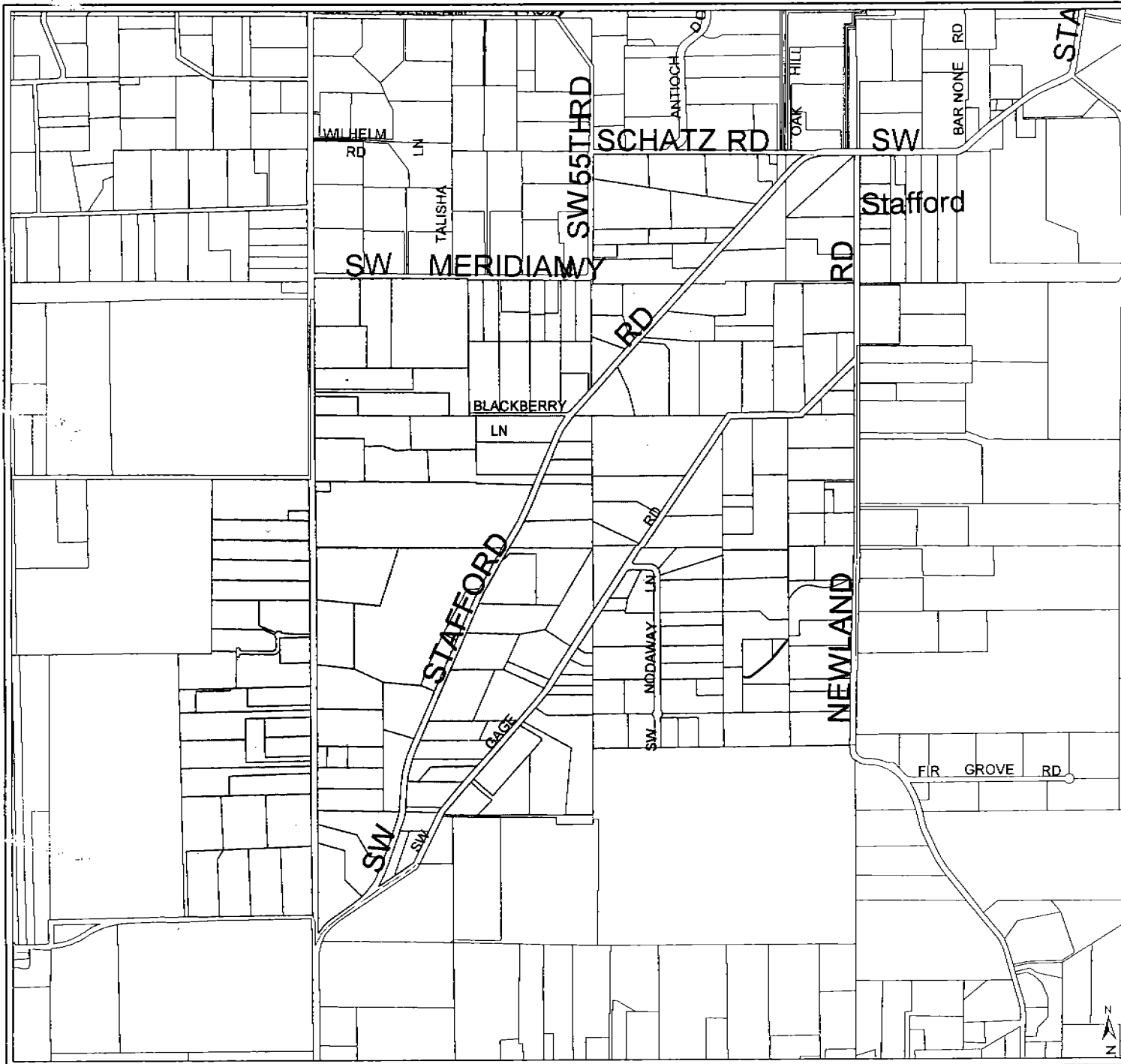
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map



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R I I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 44

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Date collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

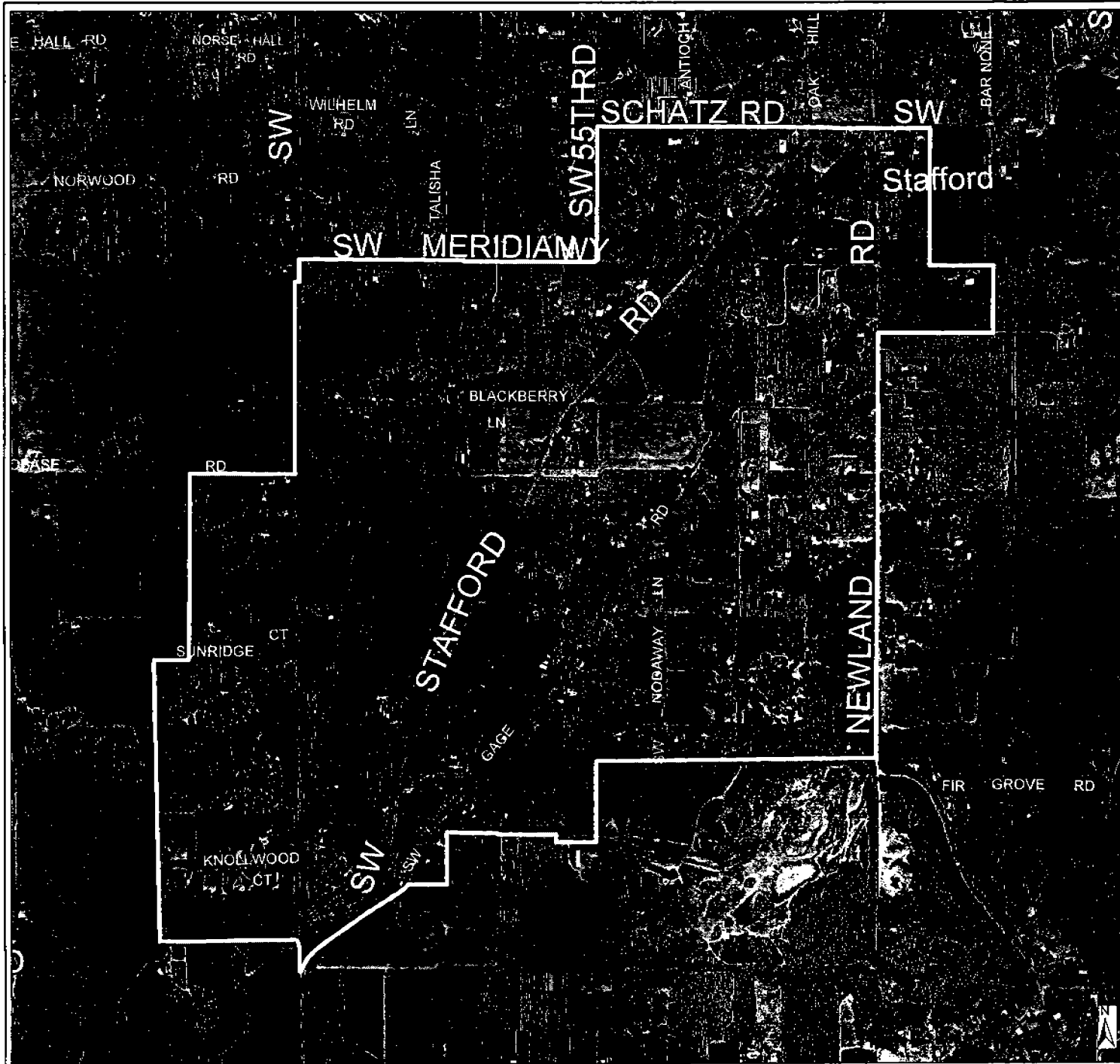
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Feet

0 1,100 2,200

Location Map

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drc@metro.or.us | www.metro-region.org



R E G I O N A L
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 44

SOURCES:


TAX LOT MAP
County Assessment and Taxation offices, 2001. Date collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

This report was prepared by Metro for the Metro Council. Metro is not responsible for the accuracy of the information provided in this report. Metro is not responsible for the accuracy of the information provided in this report. Metro is not responsible for the accuracy of the information provided in this report.

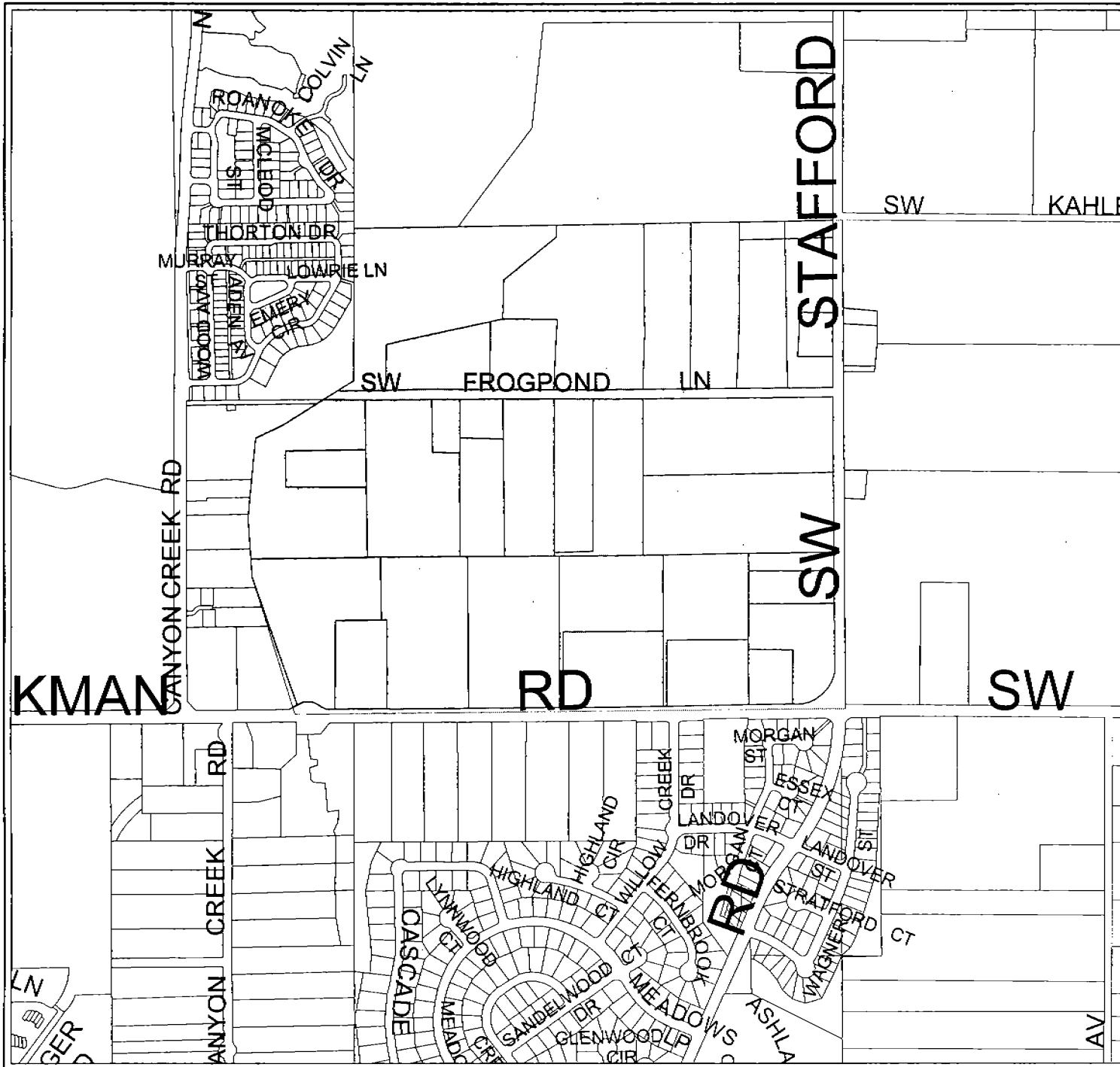
Feet
0 1,000 2,000

Clark Co.
Washington Co.
Multnomah Co.
Clackamas Co.

Location Map


METRO

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R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 45

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

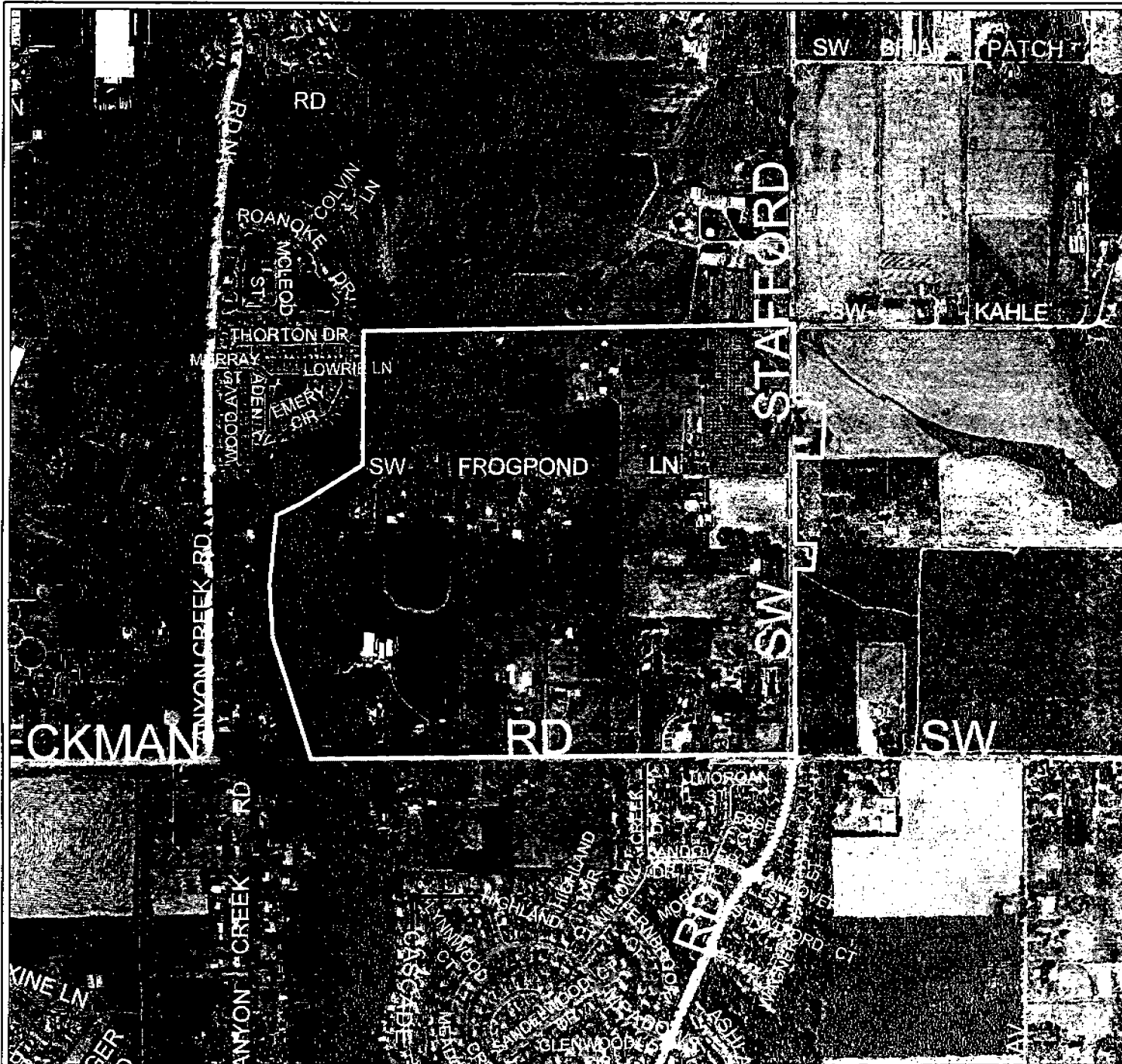
SOURCES:

TAX LOT MAP
County Assessment and Taxation office, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

0 580 1,160 Feet

Location Map

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TEL: (503) 781-1242 | FAX: (503) 781-1909
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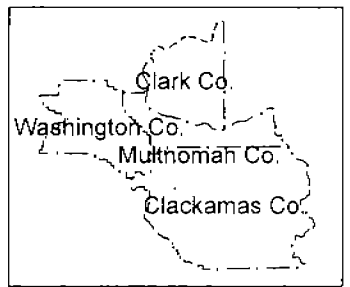
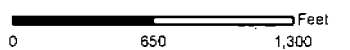
R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 45

SOURCES:

TAX LOT MAP
County Assessment and Taxation office, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Newseville, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.




Location Map



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TEL (503) 787-1742 FAX (503) 737-1909
drc@metro.dst.or.us www.metro-tag.or.gov

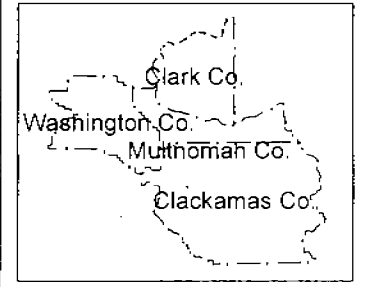
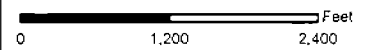


Alternatives Analysis

 Study Area 46

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

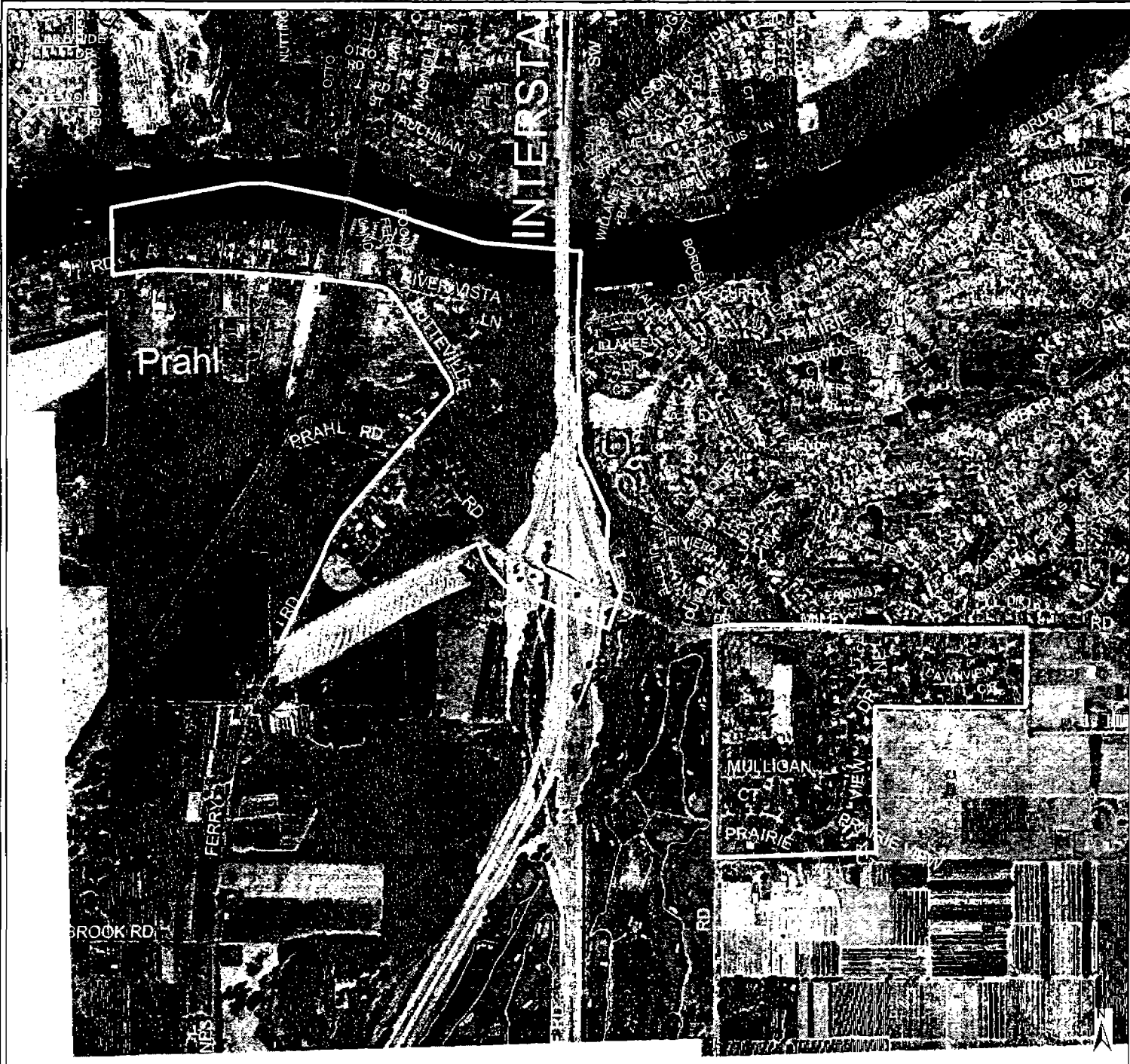
SOURCES
 TAX LOT MAP
 County Assessment and Taxation Offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus six feet.



Location Map



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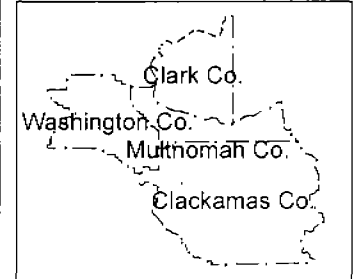
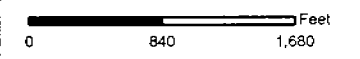
Alternatives Analysis

Study Area 46

SOURCES:

TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=150' in urban areas and 1"=250' or 1"=400' in rural areas. Horizontal accuracy is plus or minus two feet at center in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

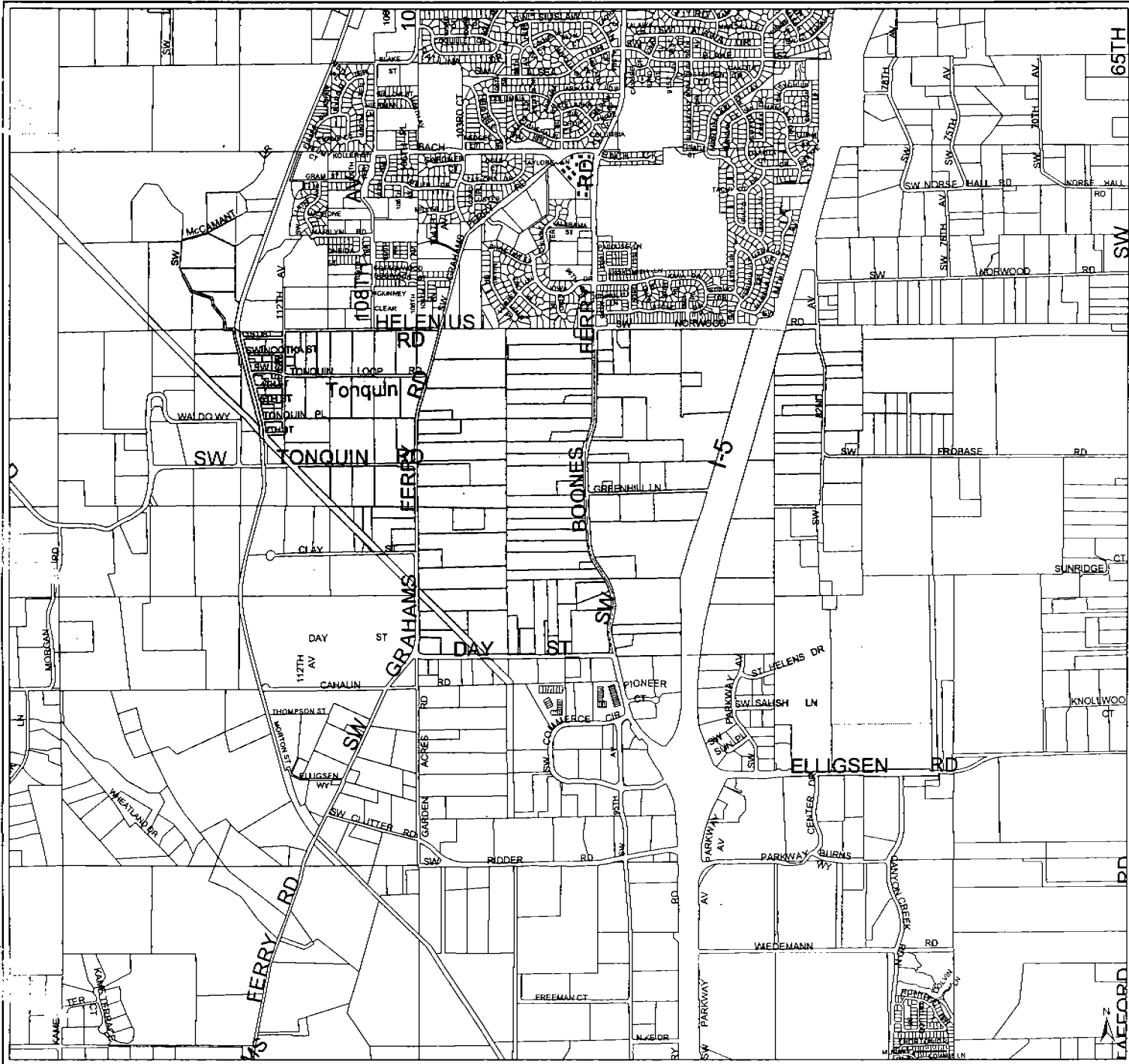
Metro staff have used this data to assist in the preparation of the Alternatives Analysis. Metro staff have not independently verified the accuracy of this data. Metro staff have used this data to assist in the preparation of the Alternatives Analysis. Metro staff have not independently verified the accuracy of this data.



Location Map



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R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 47

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

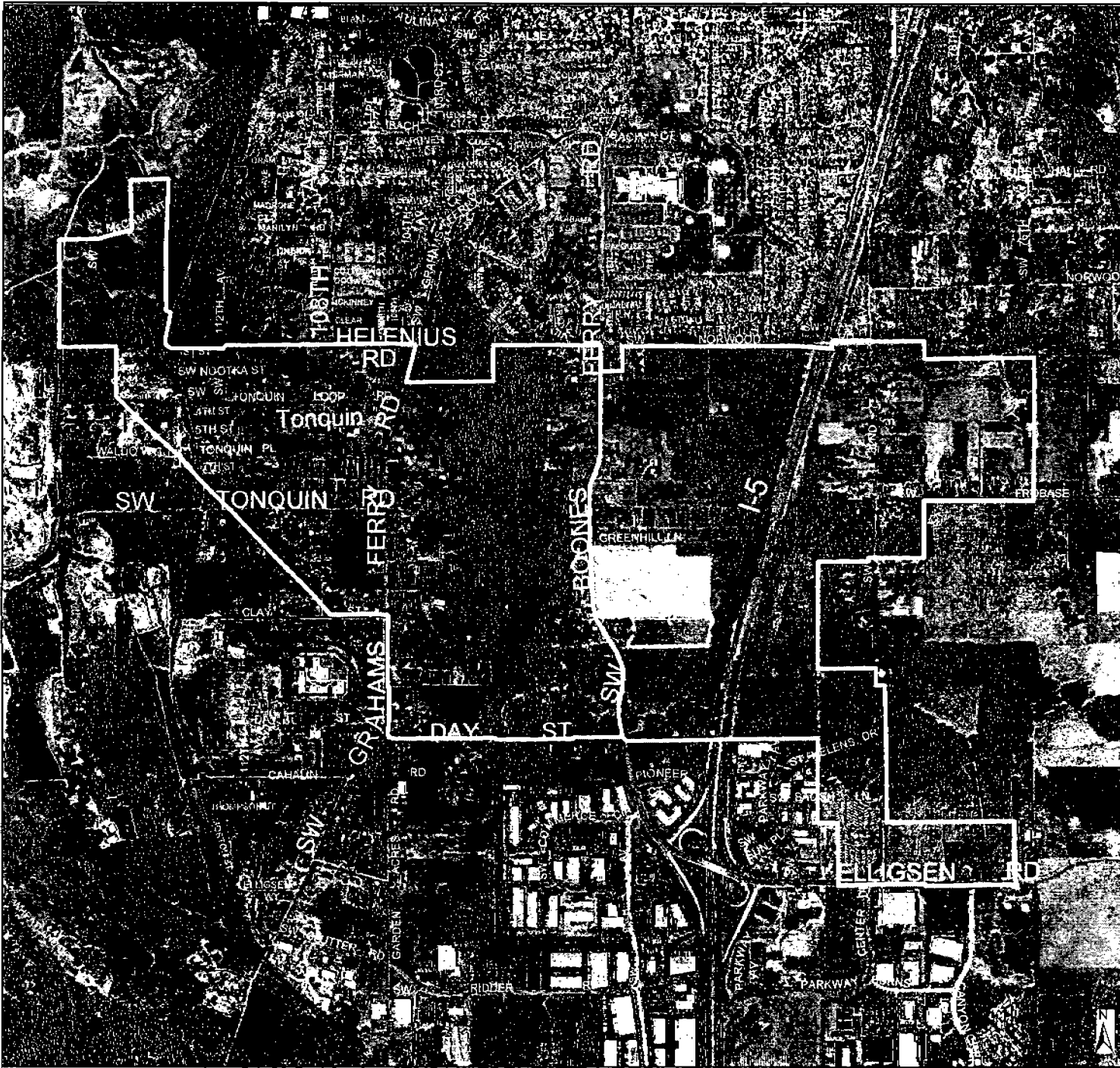
SOURCES:
 TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collected on scale of 1"=100' in urban areas and 1"=200' to 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

0 1,700 3,400 Feet

Clark Co.
 Washington Co.
 Multnomah Co.
 Clackamas Co.

Location Map

METRO DATA RESOURCE CENTER
 800 NORTH EAST GRAND AVENUE | PORTLAND, OREGON 97232-2736
 TEL (503) 797-1742 | FAX (503) 797-1909
 drc@metro.dst.or.us | www.metro-reg.or.og



R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 47

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

1:250,000 SCALE
Metro Data Resource Center, 2001. Data collection scale is 1"=250,000'. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

Feet
0 1,300 2,600


Location Map

METRO

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drc@metro.dtor.us | www.metro-region.org

R L I S
REGIONAL LAND INFORMATION SYSTEM

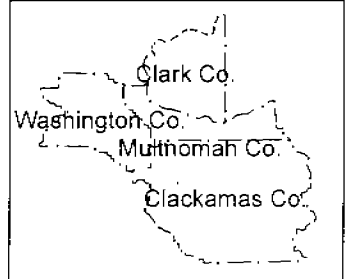
Alternatives Analysis

 Study Area 48


Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collect on scale is 1"=400' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

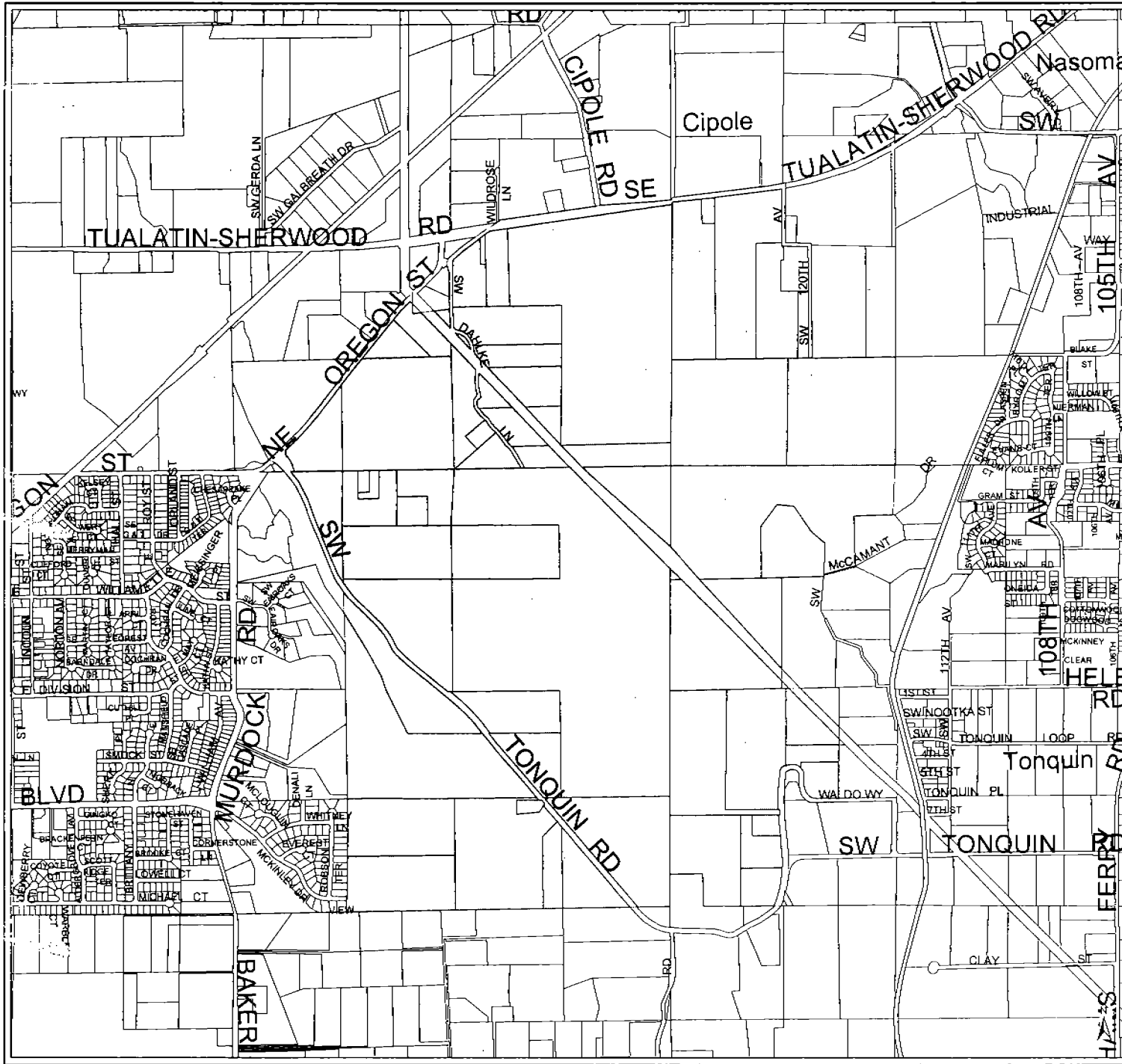
0 1,400 2,800 Feet



Location Map



METRO
METRO DATA RESOURCE CENTER
830 NORTHEAST GRAND AVENUE PORTLAND, OREGON 97232-2738
TEL (503) 787-1742 FAX (503) 797-1969
orc@metro.or.us www.metro-ia.org





R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 48

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 3"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

TOPOGRAPHIC MAP
Oregon Department of Geology and Mineral Industries, 2001. Data collection scale is 1"=200' in urban areas and 3"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

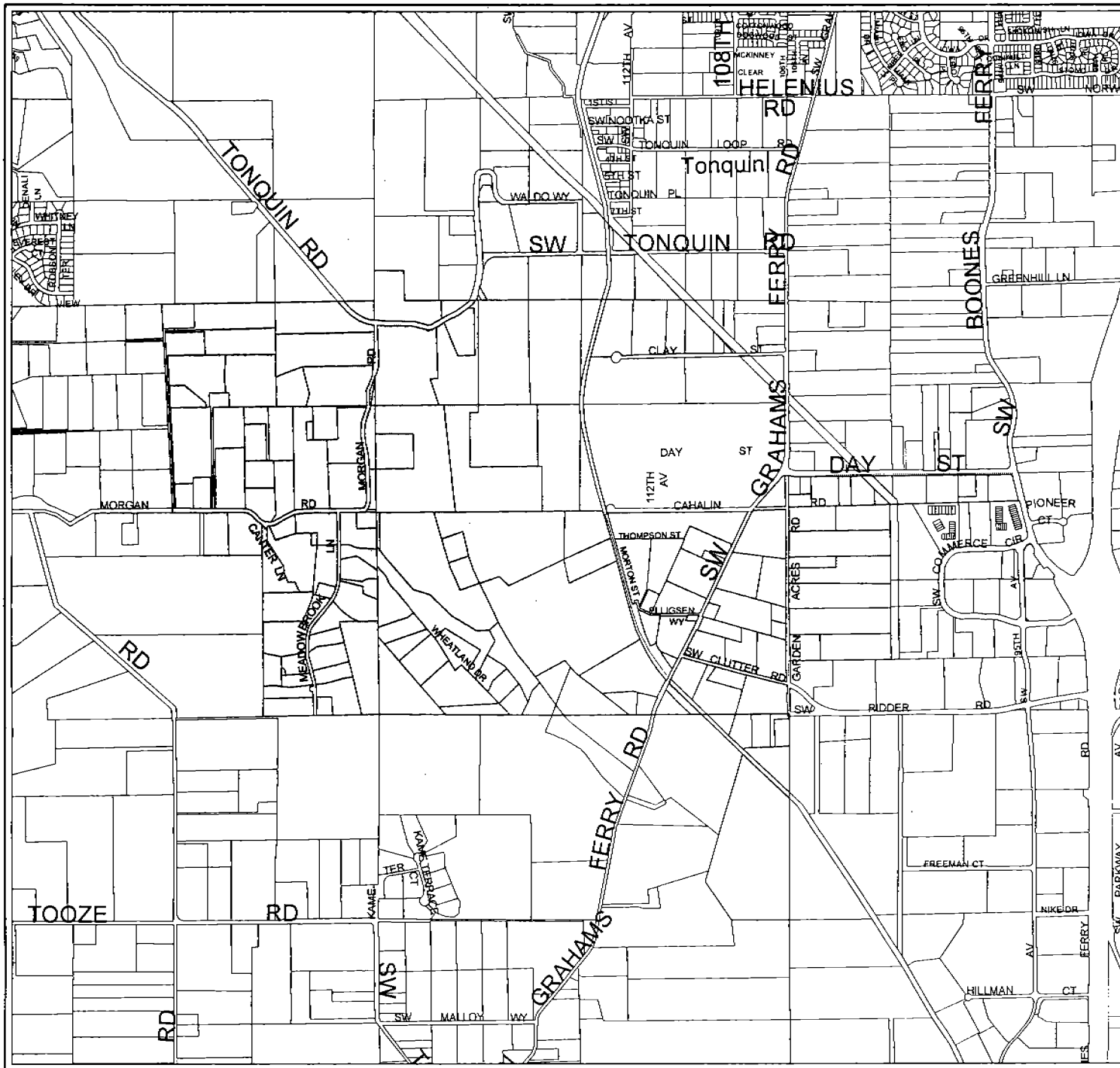
AERIAL PHOTOGRAPHY
Oregon Department of Geology and Mineral Industries, 2001. Data collection scale is 1"=200' in urban areas and 3"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

0 1,000 2,000 Feet

Location Map

METRO

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R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 49

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwauie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

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1 inch equals 1,865 feet

Location Map

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R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 49

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Date collect on scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

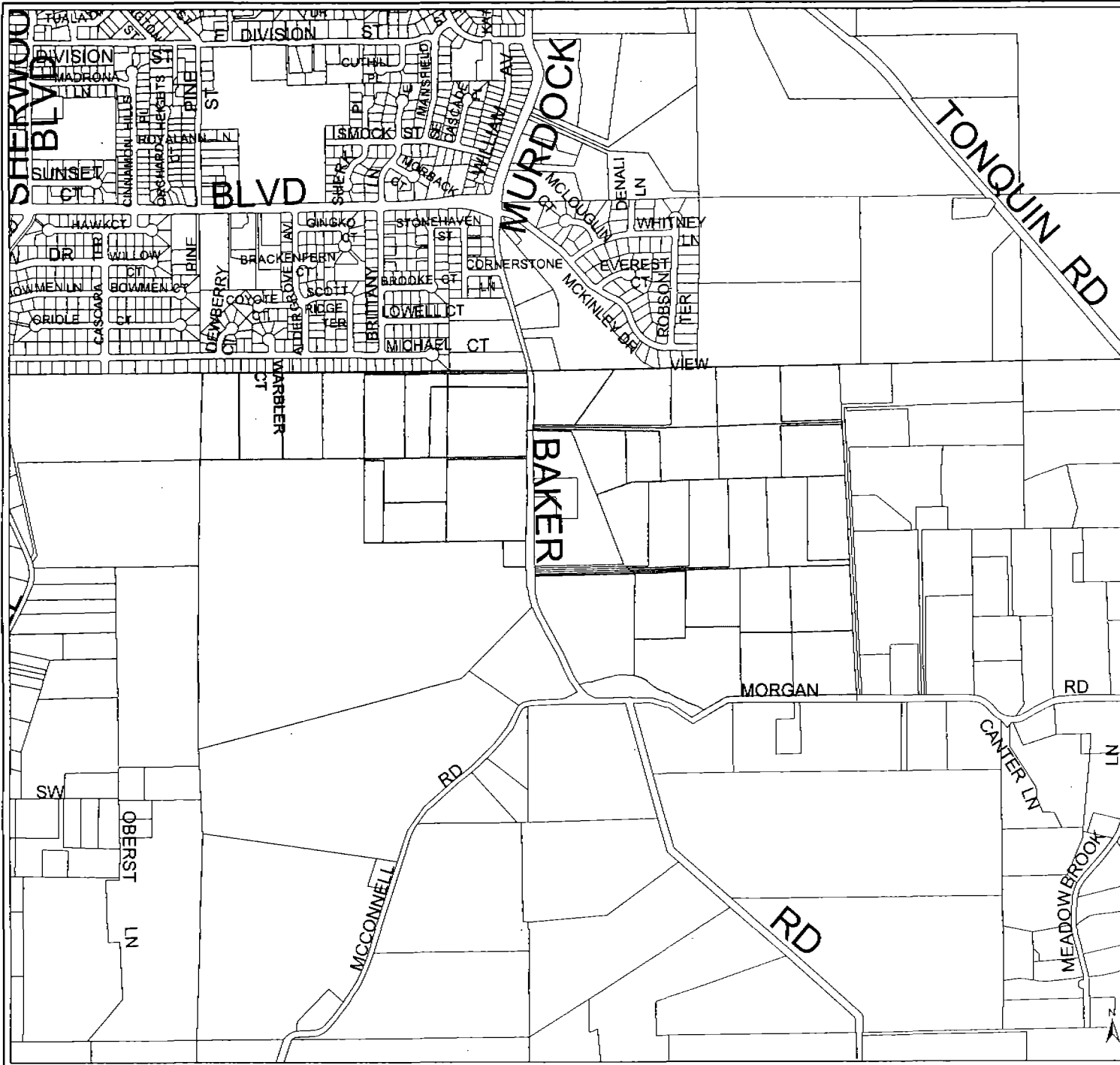
1 inch equals 1,865 feet

Feet

Location Map

METRO

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R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 50

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

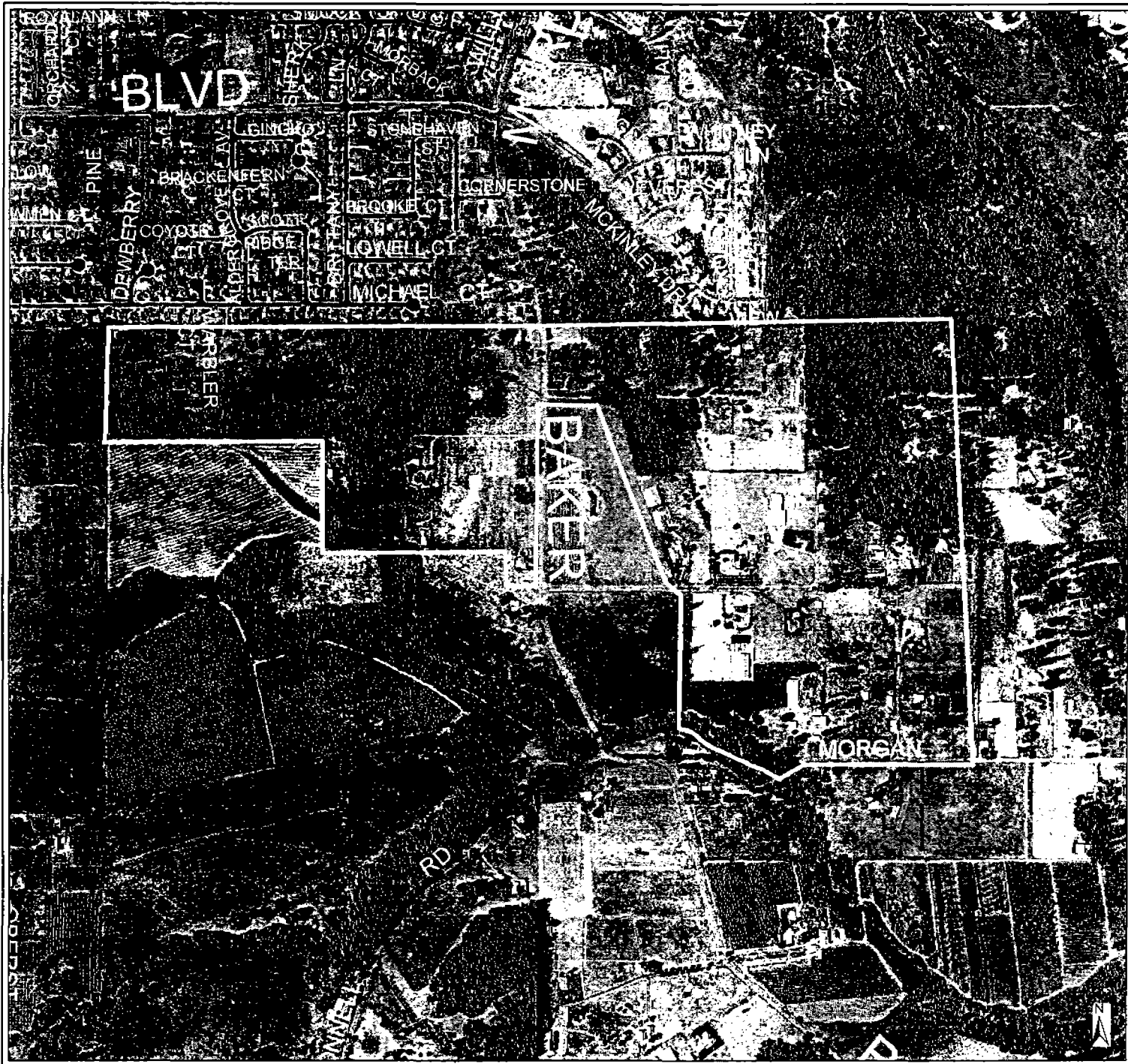
SOURCES:
TAX LOT MAP
 County Assessment and Taxation Office, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.
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0 860 1,720 Feet

Clark Co.
Washington Co.
Multnomah Co.
Clackamas Co.

Location Map

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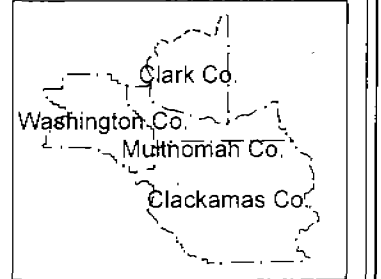
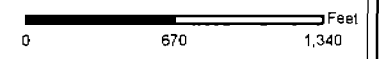
Alternatives Analysis

Study Area 50

SOURCES:

TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in Urban areas and 1"=200' in rural areas.
 Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

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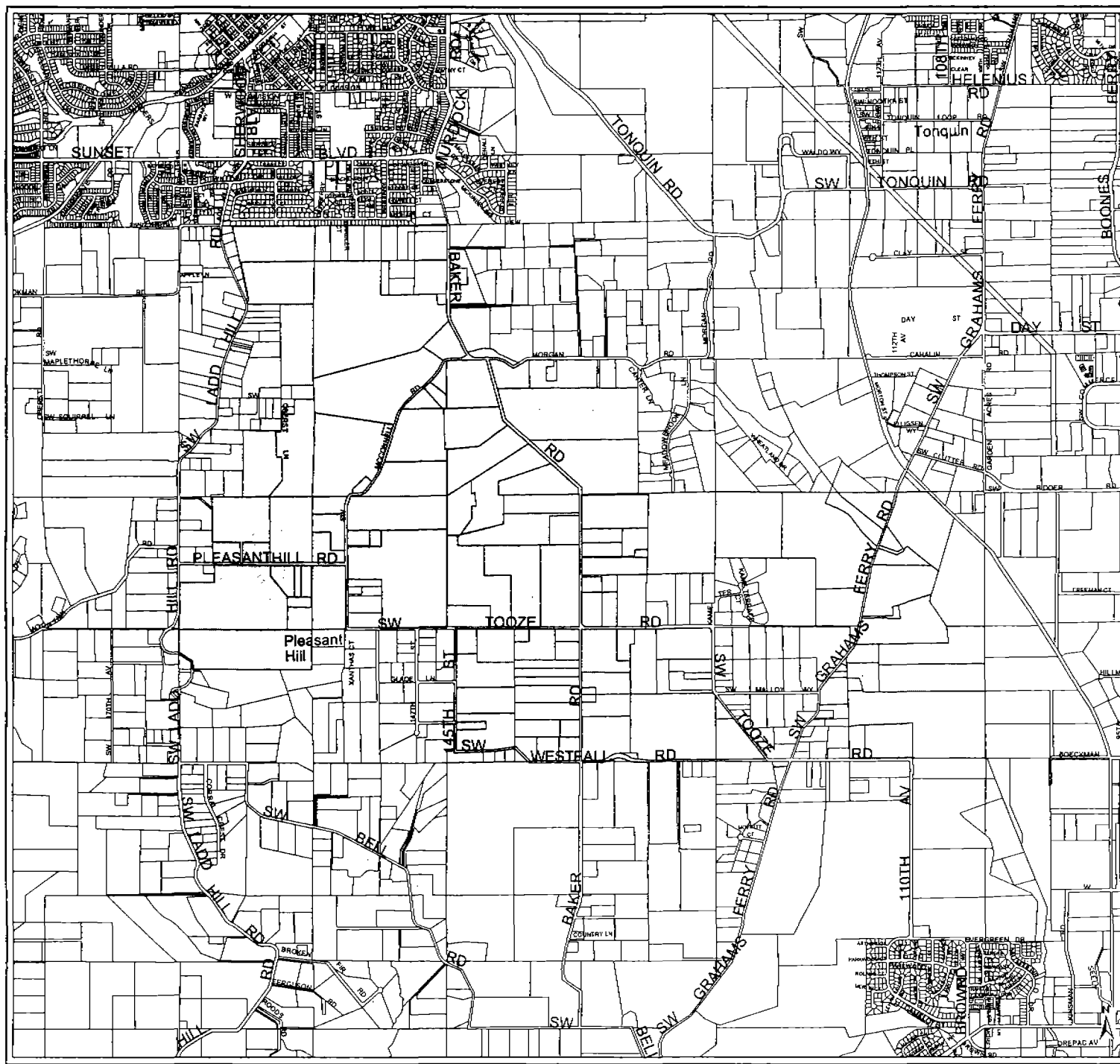



Location Map



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 drc@metro.dst.or.us | www.metro-region.org

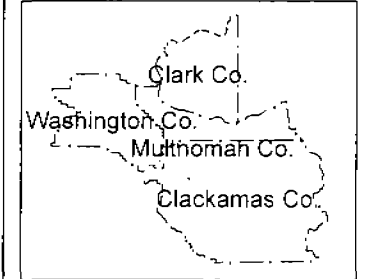
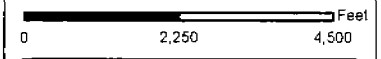
Alternatives Analysis



 Study Area 51

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



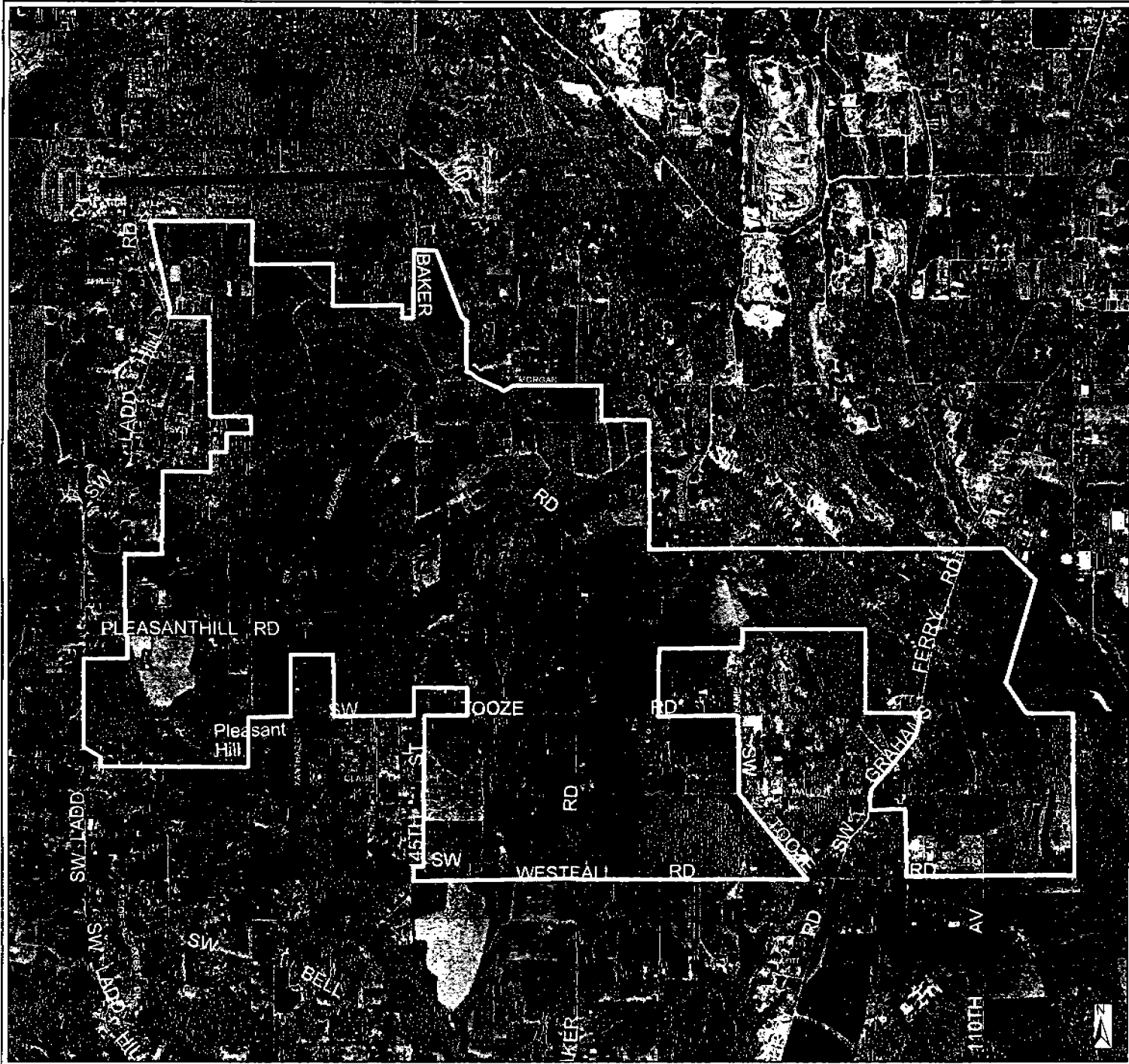
Location Map



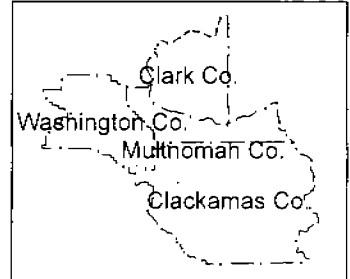
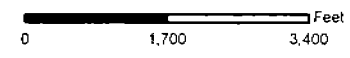
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TEL (503) 797-1742 FAX (503) 797-4900
mrc@metro-cl.org | www.metro-rag-c.org

Alternatives Analysis

Study Area 51



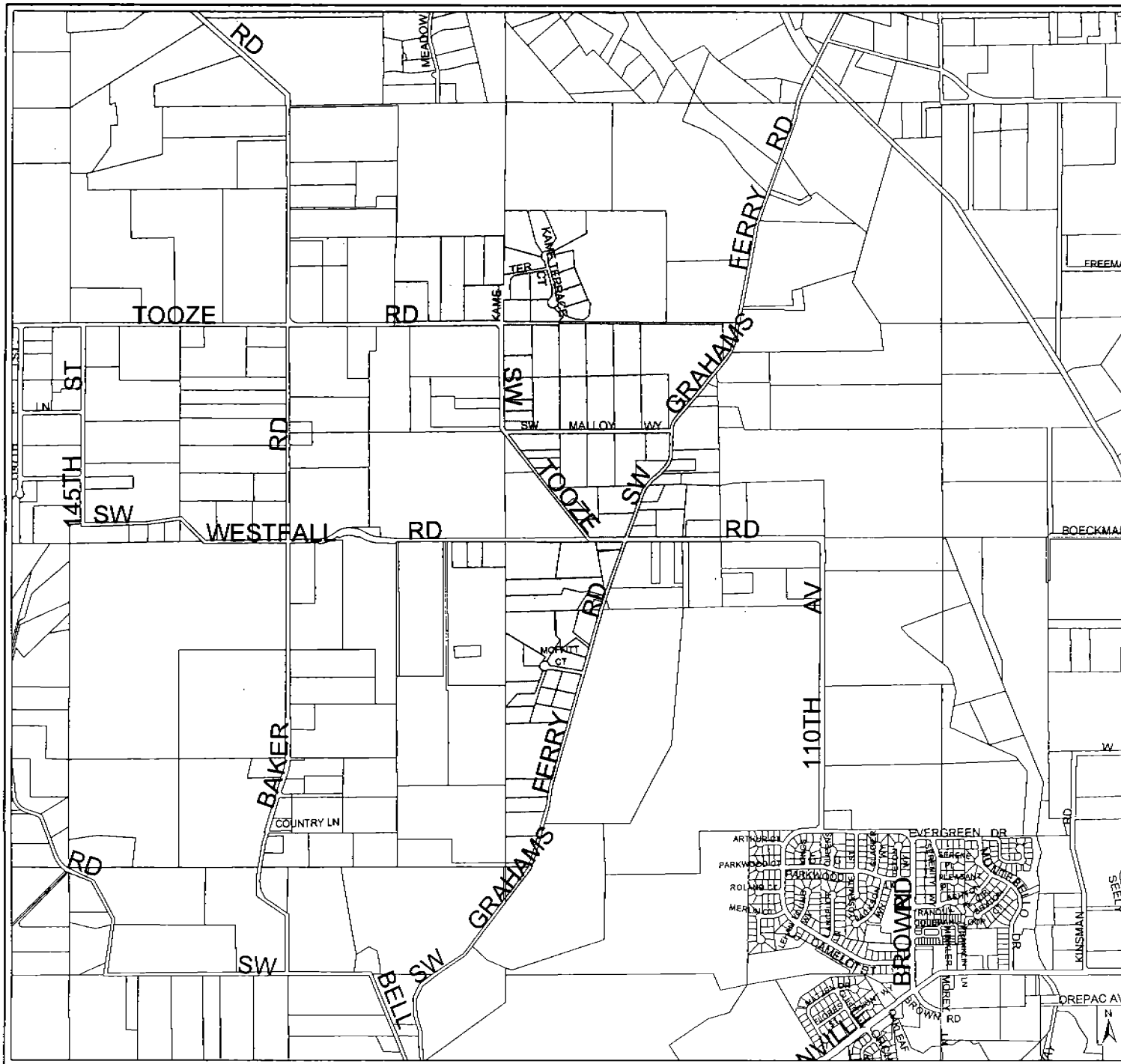
SOURCES:
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' on urban areas and 1"=200' on 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.
The above information was prepared by the Regional Land Information System (RLIS) for the Metro Council. The RLIS is a joint effort of Washington County, Clackamas County, Clatsop County, Multnomah County, and Oregon City. The RLIS is a public resource and is available to the public. The RLIS is not responsible for the accuracy of the information provided by the participating agencies.



Location Map



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R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 52

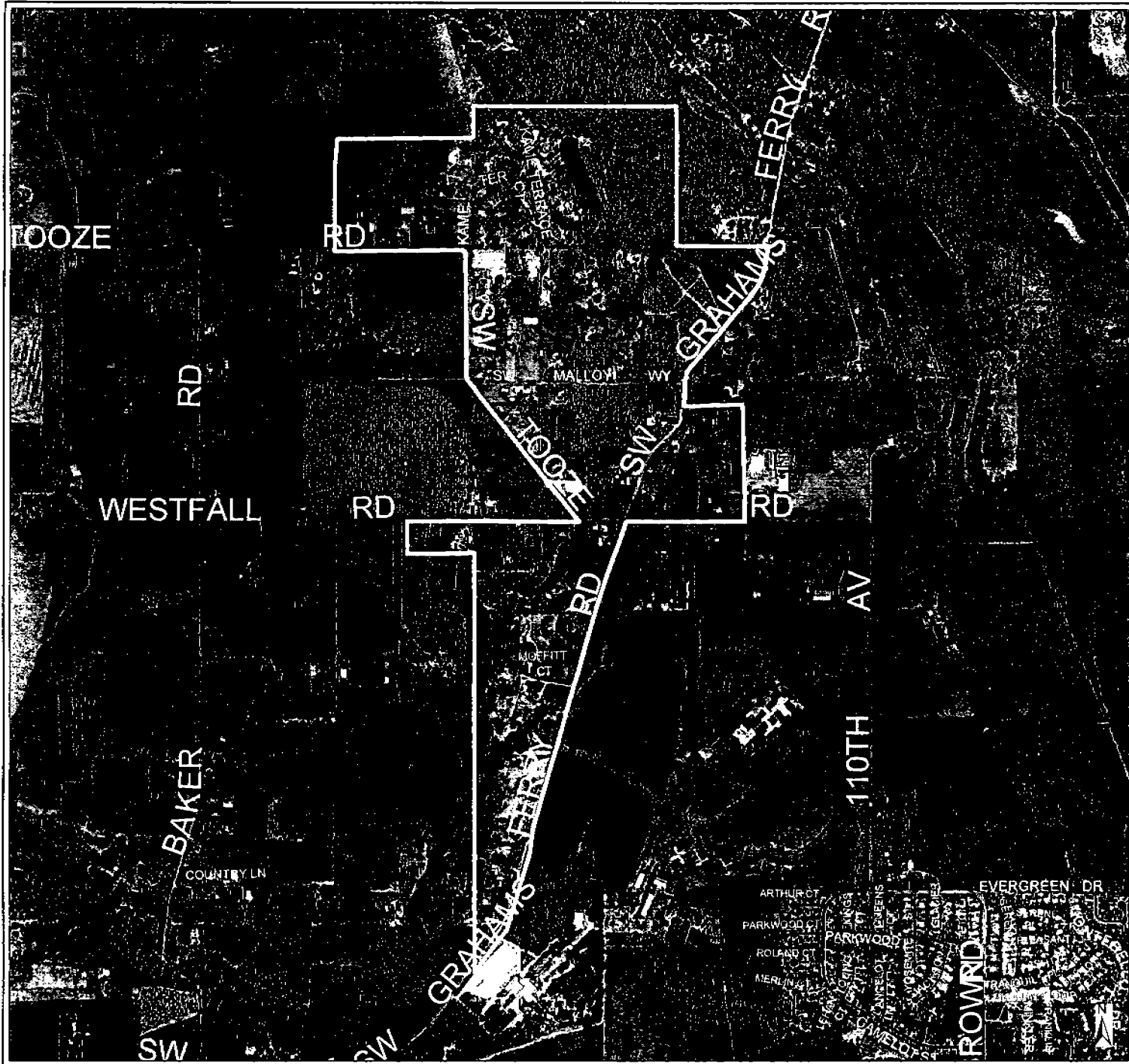
Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:
TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Multnomah, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.
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0 1,400 2,800 Feet

Location Map

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 oic@metro-oregon.org | www.metro-oregon.org



R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 52

SOURCES:

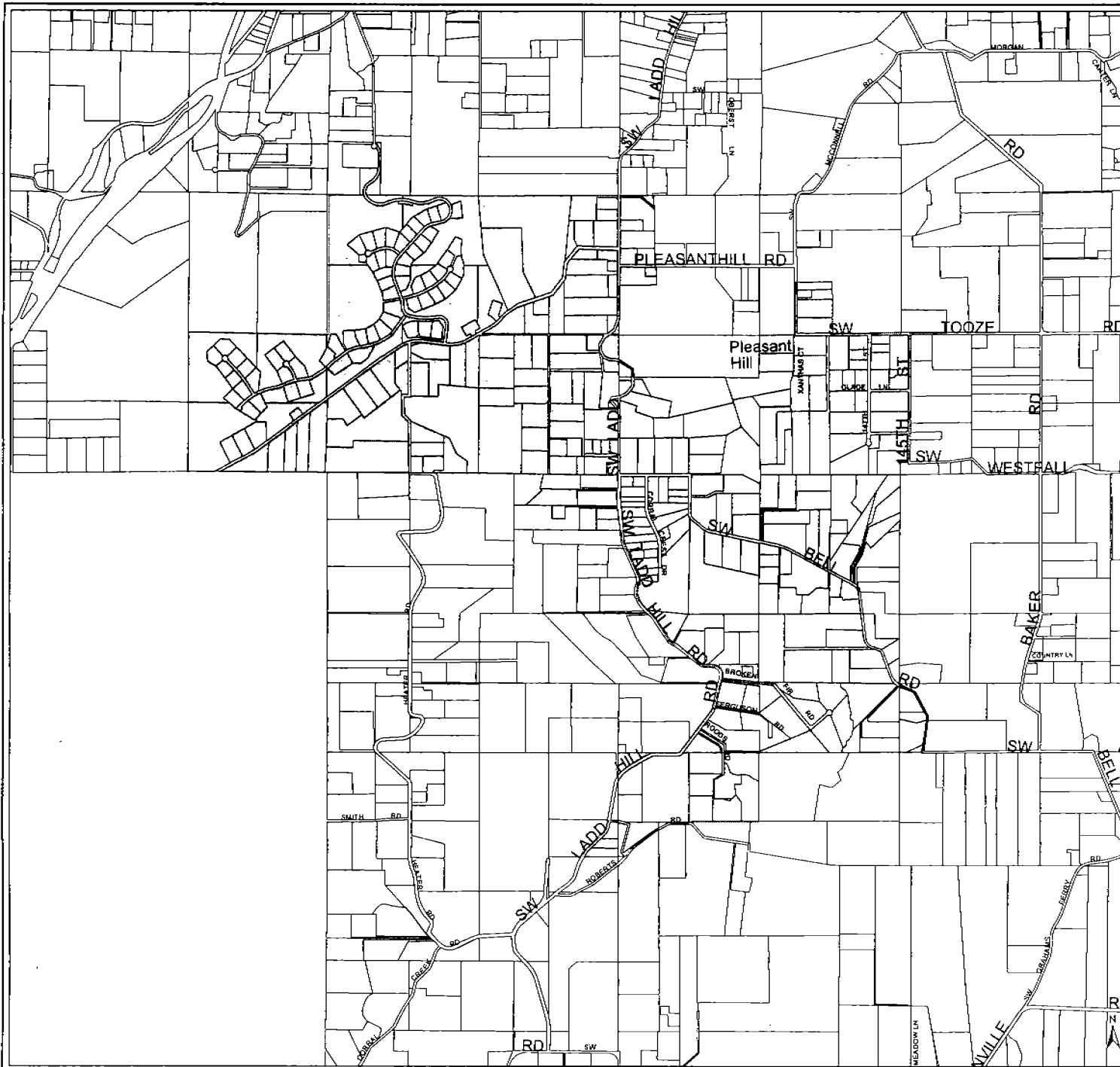
TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

Other sources: The information shown on this map was derived from the 2001 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

0 1,000 2,000 Feet

Location Map

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R L S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 53

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:


TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

STREETS
 Metro, 2001. Streets shown are those that are shown on the Metro street map. Streets shown are those that are shown on the Metro street map. Streets shown are those that are shown on the Metro street map.

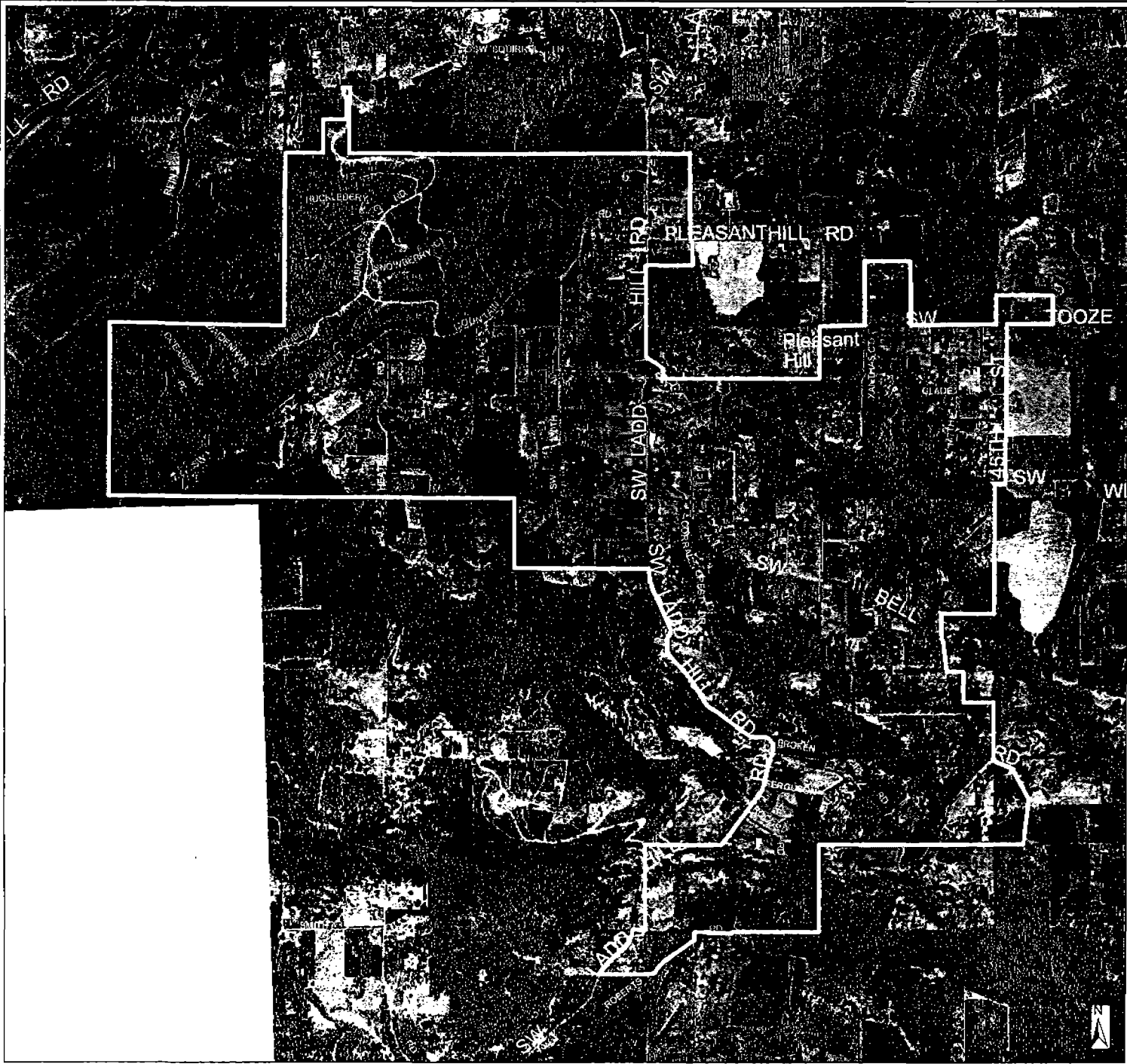
0 2,300 4,600 Feet

Clark Co.
 Washington Co.
 Multnomah Co.
 Clackamas Co.

Location Map


 METRO

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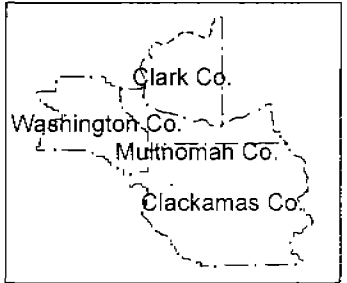
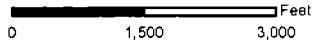
Alternatives Analysis

Study Area 53

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

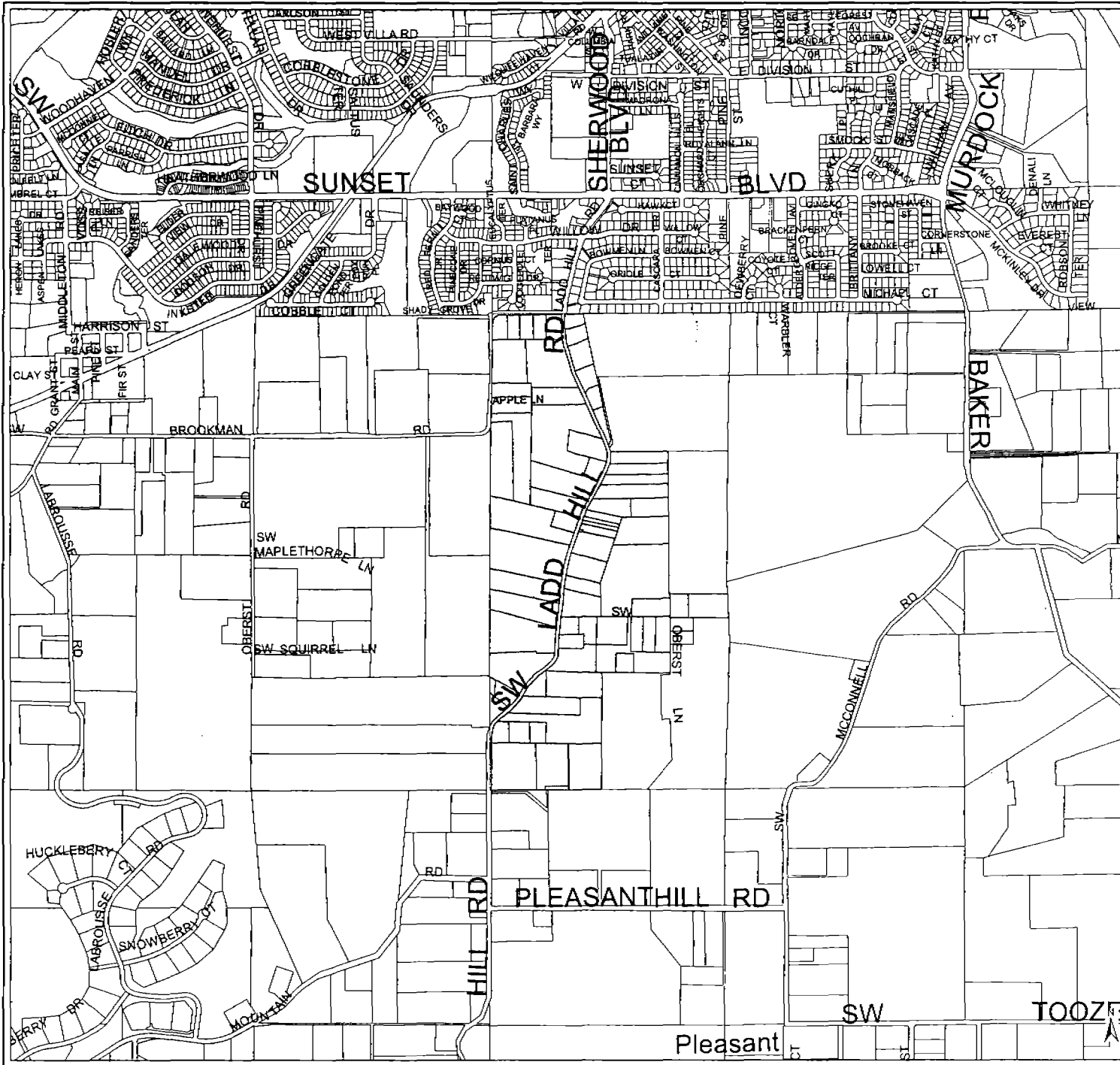
Aerial photograph is a composite of several images from the year 2001. It was taken from a low altitude, approximately 1000 feet, and is not a true vertical photograph. The image is not to scale and is not intended to be used as a map. It is intended to provide a visual context for the study area.



Location Map




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R L J S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

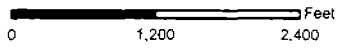
 Study Area 54

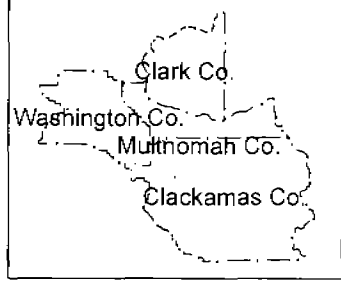
Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:


TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

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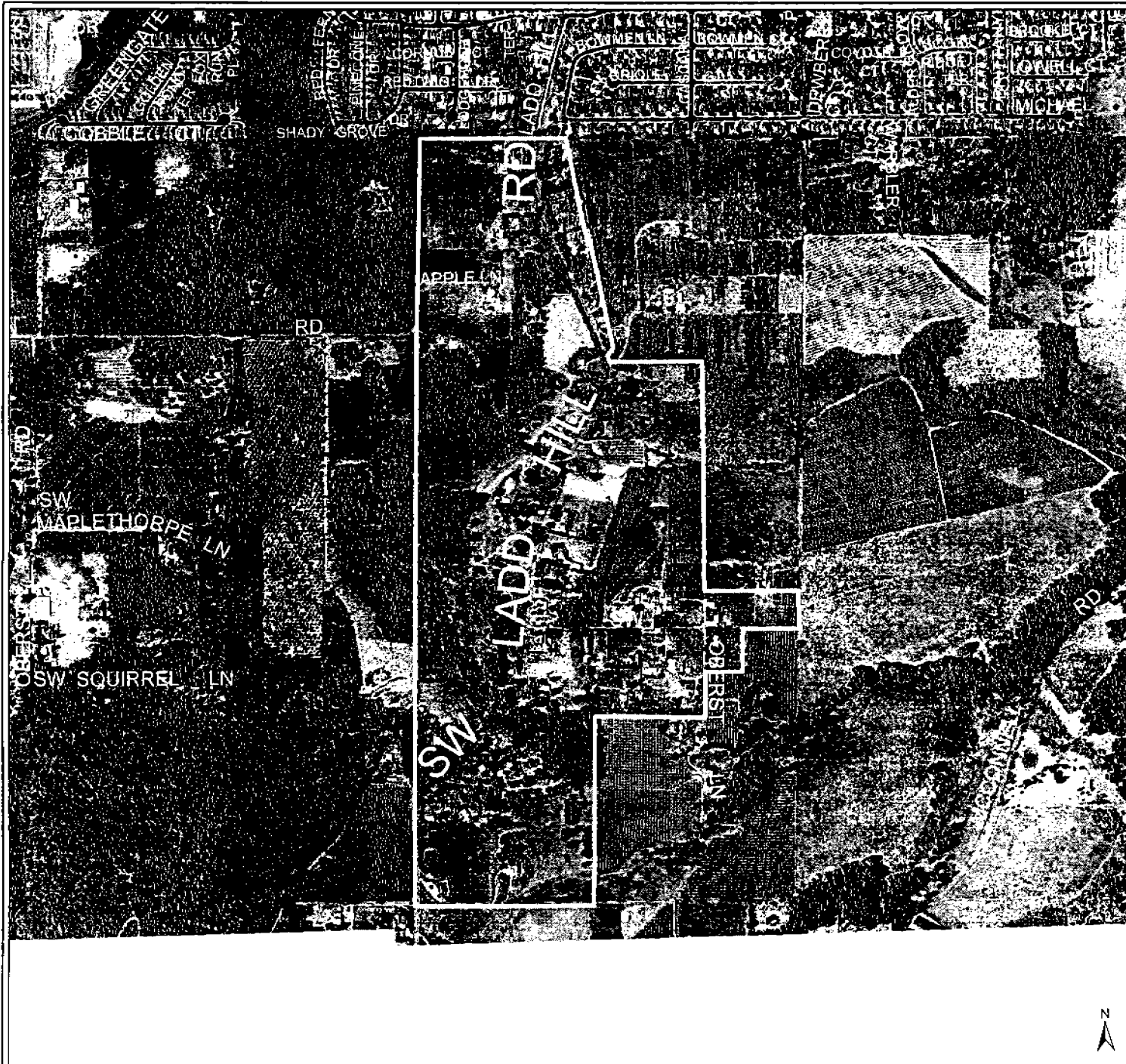




Location Map



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TEL (503) 797-1742 FAX (503) 797-1958
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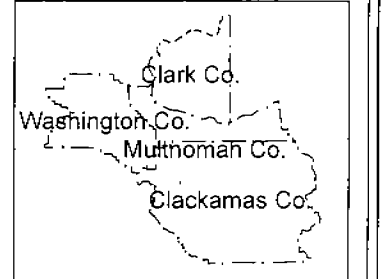
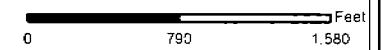


Alternatives Analysis

Study Area 54

SOURCES

TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 3"=200' or 1"=400' in rural areas.
 Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.




Location Map



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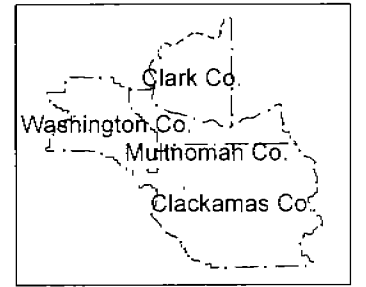
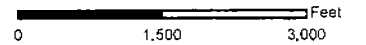
Alternatives Analysis

 Study Area 55

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:

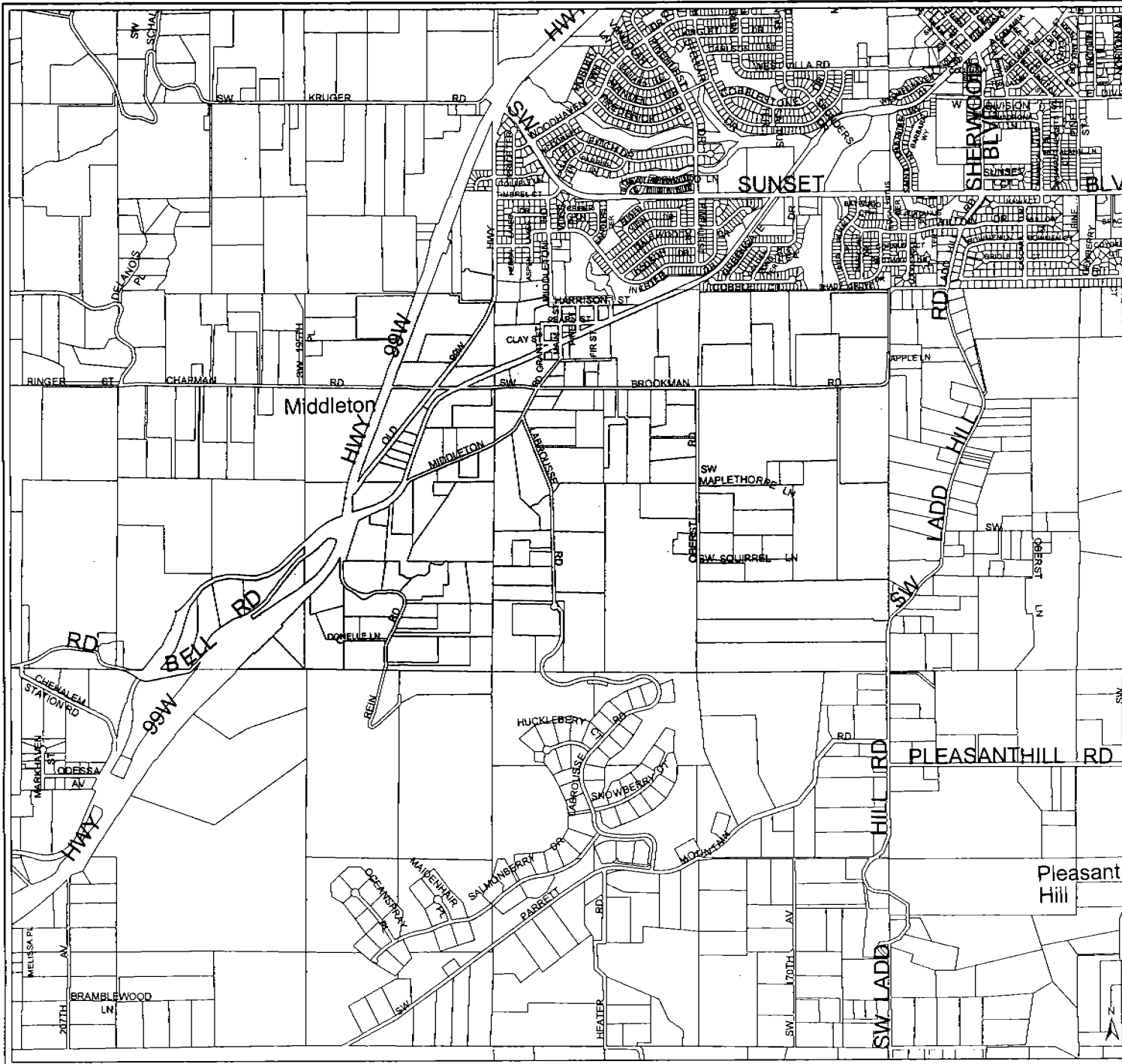
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale as 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

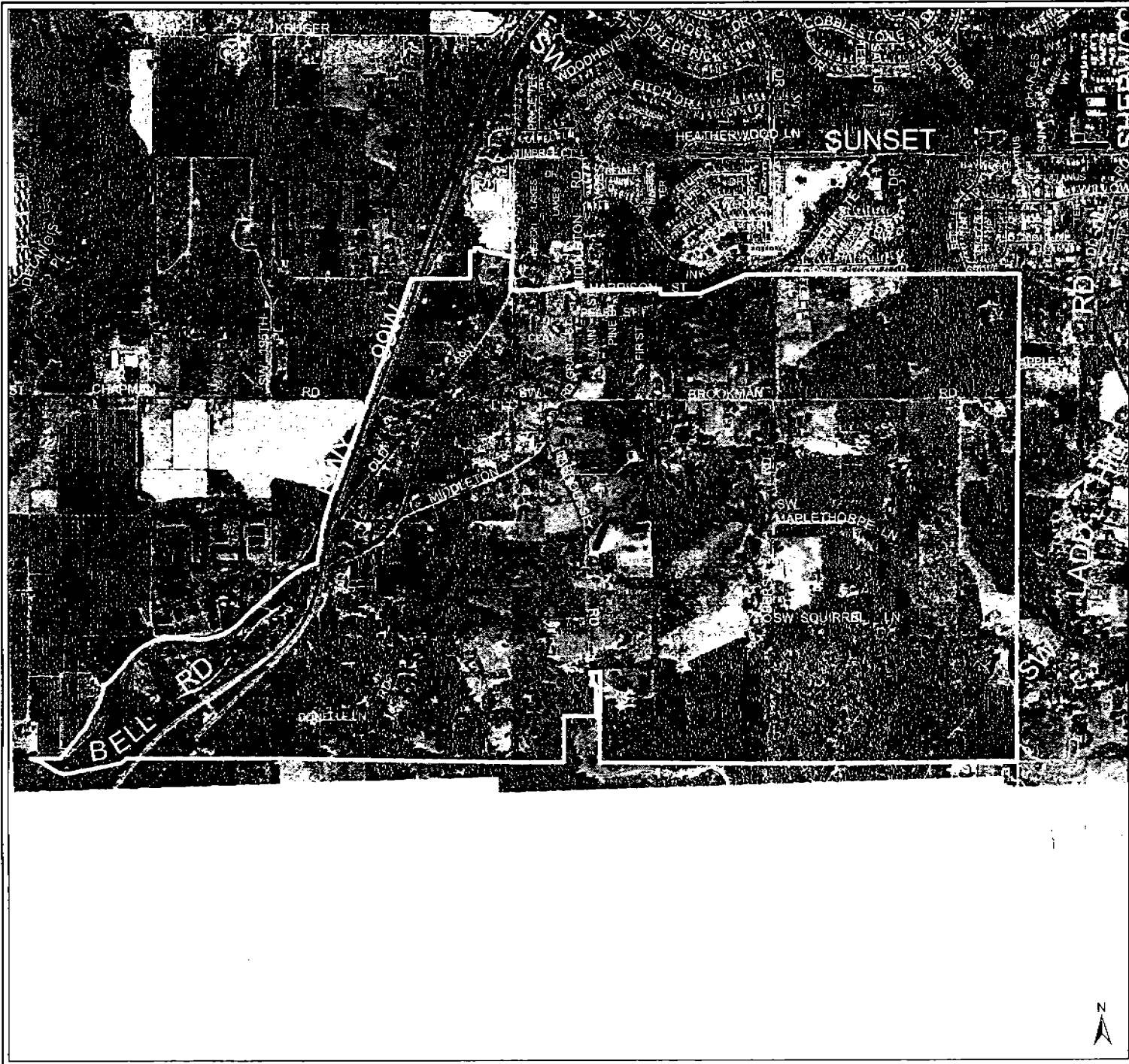


Location Map



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REGIONAL LAND INFORMATION SYSTEM

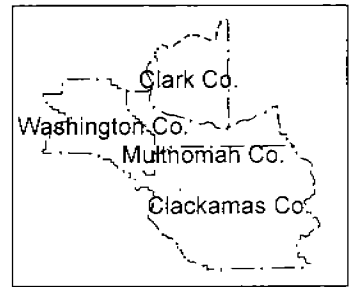
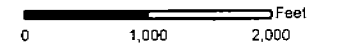
Alternatives Analysis

Study Area 55

SOURCES:

TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200 or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

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Location Map



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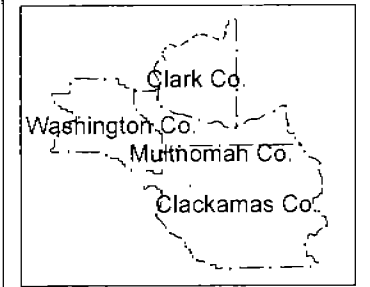
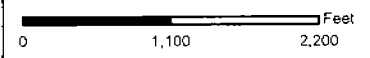
Alternatives Analysis

Study Area 56

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:

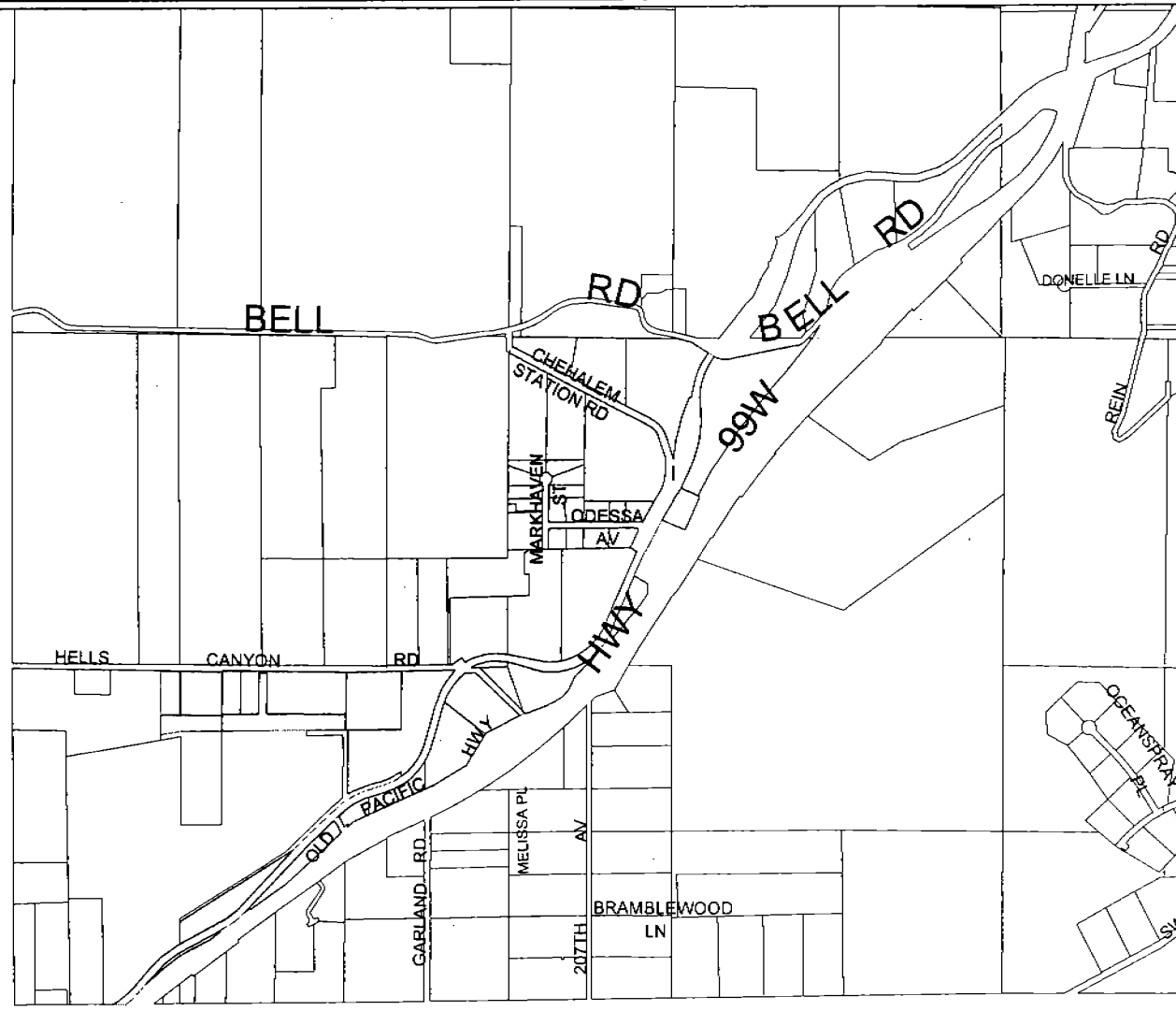
TAX LOT MAP
County Assessment and Taxation offices, 2001. Date collected on scale is 1"=100' in urban areas and 1"=250' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.
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Location Map

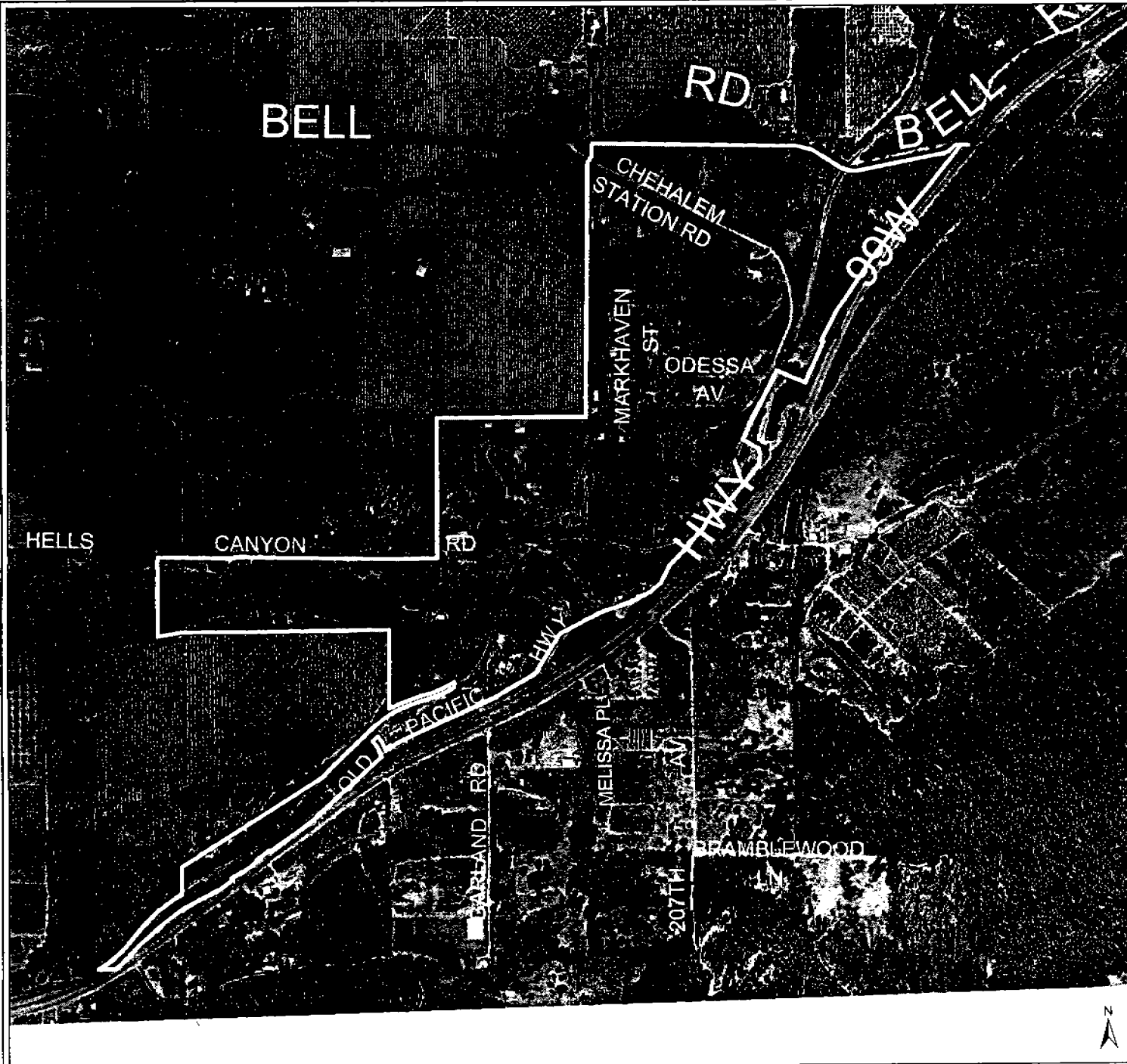


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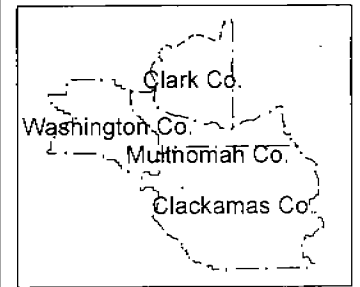
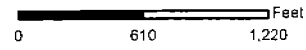


Alternatives Analysis

Study Area 56



SOURCES:
TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.
 The aerial, planimetric, color infrared photograph was processed by the Oregon Department of Transportation, Portland, Oregon. The photograph was processed by the Oregon Department of Transportation, Portland, Oregon. The photograph was processed by the Oregon Department of Transportation, Portland, Oregon. The photograph was processed by the Oregon Department of Transportation, Portland, Oregon.

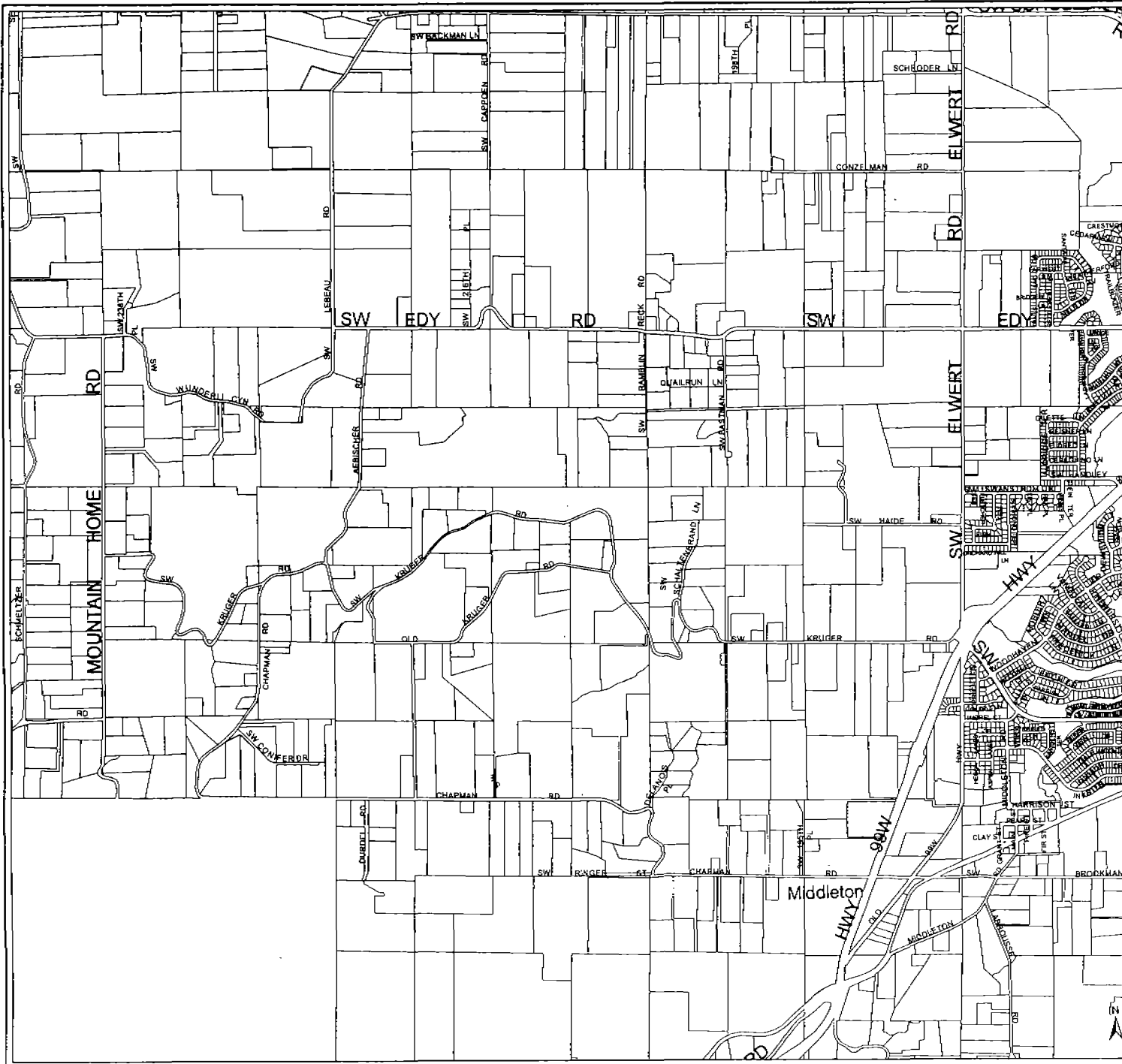


Location Map



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R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 57

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices 2001. Data collection scale is 1"=100' in urban areas and 1"=200' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

0 1,900 3,800 Feet


Clark Co.

Washington Co.

Multnomah Co.

Clackamas Co.

Location Map



METRO

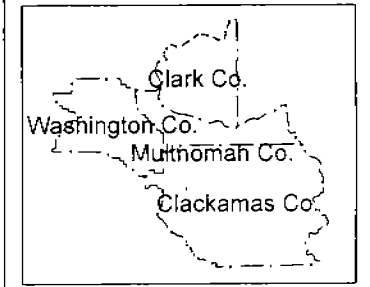
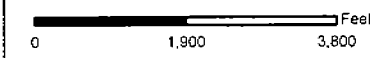
METRO DATA RESOURCE CENTER
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TEL (503) 797-1742 FAX (503) 797-1909
dlc@metro-ori.or.us | www.metro-reg.or.gov

Alternatives Analysis

Study Area 57



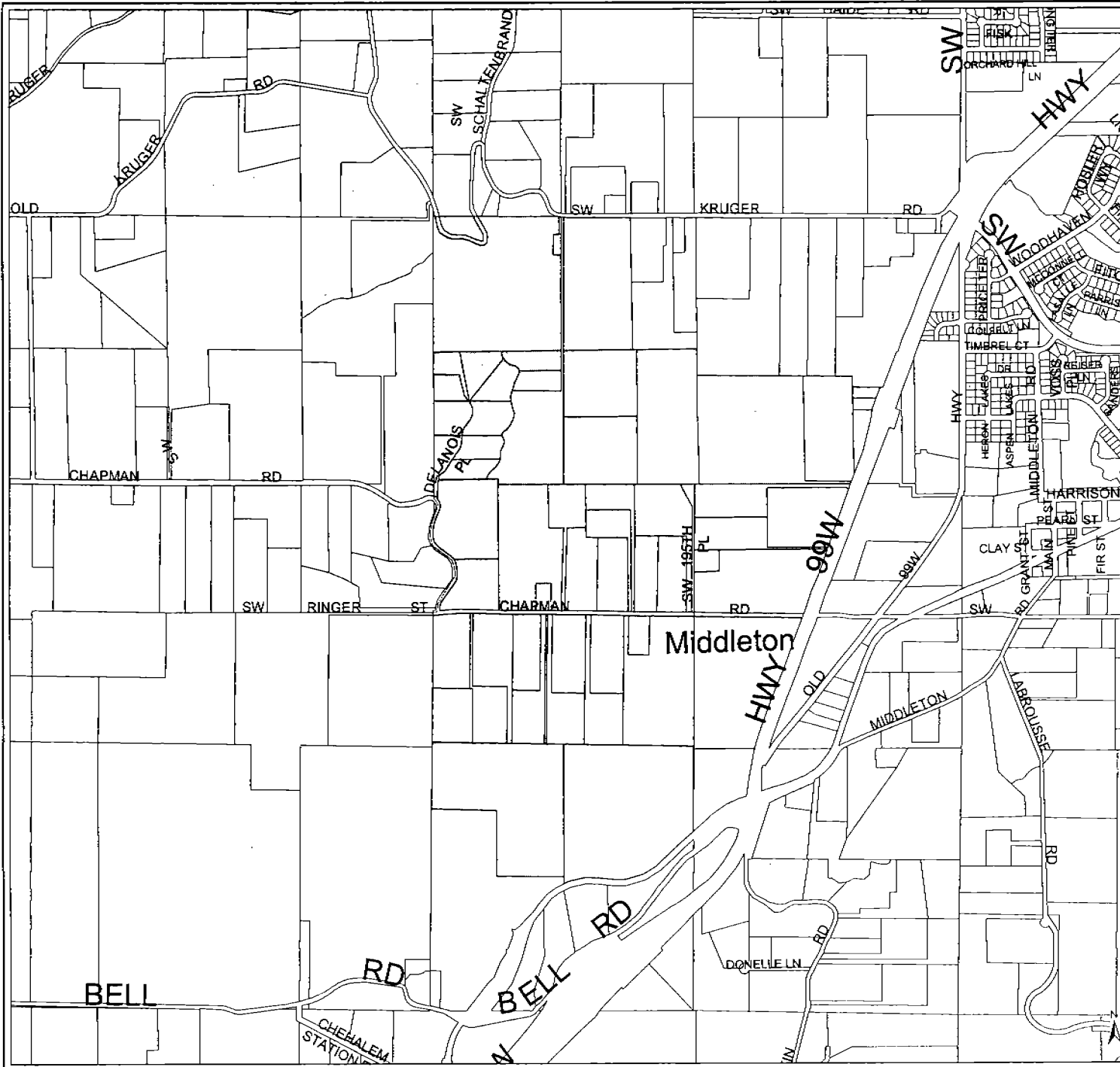
SOURCES:
TAX LOT MAP
County Assessment and Taxation office, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map



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REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

□ Study Area 58


Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:
TAX LOT MAP
County Assessment and Taxation Offices, 2301. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

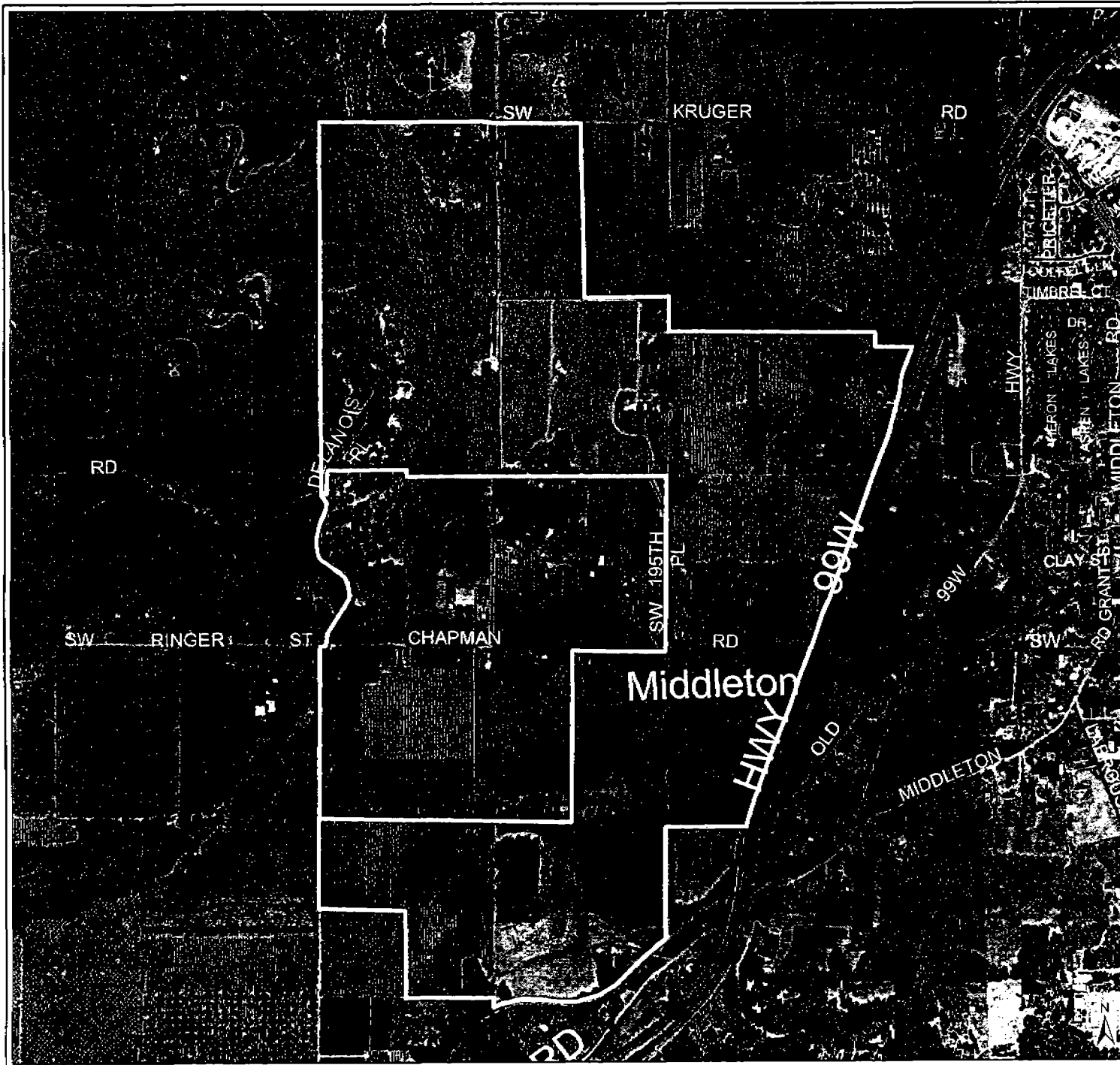
0 1,100 2,200 Feet

Clark Co.
Washington Co.
Multnomah Co.
Clackamas Co.

Location Map


METRO

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R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 58

SOURCES:


TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale of 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

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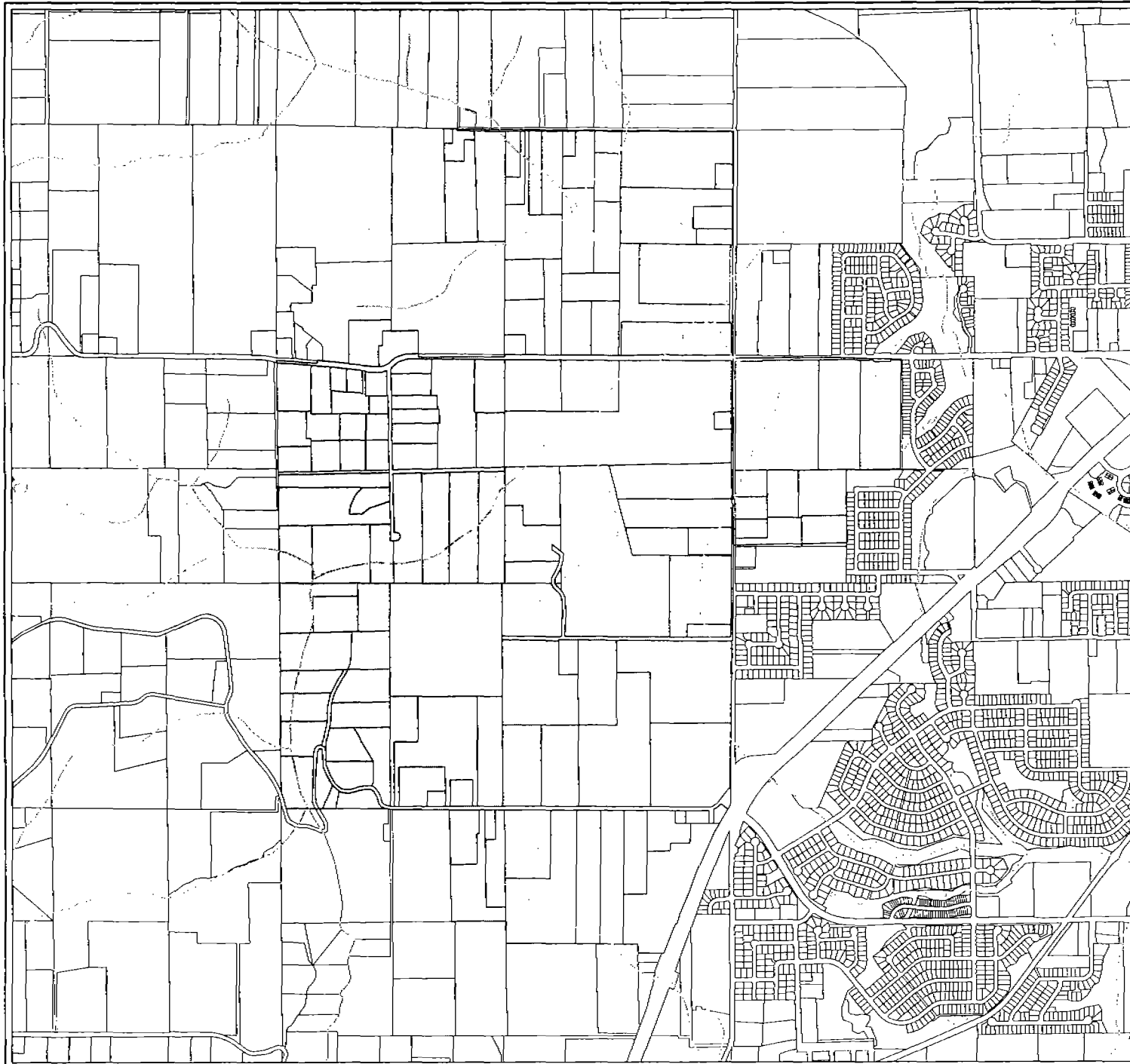
0 775 1,550 Feet

Clark Co.
Washington Co.
Multnomah Co.
Clackamas Co.

Location Map


METRO

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Alternatives Analysis

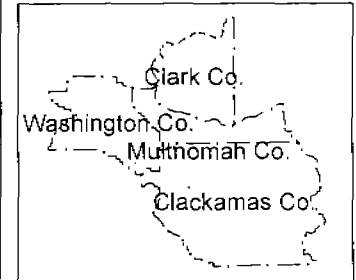
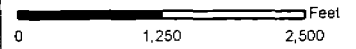
Study Area 59

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES

TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

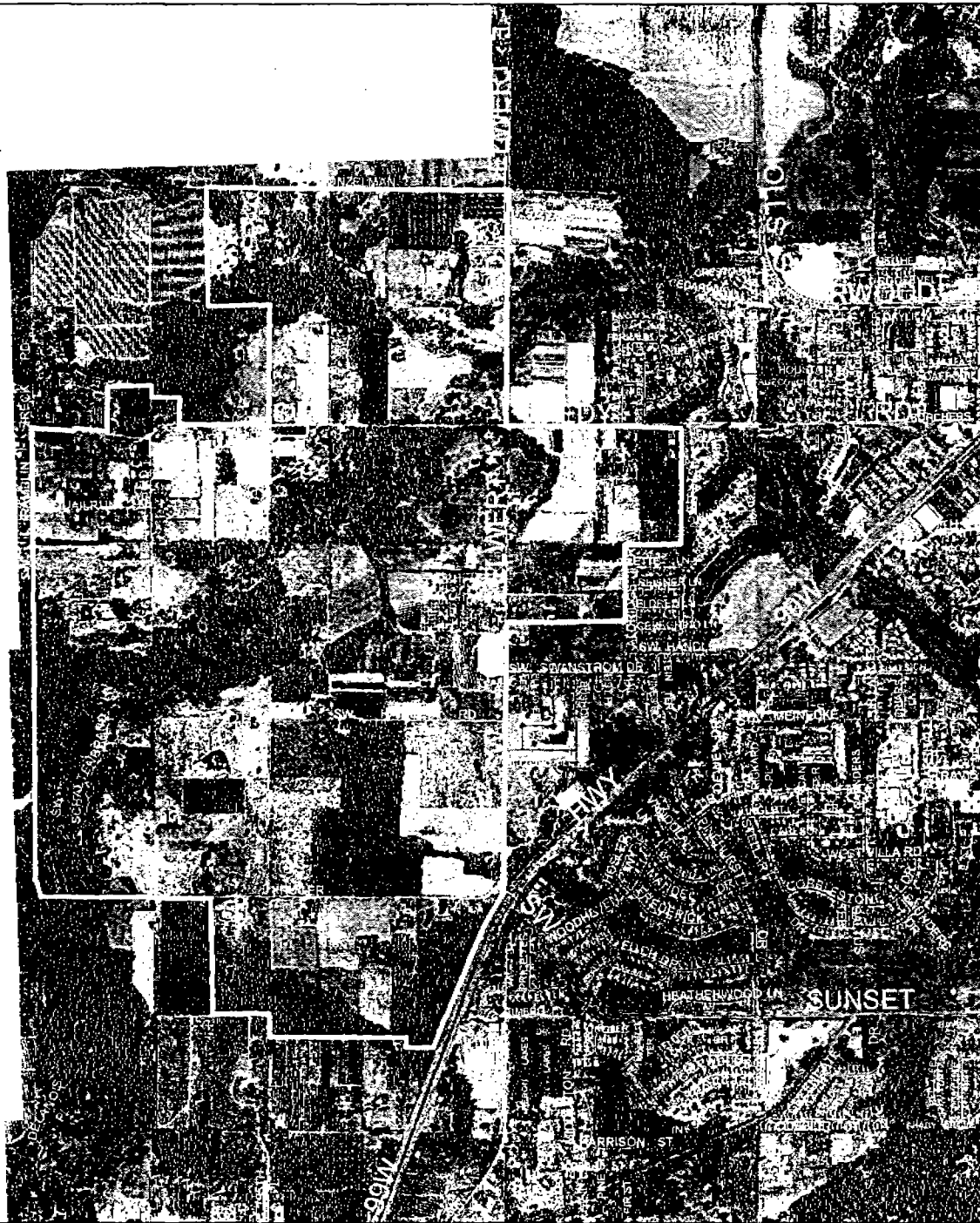
Metropolitan Planning Council, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map



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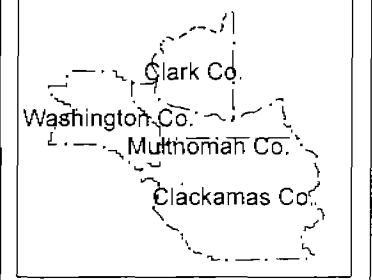
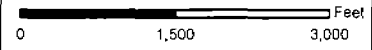
Alternatives Analysis

Study Area 59

SOURCES:

TAX LOT MAP
County Assessment and Taxation Office, 2001. Data collection scale is 1"=100' in urban areas and 1"=320' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

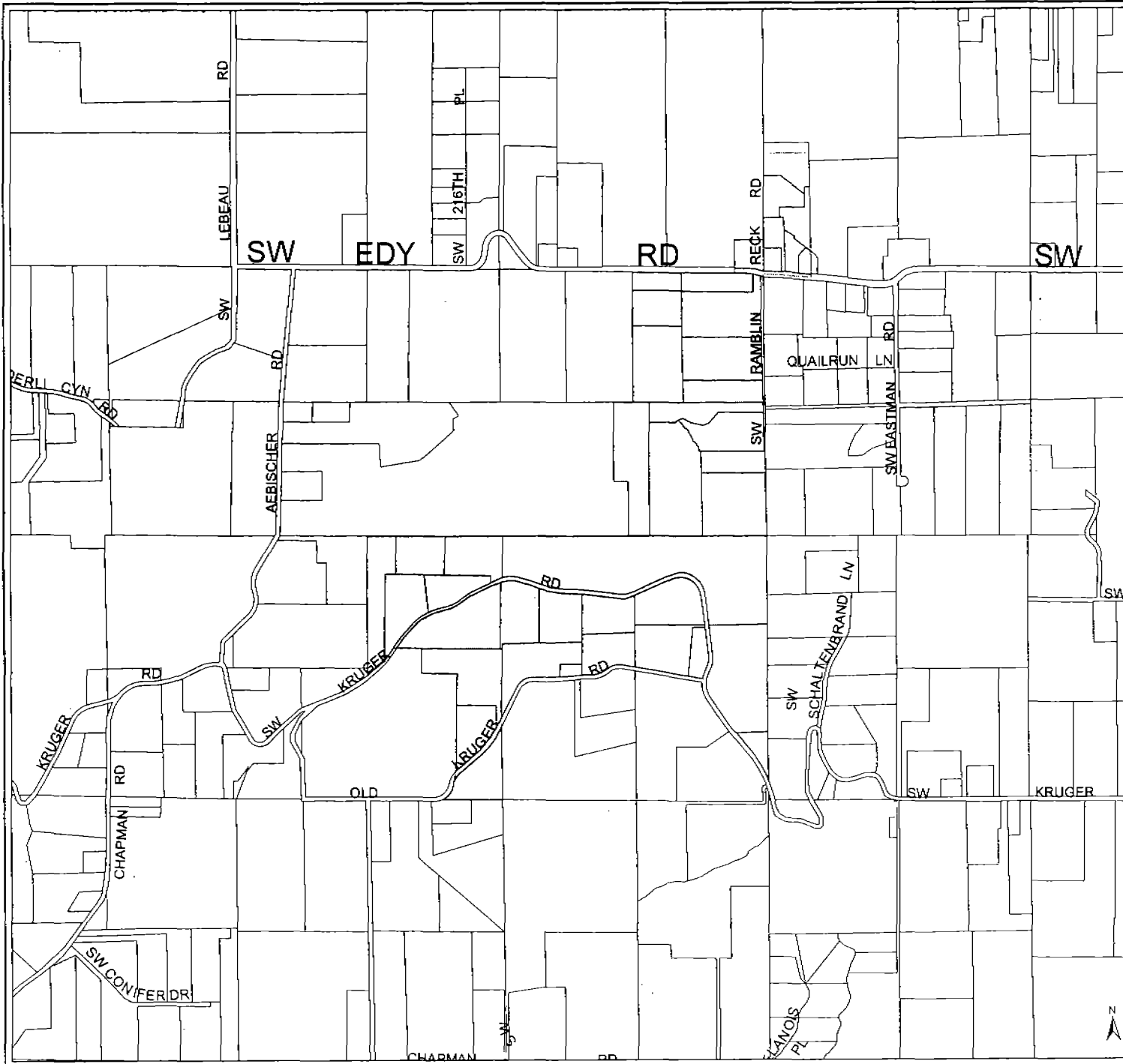
The information contained in this report is based on the data provided to METRO by the sources listed above. METRO does not warrant the accuracy or completeness of the information provided. METRO is not responsible for any errors or omissions in this report. METRO is not a professional engineering or architectural firm. METRO is not licensed to provide such services. METRO is not responsible for any actions taken based on the information provided in this report.



Location Map



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Alternatives Analysis


Study Area 60

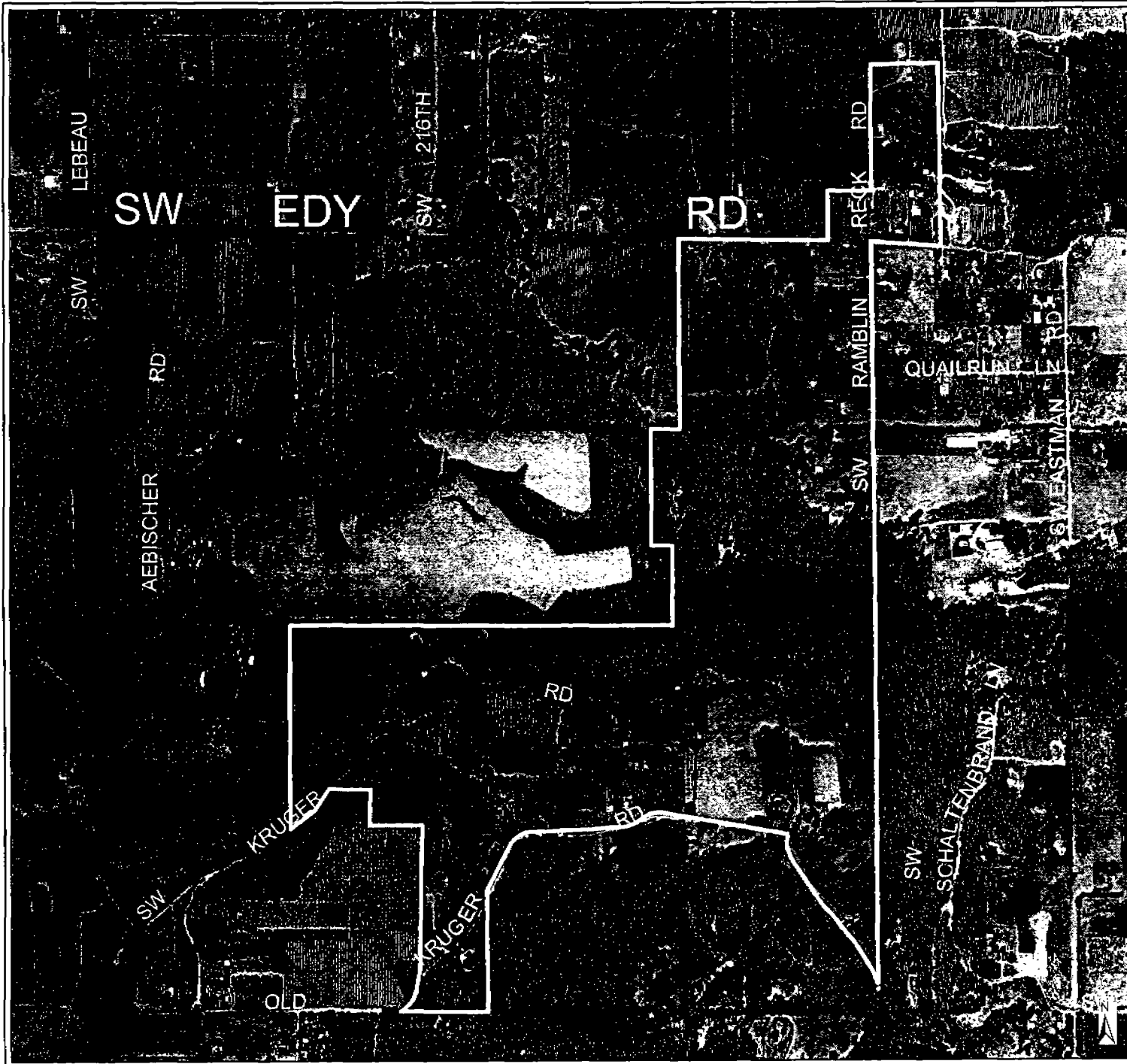
Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:

TAX LOT MAP
 County Assessment and Taxation office, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

Location Map


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R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 60

SOURCES:

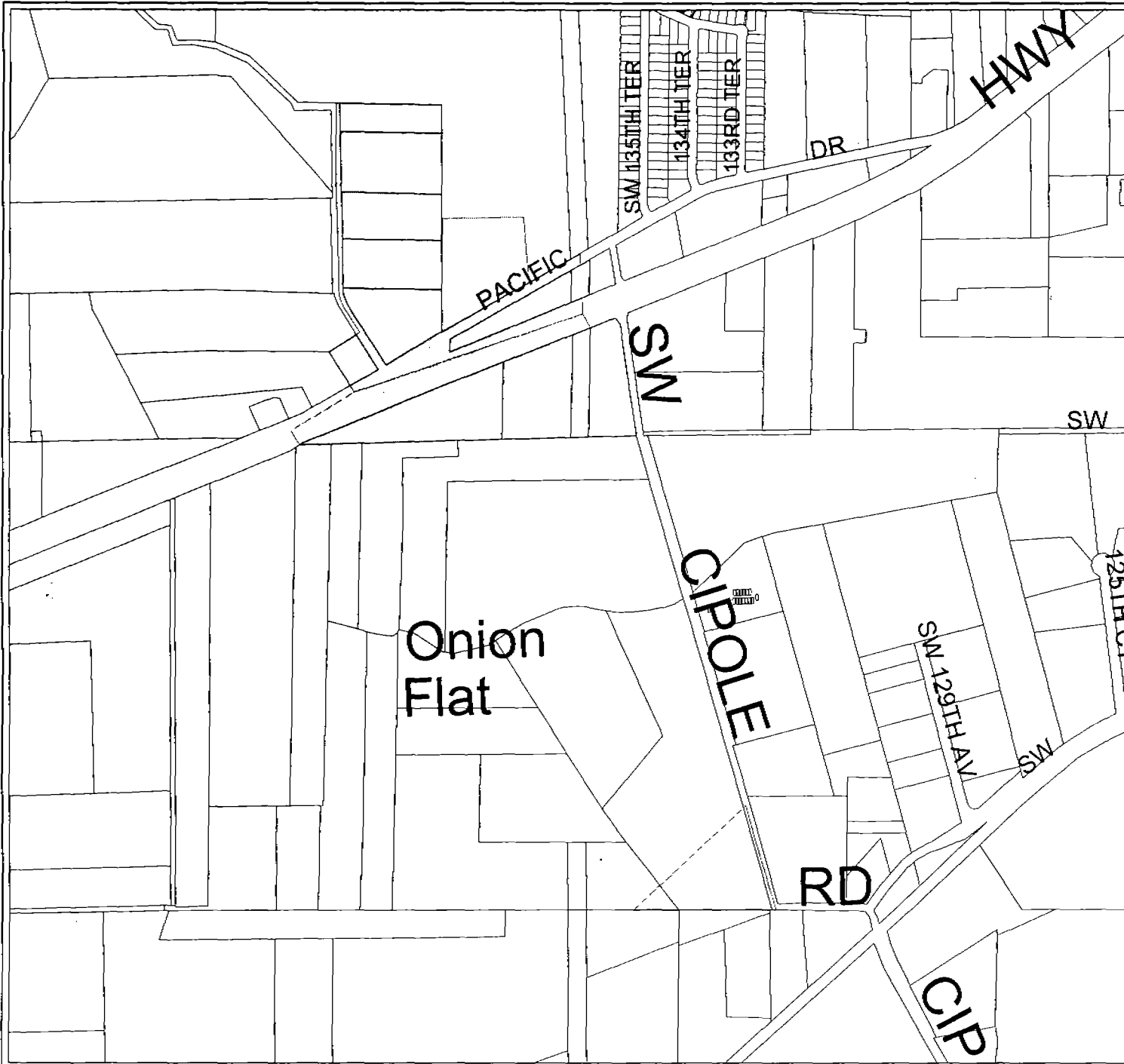
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

Location Map
Clark Co.
Washington Co.
Multnomah Co.
Clackamas Co.

Location Map

METRO

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R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 61

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale: 1"=100' in urban areas and 1"=200 or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

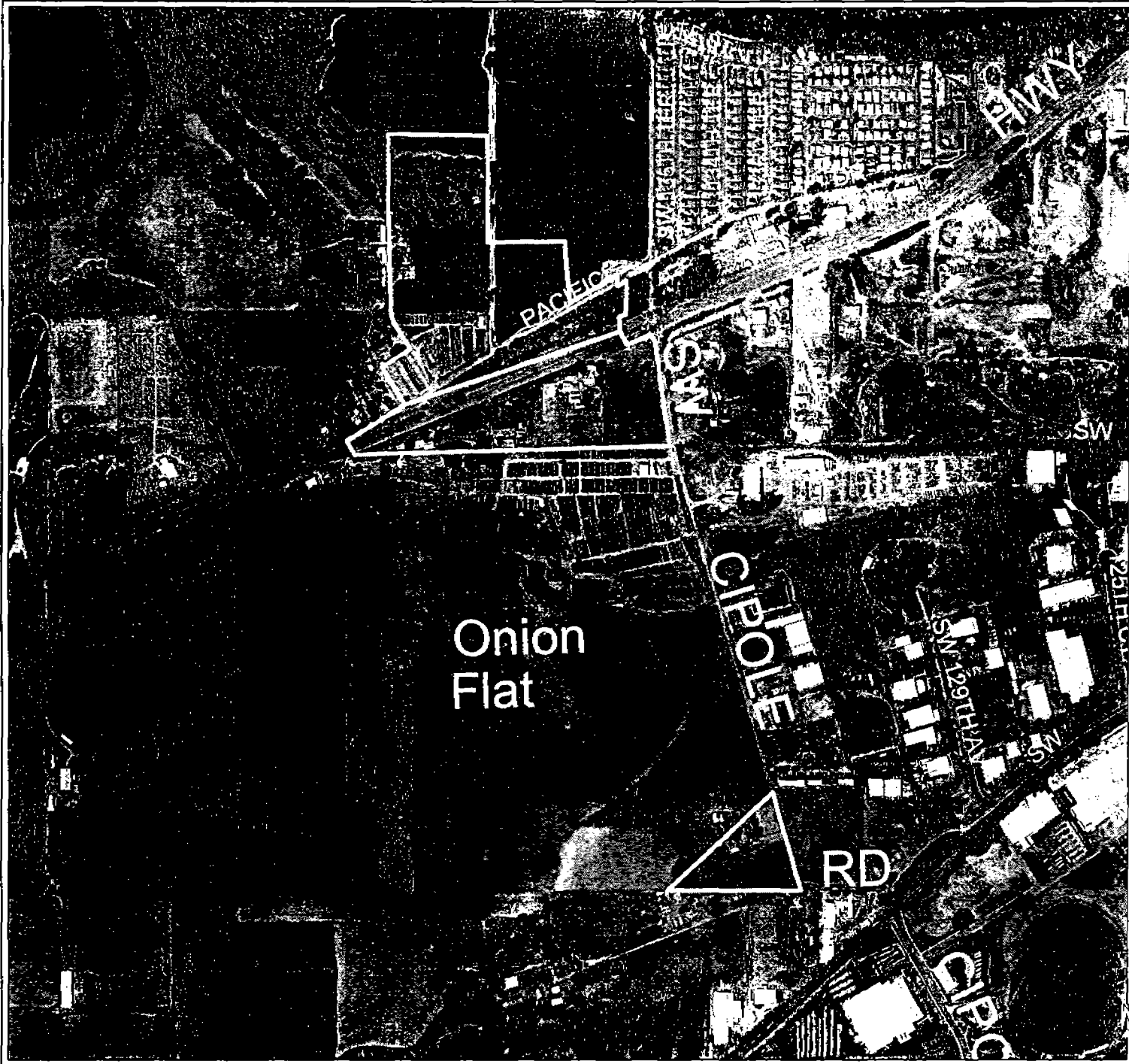
The City of Beaverton, Oregon, is the project sponsor. The project was funded by the City of Beaverton, Oregon, and the Multnomah County, Oregon. The project was completed in July 2002.

Feet
0 580 1,160

Location Map

METRO

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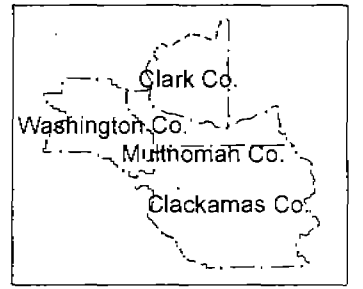
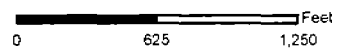


Alternatives Analysis

Study Area 61

SOURCES:

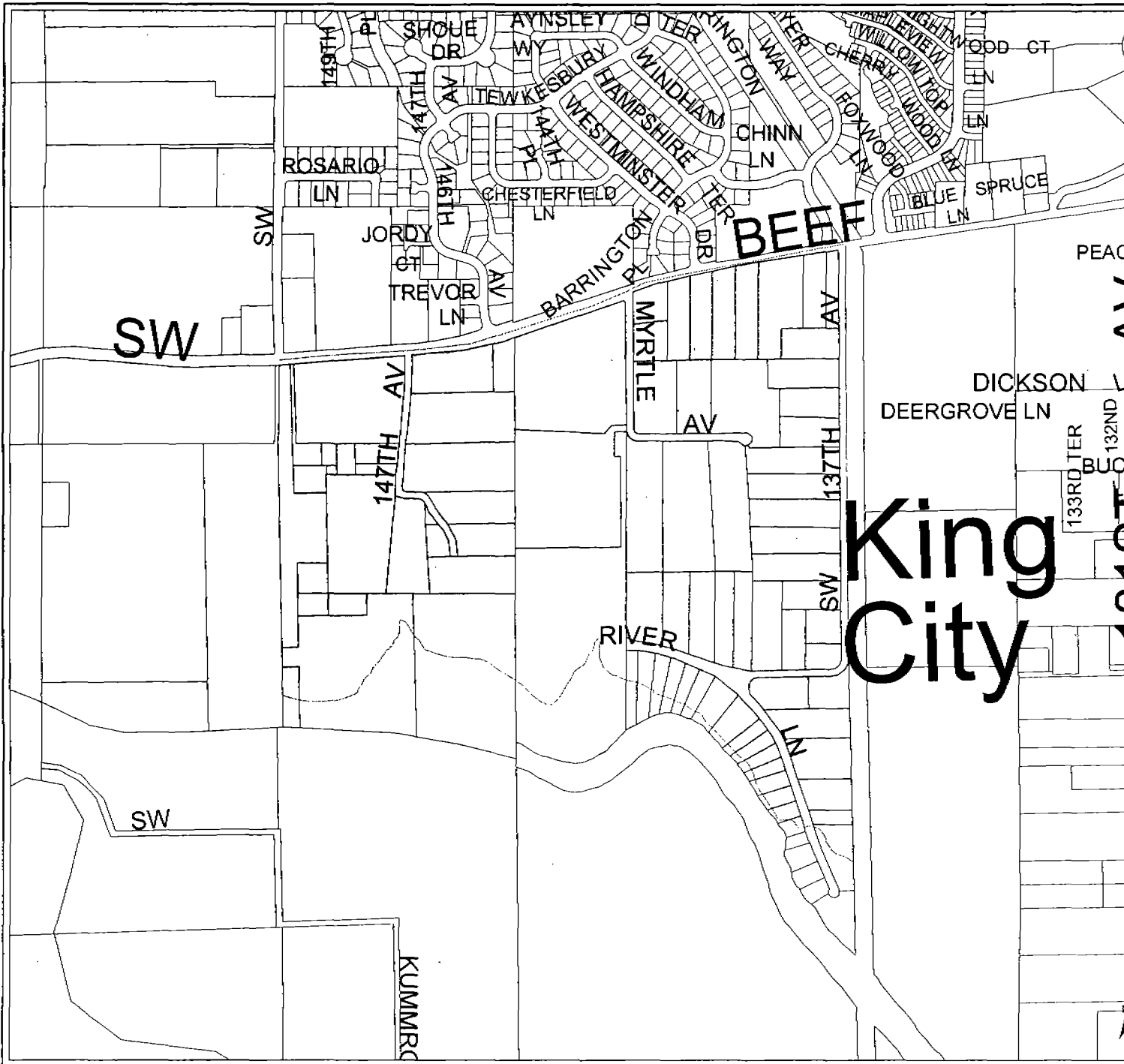
TAX LOT MAP
County Assessment and Taxation office, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map



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REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 62

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:

TAX LOT MAP
County Assessment and Taxation office, 2001. Date collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

0 650 1,300 Feet

Location Map

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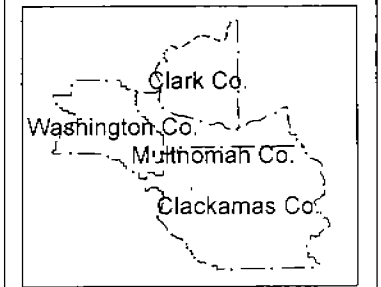
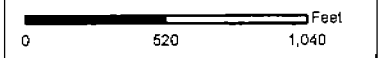
Alternatives Analysis

Study Area 62

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

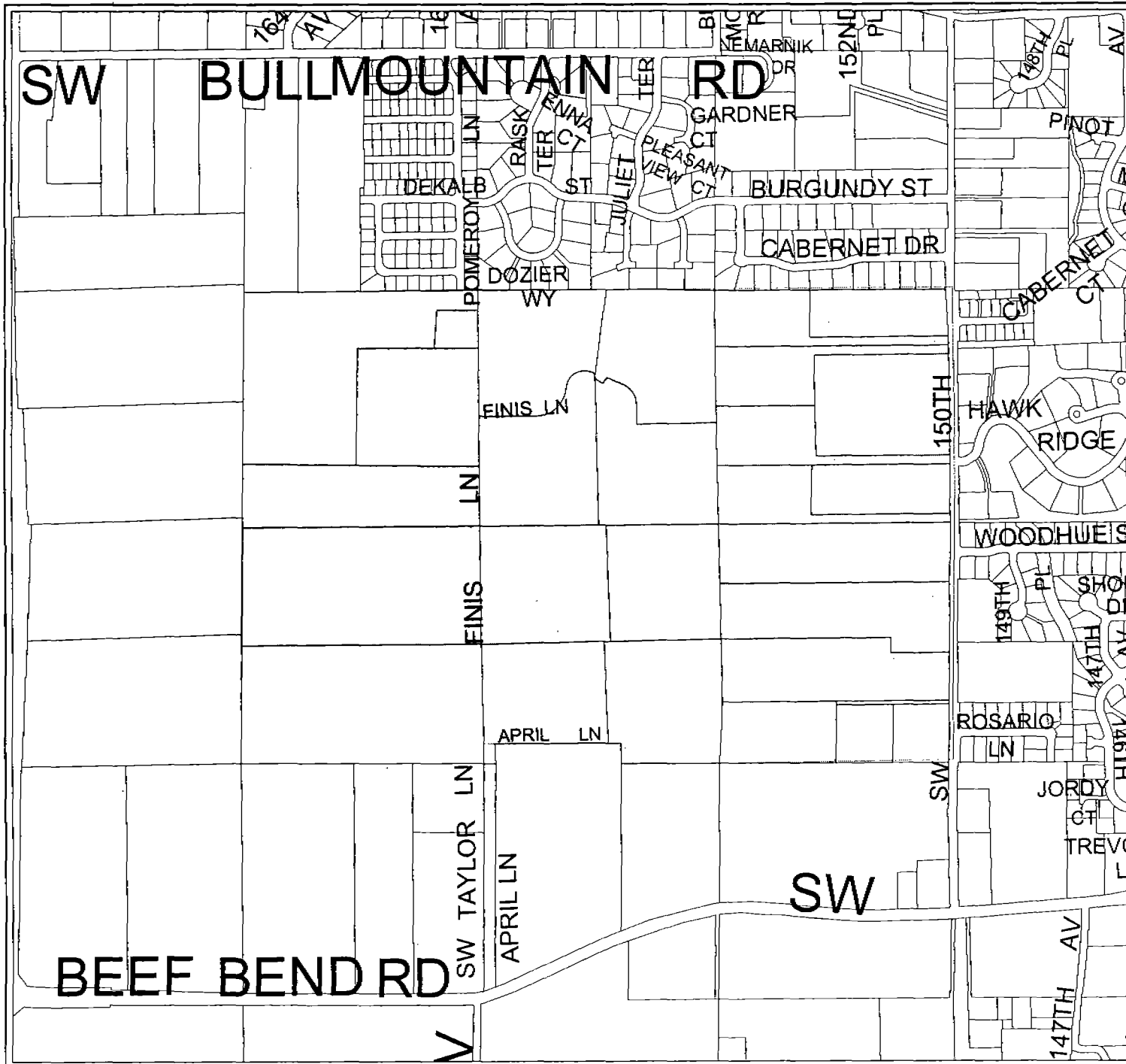
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Location Map



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Alternatives Analysis

Study Area 63

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

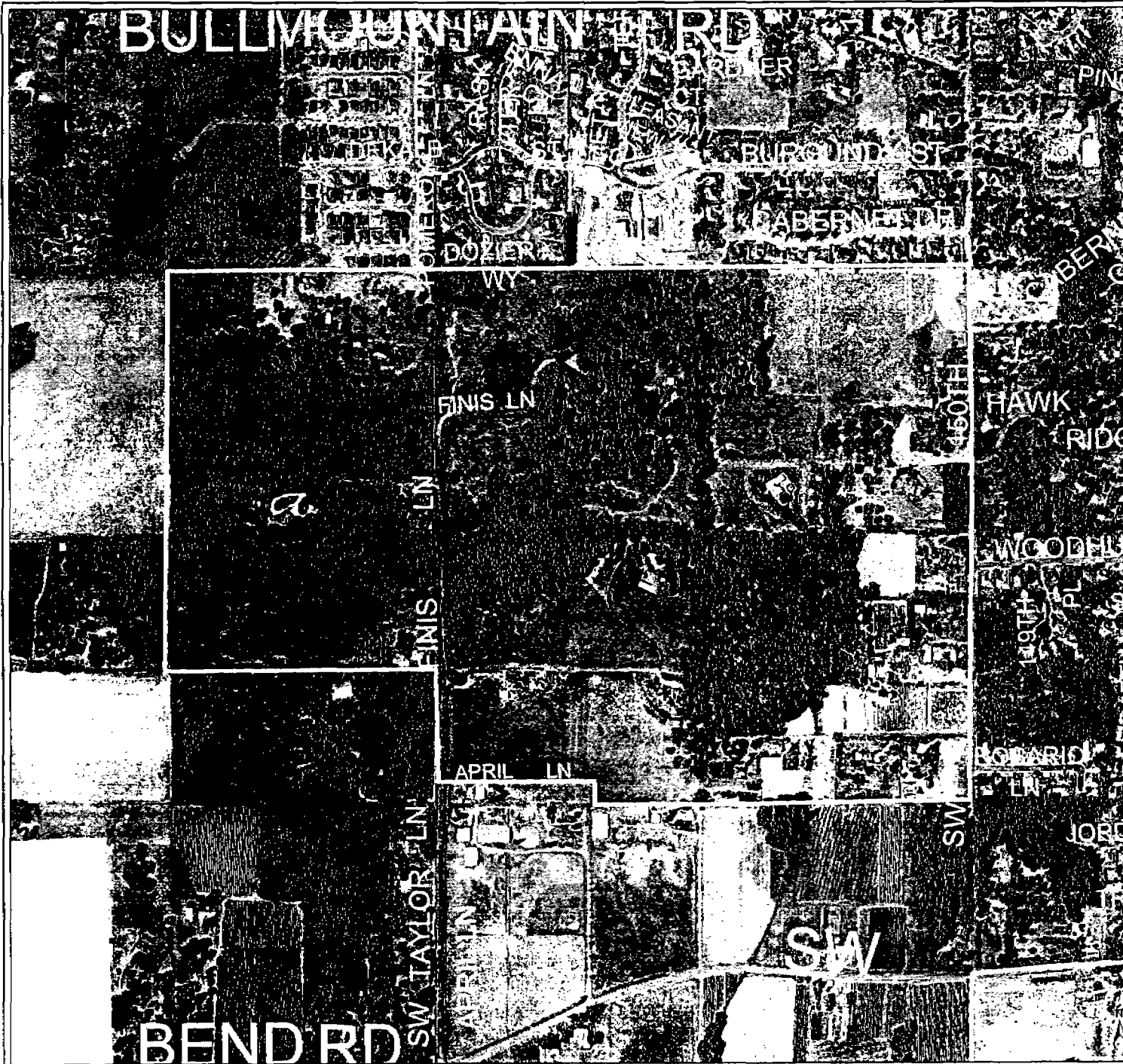
SOURCES:
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

Feet
0 650 1,300

Location Map

METRO

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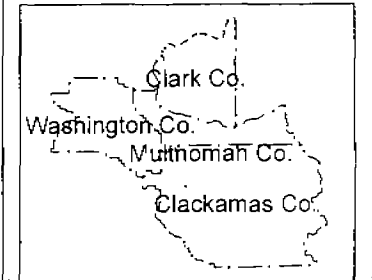
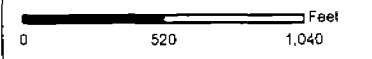


Alternatives Analysis

Study Area 63

SOURCES:

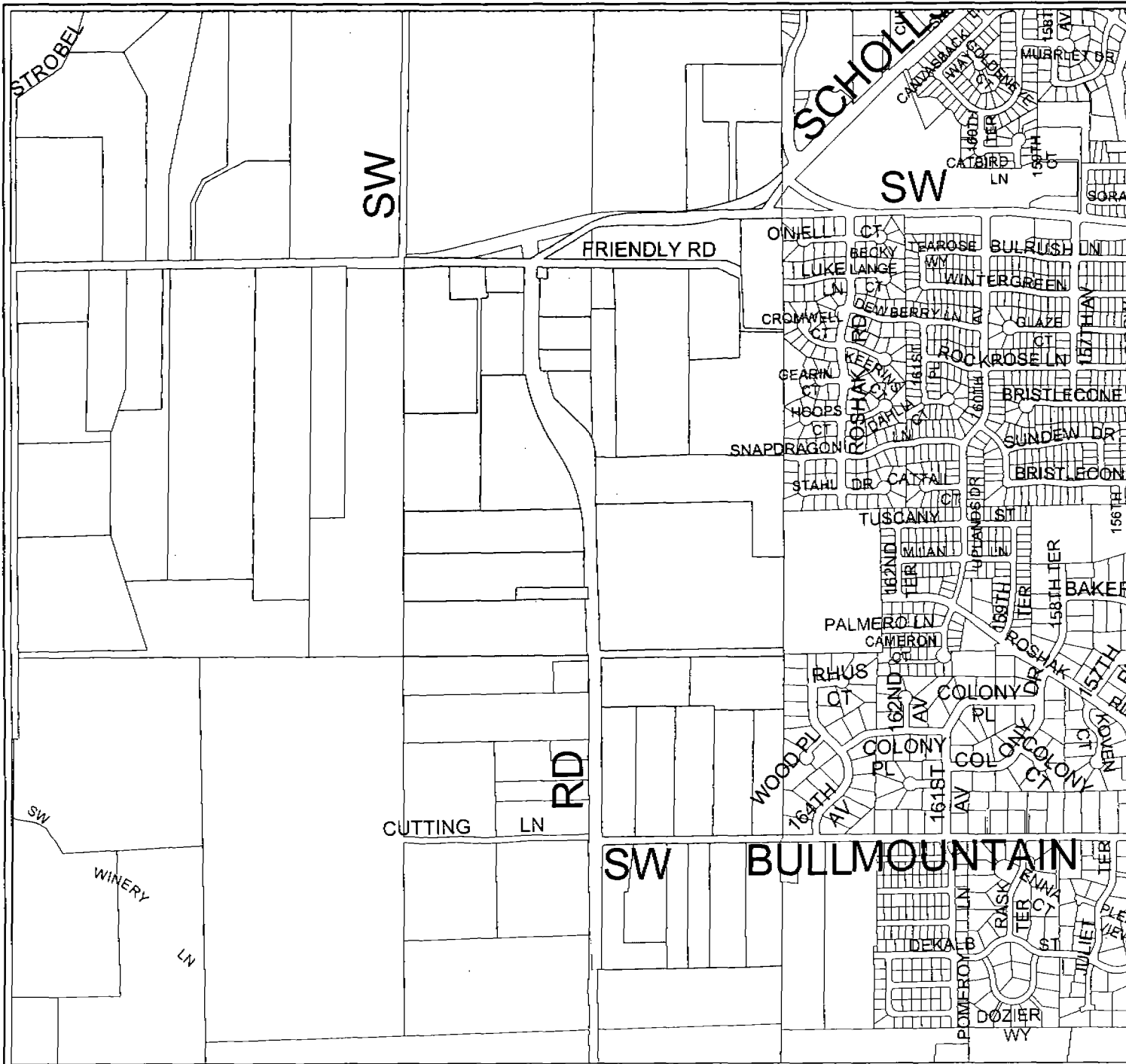
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus two feet or better in Beaverton, Hillsboro, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map



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Alternatives Analysis

Study Area 64

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

Location Map

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R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

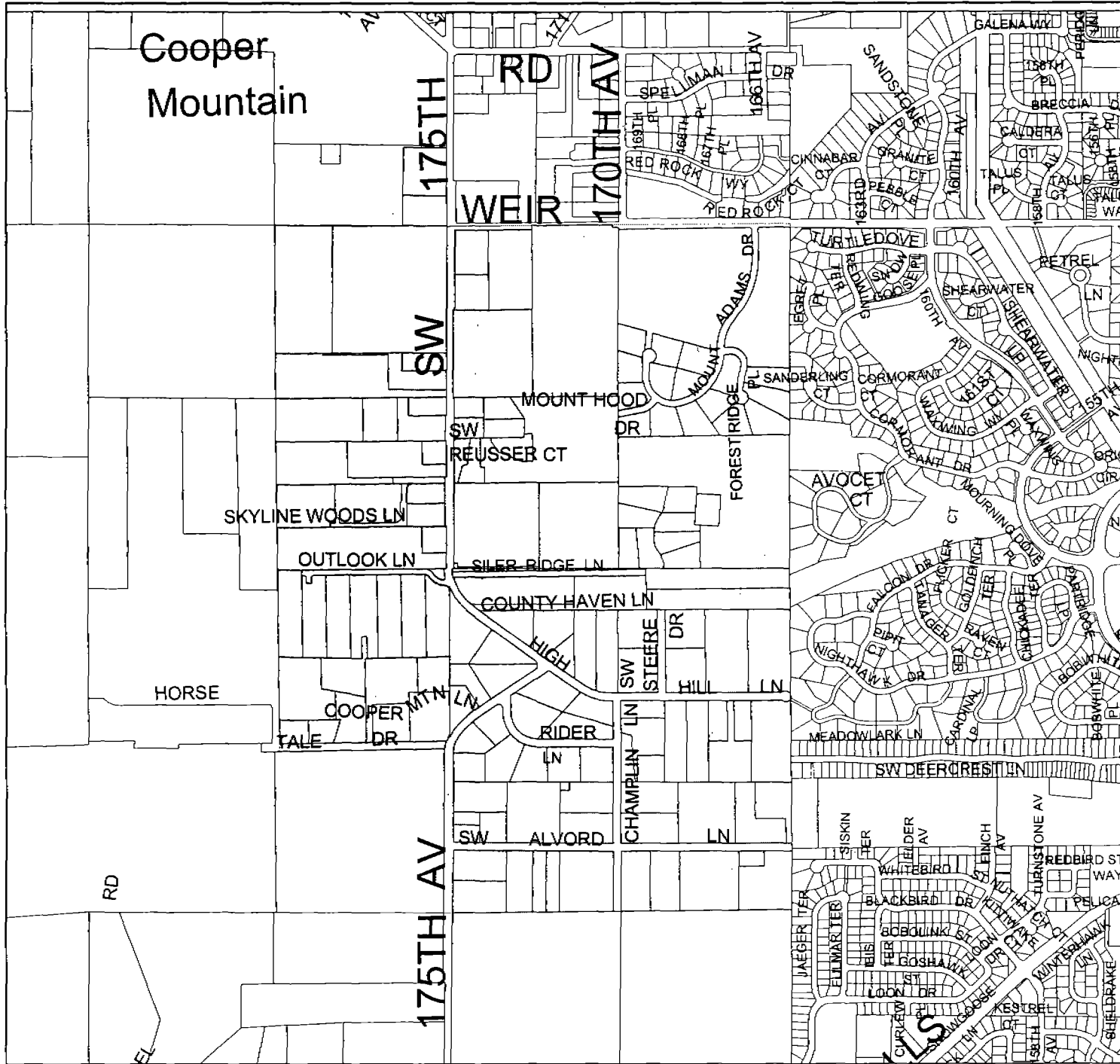
Study Area 64

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

Location Map

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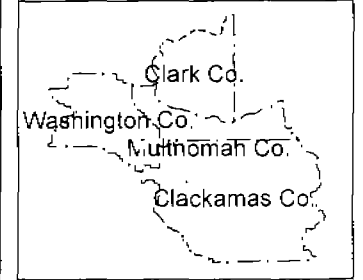
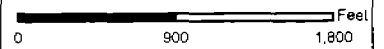


Alternatives Analysis

Study Area 65

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas.
Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map



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Alternatives Analysis

Study Area 65

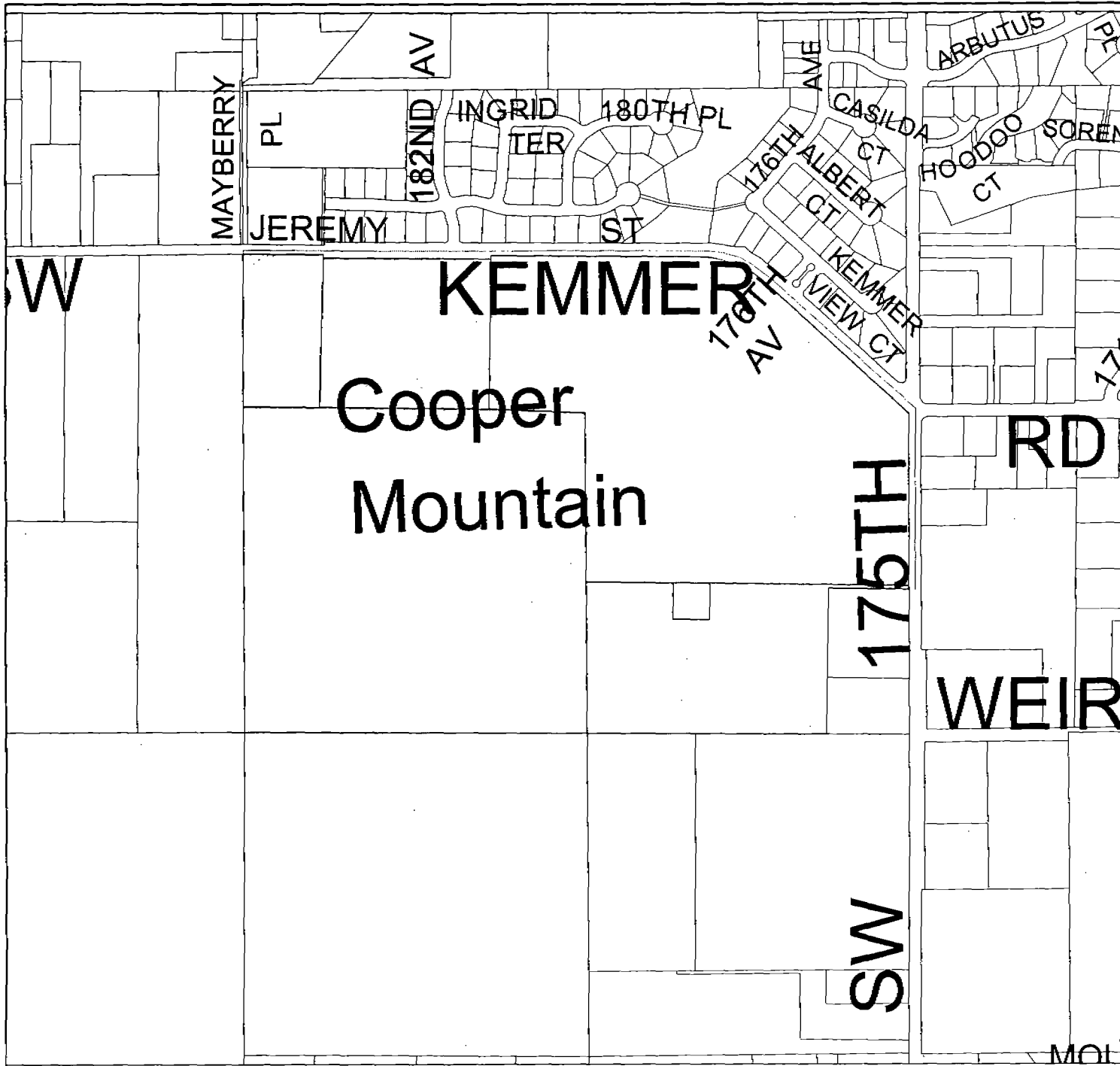
SOURCES:

TAX LOT MAP:
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200 or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

Location Map

METRO

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R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 66

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

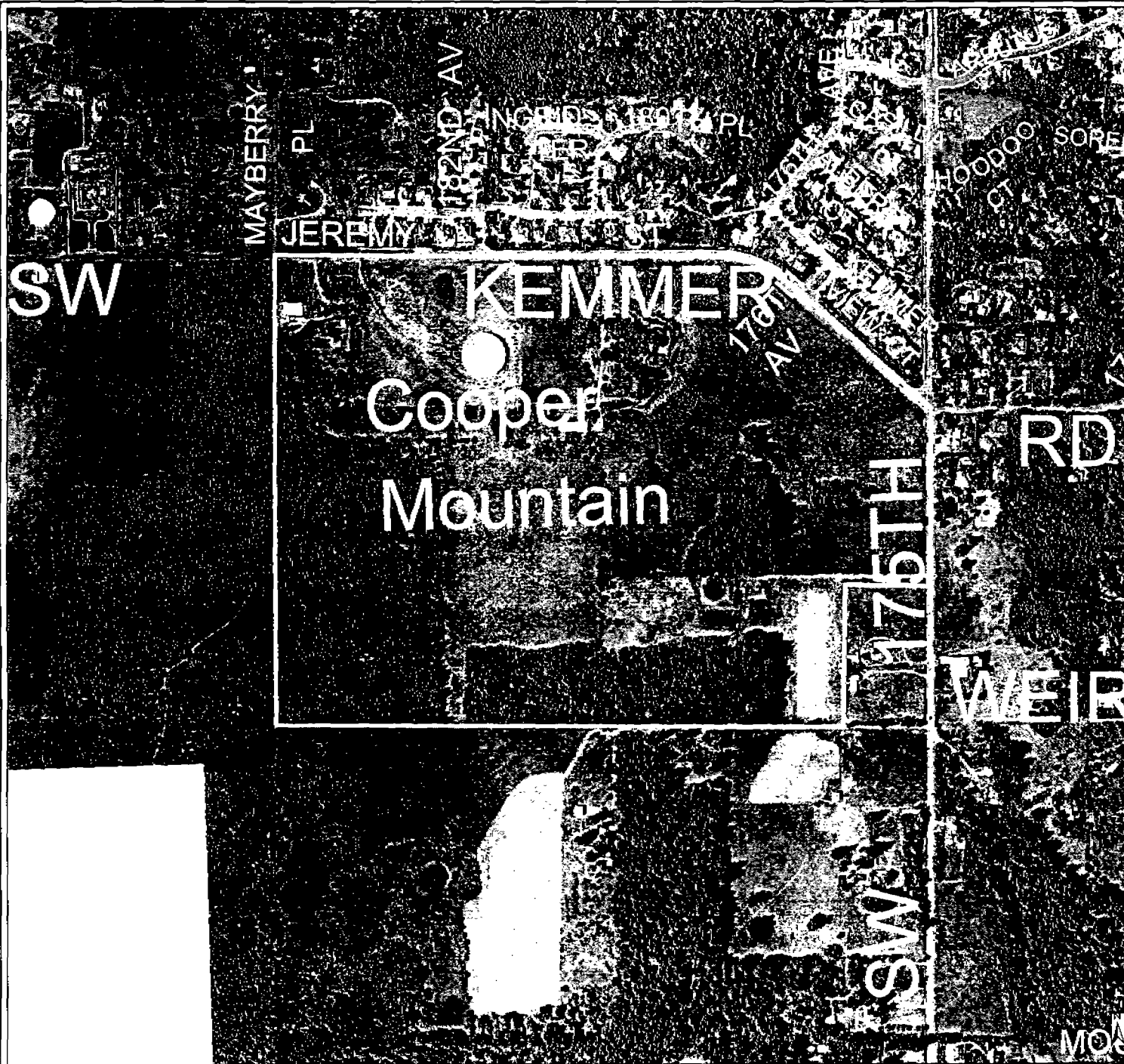
SOURCES:
TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Medaville, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

Feet
0 475 950

Location Map

METRO

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 drc@metro.or.us www.metro-region.org

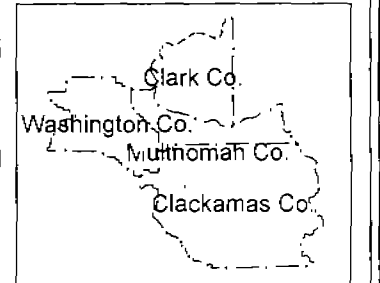
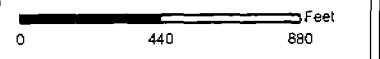


Alternatives Analysis


Study Area 66

SOURCES:

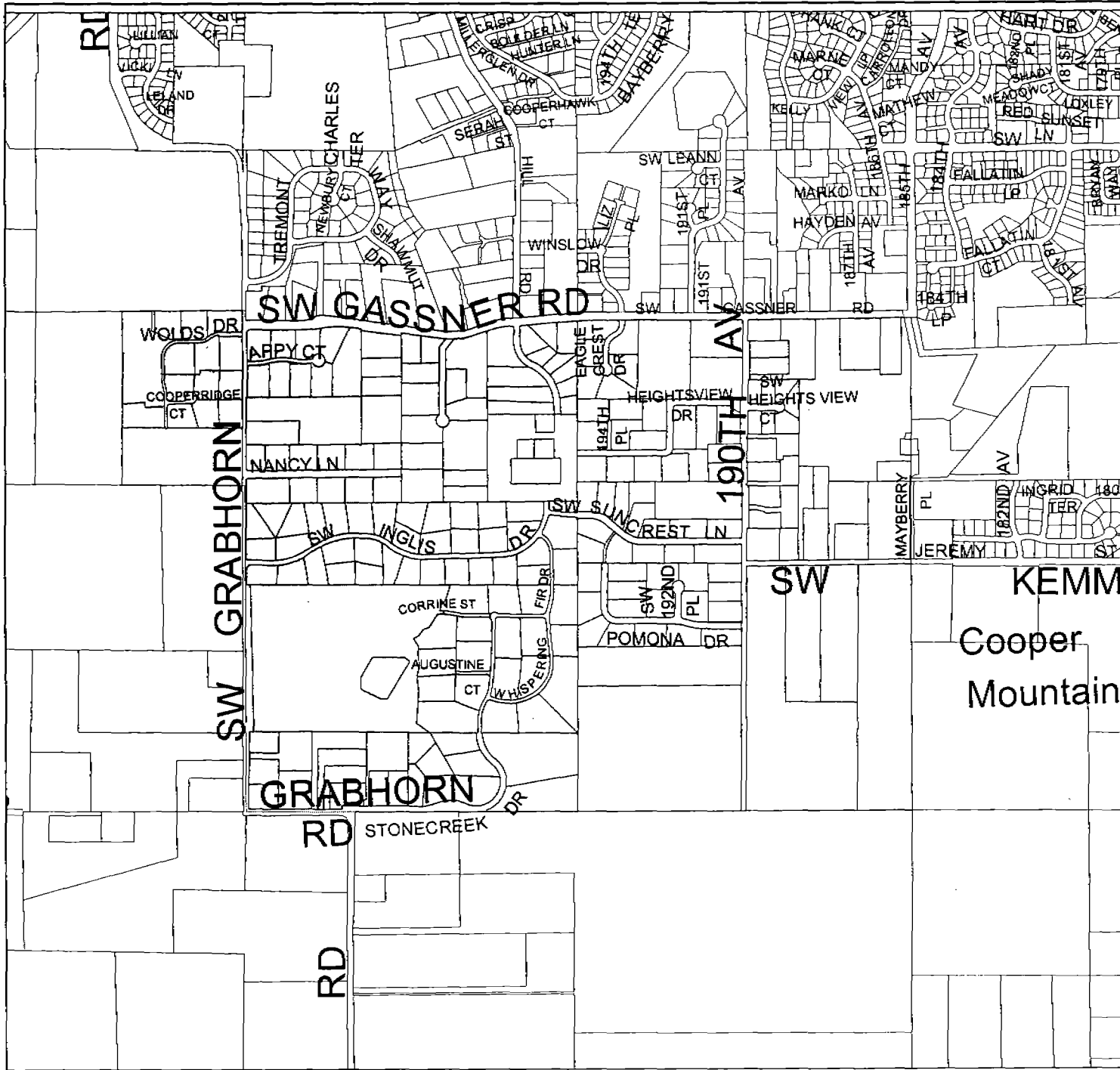
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Medvaskie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map



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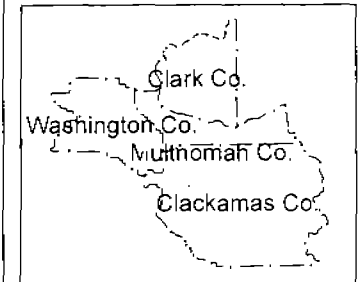
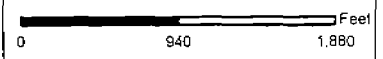
Alternatives Analysis

Study Area 67

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:

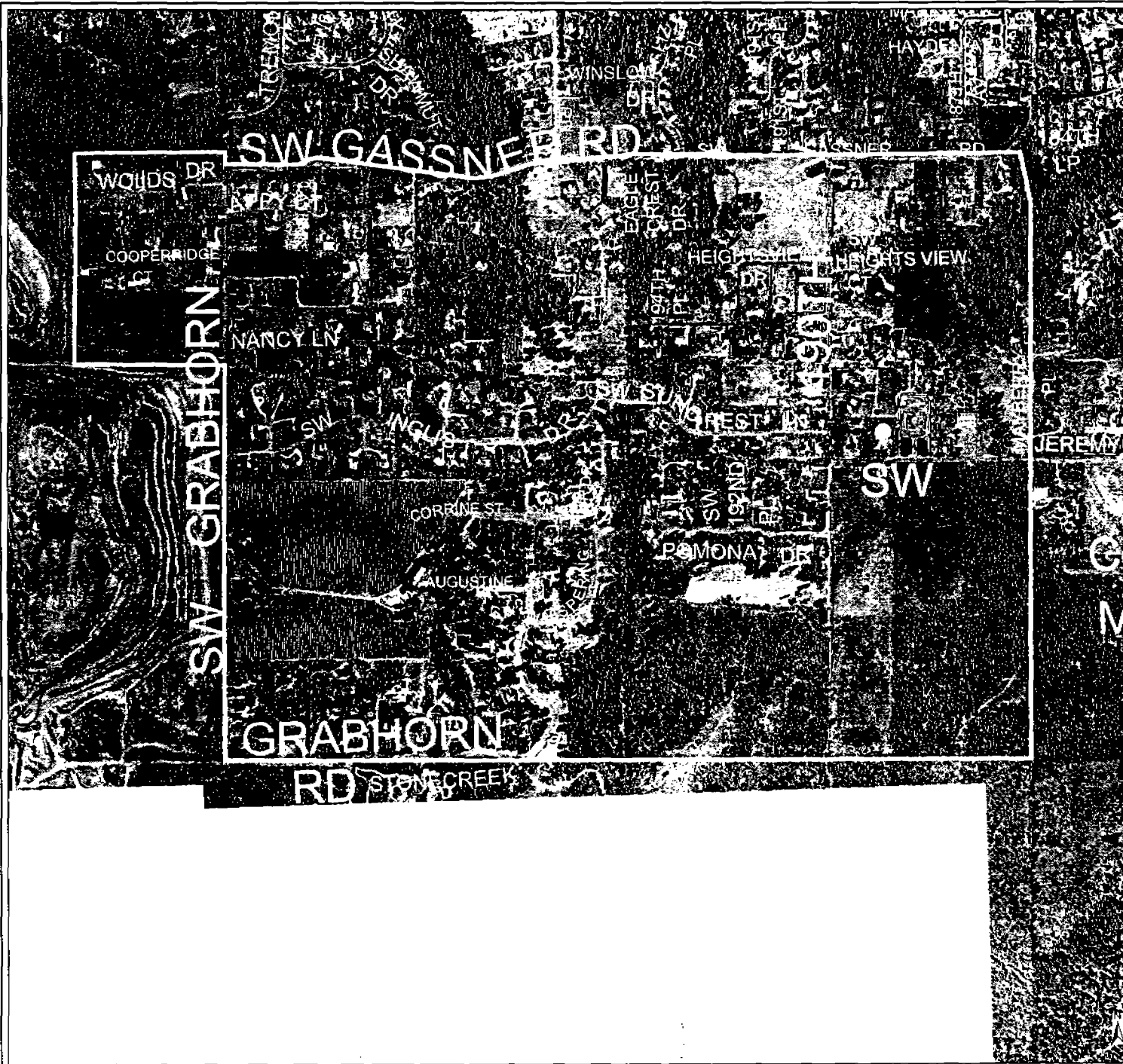
TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map



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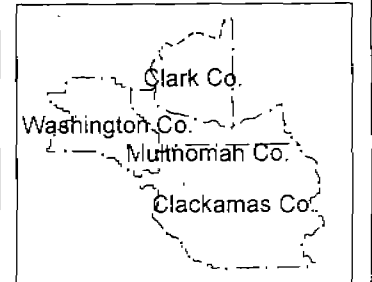
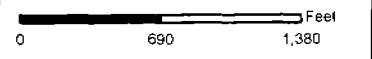


Alternatives Analysis

Study Area 67

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map



METRO DATA RESOURCE CENTER
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Alternatives Analysis

Study Area 68

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:

TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

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Clark Co.

Washington Co.

Multnomah Co.

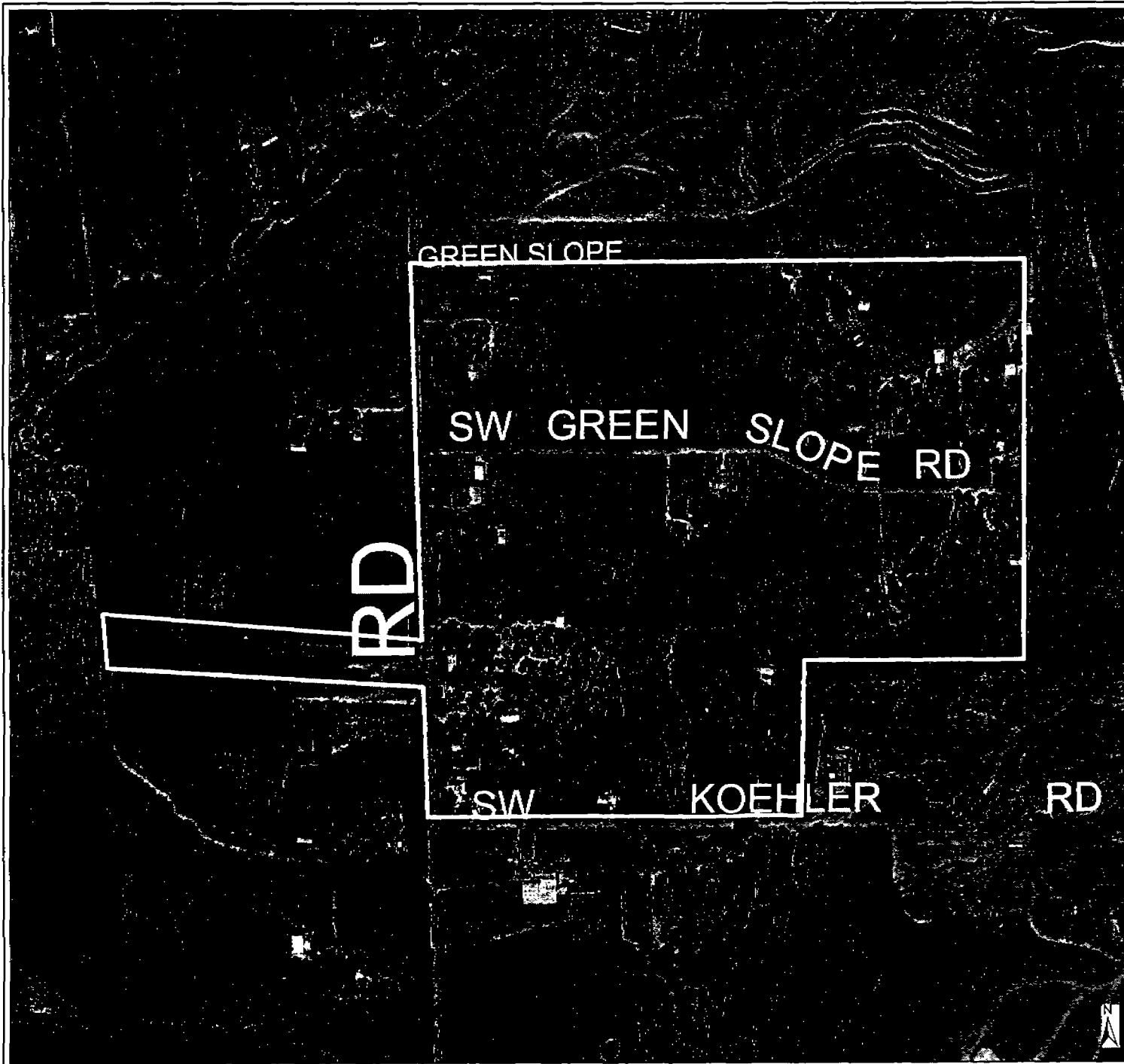
Clackamas Co.

Location Map

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 TEL (503) 797-1742 | FAX (503) 797-1809
 drc@metro.dst.or.us | www.metroregion.org

Alternatives Analysis

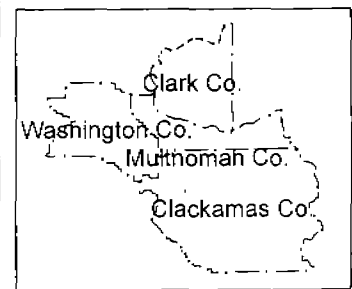
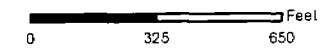
Study Area 68



SOURCES:

TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Clatsop, Multnomah, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

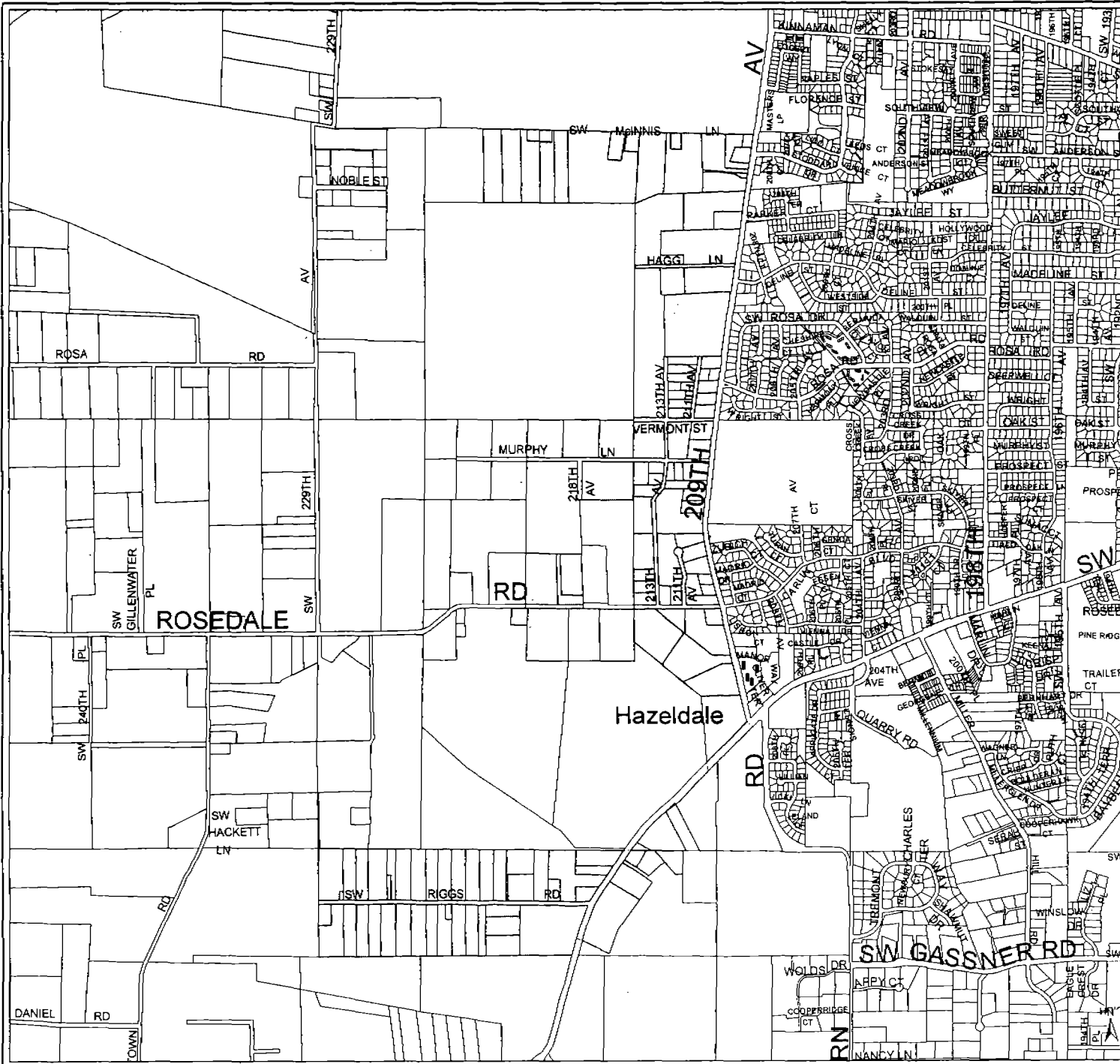
USGS, 1998. Topographic map of the study area. Scale is 1:250,000. Horizontal accuracy is plus or minus 100 feet. Vertical accuracy is plus or minus 10 feet. Data source is the National Wetlands Inventory. Data source is the National Wetlands Inventory. Data source is the National Wetlands Inventory.



Location Map



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REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 69

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:

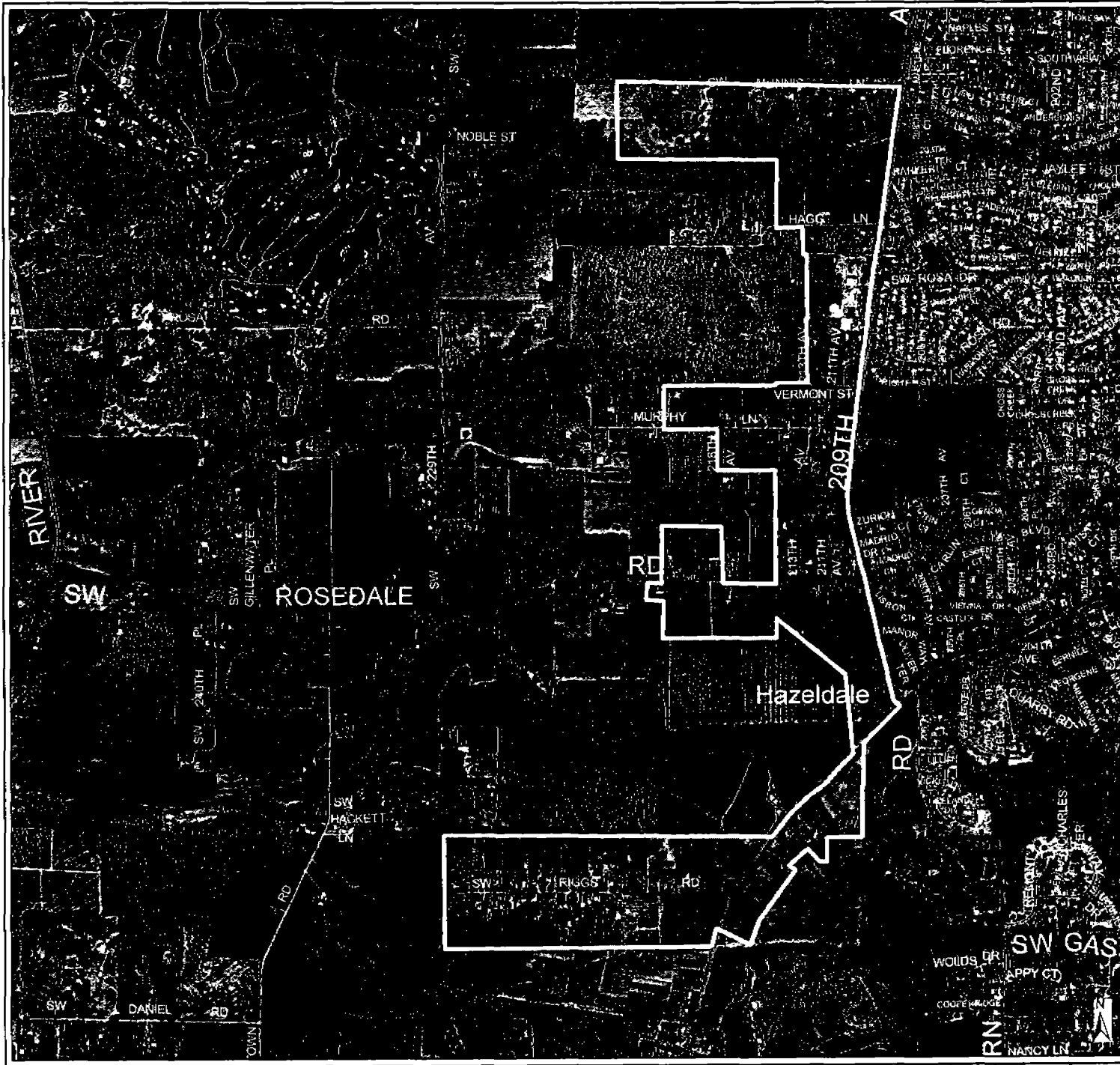
TAX LOT MAP
County Assessment and Taxation Office, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

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0 1,300 2,600 Feet

Location Map

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R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 69

SOURCES:

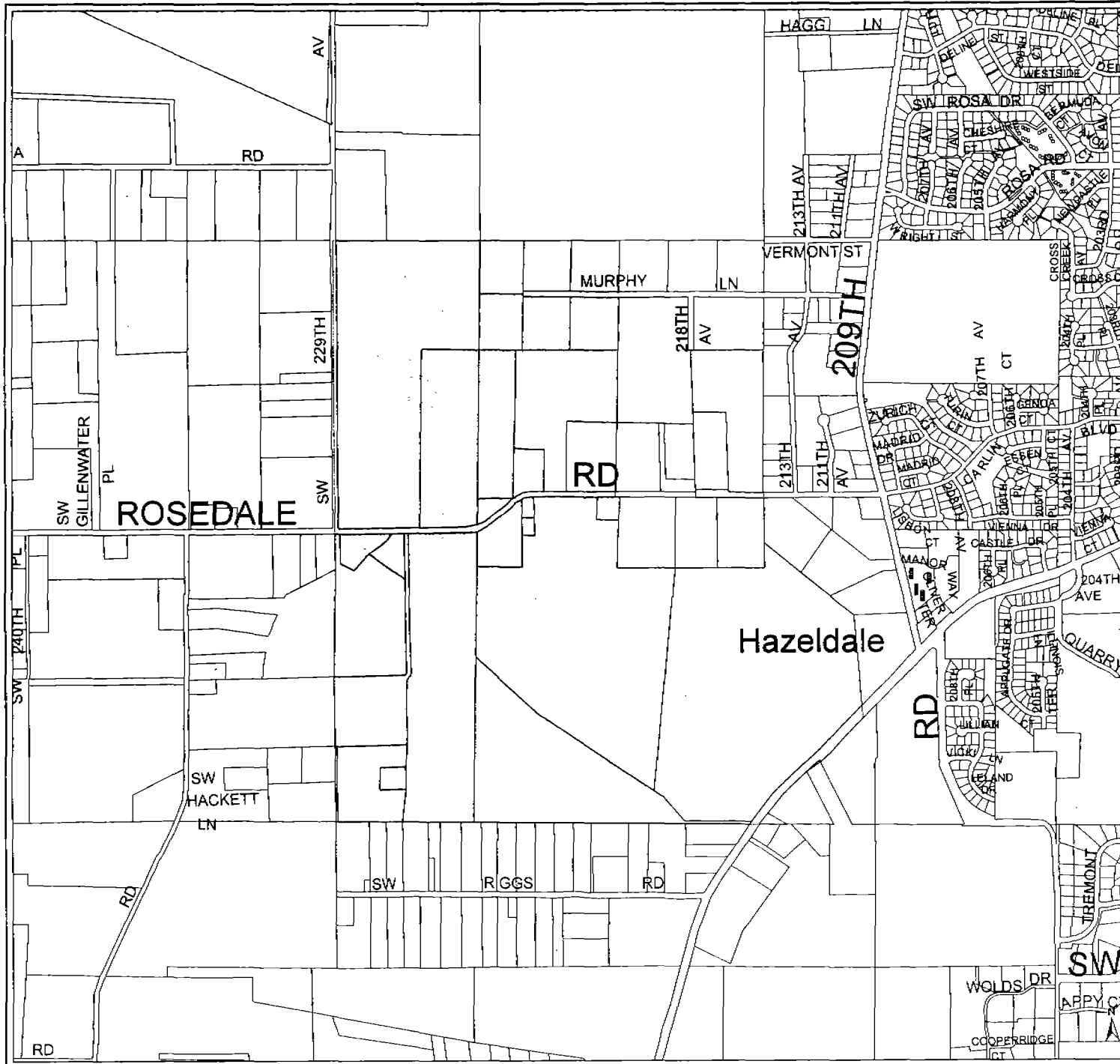
TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

For a complete list of participating agencies and their data, contact Metro at 600 Northeast Grand Avenue, Portland, Oregon 97232-2736. Metro staff are available to assist you in understanding the data and its use. If you have any questions, please contact Metro at 503-797-1742. Metro staff are available to assist you in understanding the data and its use. If you have any questions, please contact Metro at 503-797-1742.

0 1,300 2,600 Feet

Location Map

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R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 70

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:

TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=250' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet at best in Beaverton, Milwaukie, Oregon City, Tualum and Multnomah County. Other areas are plus or minus ten feet.

The information on this map was derived from the following sources: Metro Data Resource Center, 2001. Data collection scale is 1"=100' in urban areas and 1"=250' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet at best in Beaverton, Milwaukie, Oregon City, Tualum and Multnomah County. Other areas are plus or minus ten feet.

0 975 1,950 Feet

Clark Co.

Washington Co.

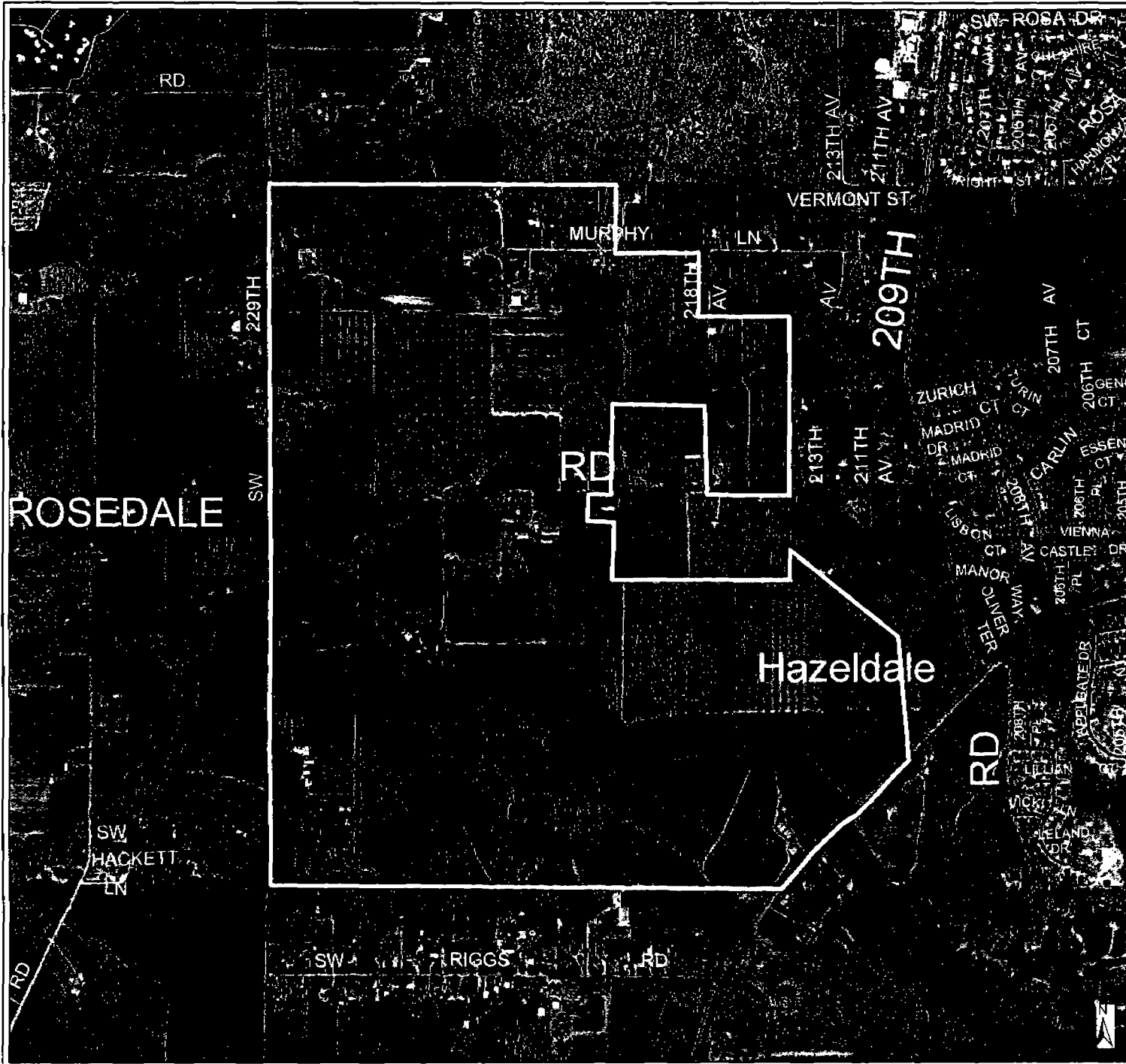
Multnomah Co.

Clackamas Co.

Location Map

METRO

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R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 70

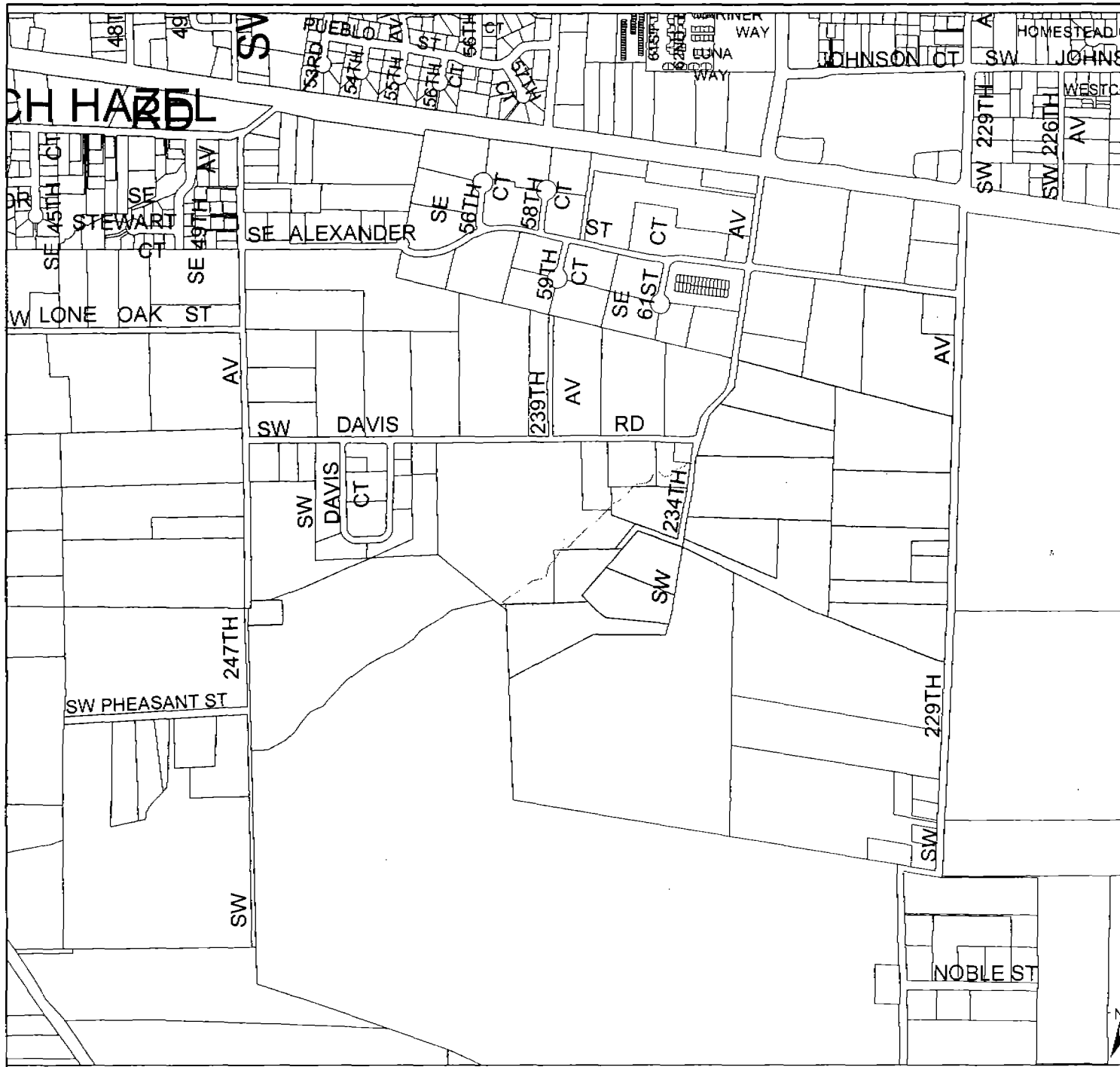
SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

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Alternatives Analysis

Study Area 71

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

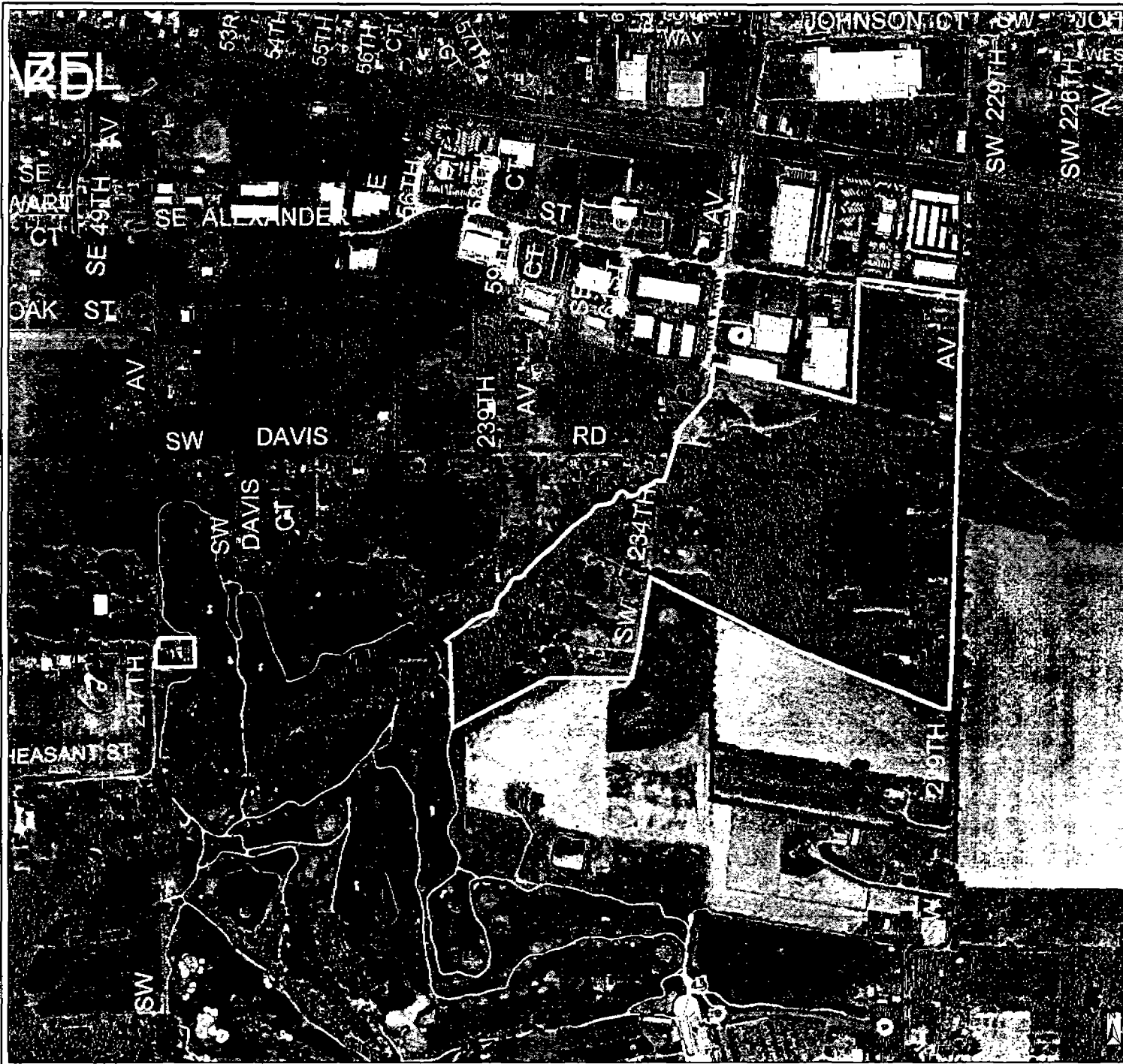
Other Sources:
Metro
City of Beaverton
City of Milwaukie
City of Oregon City
City of Tigard
Multnomah County
Washington County
Clackamas County

0 700 1,400 Feet

Location Map

METRO

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REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 71

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.


Feet
0 600 1,200

Clark Co.
Washington Co.
Multnomah Co.
Clackamas Co.

Location Map

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 drc@metro.dat.or.us | www.metrodata.org

Alternatives Analysis

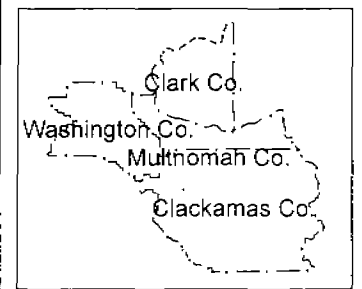
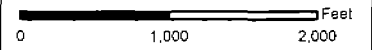
 Study Area 72

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=250' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Multnomah, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

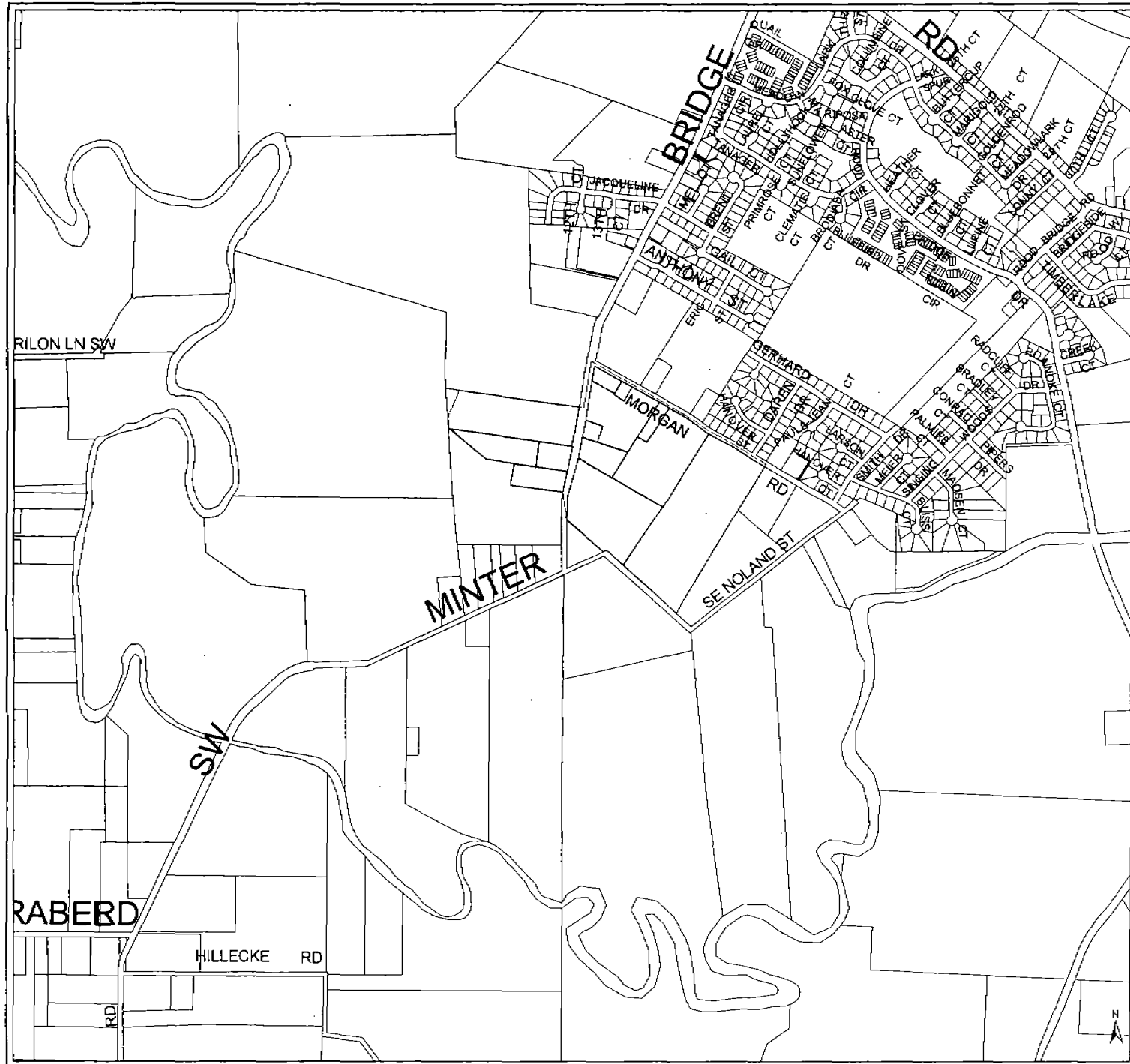
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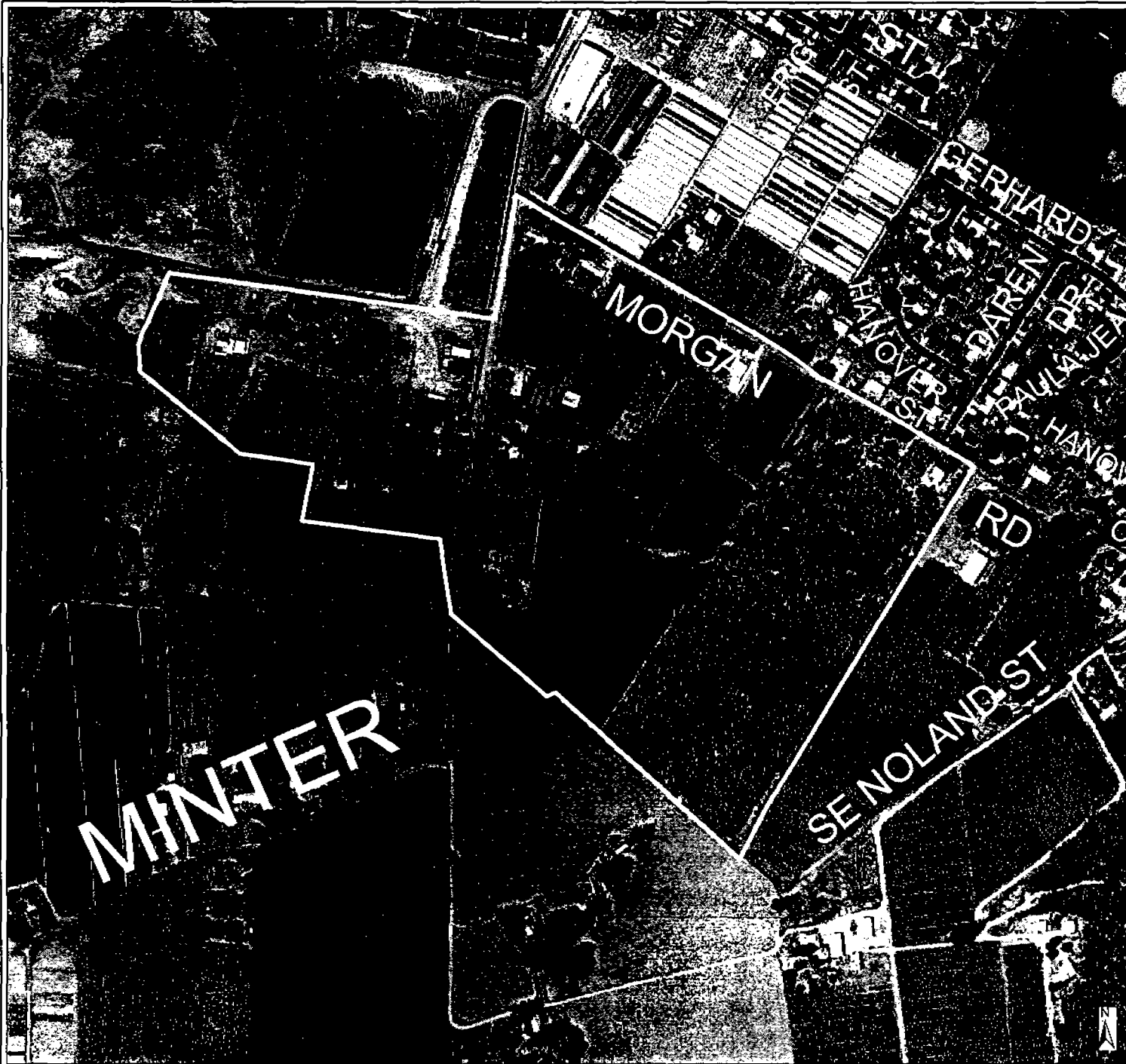


Location Map



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drc@metro.dst.or.us www.metro-region.org





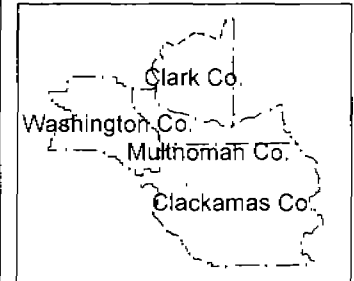
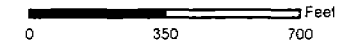
Alternatives Analysis

Study Area 72

SOURCES:

TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

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Location Map



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Alternatives Analysis

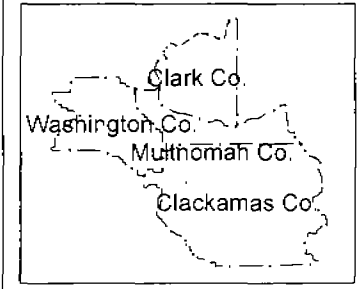
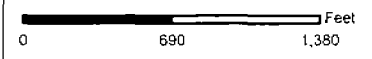
Study Area 73

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:

TAX LOT MAP
County Assessment and Taxation office, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas.
Horizontal accuracy is plus or minus five feet or better in Gresham, Multnomah, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

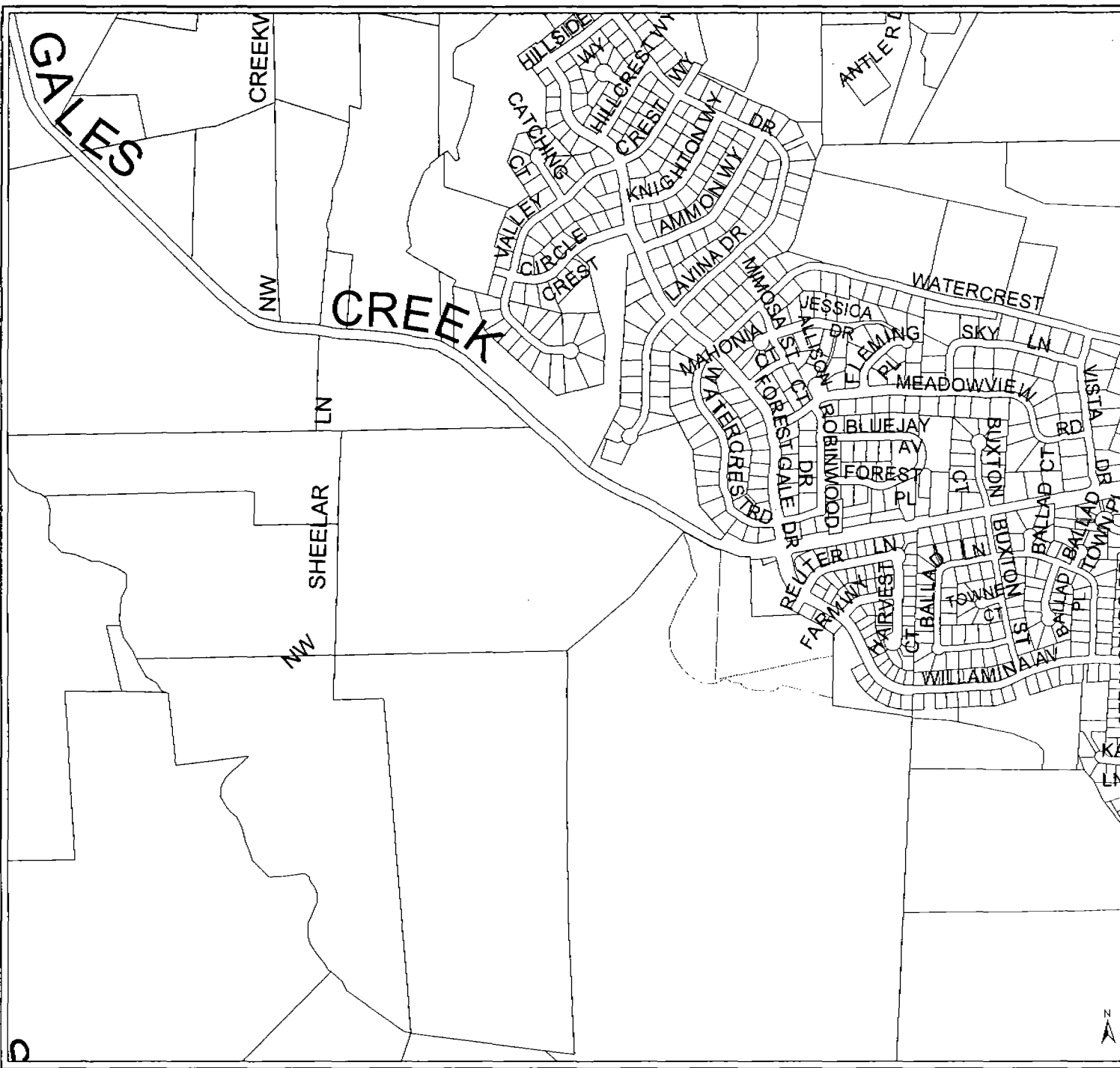
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Location Map



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drc@metro-oreg.org www.metro-oreg.org





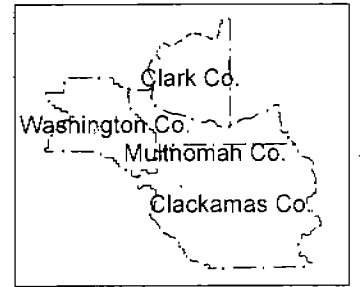
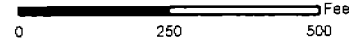
Alternatives Analysis

Study Area 73

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' at 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Dragon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

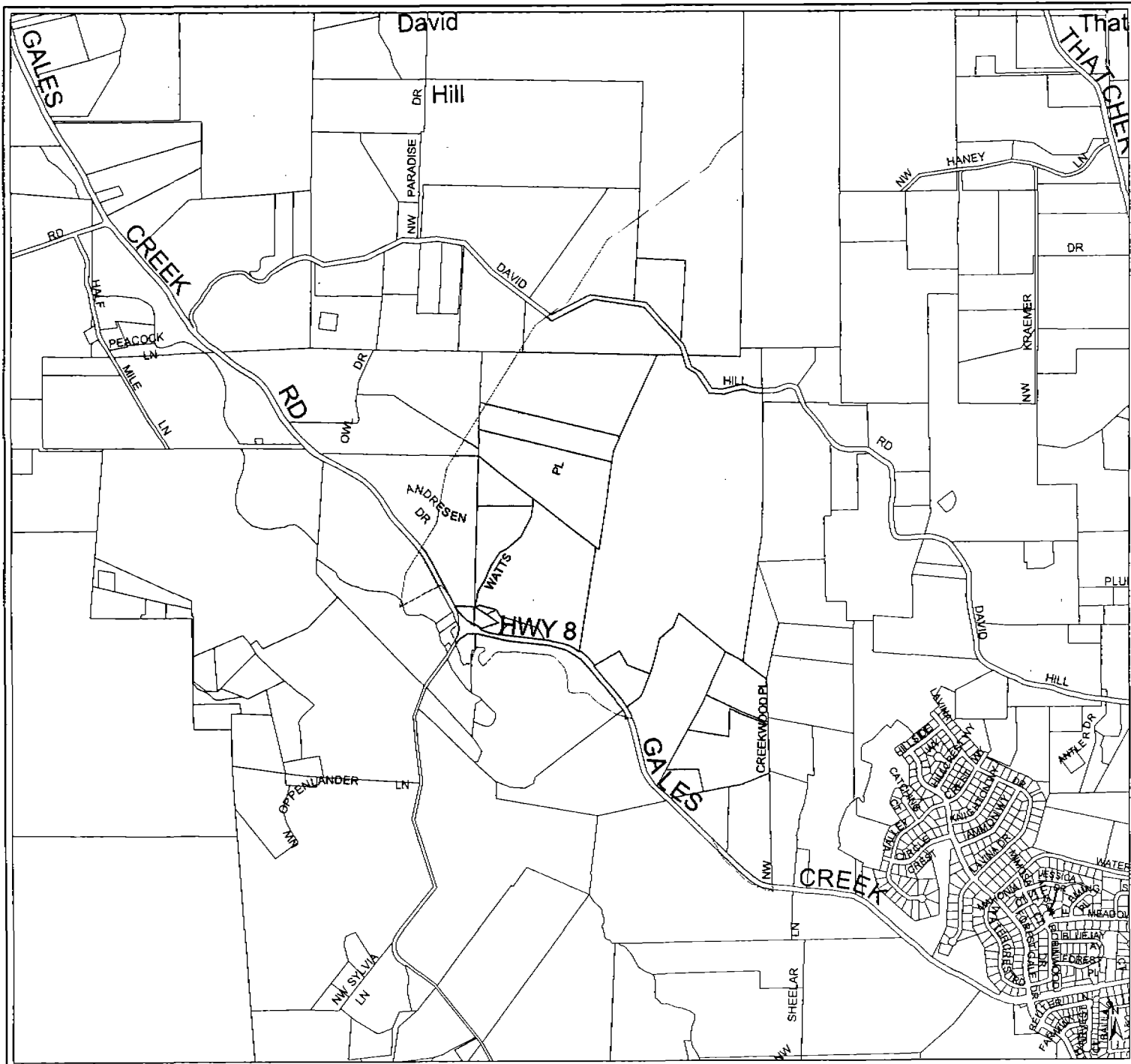
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Location Map



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R L I S
 REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 74

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:
 TAX LOT MAP
 County Assessment and Taxation offices, 2001. Date collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Clatsop, Clackamas, Multnomah County. Other areas are plus or minus ten feet.

Feet
 0 1,400 2,800

Location Map

METRO
 METRO DATA RESOURCE CENTER
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R E G I O N A L L A N D I N F O R M A T I O N S Y S T E M

Alternatives Analysis

Study Area 74

SOURCES

TAX LOT MAP
 County Assessment and Taxation office, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

Scale:
 0 1,000 2,000 Feet


Clark Co.

Washington Co.

Multnomah Co.

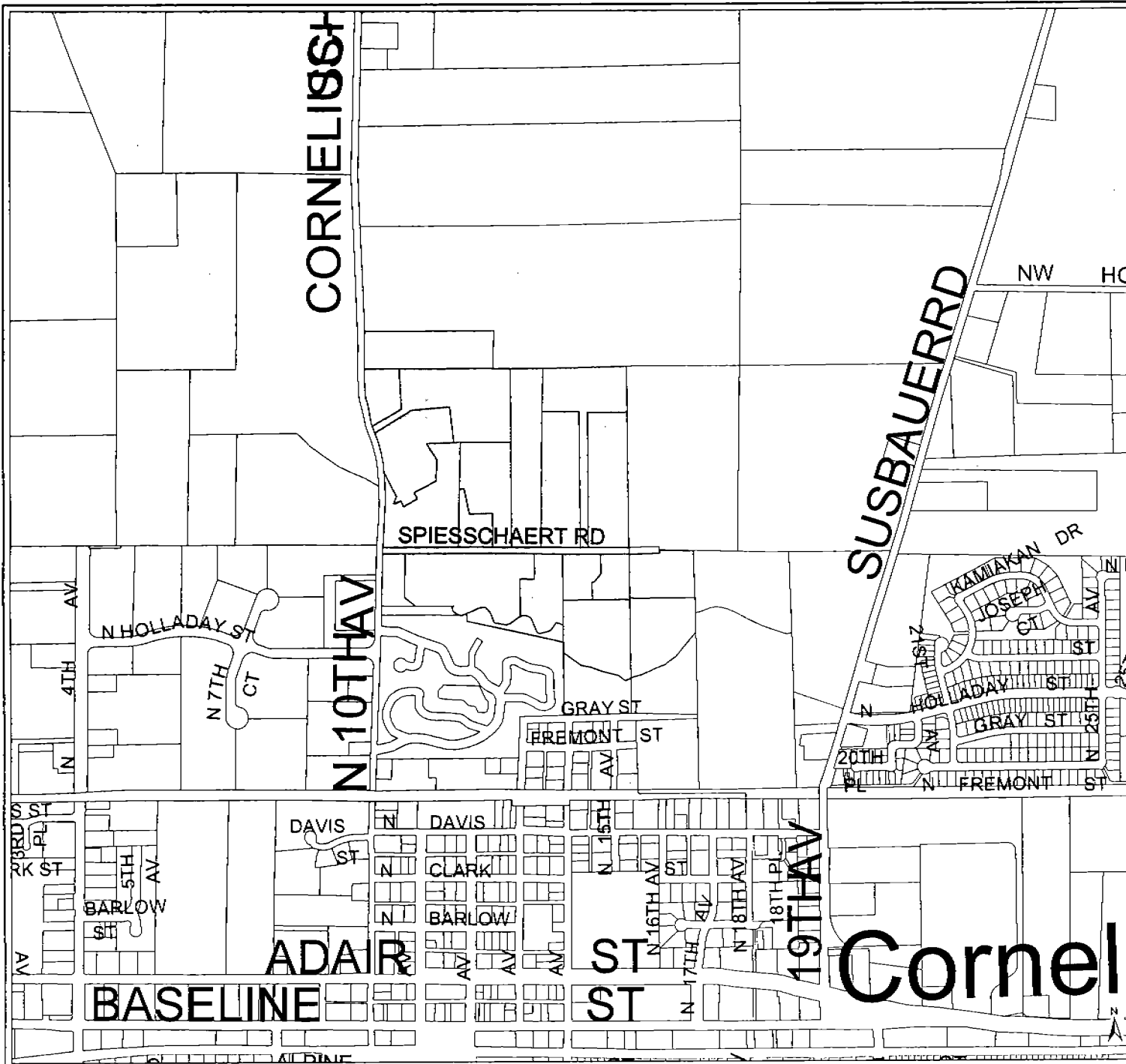
Clackamas Co.

Location Map



METRO

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Alternatives Analysis

Study Area 75

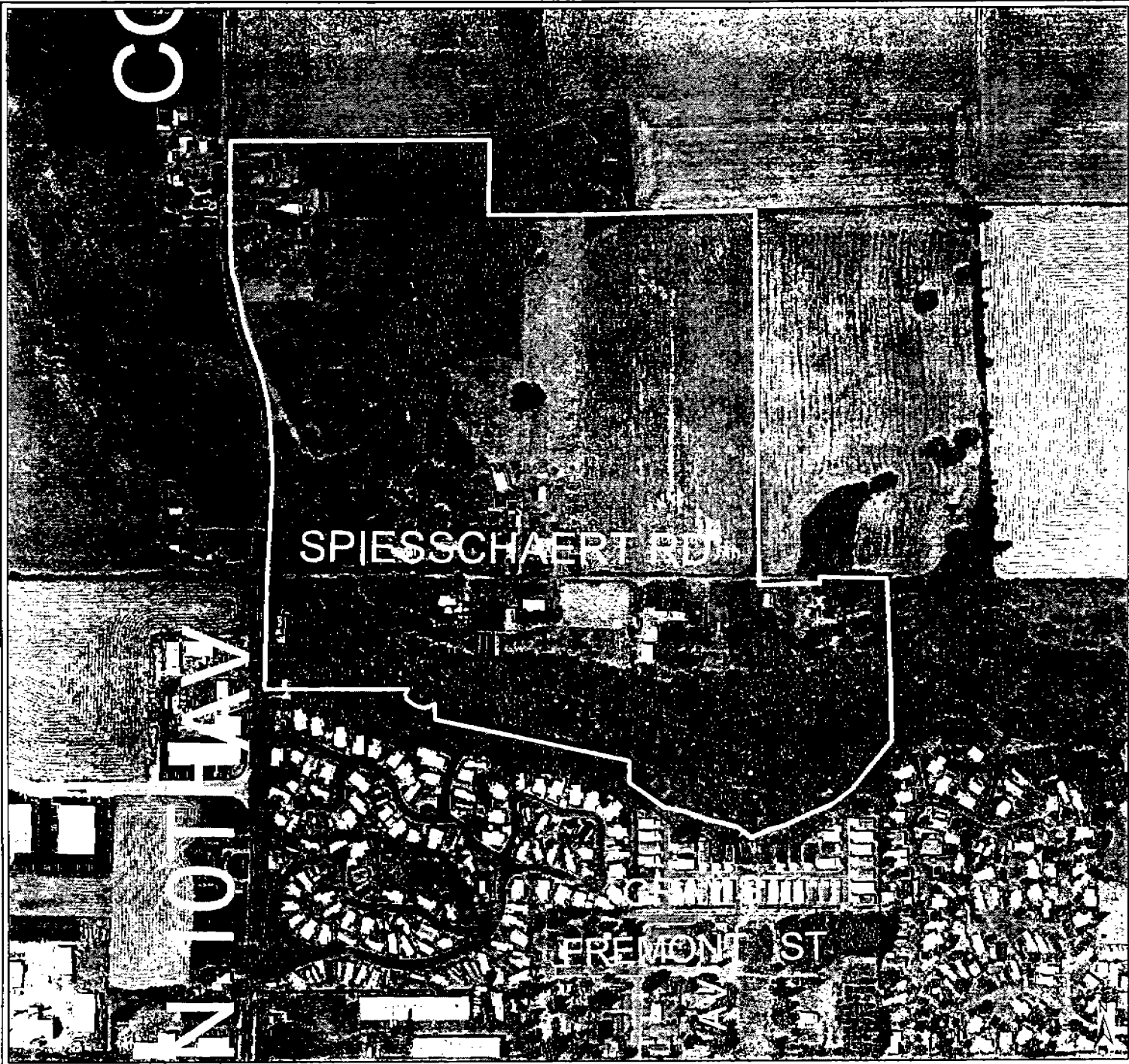
Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES
 TAX LOT MAP
 County Assessment and Taxation office, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

0 680 1,360
 Feet

Location Map

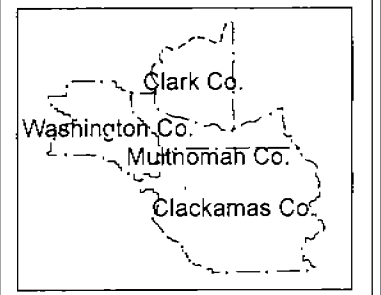
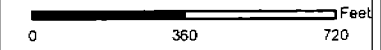
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 drs@metro.or.us | www.metro-region.org



Alternatives Analysis

Study Area 75

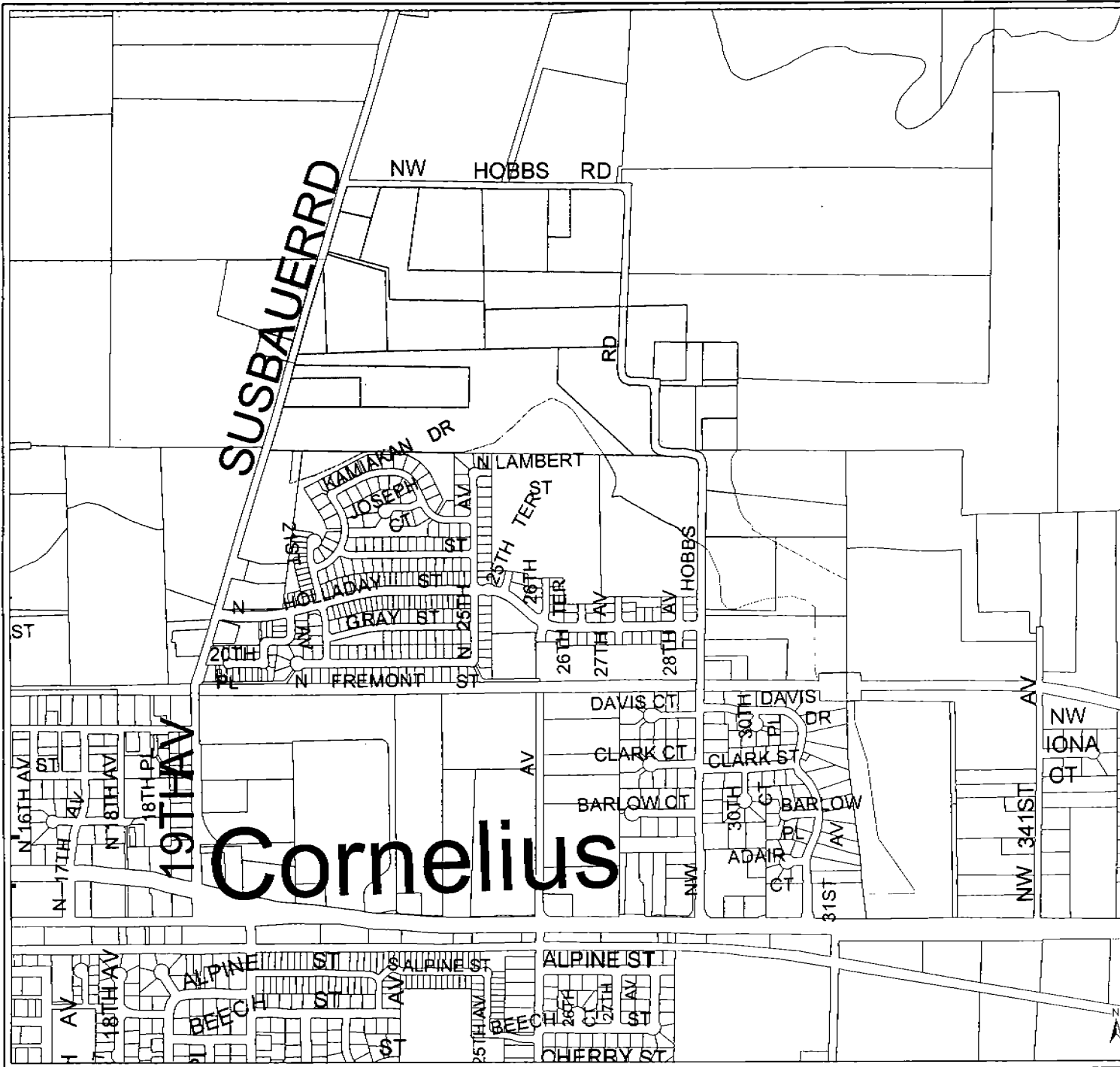
SOURCES:
TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.
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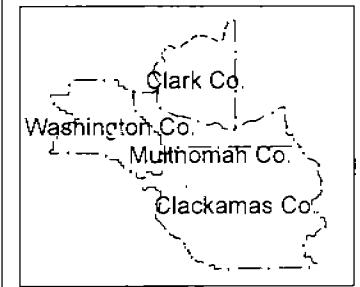
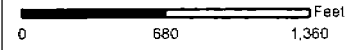


Alternatives Analysis

Study Area 76

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

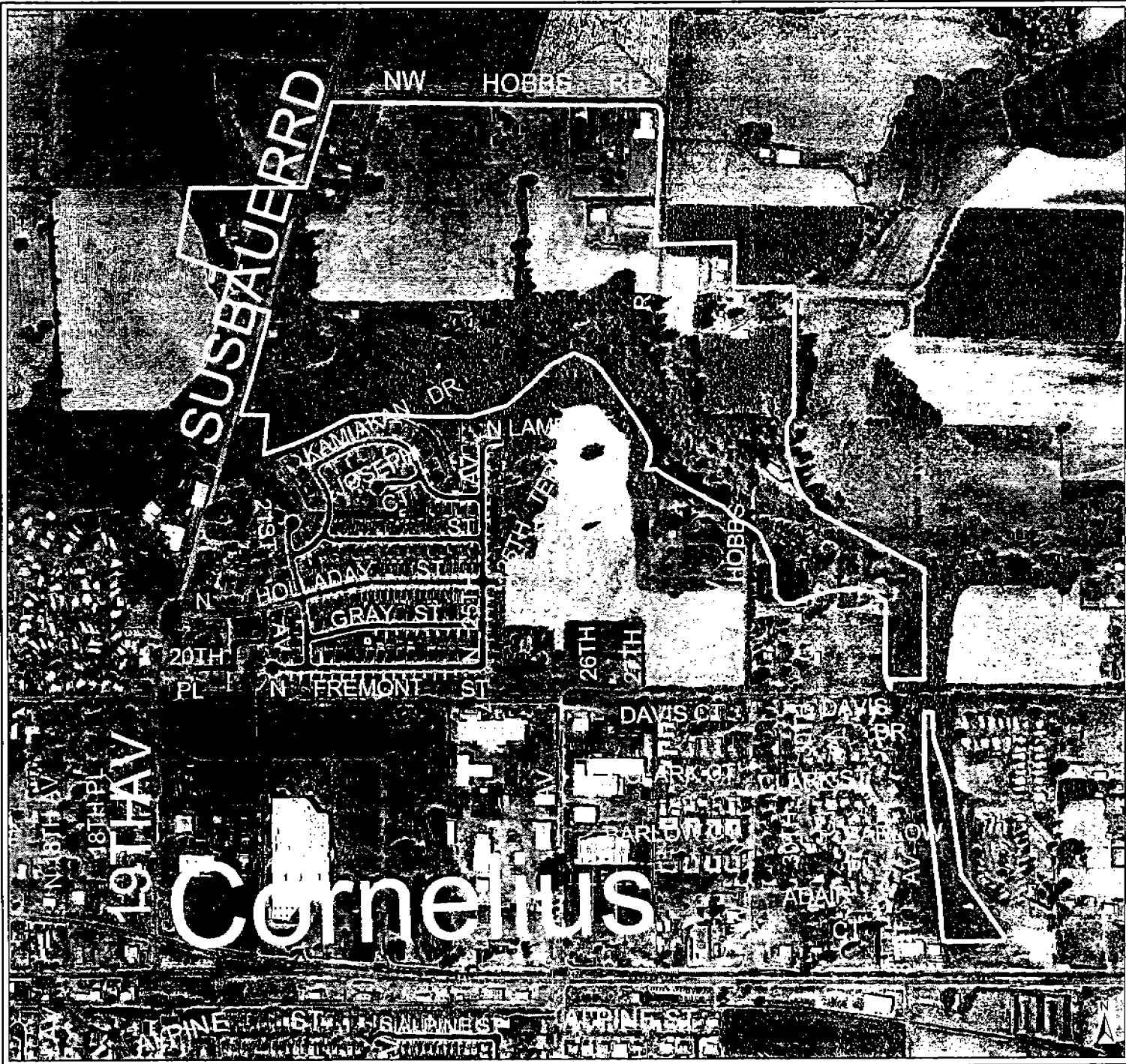
SOURCES
TAX LOT MAP
 County Assessment and Taxation offices, 2001. Date collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map



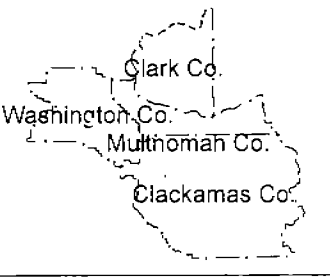
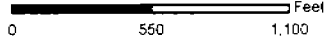
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 drc@metro.or.us | www.metro-region.org



Alternatives Analysis

Study Area 76

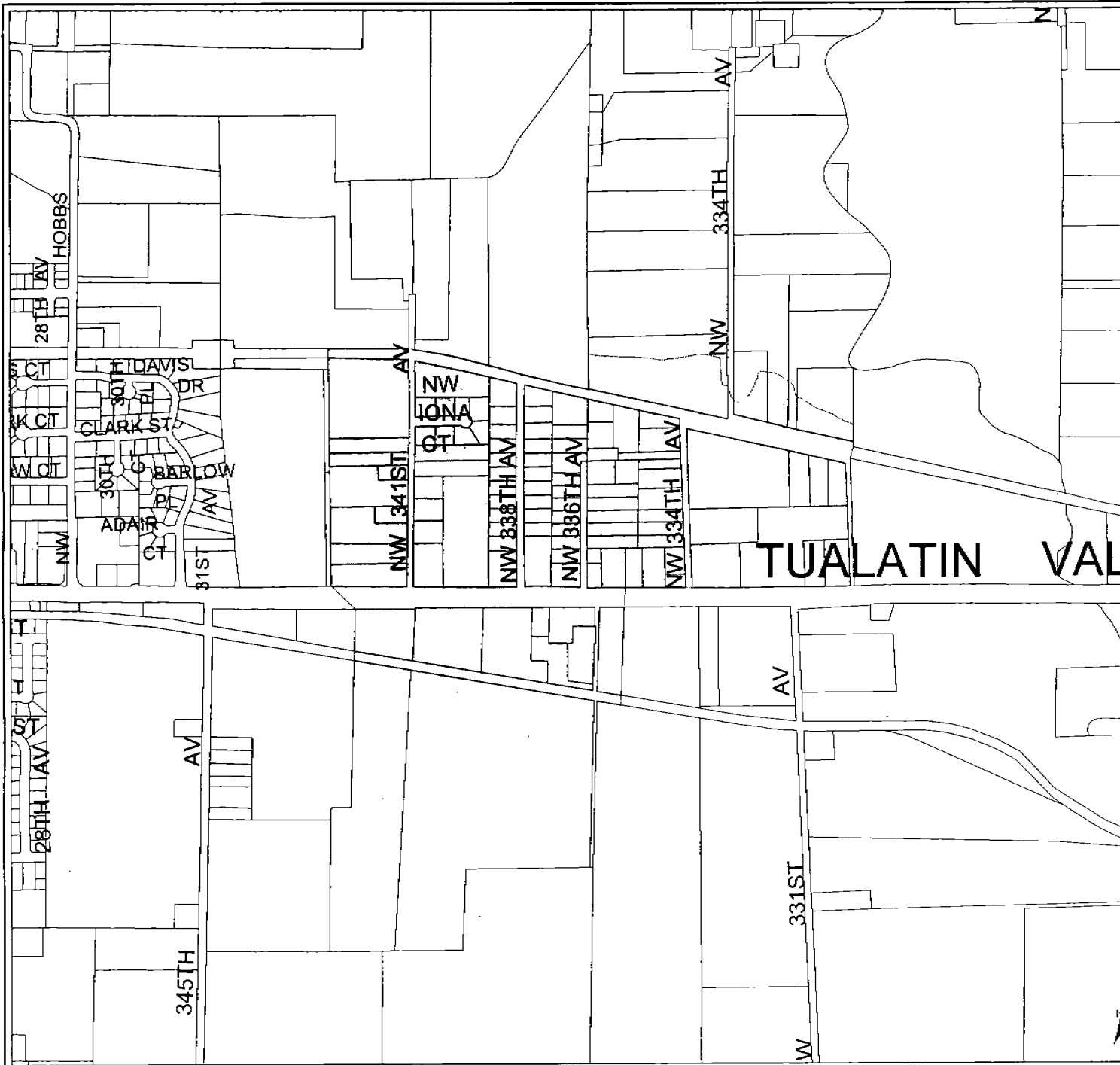
SOURCES:
TAX LOT MAP
County Assessment and Taxation office, 2001. Data collection scale is 1"=400' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet of better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map



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R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 77

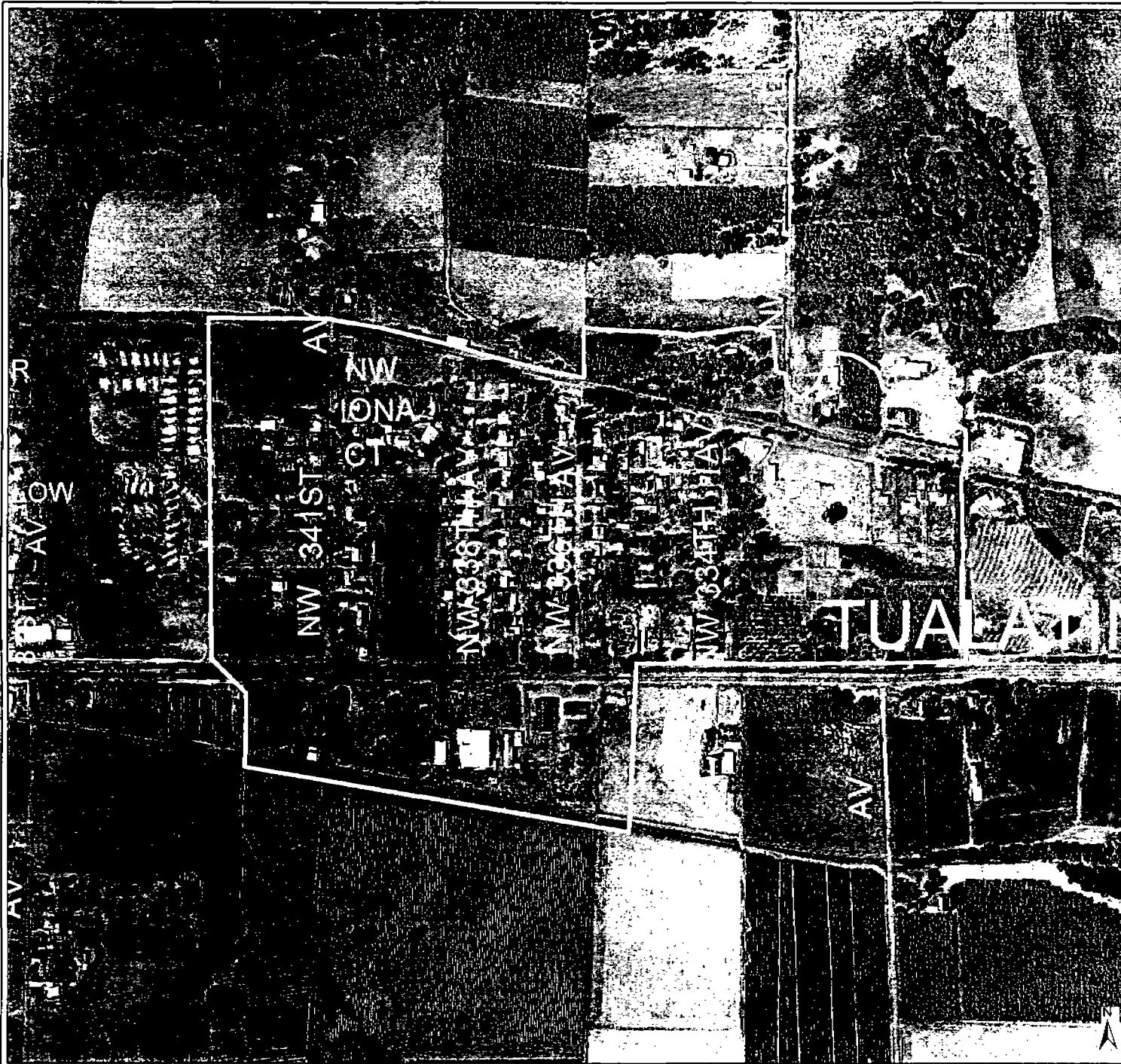
Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:
 TAX LOT MAP
 County Assessment and Taxation offices, 2001. Date collection scale is 1"=100' in urban areas and 1"=200' in 1"-400' in rural areas. Horizontal accuracy is 3/16" or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

0 690 1,380
 Feet

Location Map

METRO DATA RESOURCE CENTER
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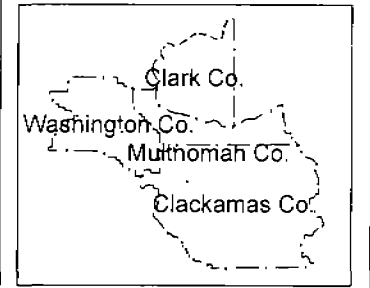
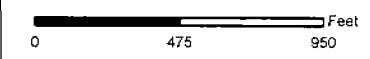
Alternatives Analysis

Study Area 77

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

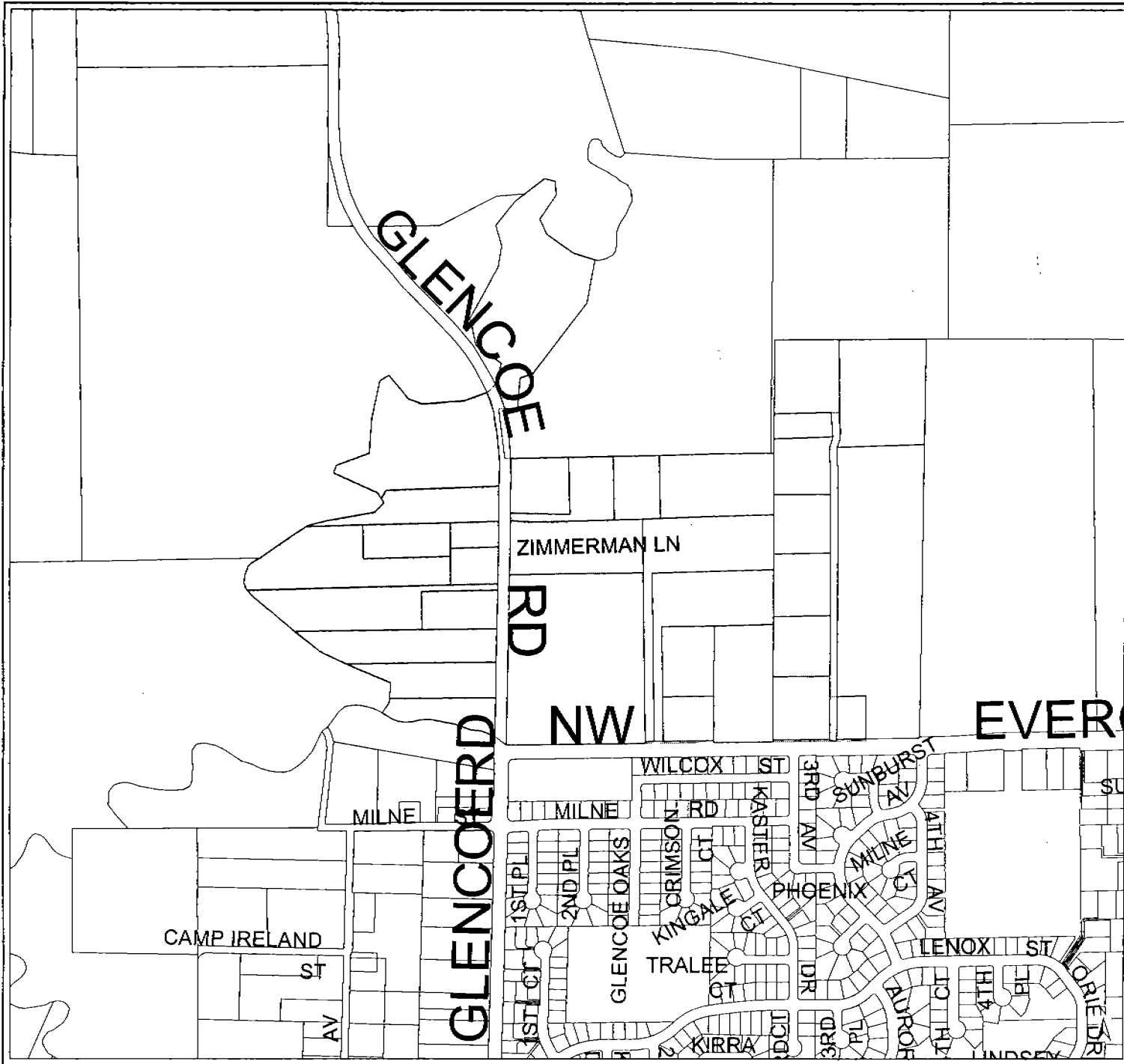
2001 aerial imagery provided by the Oregon Department of Transportation, Multnomah County, Washington County, Clackamas County, and Clatsop County. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map



METRO DATA RESOURCE CENTER
600 NORTHEAST GRAND AVENUE | PORTLAND, OREGON 97232-2736
TEL: (503) 797-1742 | FAX: (503) 797-1909
drc@metro.oreg.gov | www.metro-region.org



Alternatives Analysis

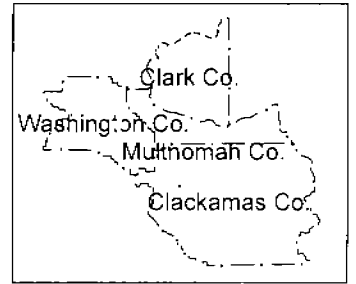
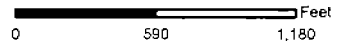
Study Area 78

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

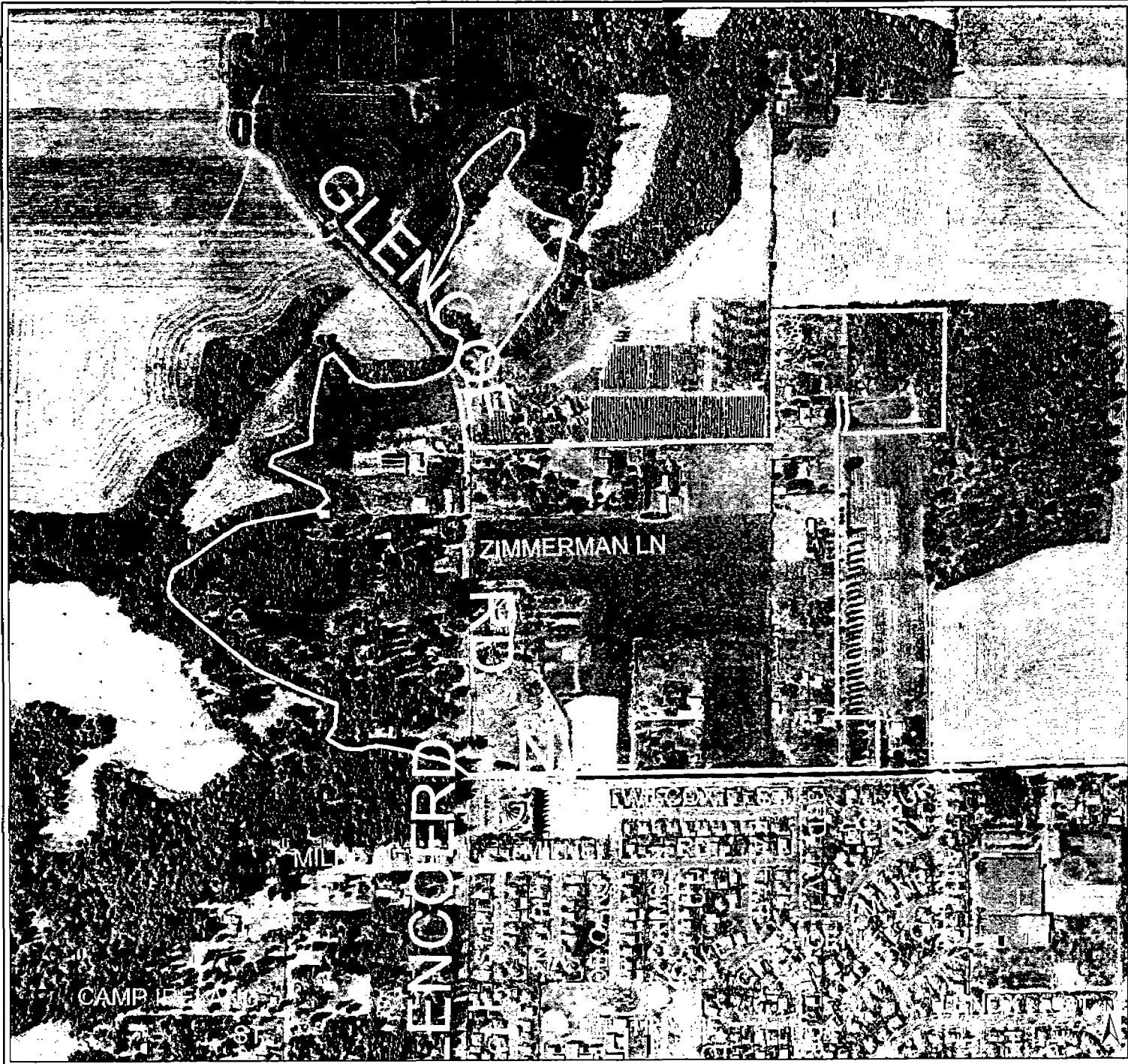
STREET CENTERLINE DATA
Metro, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map



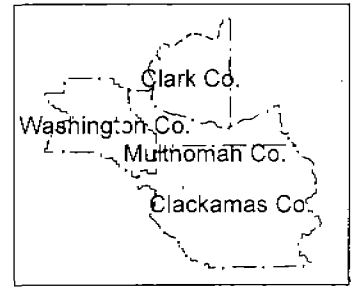
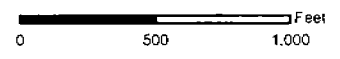
METRO DATA RESOURCE CENTER
600 NORTHEAST GRAND AVENUE | PORTLAND, OREGON 97232-3736
TEL (503) 297-1743 | FAX (503) 297-1808
dlc@metro.dst.or.us | www.metro-region.org



Alternatives Analysis

Study Area 78

SOURCES:
TAX LOT MAP
 County Assessment and Taxation offices, 2001. Date collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.




Location Map



METRO DATA RESOURCE CENTER
 600 NORTHEAST GRAND AVENUE | PORTLAND, OREGON 97231-2736
 TEL (503) 797-1742 | FAX (503) 797-1509
 dr@metro-clius.us | www.metro-region.org

Alternatives Analysis

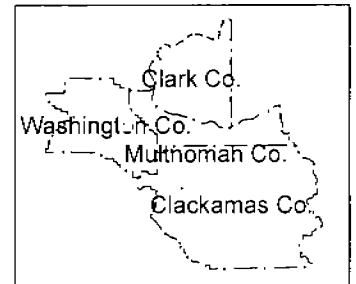
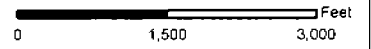
 Study Area 79

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Lakeview, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

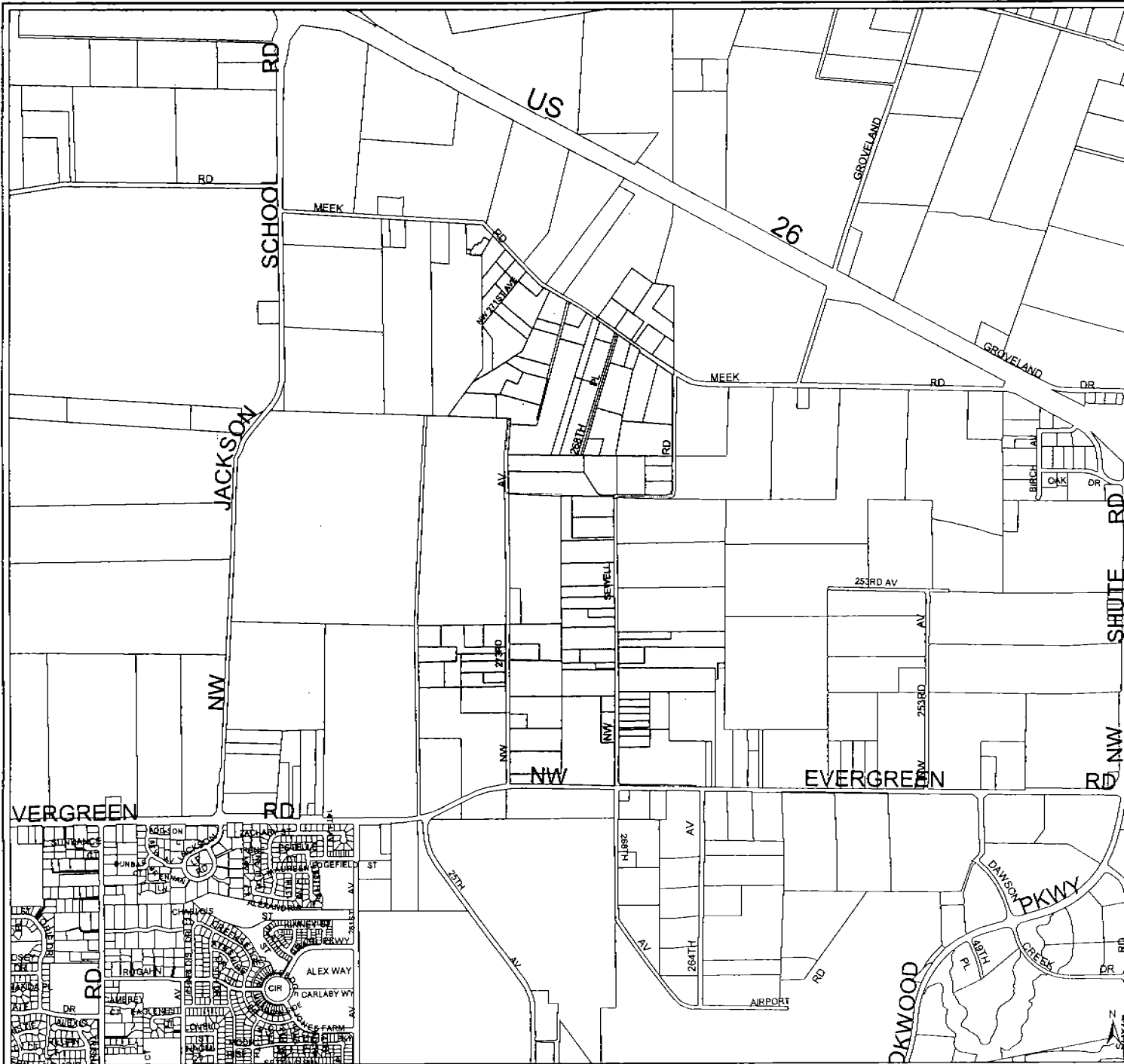
This report was prepared by the Metro Regional Information System (RIS) staff. The data was collected from the County Assessment and Taxation offices. The data was processed and analyzed by the Metro RIS staff. The data was then used to create this report. The data was last updated on 7/8/2002.

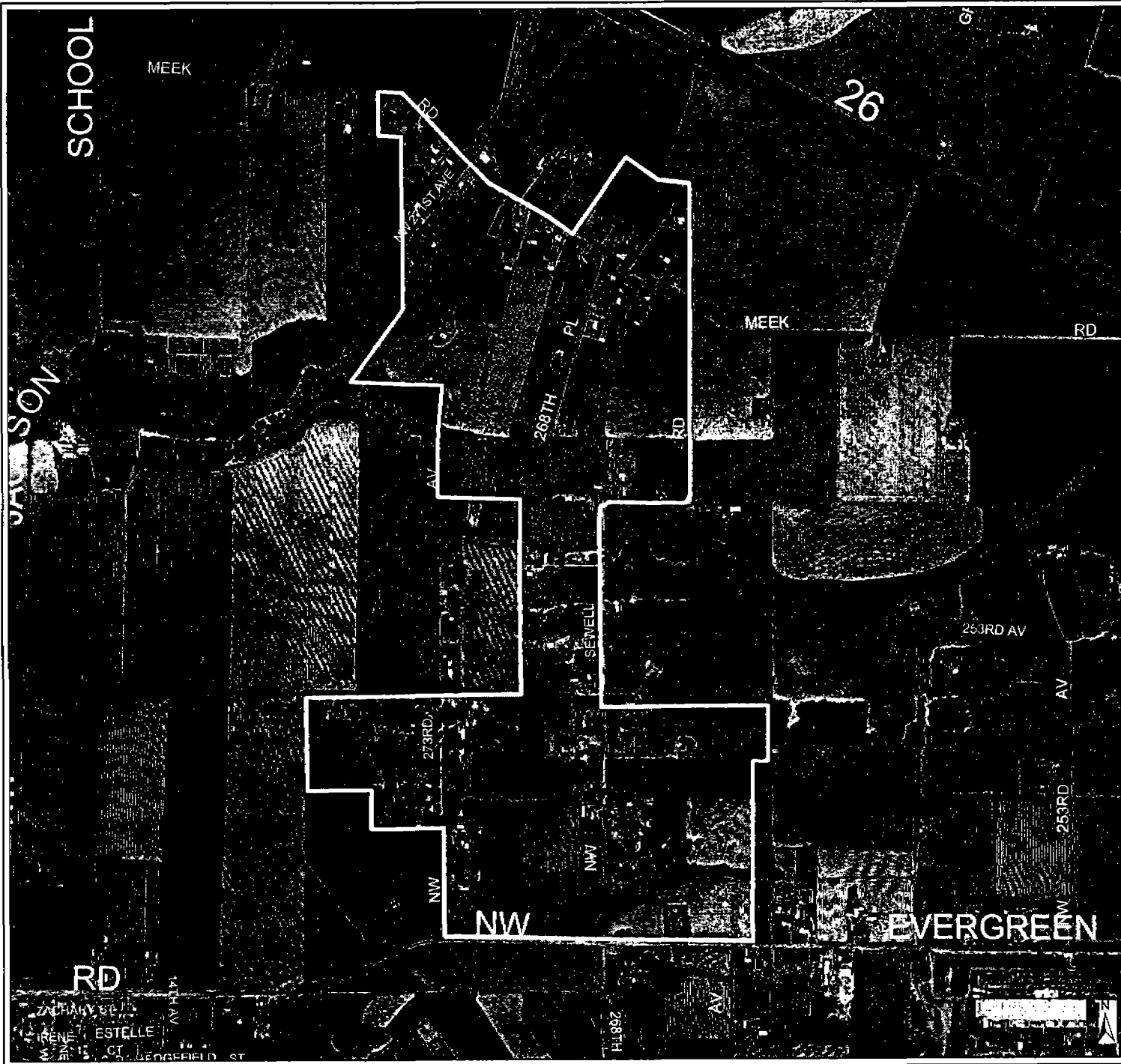


Location Map



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TEL (503) 797-1742 | FAX (503) 797-1909
arc@metro.dsi.or.us | www.metro-region.org





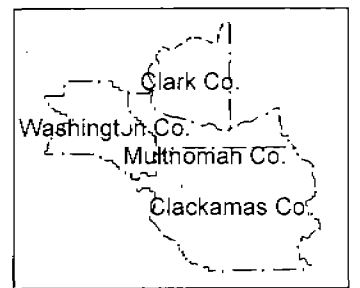
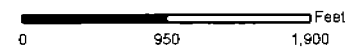
Alternatives Analysis

Study Area 79

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

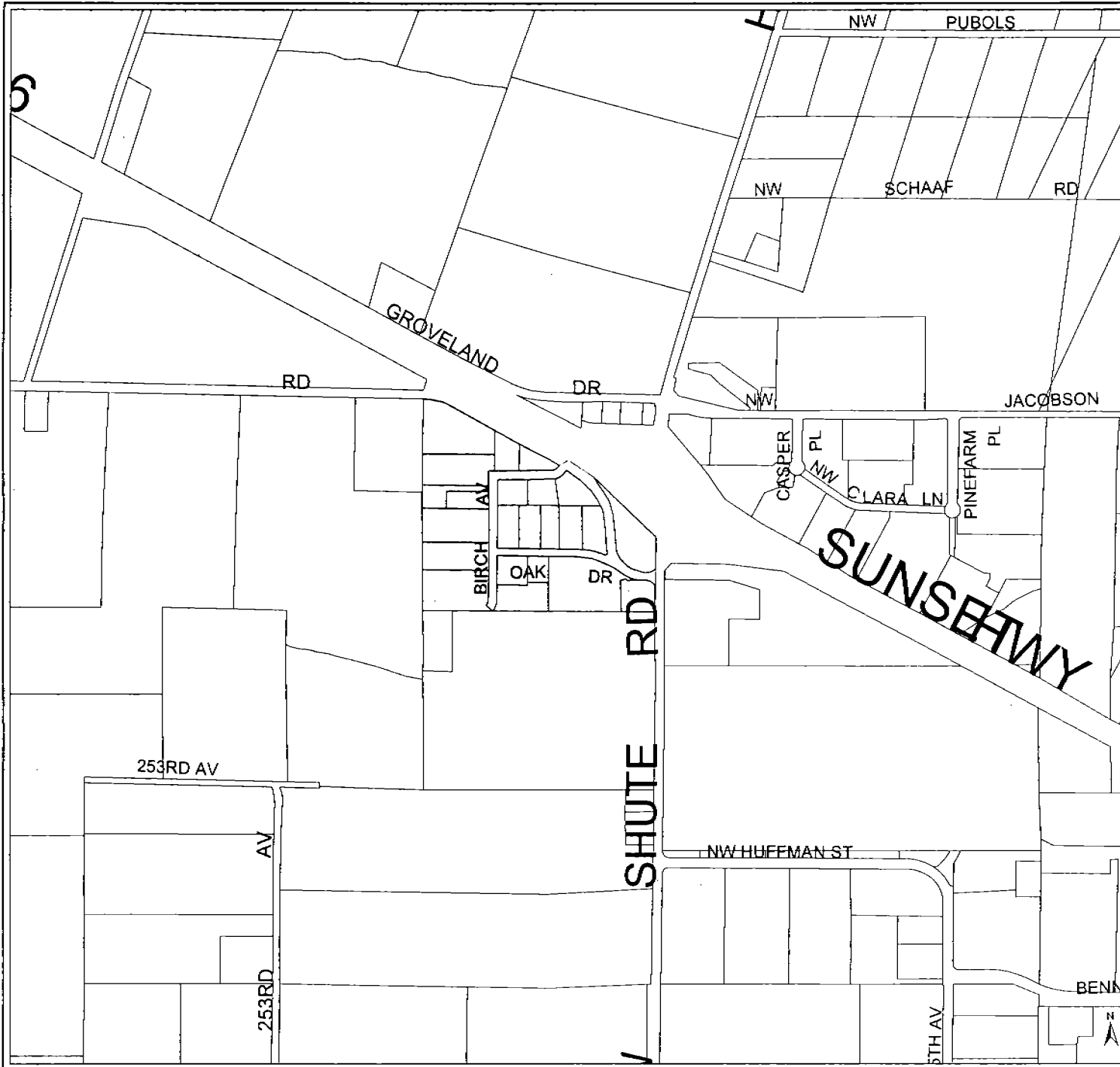
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Location Map




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800 NORTHEAST GRAND AVENUE | PORTLAND, OREGON 97232-2736
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drc@metro.dnr.or.us | www.metro-reg.com



R L I S
 REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

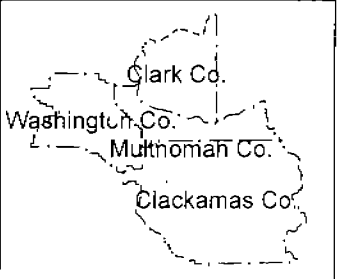
 Study Area 80


Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

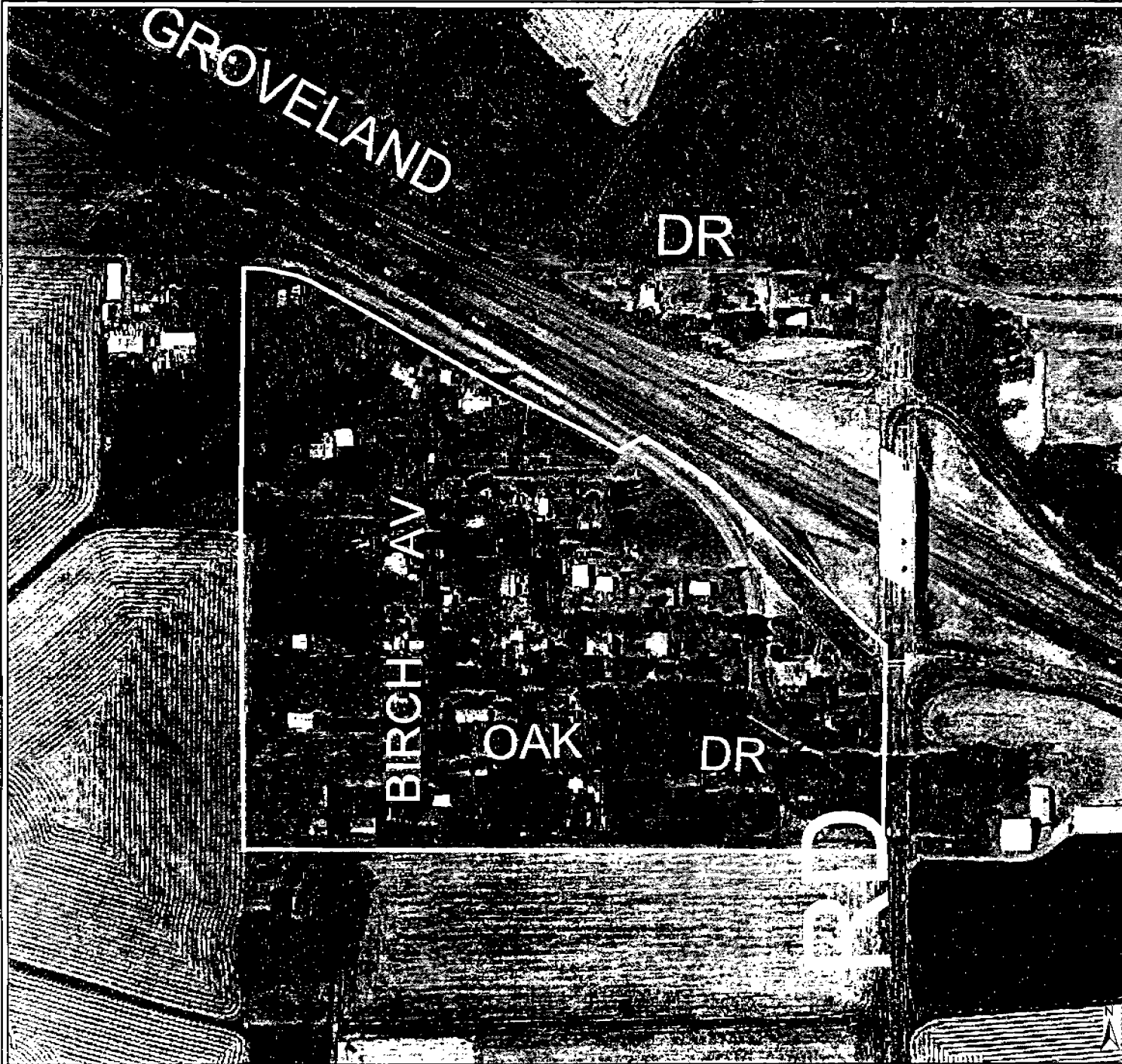
SOURCES:
TAX LOT MAP
 County Assessment and Taxation office, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tualatin and Multnomah County. Other areas are plus or minus ten feet.

0 790 1,580 Feet

Location Map




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 600 NORTHEAST GRAND AVENUE | PORTLAND, OREGON 97232-2736
 TEL (503) 781-1742 | FAX (503) 797-4309
 dic@metro.dci.or.us | www.mvireg.or.gov



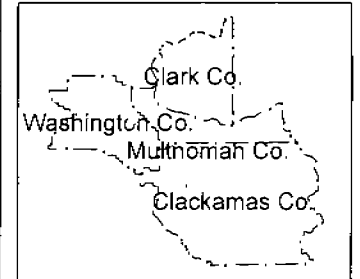
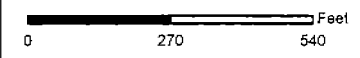
Alternatives Analysis

Study Area 80

SOURCES:

TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

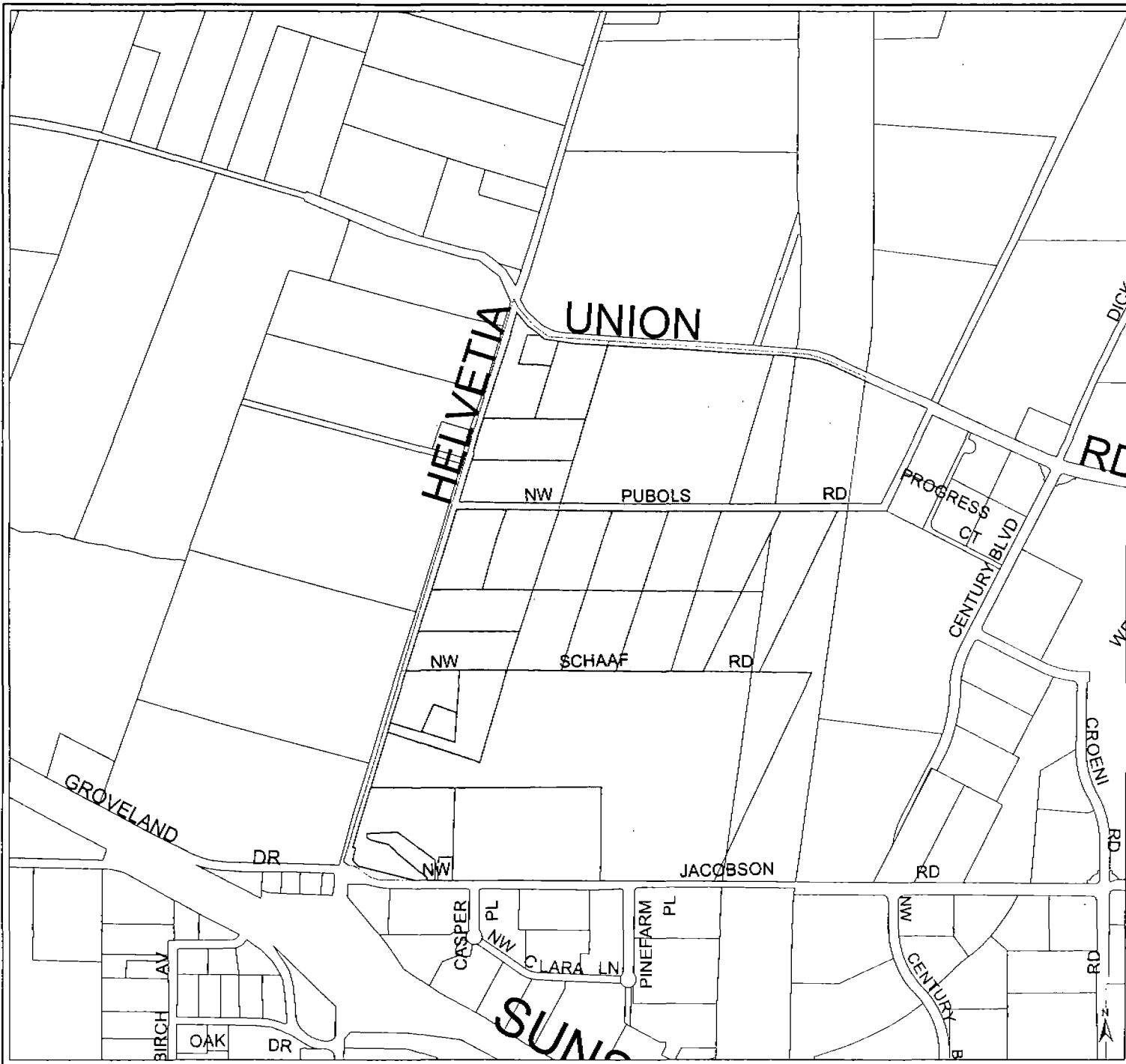
This file contains information that was derived from the Multnomah County Assessment and Taxation offices, 2001. It is provided as a reference only and should not be used for any other purpose. The information is provided as is and is not guaranteed to be accurate. The information is provided as a reference only and should not be used for any other purpose.



Location Map



METRO DATA RESOURCE CENTER
 600 NORTHEAST GRAND AVENUE | PORTLAND, OREGON 97232-2758
 TEL (503) 797-1742 | FAX (503) 797-1909
 drl@metro-ori.or.us | www.metro-region.org

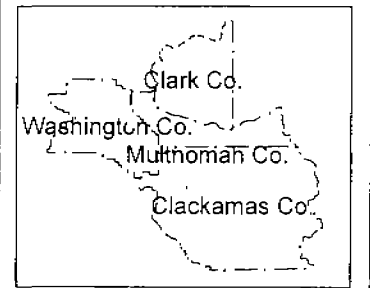
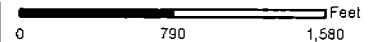


Alternatives Analysis

Study Area 81

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

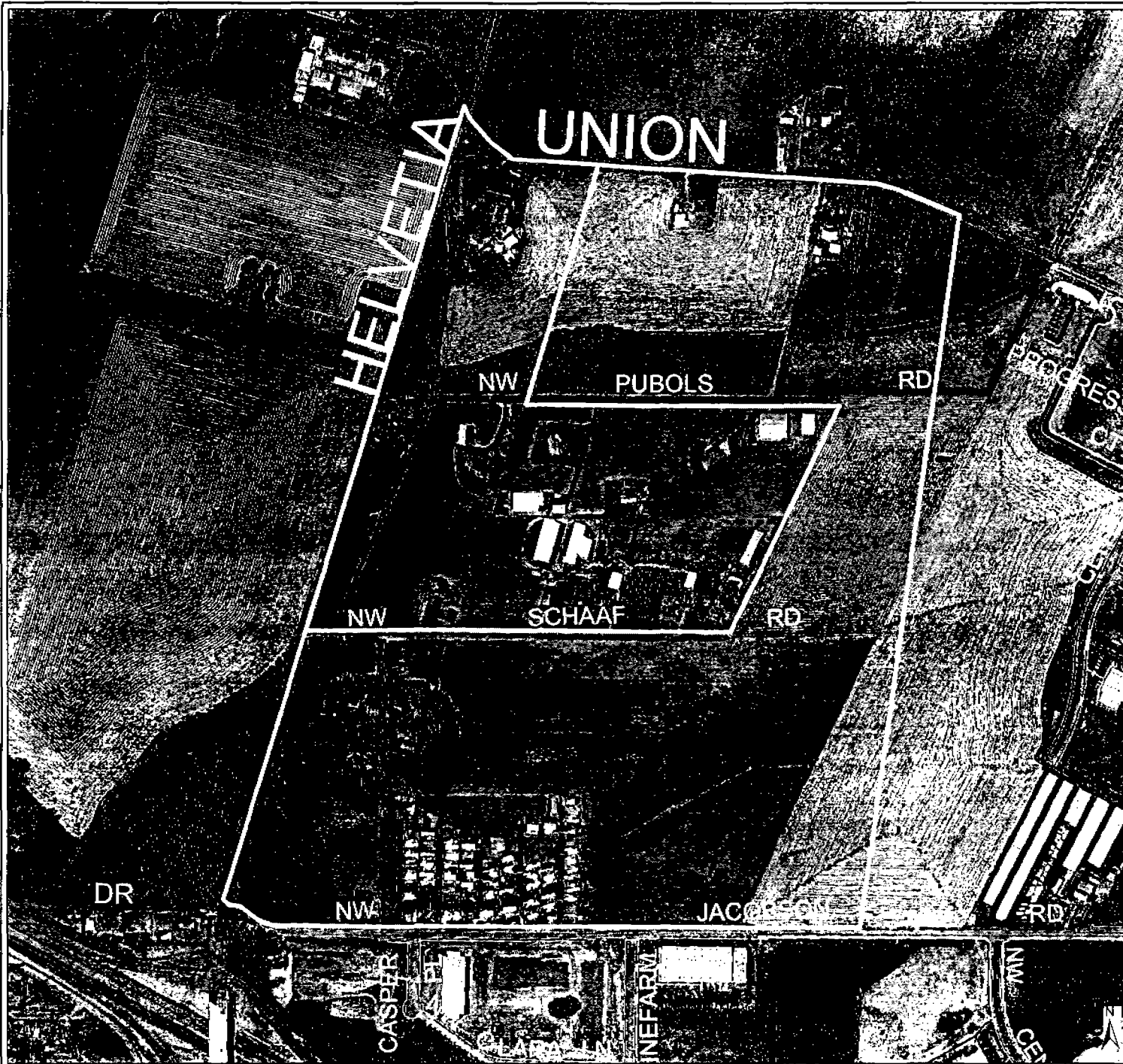
SOURCES:
TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.
 COUNTY OF CLATSOP, ASTORIA, OREGON
 CLATSOP COUNTY ASSESSMENT AND TAXATION OFFICE
 1000 1/2 AVENUE
 ASTORIA, OREGON 97103
 (503) 325-2200
 www.clatsopcounty.org



Location Map



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 600 NORTHEAST GRAND AVENUE | PORTLAND, OREGON 97232-2736
 TEL (503) 797-1742 | FAX (503) 797-1909
 dr@metrodata.org | www.metro-region.org



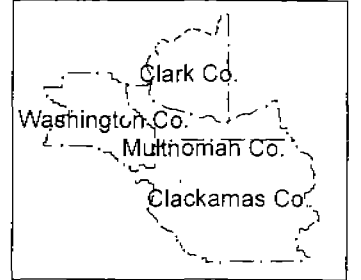
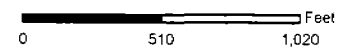
Alternatives Analysis

Study Area 81

SOURCES

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 8"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

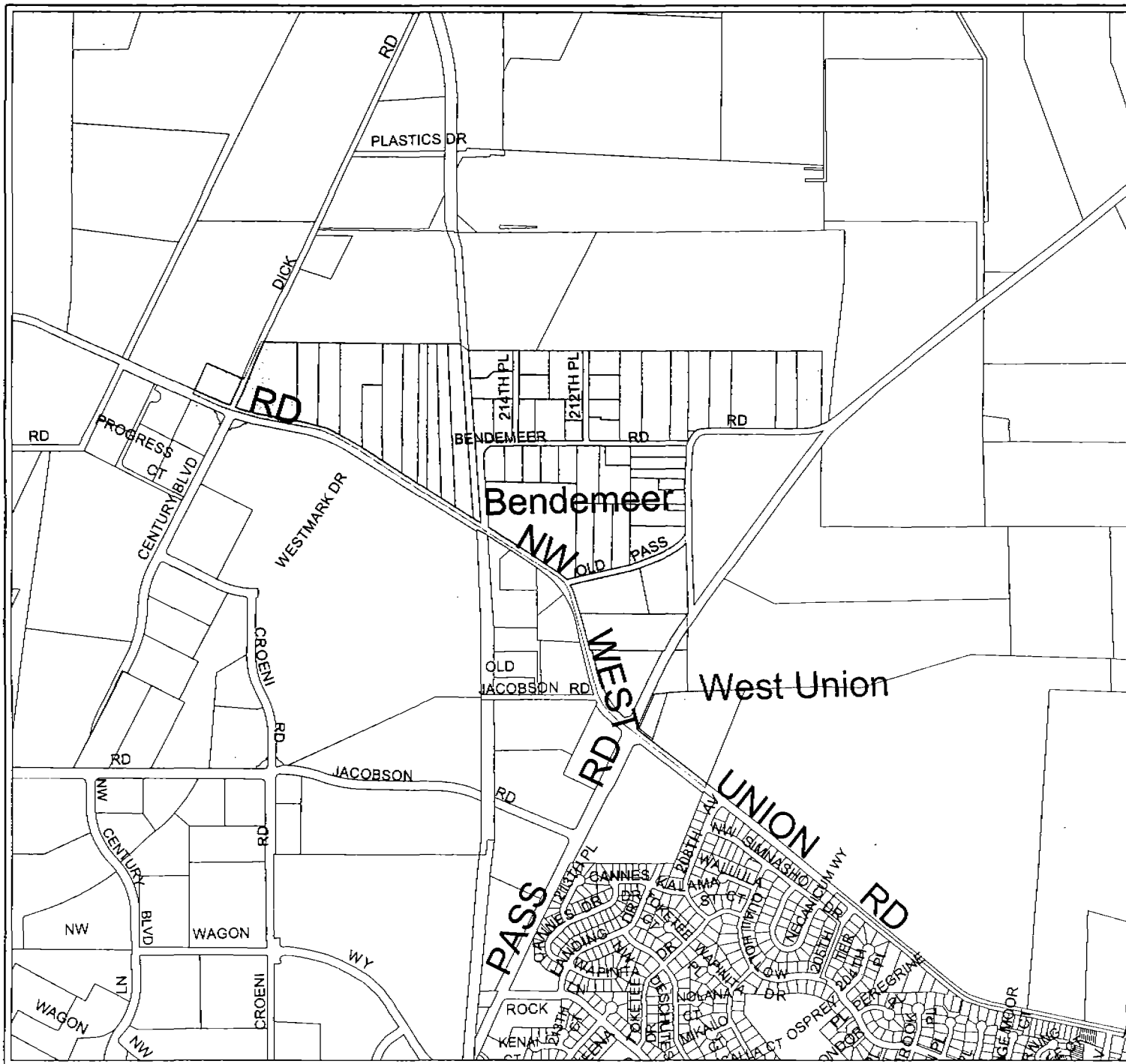
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Location Map



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dlr@metro-dsl.or.us | www.metro-reg.cn.org



R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 82

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:

TAX LOT MAP
County Assessment and Taxation office, 2001. Date collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

Scale: 0 880 1,760 Feet

Location Map

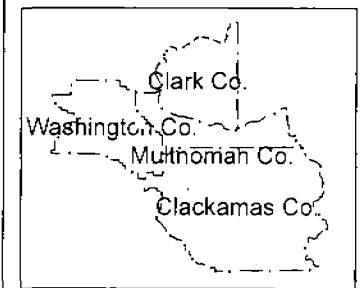
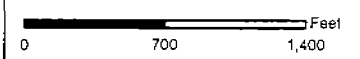
METRO
METRO DATA RESOURCE CENTER
800 NORTHEAST GRAND AVENUE | PORTLAND, OREGON 97232-2736
TEL (503) 797-1742 FAX (503) 797-1909
dlr@metro-dsl.or.us | www.metro-reg.cn.org

Alternatives Analysis

Study Area 82



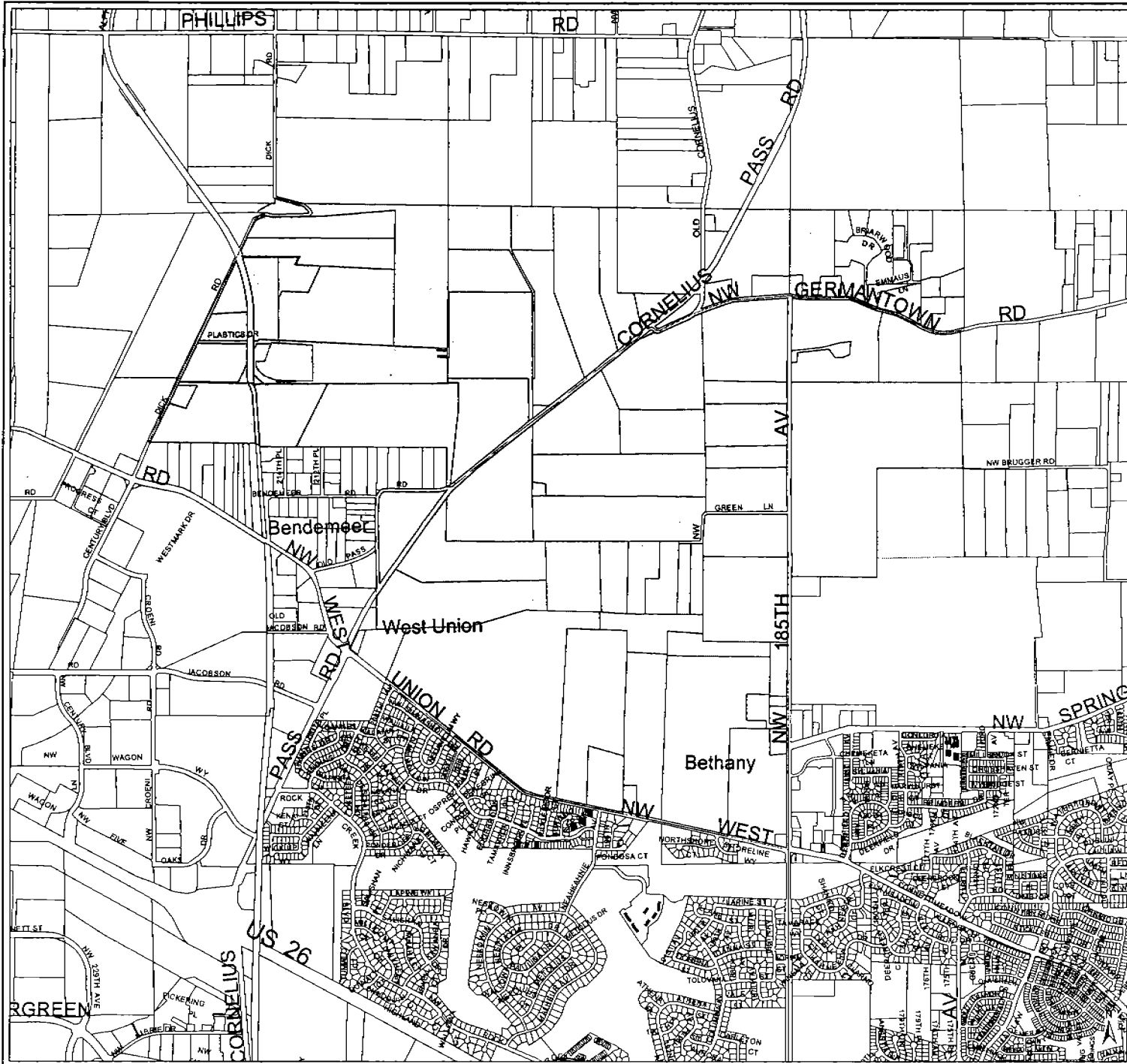
SOURCES:
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=1000' in urban areas and 1"=2000' or 1"=4000' in rural areas. Horizontal accuracy is plus or minus five feet in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.




Location Map



METRO DATA RESOURCE CENTER
800 NORTHEAST GRAND AVENUE | PORTLAND, OREGON 97232-2736
TEL (503) 787-1742 FAX (503) 787-1936
dlc@metro.dsi.or.us | www.metro-reg.on.org



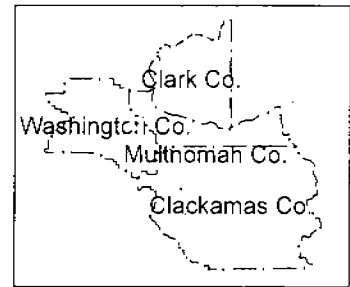
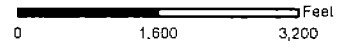
Alternatives Analysis

 Study Area 83

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:

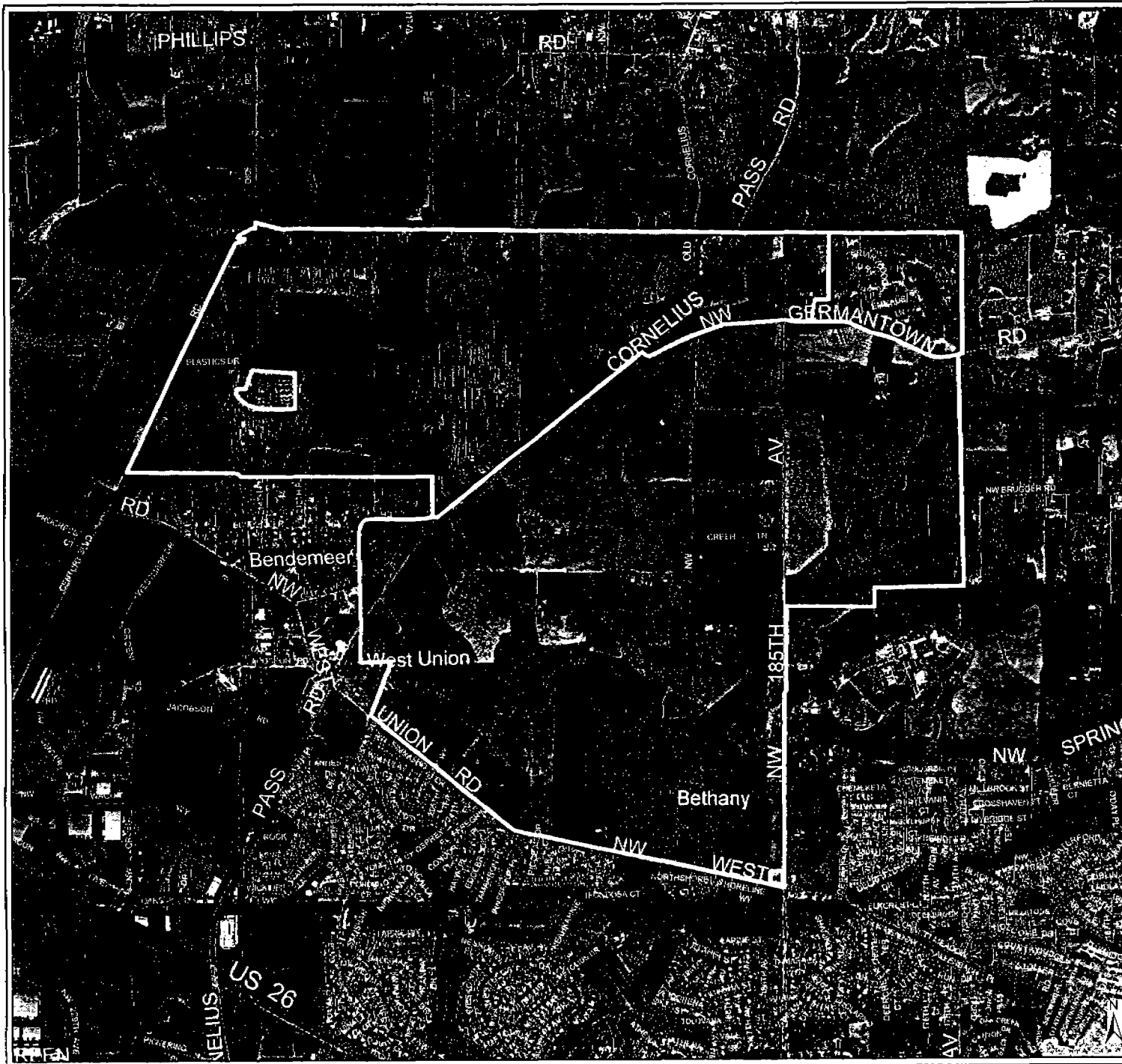
FAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collected on scale of 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map



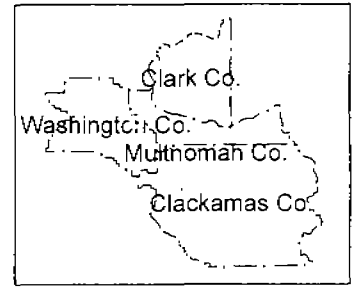
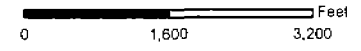
METRO DATA RESOURCE CENTER
 800 NORTHEAST GRAND AVENUE | PORTLAND, OREGON 97232-7238
 TEL (503) 797-1742 | FAX (503) 797-1909
 drc@metro-drl.or.us | www.metro-region.org



Alternatives Analysis

Study Area 83

SOURCES:
TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map



METRO
 METRO DATA RESOURCE CENTER
 600 NORTHEAST GRAND AVENUE | PORTLAND, OREGON 97232-2736
 TEL (503) 797-1742 | FAX (503) 797-1928
 dr@metro.oregon.gov | www.metroreg.org

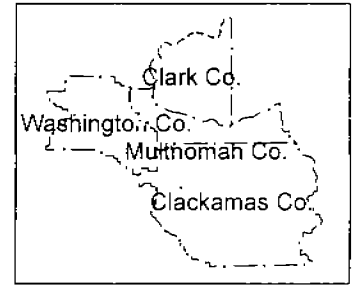
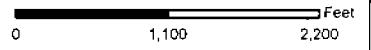
Alternatives Analysis

Study Area 84

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=400' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map



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600 NORTHEAST GRAND AVENUE | PORTLAND, OREGON 97232-2736
TEL (503) 797-1742 FAX (503) 797-1909
arc@metro.oregon.gov www.metro-region.org

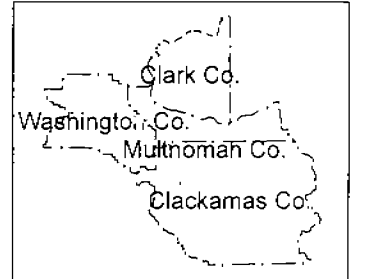
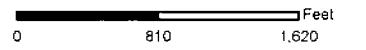


Alternatives Analysis

Study Area 84



SOURCES:
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data correction scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map



METRO DATA RESOURCE CENTER
608 NORTHEAST GRAND AVENUE PORTLAND, OREGON 97232-2736
TEL (503) 797-1742 FAX (503) 797-1939
drc@metro.dsi.or.us www.metroregion.org

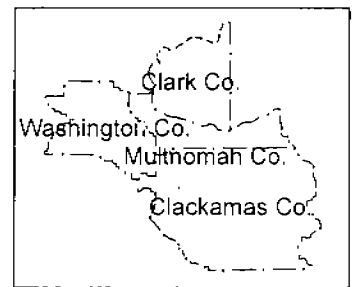
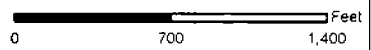
Alternatives Analysis

Study Area 85

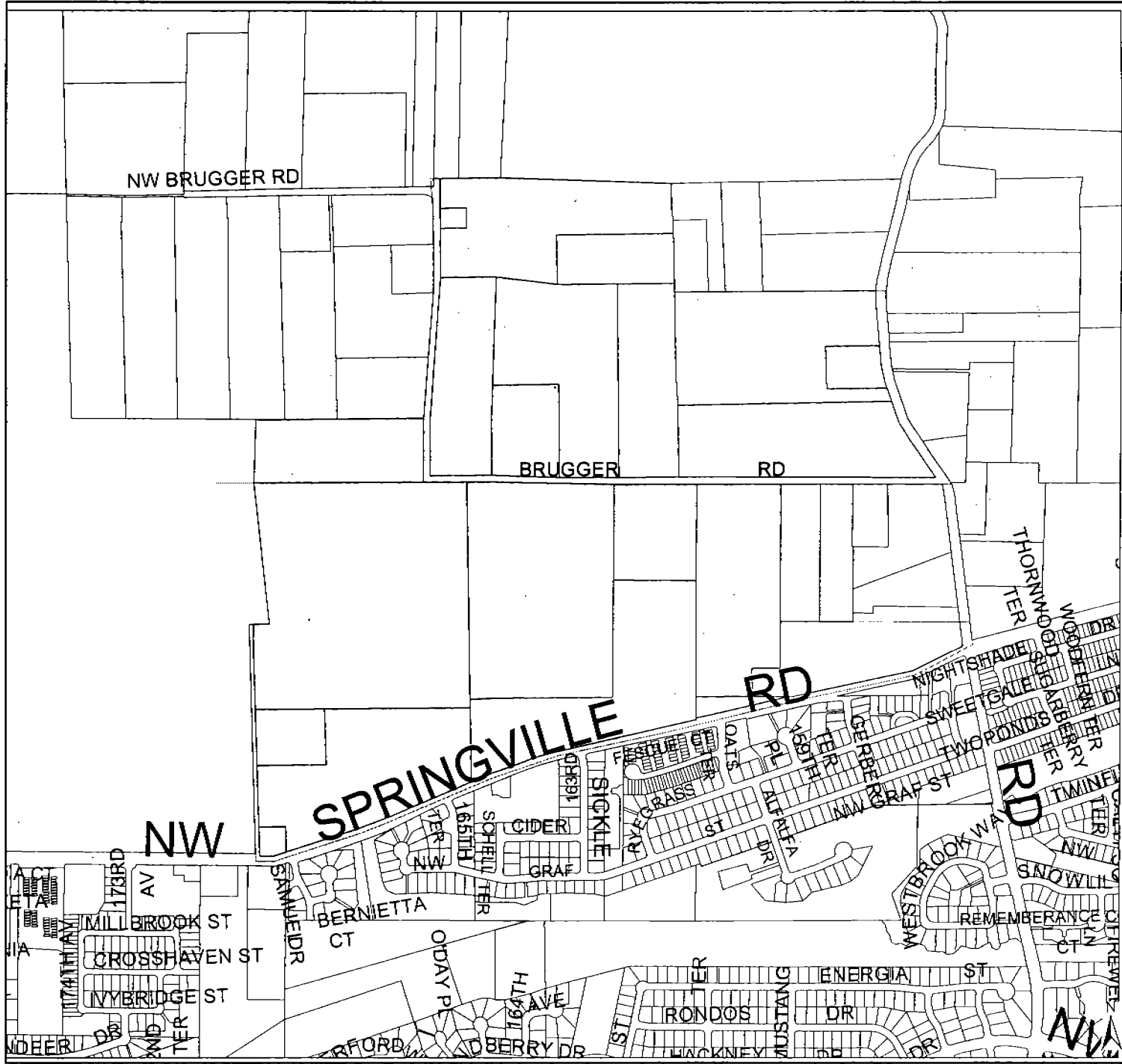
Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=400' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



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drc@metro.oreg.on.us | www.metro.oreg.on.us

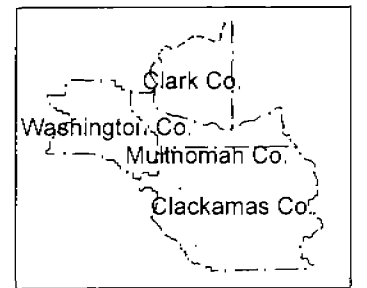
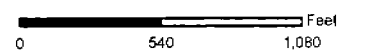


Alternatives Analysis

Study Area 85



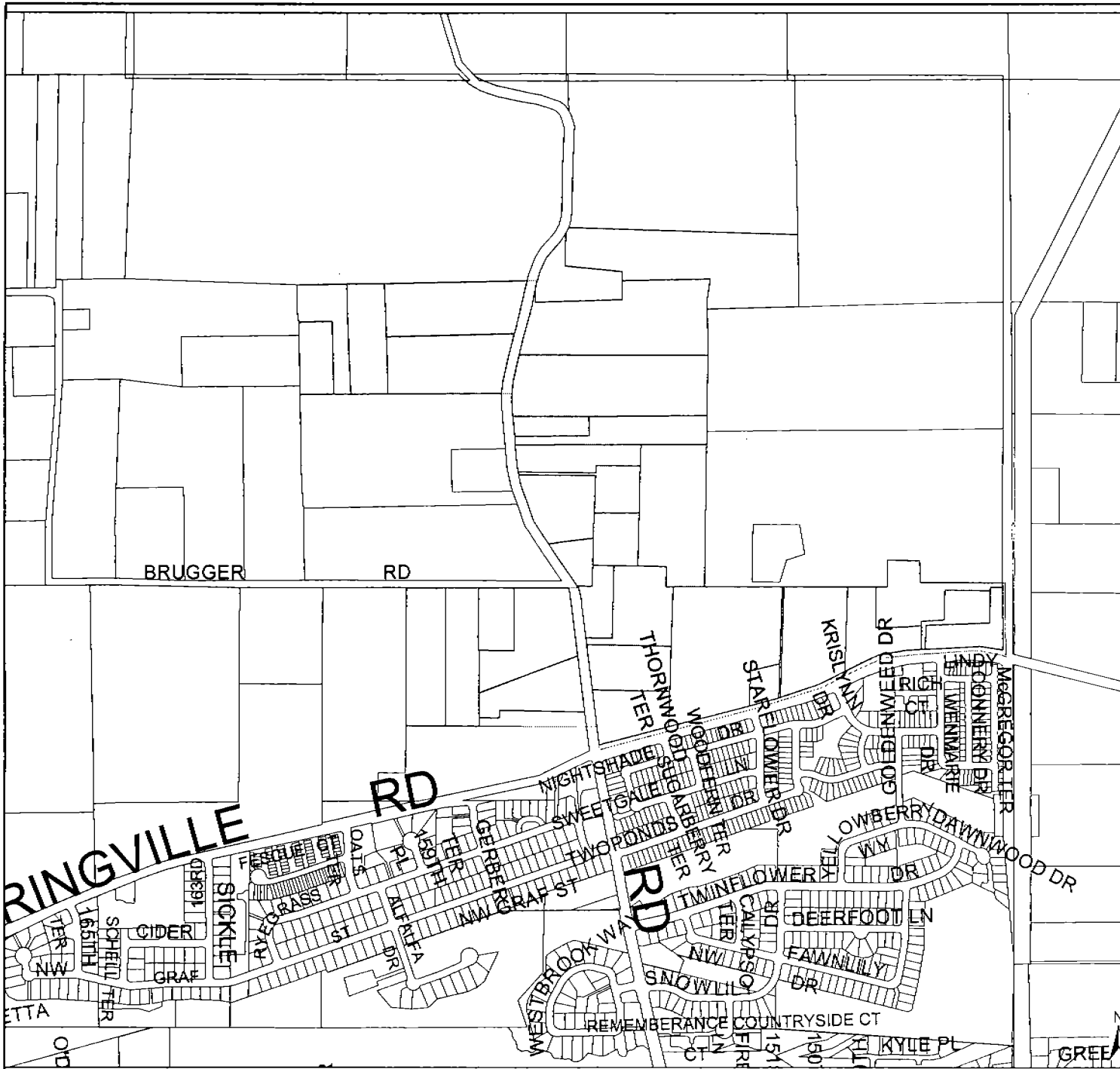
SOURCES:
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map



METRO
METRO DATA RESOURCE CENTER
600 NORTHEAST GRAND AVENUE | PORTLAND, OREGON 97232-2736
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drc@metro.dst.or.us | www.metro-region.org



R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 86

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:

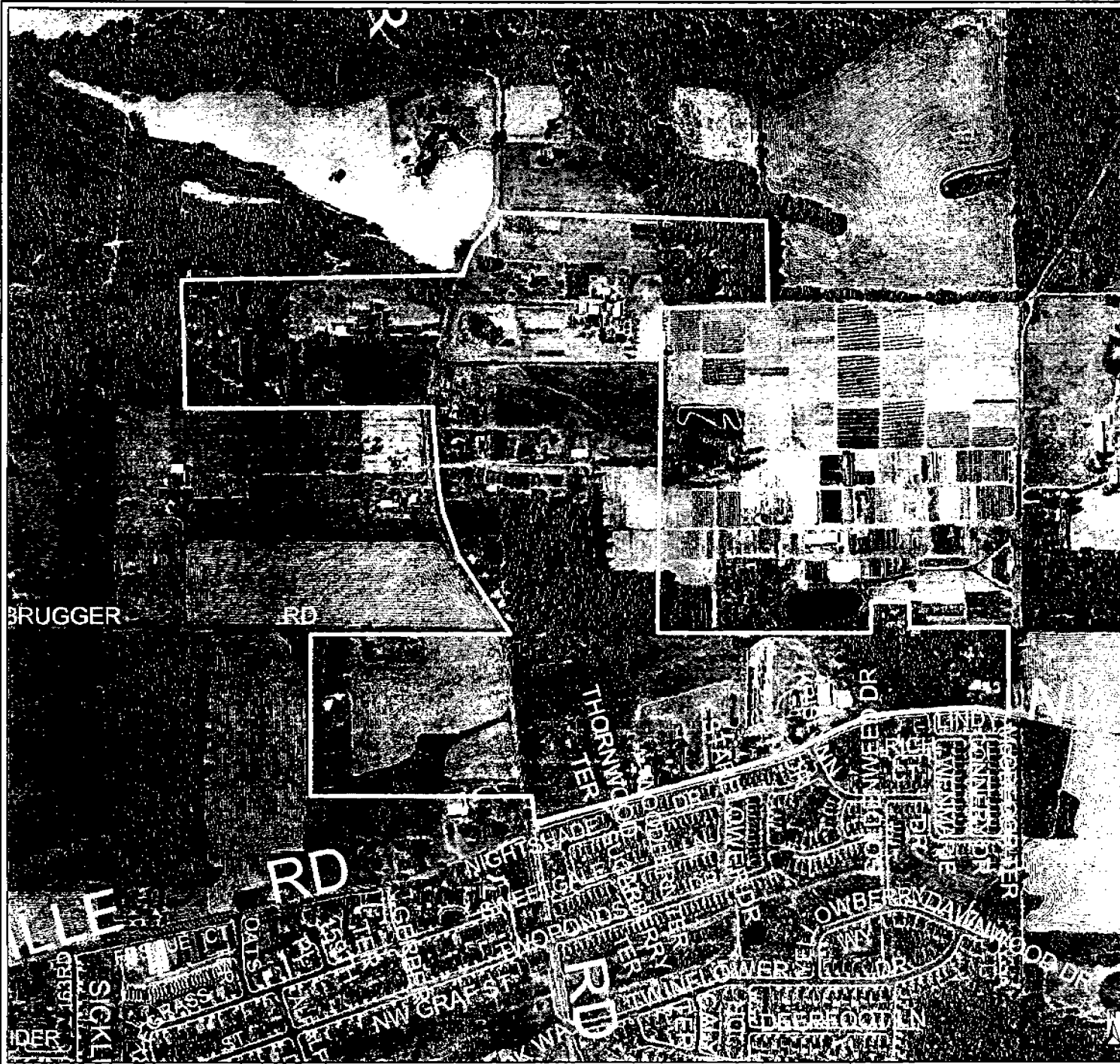
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

Scale: 0 700 1,400 Feet

Location Map

METRO

METRO DATA RESOURCE CENTER
600 NORTHEAST GRAND AVENUE | PORTLAND, OREGON 97232-2736
TEL (503) 797-1742 | FAX (503) 797-1898
sic@metro.or.us | www.metro-region.org



R L I S
REGIONAL LAND INFORMATION SYSTEM

Alternatives Analysis

Study Area 86

SOURCES:


TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

Location Map

0 540 1,080 Feet

METRO DATA RESOURCE CENTER
 600 NORTHEAST GRAND AVENUE | PORTLAND, OREGON 97232-2738
 TEL (503) 797-4742 | FAX (503) 797-1909
 dr@mtrdcsl.or.us | www.metro-oregon.org

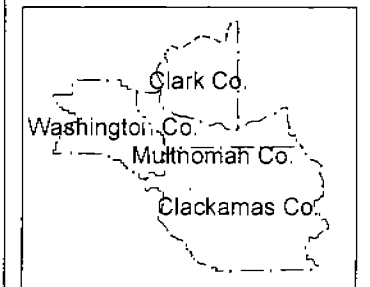
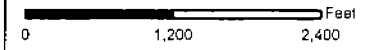
Alternatives Analysis

 Study Area 87

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:

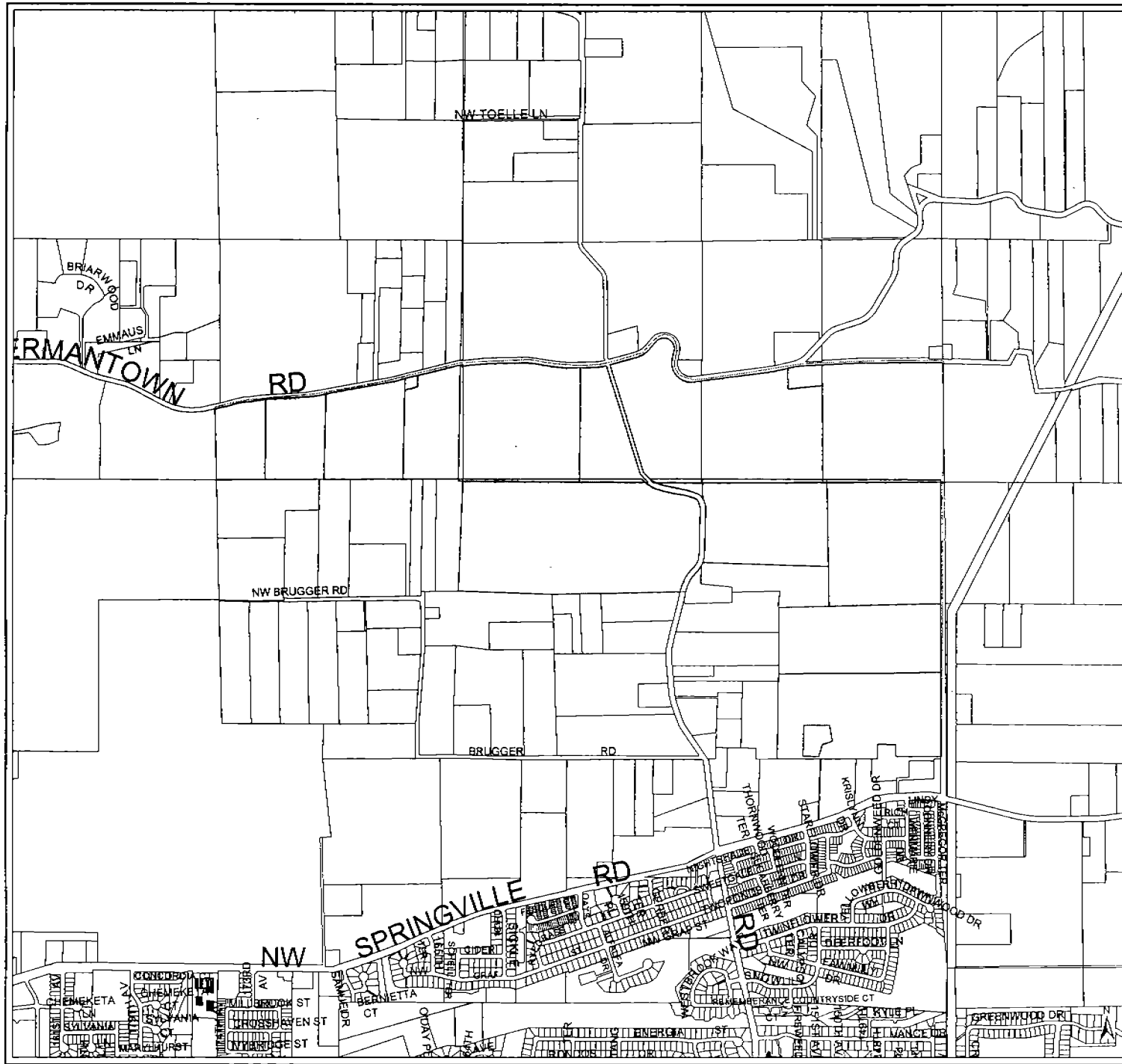
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' to 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map

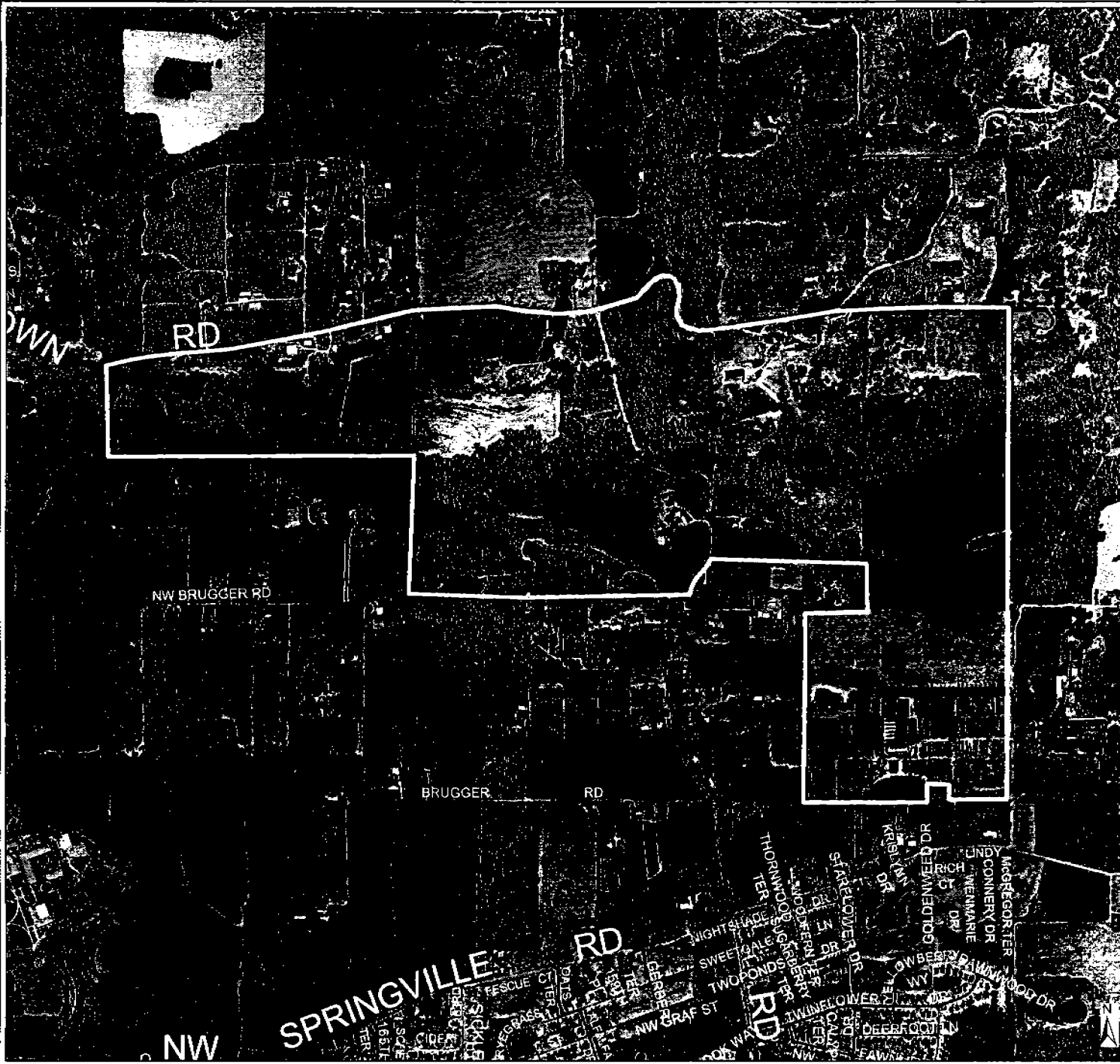


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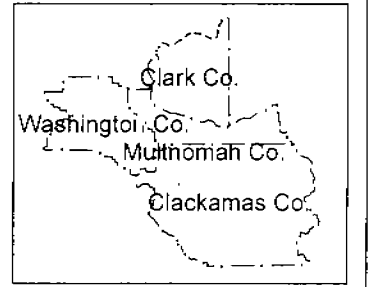
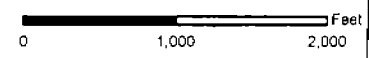
Alternatives Analysis

Study Area 87



SOURCES:


TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map

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Alternatives Analysis

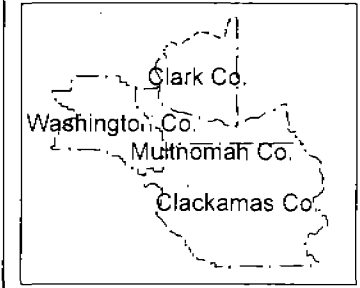
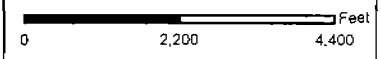
 Study Area 88

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

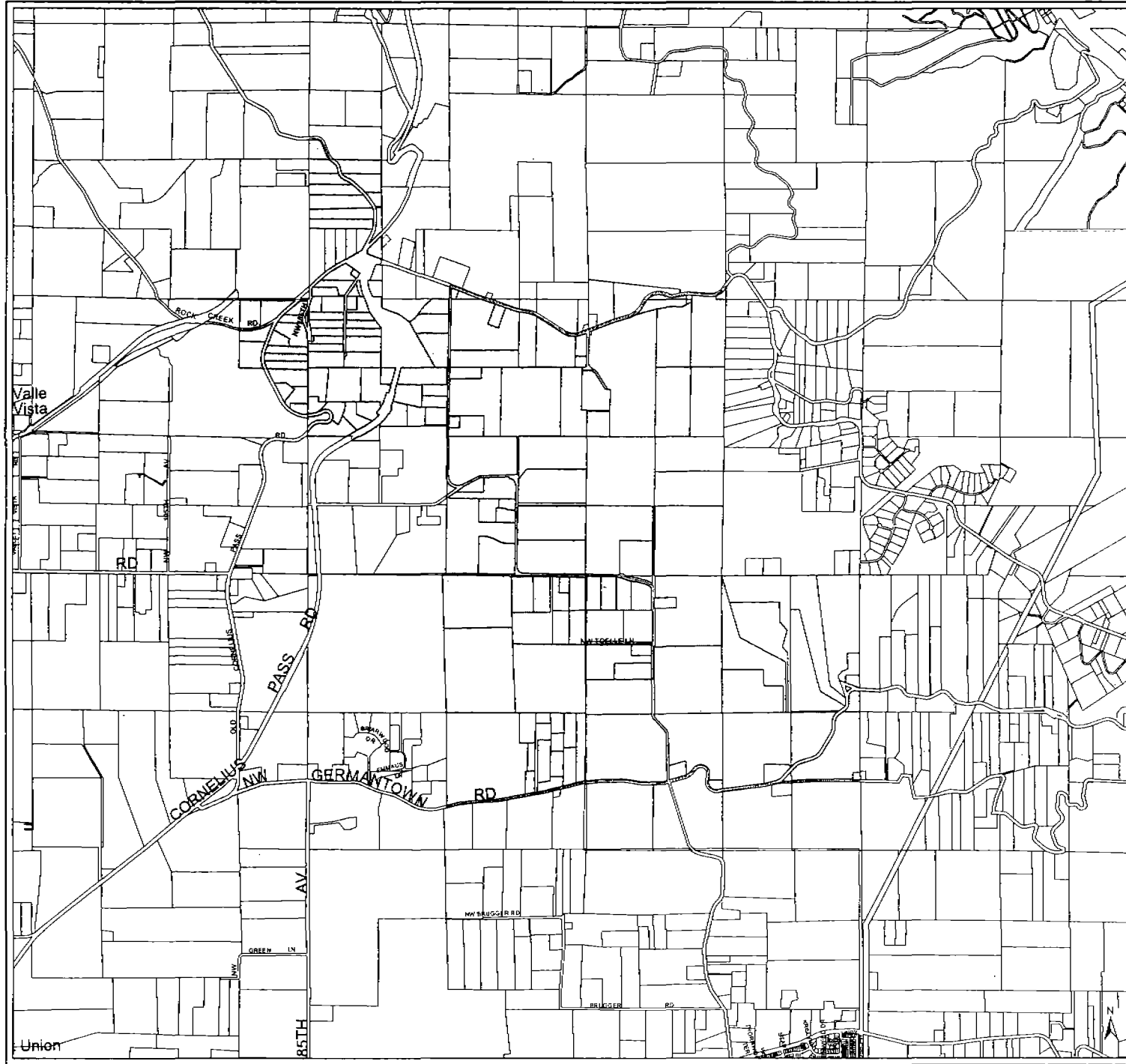
The Metro Information System is a project of the Metro Council. The Metro Council is a joint effort of Washington, Clark, Multnomah and Clackamas counties. The Metro Council is a public agency created by the Metro Council Act, Oregon Statute 215.000. The Metro Council is a public agency created by the Metro Council Act, Oregon Statute 215.000. The Metro Council is a public agency created by the Metro Council Act, Oregon Statute 215.000.

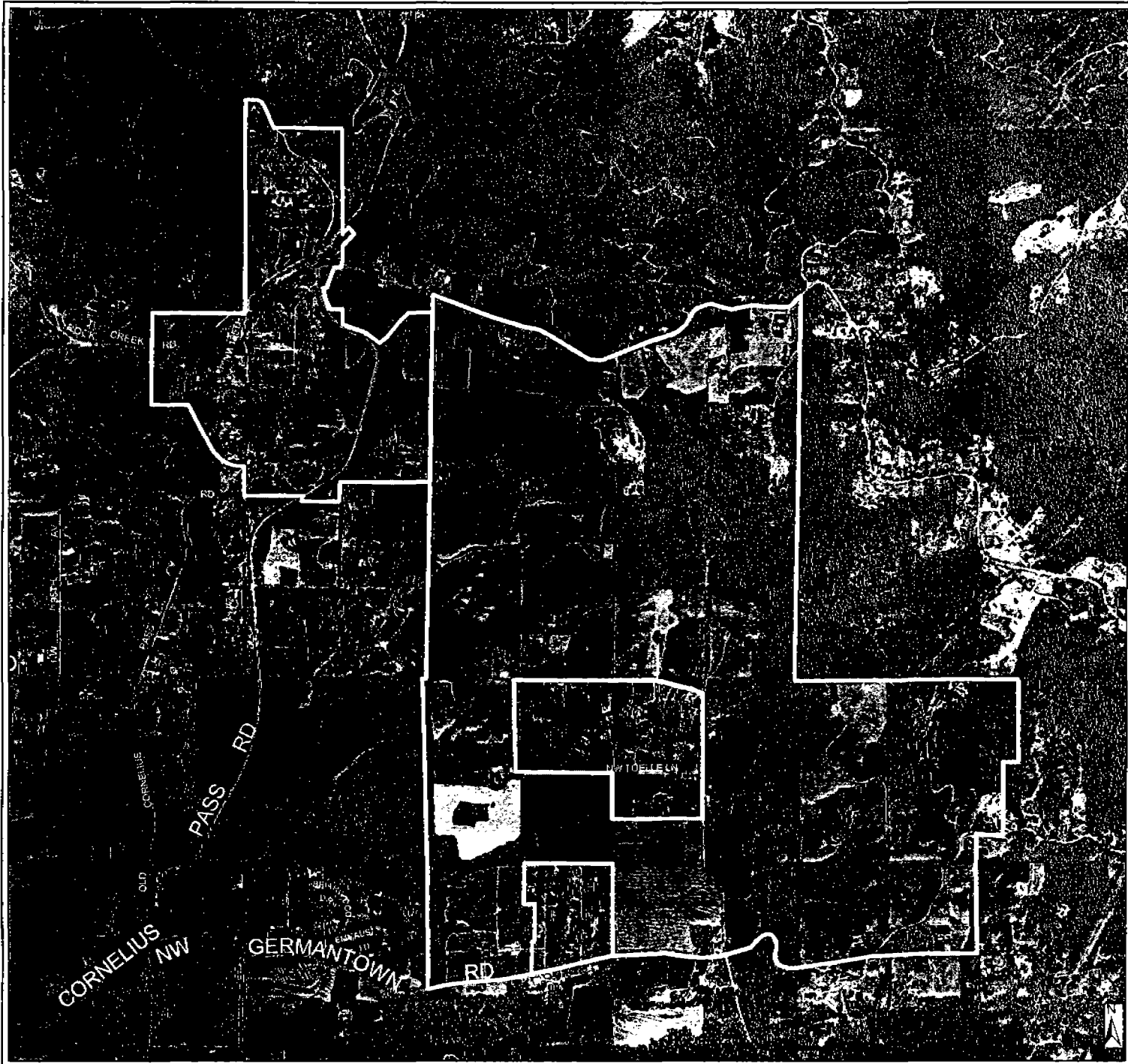


Location Map



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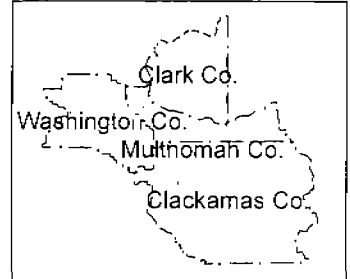
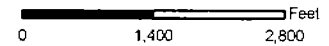
Alternatives Analysis

Study Area 88

SOURCES:

FAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet at Beaver-ton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

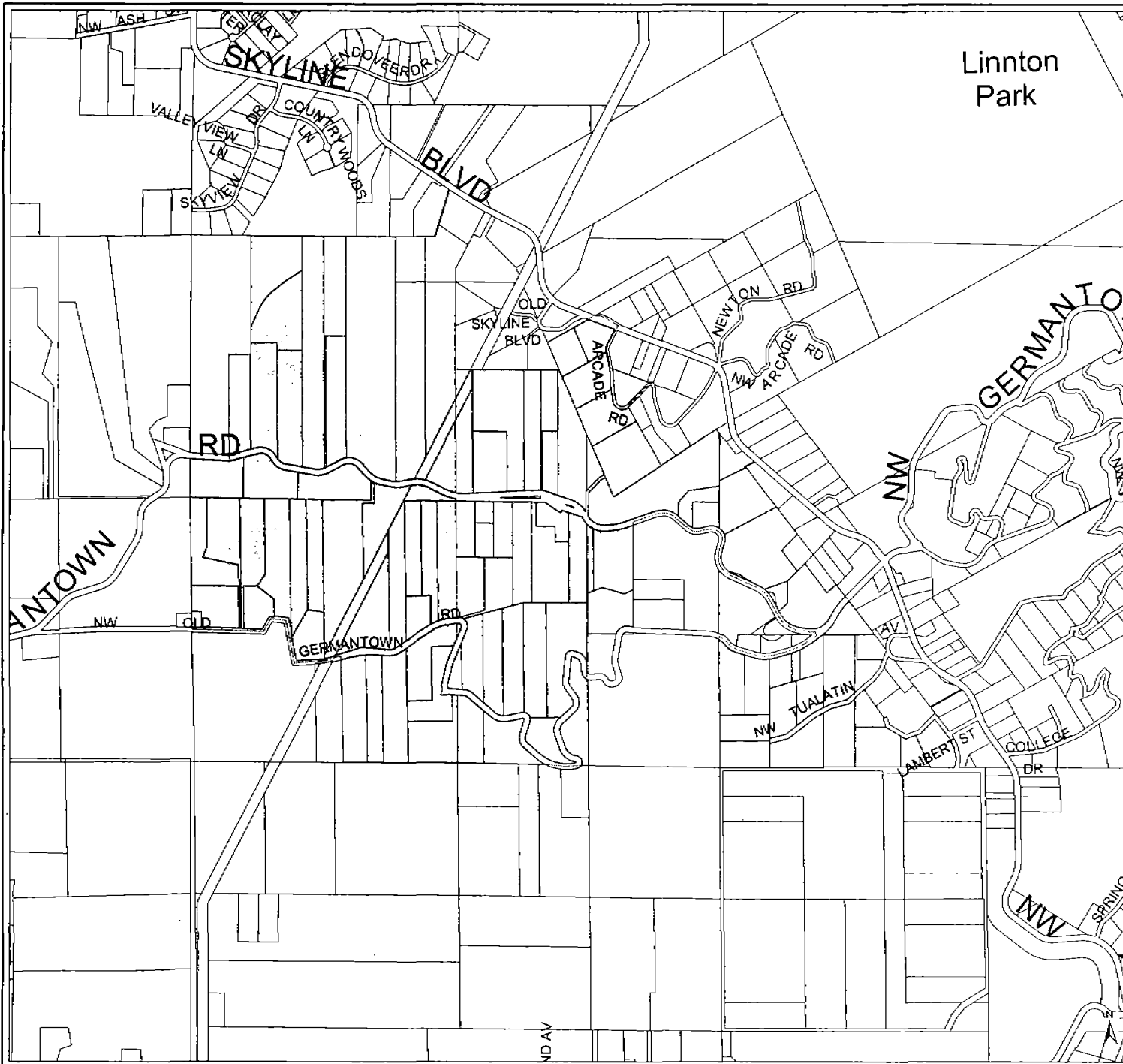
1. Aerial photography was collected on 11/15/01. The data was processed and georeferenced to the 2001 County Assessment and Taxation offices data. The data was then overlaid on the 2001 County Assessment and Taxation offices data. The data was then processed and georeferenced to the 2001 County Assessment and Taxation offices data. The data was then overlaid on the 2001 County Assessment and Taxation offices data.



Location Map




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Linnton
Park

Alternatives Analysis

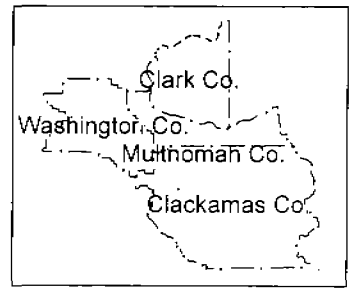
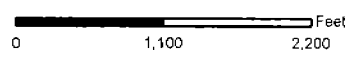
 Study Area 89

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Date collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

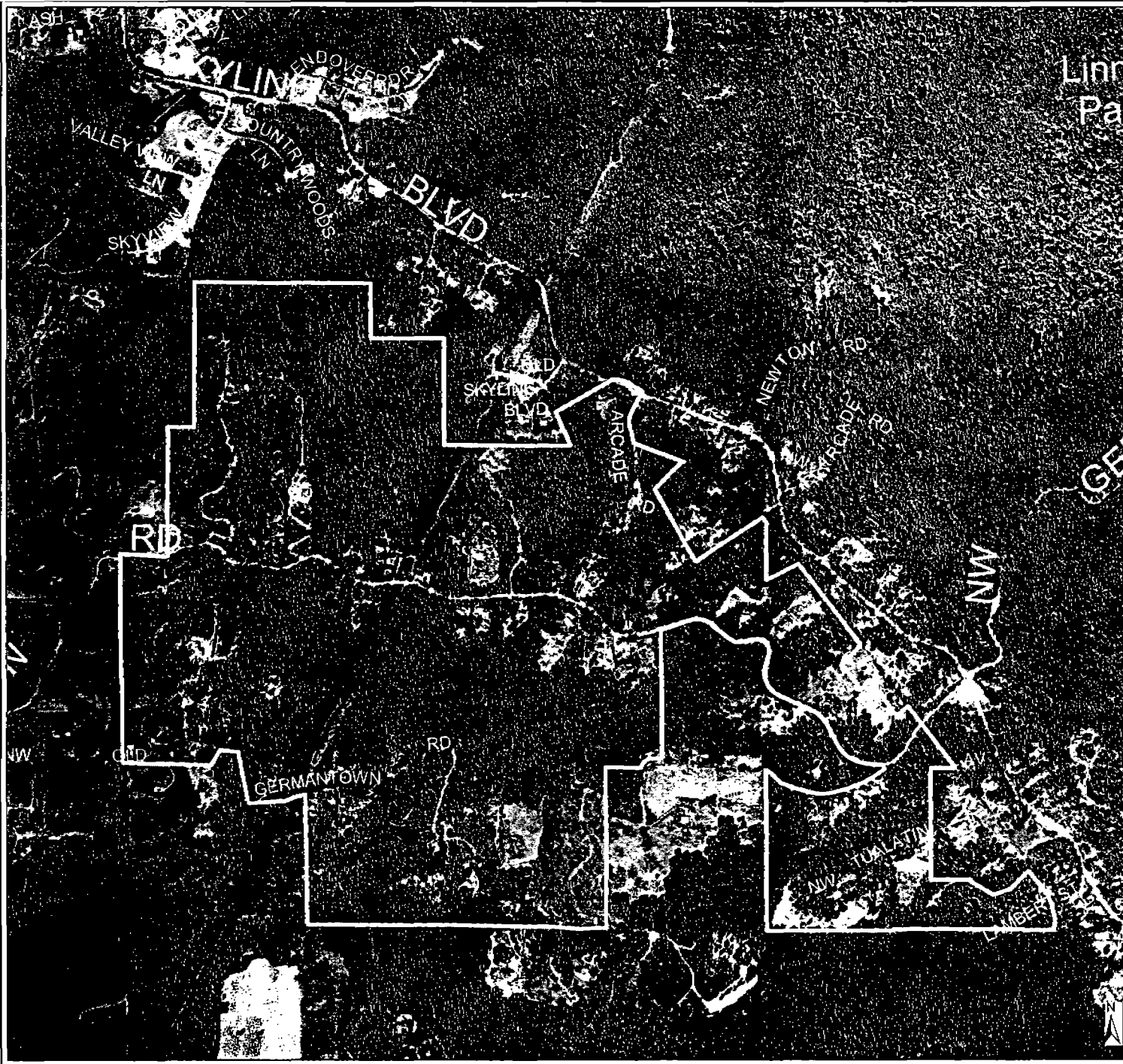
Other sources include:
Clark County Assessor's Office
Washington County Assessor's Office
Multnomah County Assessor's Office
Clackamas County Assessor's Office
Metro GIS Department
Metro Planning and Development Department
Metro Transportation Department
Metro Public Works Department
Metro Engineering Department
Metro Environmental Services Department
Metro Parks and Recreation Department
Metro Community Development Department
Metro Economic Development Department
Metro Housing and Community Development Department
Metro Public Safety Department
Metro Public Works Department
Metro Transportation Department
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Metro Community Development Department
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Metro Housing and Community Development Department
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Location Map



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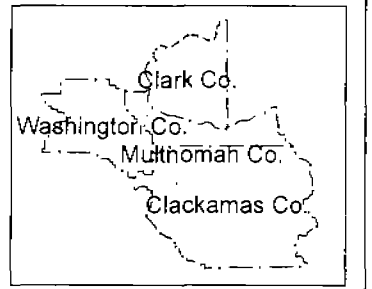
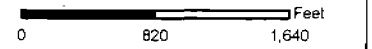


Alternatives Analysis

Study Area 89

SOURCES

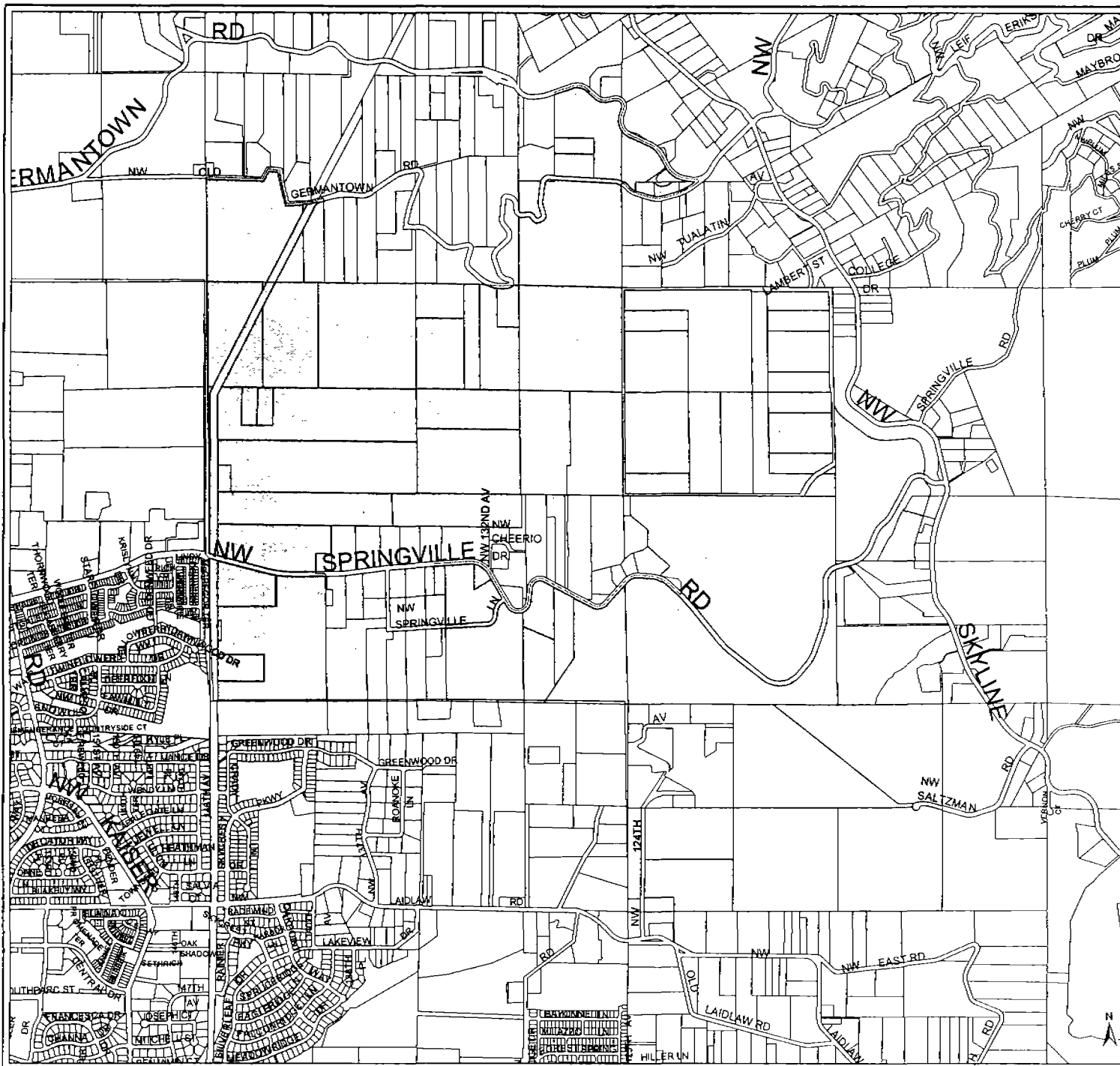
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet at Better in Seaview, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map



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Alternatives Analysis

Study Area 90

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:
TAX LOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tualatin and Multnomah County. Other areas are plus or minus ten feet.

0 1,500 3,000 Feet

Location Map

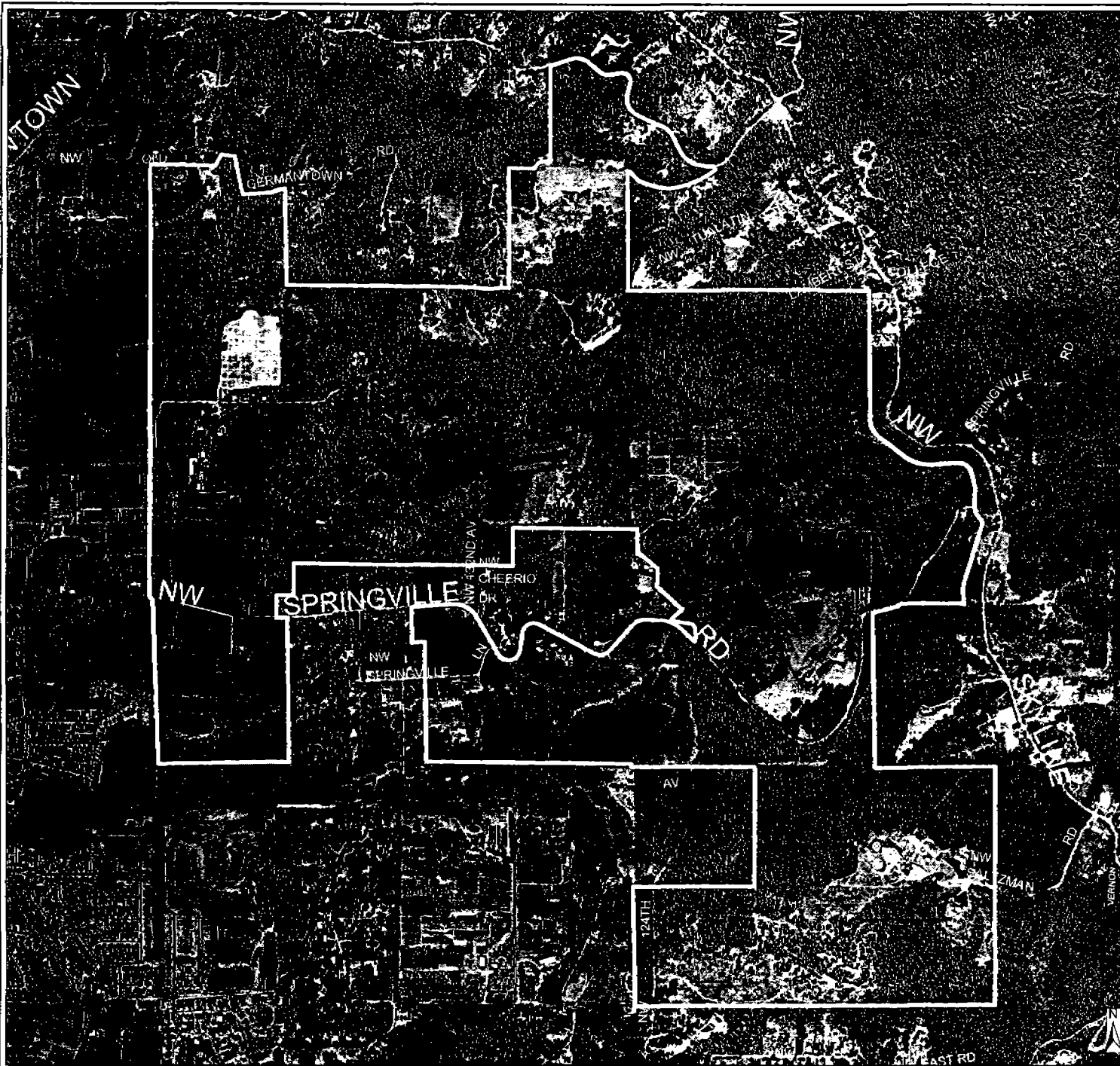
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Project Date: Jul 8, 2002

Plot date: Jul 24, 2002 J:\rail\proj\0147\ep\me90_map.mxd

Please recycle with mixed paper



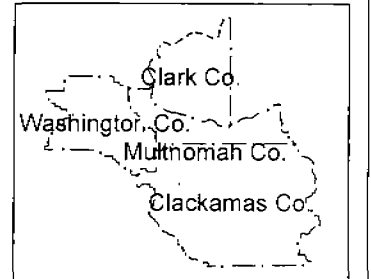
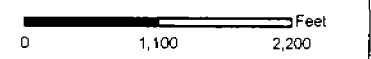
Alternatives Analysis

Study Area 90

SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

AIR PHOTO
Aerial photograph of the study area, showing the location of the study area in relation to the surrounding area. The photograph was taken in 2001.




Location Map



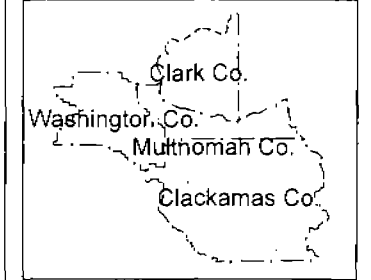
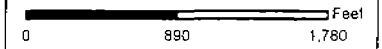
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Alternatives Analysis

 Study Area 91

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

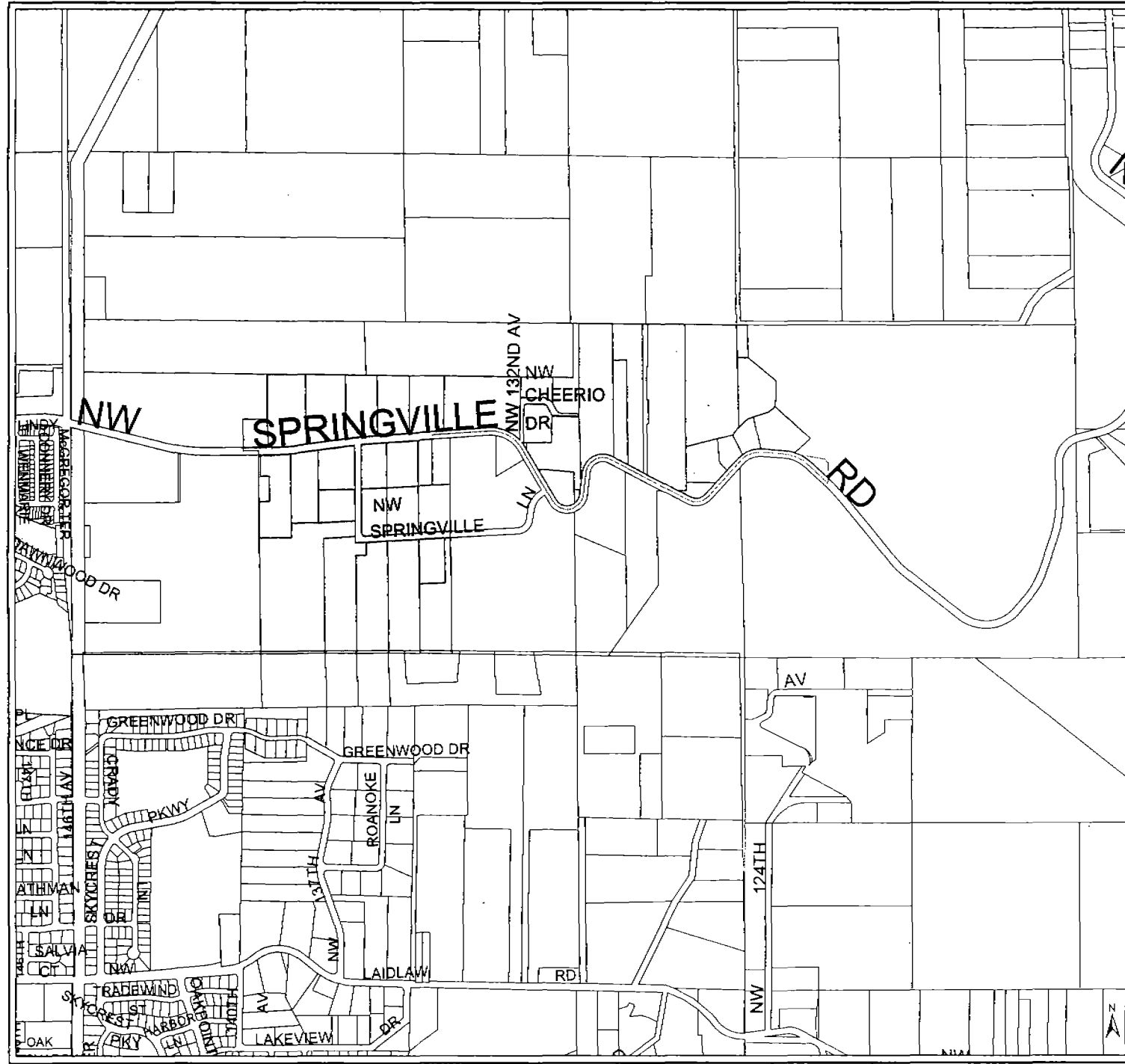
SOURCES
TAX LOT MAP
County Assessment and Taxation office, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Multnomah, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

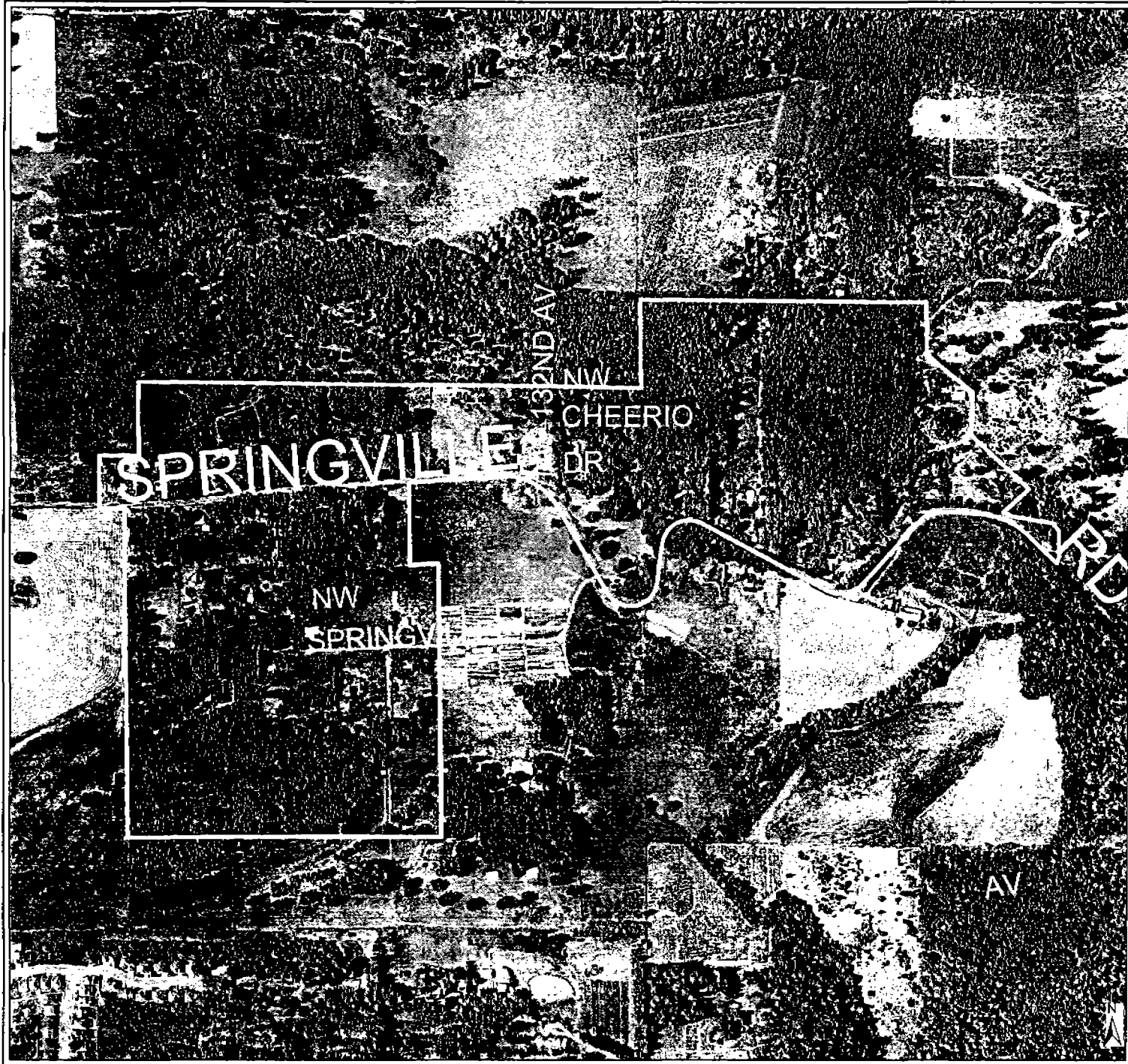


Location Map



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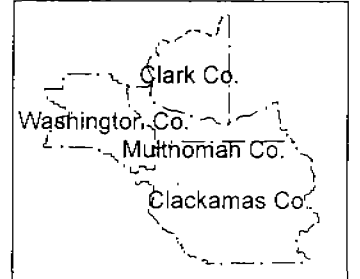
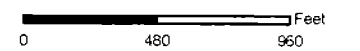




Alternatives Analysis

Study Area 91

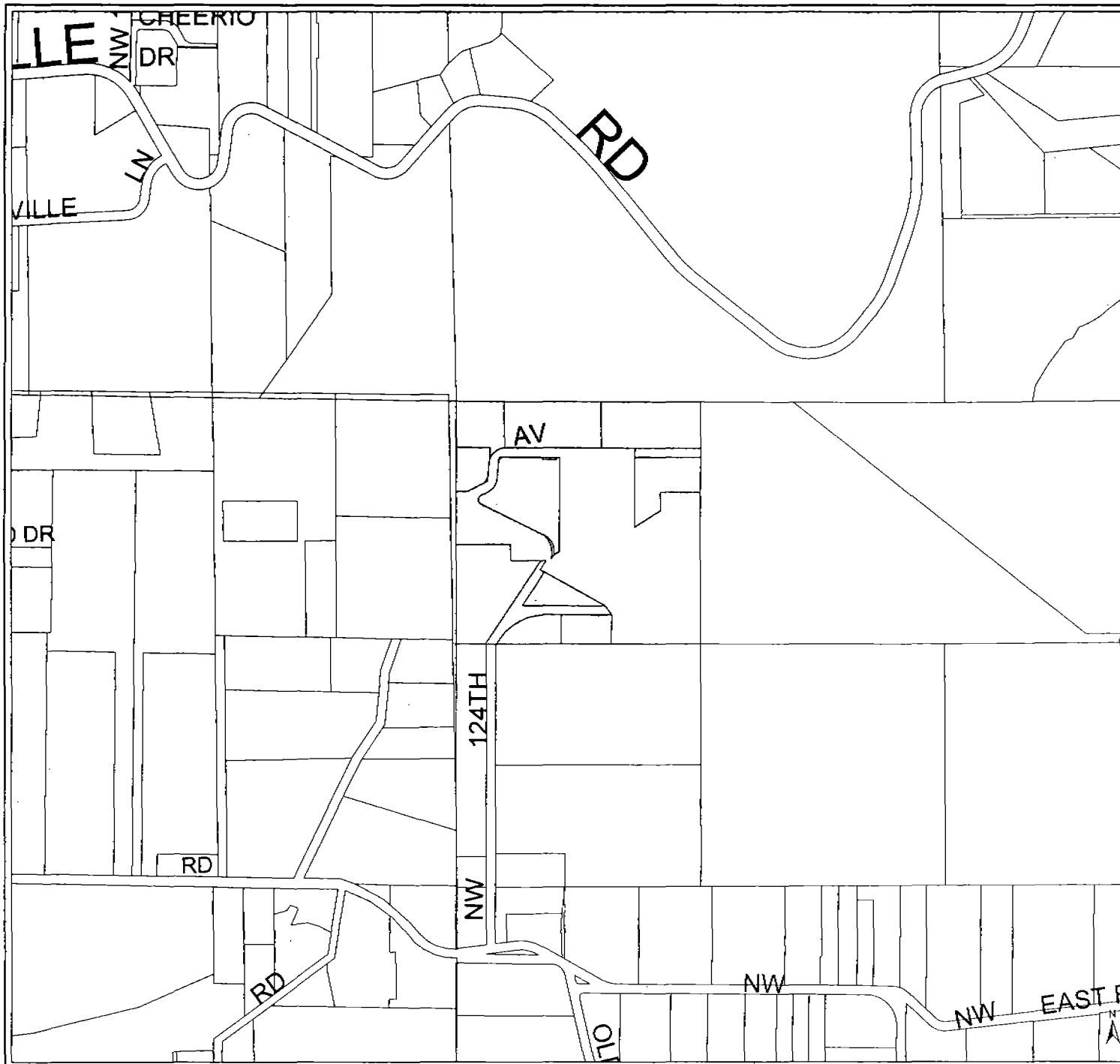
SOURCES:
TAX LOT MAP
 County Assessment and Taxation offices, 2003. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map




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Alternatives Analysis

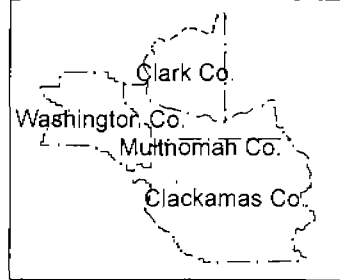
 Study Area 92

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).


SOURCES:

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

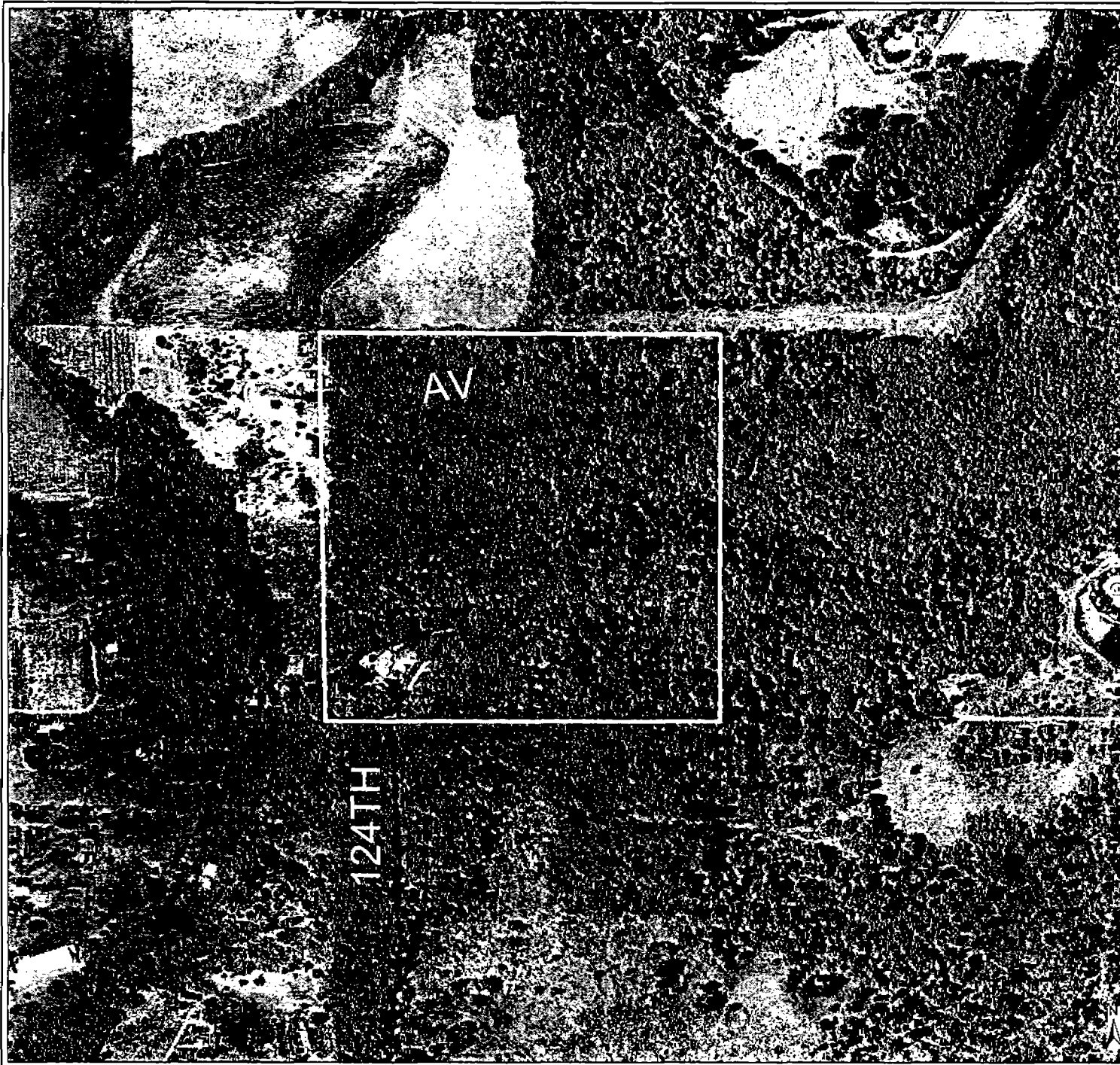
Scale: 0 550 1,100 Feet



Location Map



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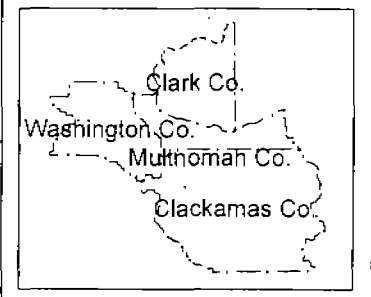
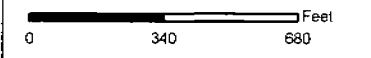
Alternatives Analysis

Study Area 92

SOURCES:

TAX LOT MAP
County Assessment and Taxation Offices, 2001. Data collection scale as 1"=100' in urban areas and 1"=200 or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

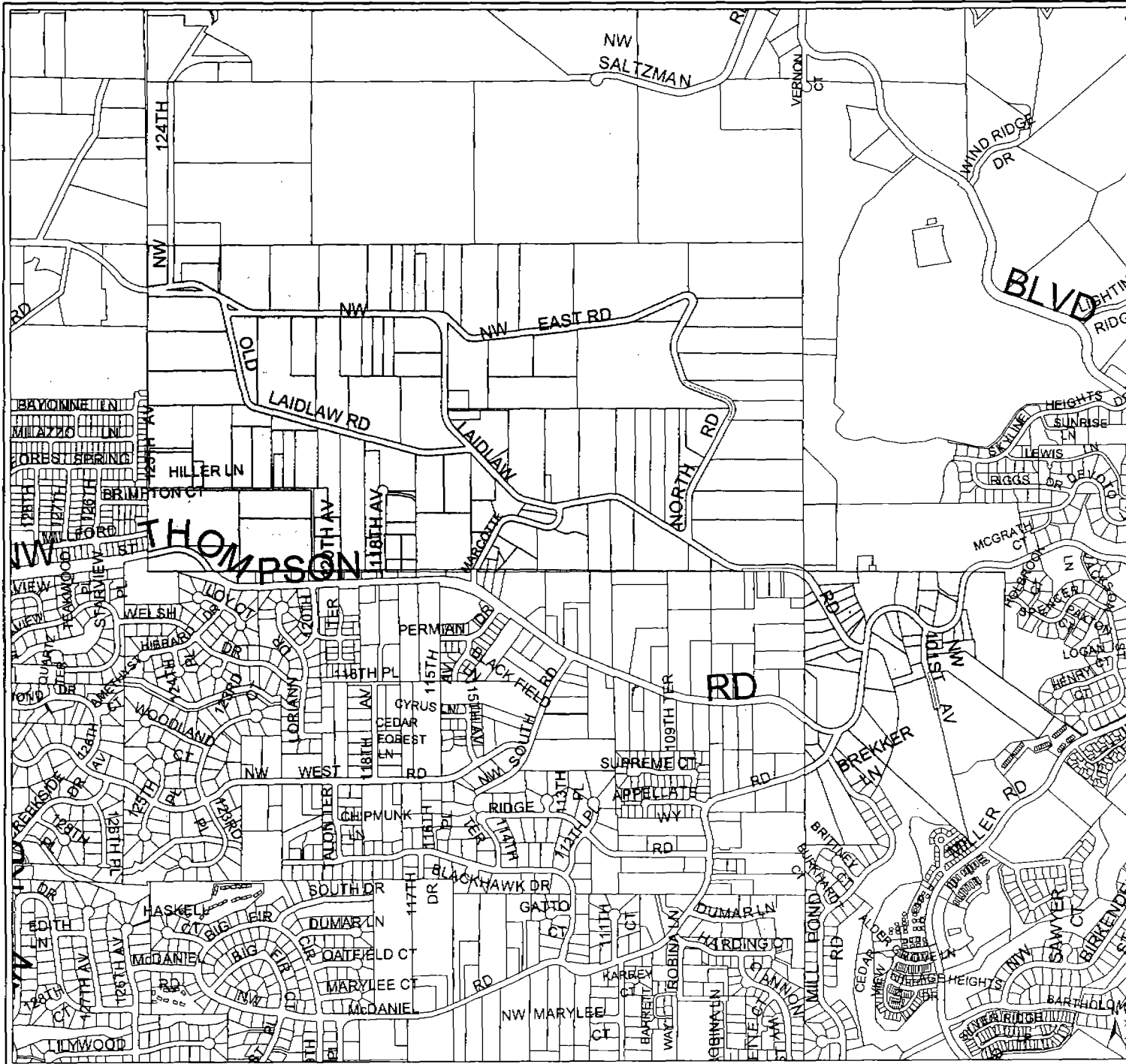
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Alternatives Analysis

Study Area 93

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

SOURCES:
TAX LOT MAP
County Assessment and Taxation offices, 2001. Date collection scale is 1"=150' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

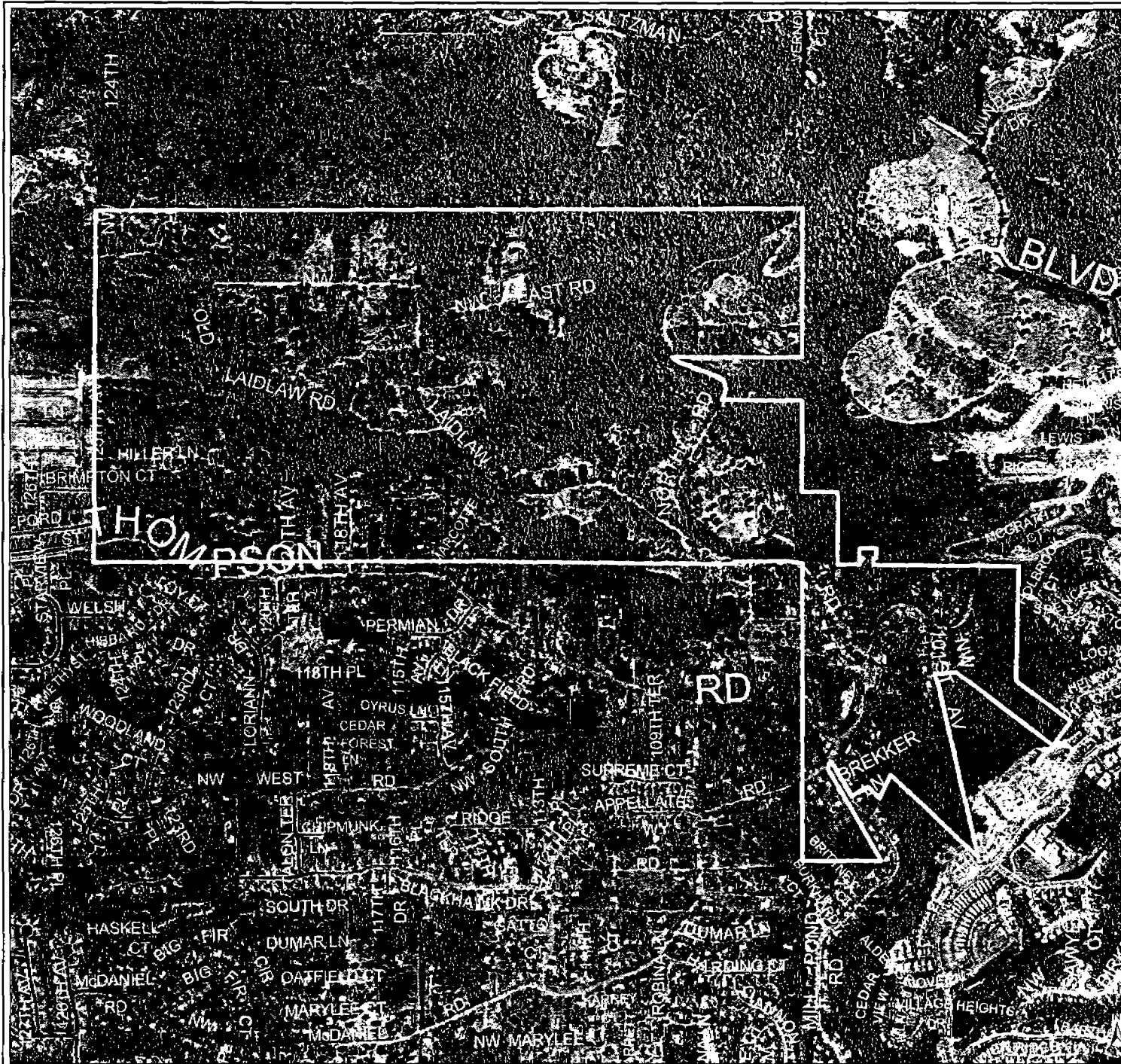
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0 860 1,720 Feet

Clark Co.
Washington Co.
Multnomah Co.
Clackamas Co.

Location Map

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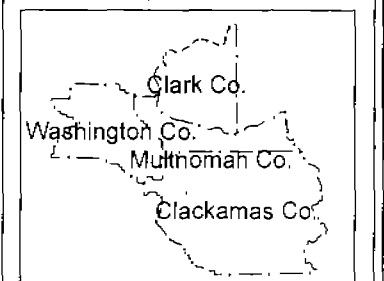
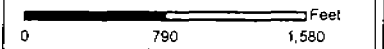


Alternatives Analysis

Study Area 93

SOURCES

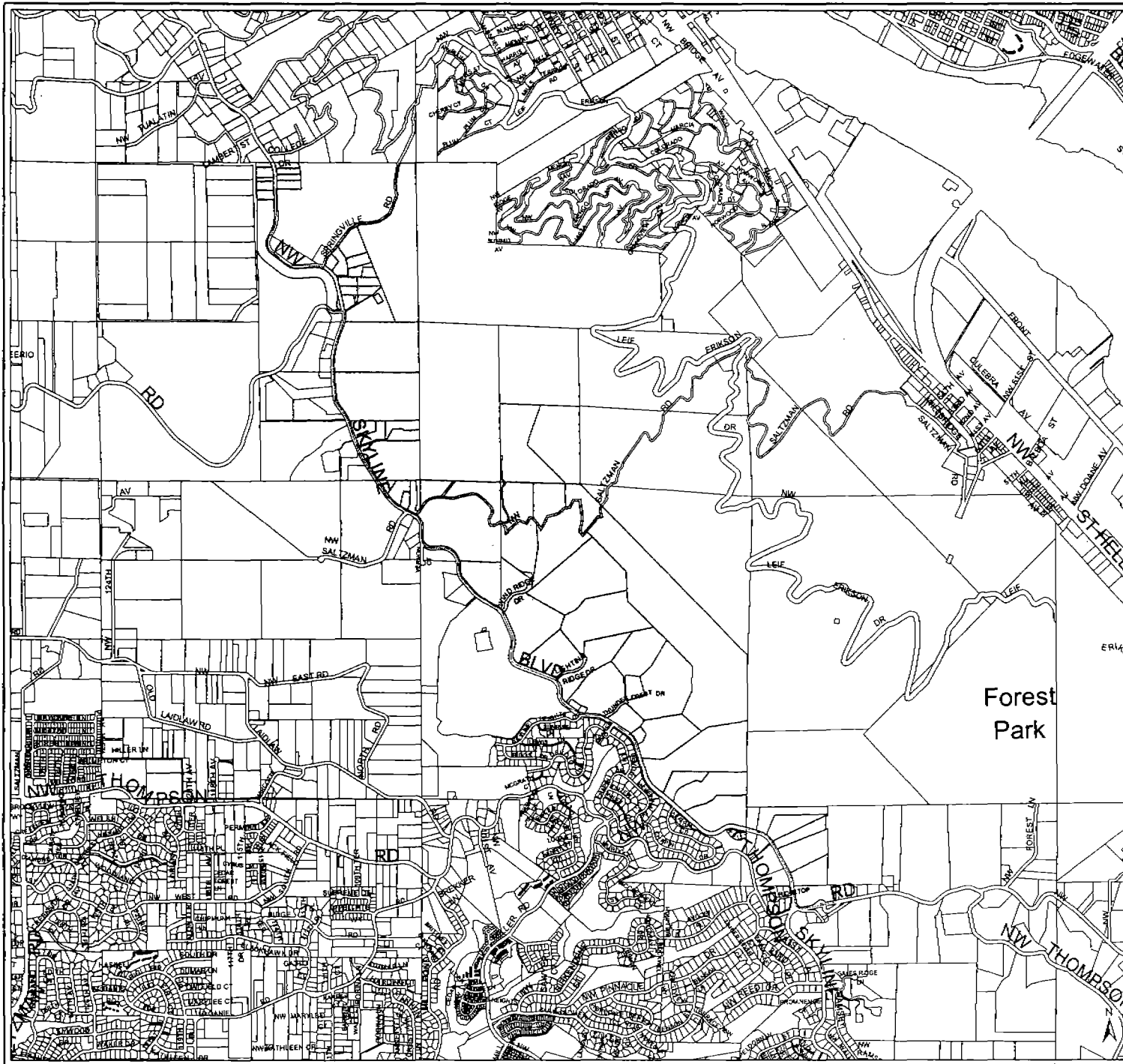
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Clatsop, Multnomah, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.



Location Map



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Alternatives Analysis

Study Area 94

Note: Study Area boundaries include the entire right-of-way of adjacent streets, consistent with Metro Code 3.01.025(j).

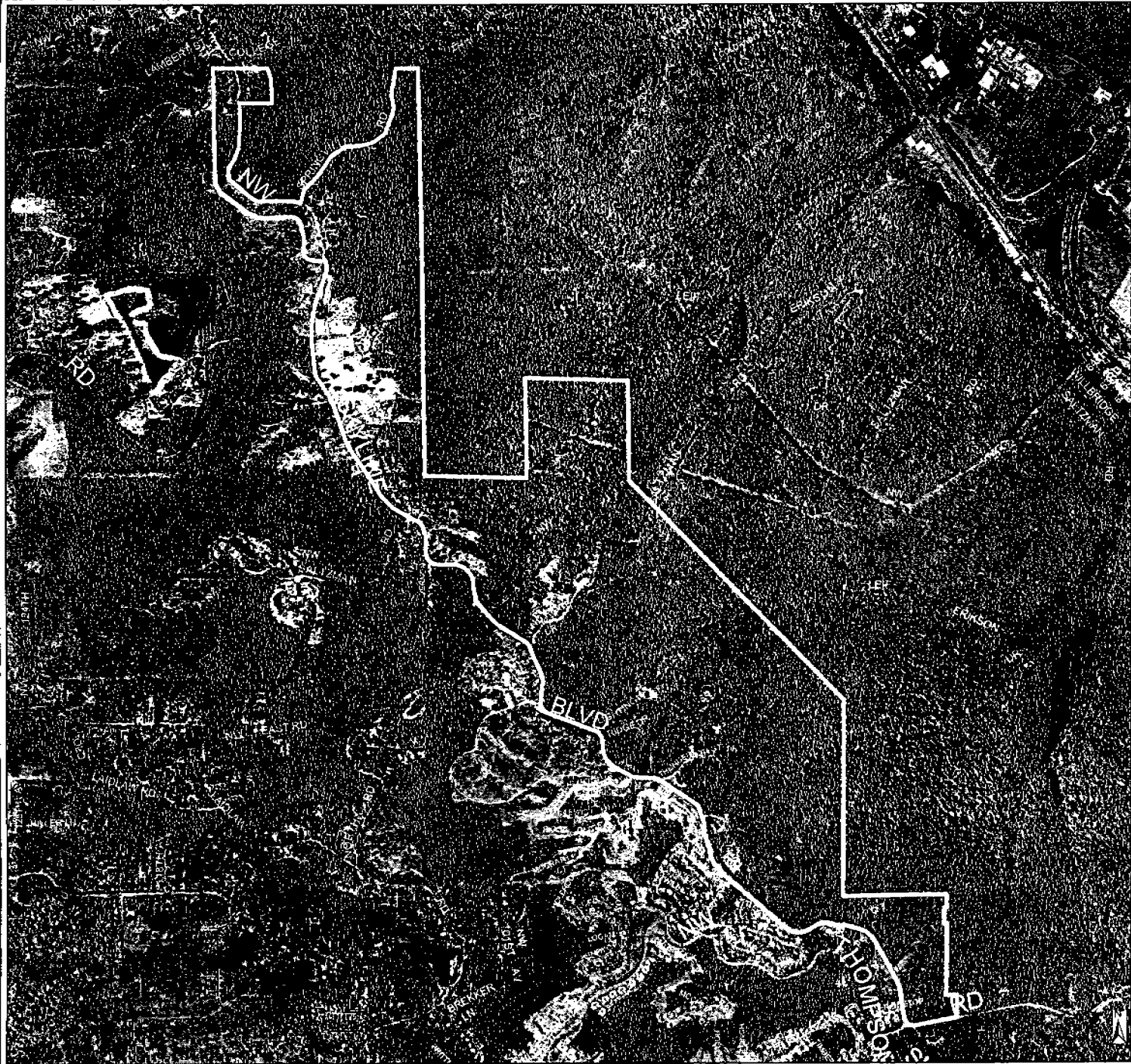
SOURCES:
TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

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Feet
0 1,900 3,800

Location Map

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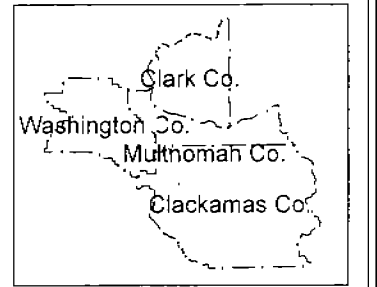
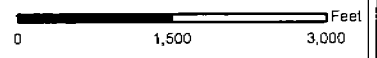


Alternatives Analysis Study Area 94

SOURCES

TAX LOT MAP
County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

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Location Map



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Appendix A, Item #7 Ordinance No. 02-969

TECHNICAL AMENDMENTS TO THE URBAN GROWTH BOUNDARY

November 2002

Prepared and Presented by: Brenda Bernards

BACKGROUND AND ANALYSIS

Subtask 17 of Task 2 of the Periodic Review work program includes the consideration of technical amendments to the UGB as part of the Final UGB decision. An extensive review was undertaken by staff to identify technical modifications that would improve the function of the boundary. Generally, the review revealed four categories of amendments:

- Amendments requiring annexation into the Metro jurisdictional boundary;
- Amendments to alignment of the UGB with jurisdictional boundaries;
- River related amendments; and
- Amendments that are more than technical in nature.

Council has already made a number of technical amendments to the UGB in Subtask 5 of Task 1 of the Periodic Review work program through Ordinance No. 01-900A. Ordinance No. 01-900A corrected map inconsistencies that were a result of mapping errors and interpretations of the UGB.

Since the initial review, two additional technical amendments were brought to the attention of staff. The first is a roadway realignment south of the City of Tualatin and the second is a case, south of Hillsboro, where the UGB does not follow the lot line resulting in a lot only partially in the boundary.

Annexations into the Metro Jurisdictional Boundary

The annexation related amendments are found in Oregon City, Sherwood, Forest Grove, Cornelius and Hillsboro. These are instances where the UGB extends beyond the Metro jurisdictional boundary. In a number of cases, city limits extend beyond both the UGB and the Metro jurisdictional boundary. A number of these areas are already developed. Also, there are a number of cases where the city limits extends to the entire right of way but the Metro jurisdictional boundary and the UGB extend to the centerline. Due to the complexity of the annexation process, these technical amendments will be dealt with in a follow-up task to periodic review.

Alignment of the UGB with Jurisdictional Boundaries

In a number of areas, the UGB was defined by floodplains while city boundaries were defined by lot lines. These are relatively simple fixes where the UGB needs to be expanded to coincide with jurisdictional boundaries. In addition, there are a number of cases where the jurisdictional boundary extends to the entire right-of-way but the UGB extends to the centerline. The review identified 19 locations that city limits extend beyond the UGB covering approximately 44 acres. These were located adjacent to the cities of Troutdale, Gresham, Happy Valley, Oregon City, West Linn, Tualatin, Cornelius and Forest Grove.

Generally these areas can be grouped by three types. First, amending the UGB to cover the same portion of a roadway as a city's boundary. Second, amending the UGB where it follows the floodplain and the city limits follow property lines. Third, amending the UGB to include a parcel or group of parcels left out of the UGB but are in the City limits. As the purpose of this effort is to align the UGB with city limits, no significant capacity is anticipated from these amendments. Most of the non-roadway amendments are zoned for low density residential uses. Much of these areas have been developed or are unbuildable due to environmental constraints.

These technical amendments involving alignment of the UGB to coincide with jurisdictional boundaries are identified below. A number of these are included in Alternative Analysis Study Areas and if brought into the UGB as part of the general land need, will mean a technical adjustment is unnecessary.

River Related Amendments

There are two types of river related UGB discrepancies identified. The first is where a jurisdictional boundary extends into the waterway and the second is where a river may have modified its course. In both cases no changes are necessary as jurisdictions cannot develop in the water and the shifting of the watercourse is minor and does not impact urbanizable land.

Other Amendments

The review of the UGB also identified approximately 692 acres in six locations where the city limits extend beyond the UGB. These areas are adjacent to the cities of Happy Valley, Tualatin, Sherwood, Forest Grove and Portland. Due to the size of the required adjustment or the fact that the area under consideration was resource land, amendments to the boundary in these cases are considered to be more than technical in nature.

PROPOSED AMENDMENTS TO THE URBAN GROWTH BOUNDARY

A series of maps are included in Attachment B showing the existing UGB and the proposed new location of the UGB to more closely follow city limits. The Areas have been divided into two groups: those that are not in an Alternative Analysis Study Area and those that are. In addition to the proposed UGB amendments, a 2040 design type is proposed for each area based on the adjacent designated design type.

Areas Outside of Alternative Analysis Study Areas

Forest Grove

Area 1 (Map 1)

Area 1 is approximately 1.2 acres in size. The Forest Grove city limits extend beyond the UGB at the southwestern edge below 9th Avenue. This area is zoned for heavy industrial. The UGB is defined by the floodplain and the city limits are defined by lot lines. This area would be shown as Industrial Area on the 2040 Growth Concept Map and the Title 4 Employment and Industrial Areas Map.

Area 2 (Map 2)

Area 2 is approximately 7.1 acres in size. The Forest Grove city limits extend beyond the UGB on the southeastern edge of the city adjacent to Cornelius. The UGB is defined by the floodplain and the city limits are defined by lot lines. This area is zoned for mixed-use industrial

on the western portion and single family residential on the eastern portion. This area would be shown as Employment Area for the western portion on the 2040 Growth Concept and the Title 4 Employment and Industrial Area Map and Outer Neighborhood for the eastern portion on the 2040 Growth Concept Map.

Cornelius – South side

Area 3 (Map 3)

Area 3 is approximately 4.0 acres in size. The Cornelius city limits extend beyond the UGB in the general area of Flax Plant Road. A small portion of the UGB extends beyond the Metro boundary in this area. The UGB is defined by the floodplain and the city limits are defined by lot lines. It is zoned for multi-family residential. This area would be shown as Outer Neighborhood on the 2040 Growth Concept Map.

Area 4 (Map 3)

Area 4 is approximately 3.0 acres in size. The Cornelius city limits extend beyond the UGB in the general area of S. Ivy Court. The UGB is defined by the floodplain and the city limits are defined by lot lines. It is zoned for mixed-use industrial uses. This area would be shown as Employment Area on the 2040 Growth Concept Map.

Area 5 (Map 3)

Area 5 is approximately 11.0 acres in size. The Cornelius city limits extend beyond the UGB in the general area of S. Ivy Court. The UGB is defined by the floodplain and the city limits are defined by lot lines. The zoning for this area is divided into single family, multi-family and mixed-use industrial uses. This area would be shown as Outer Neighborhood and Employment Area on the 2040 Growth Concept Map.

City of Troutdale

Area 6 (Map 4)

Area 6 is approximately 1.0 acre in size. The Troutdale city limits at SE Thompson Road/Columbia River Highway extend beyond the UGB and is zoned for low density residential. The city limits follows lot lines, the UGB cuts across four parcels. This area would be shown as Outer Neighborhood on the 2040 Growth Concept Map.

Areas within Alternative Analysis Study Areas

Cornelius – North side

Area 7 (Map 5)

Area 7 is approximately 2.5 acres in size. The Cornelius city limits extend beyond the UGB east of N. 10th Avenue. It is zoned rural residential and parks and open space. The UGB is defined by the floodplain and the city limits are defined by lot lines. An additional 0.2 acres of the city limit extend beyond the Metro boundary. This area is within Alternative Analysis Study Area 75. This area would be shown as Outer Neighborhood with a public park overlay on a portion on the 2040 Growth Concept Map.

Area 8 (Map 6)

Area 8 is approximately 1.0 acres in size. The Cornelius city limits extend beyond the UGB, at northern edge of the city, east of NW Susbauer Road. This is owned by the homeowners association directly to the south and is zoned rural residential. The UGB is defined by the floodplain and the city limits are defined by lot lines. This area is within Alternative Analysis Study Area 76. This area would be shown as Outer Neighborhood on the 2040 Growth Concept Map.

Area 9 (Map 6)

Area 9 is approximately 0.7 acres in size. The Cornelius city limits extend beyond the UGB at the northeast corner of the city, east of N. Lambert Street. It is zoned rural residential. The UGB is defined by the floodplain and the city limits are defined by lot lines. This area is within Alternative Analysis Study Area 76. This area would be shown as Outer Neighborhood on the 2040 Growth Concept Map.

Area 10 (Map 6)

Area 10 is approximately 10 acres in size. The Cornelius city limits beyond the UGB east of N. 31st Avenue. The UGB is defined by the floodplain and the city limits are defined by lot lines. An additional 0.5 acres of the city limit extend beyond the Metro boundary. The northern portion of this Area is zoned rural residential and is within Alternative Analysis Study Area 76. The southern portion of this Area is zoned single family residential. While this portion is not being studied as part of the Alternative Analysis Study as it is resource land, it is already developed with single family residences and is within the Cornelius city limits. This area would be shown as Outer Neighborhood on the 2040 Growth Concept Map.

City of Tualatin

Area 11 (Map 7)

Area 11 is approximately 1.2 acres in size. At the Intersection of I5 and I205, the Tualatin city limits extend beyond the UGB. This area is within Alternative Analysis Study Area 43. This area would be shown as Inner Neighborhood on the 2040 Growth Concept Map.

Area 12 (Map 8)

Area 12 is approximately 1,800-sq. ft. in size. The Tualatin city limits run down the middle of SW Borland Road and UGB runs along the northern edge at the eastern edge of the city. This area is within Alternative Analysis Study Area 42. This area would be shown as Inner Neighborhood on the 2040 Growth Concept Map.

City of West Linn

Area 13 (Map 9)

Area 13 is approximately 0.3 acres in size. The West Linn city limits extend beyond the UGB southwest of SW Johnson Road and is zoned for low density residential. The area is within Alternative Analysis Study Area 35. This area would be shown as Outer Neighborhood on the 2040 Growth Concept Map.

Area 14 (Map 10)

Area 14 is approximately 3.0 acres in size. It is a small island inside West Linn city limits but is beyond the UGB. The City has purchased the island, which is connected by a causeway, for park purposes. This area is within Alternative Analysis Study Area 35. This area would be shown as Outer Neighborhood on the 2040 Growth Concept Map with a Public Parks overlay.

City of Oregon City

Area 15 (Map 11)

Area 15 is approximately 0.7 acres in size. The Oregon City city limits extend beyond the UGB on one tax lot to the east of Newell Ridge Drive and Newell Crest Drive intersection and is zoned for low density residential. This area is within Alternative Analysis Area 26. This area would be shown as Outer Neighborhood on the 2040 Growth Concept Map.

City of Happy Valley

Area 16 (Map 12)

Area 16 is approximately 0.5 acres in size. Happy Valley city limits extend beyond the UGB at the eastern edge of Sunnyside Road on a piece of land for future road expansion. This area is adjacent to Alternative Analysis Study Area 17. This area would be shown as Inner Neighborhood on the 2040 Growth Concept Map.

City of Gresham

Area 17 (Map 13)

Area 17 is approximately 0.35 acres in size. The Gresham city limits extend beyond the UGB in the road right of way roughly 400 feet south of where SE Hillyard Road meets SE U.S. Highway 26. This area is adjacent to Alternative Analysis Study Area 12. This area would be shown as Inner Neighborhood on the 2040 Growth Concept Map.

Area 18 (Map 14)

Area 18 is approximately 300-sq. ft. in size. The Gresham city limits extend beyond the UGB in the road right of way at SE Anderson and SE 33rd Court. This area is adjacent to Alternative Analysis Study Area 6. This area would be shown as Inner Neighborhood on the 2040 Growth Concept Map.

Area 19 (Map 15)

Area 19 is approximately 1.4 acres in size. The Gresham city limits extend beyond the UGB on three tax lots at E. Powell Boulevard and SE 282nd Avenue and is zoned for low density residential. This area is within Alternative Analysis Study Area 2. This area would be shown as Inner Neighborhood on the 2040 Growth Concept Map.

Additional Technical Amendments

Area 20 (Map 16)

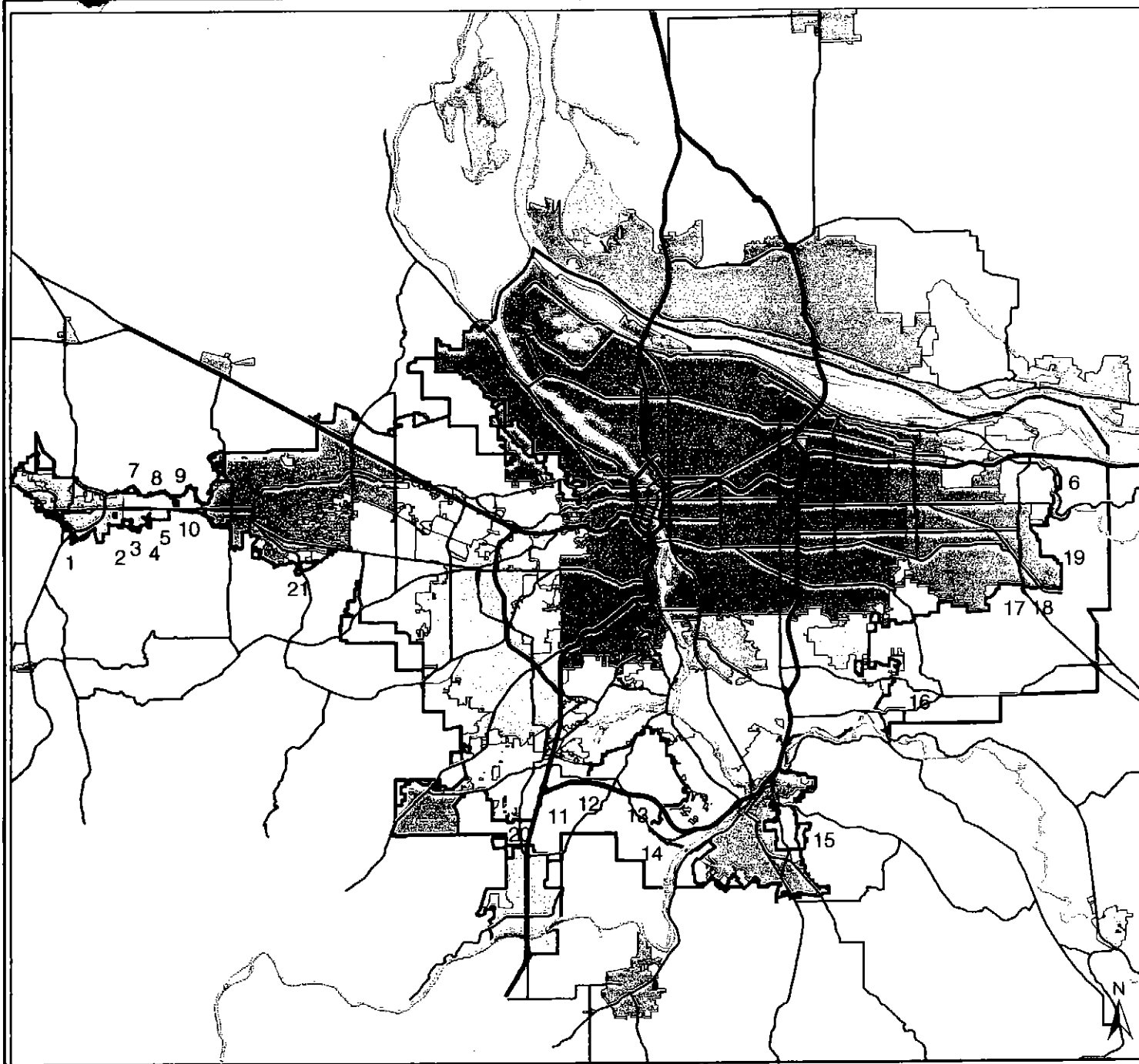
Area 20 is approximately 4 acres in size. The entire lot is approximately 6 acres in size with 2 acres inside the UGB. The area, south of the City of Hillsboro on River Road is non-resource land and is not within a study area. It is zoned for residential uses and would be shown as Outer Neighborhood on the 2040 Growth Concept Map.

Area 21 (Map 17)

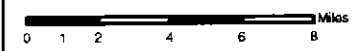
Area 21 is approximately 9,000-sq. ft. in size. The Tualatin city limits extend to the center of Graham's Ferry Road and the UGB does not include the road. This area is within Alternative Analysis Study Area 47. This area would be shown as Outer Neighborhood on the 2040 Growth Concept Map.

I:\gm\community_development\share\Technical Amendment Appendix 7.doc

UGB Technical Amendments November 2002



- UGB
- ▨ Proposed UGB Amendment
- Metro Jurisdictional Boundary



SOURCES:
TAX LOT MAP
County Assessment and Taxation office, 2001. Data collection scale is 1"=100' in urban areas and 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

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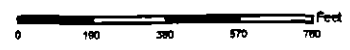
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Area 1 (Map 1)
Forest Grove

UGB Technical Amendments
July 2002

- UGB
- ▨ Proposed UGB Amendment
- Metro Jurisdictional Boundary

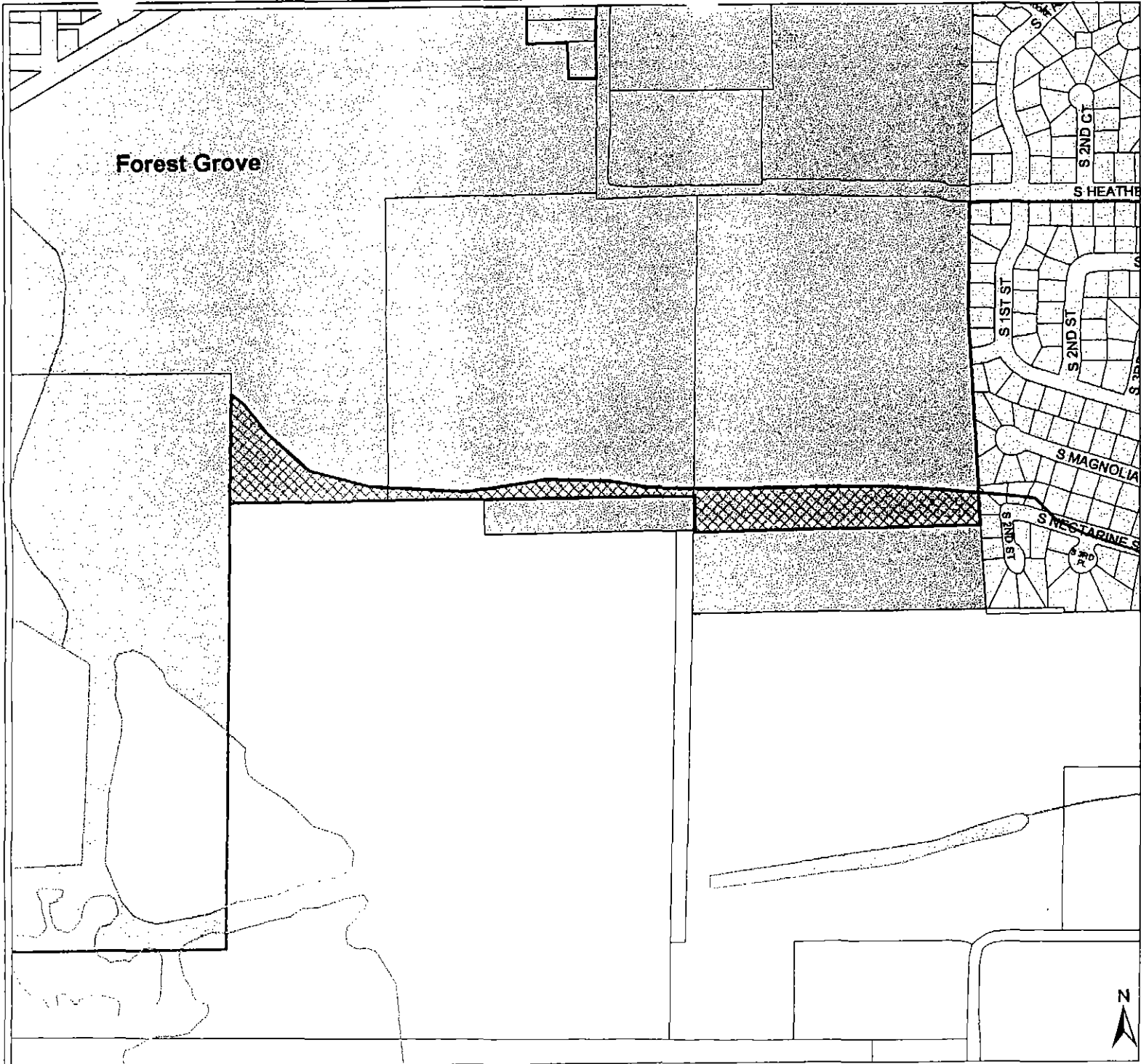


SOURCES:
TAX LOT MAP
 County Assessment and Treasurer offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

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Area 2 (Map 2)
Forest Grove

UGB Technical Amendments
July 2002

-  UGB
-  Proposed UGB Amendment
-  Metro Jurisdictional Boundary



SOURCES:
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County Assessment and Taxation Office, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Hillsdale, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

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Area 3, 4, 5 Map 3) Cornelius

UGB Technical Amendments
July 2002

- UGB
- ▨ Proposed UGB Amendment
- Metro Jurisdictional Boundary

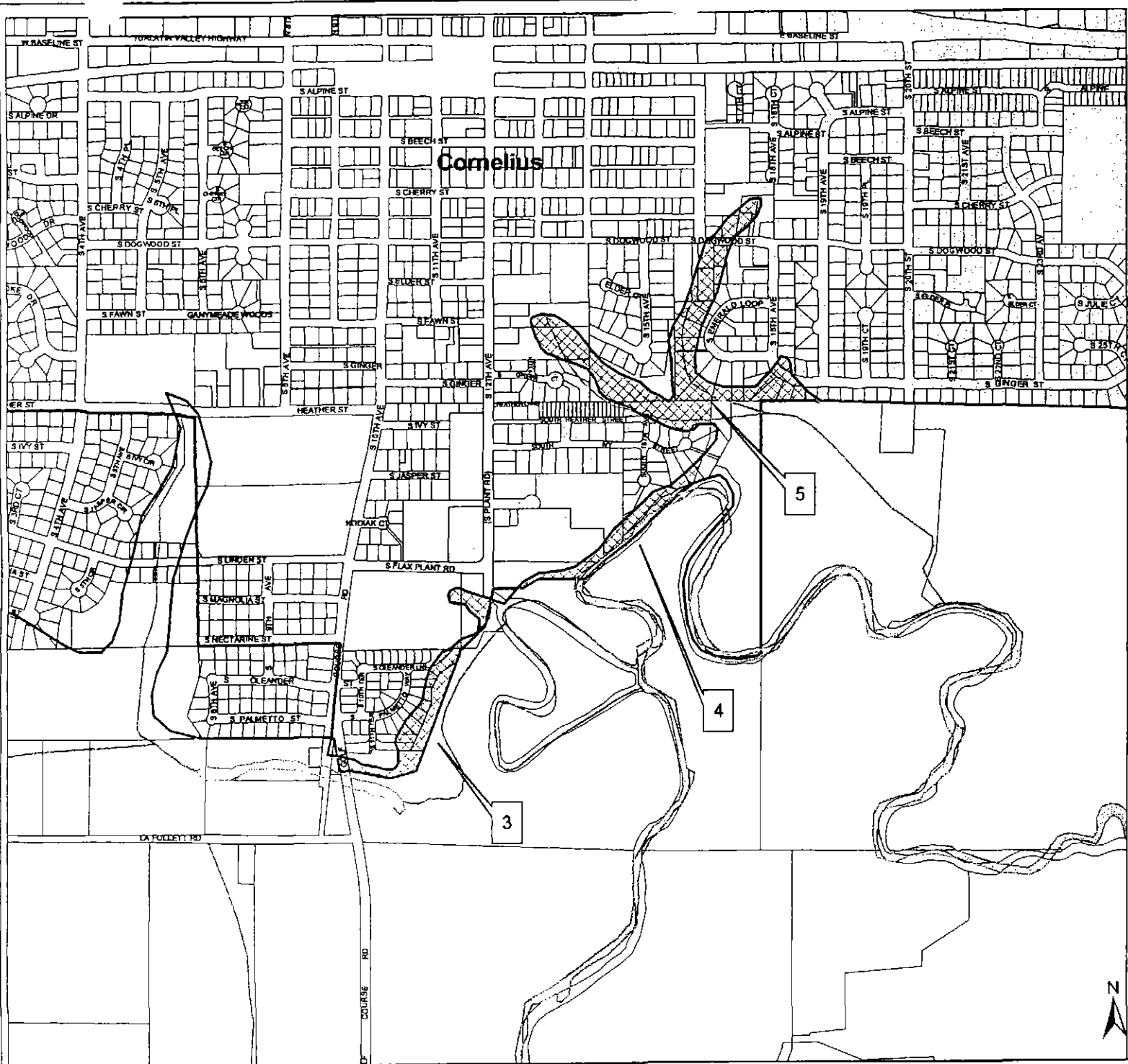


SOURCES:
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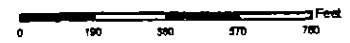


Area 6 (Map 4)

Troutdale

UGB Technical Amendments
July 2002

- UGB
- ▨ Proposed UGB Amendment
- Metro Jurisdictional Boundary

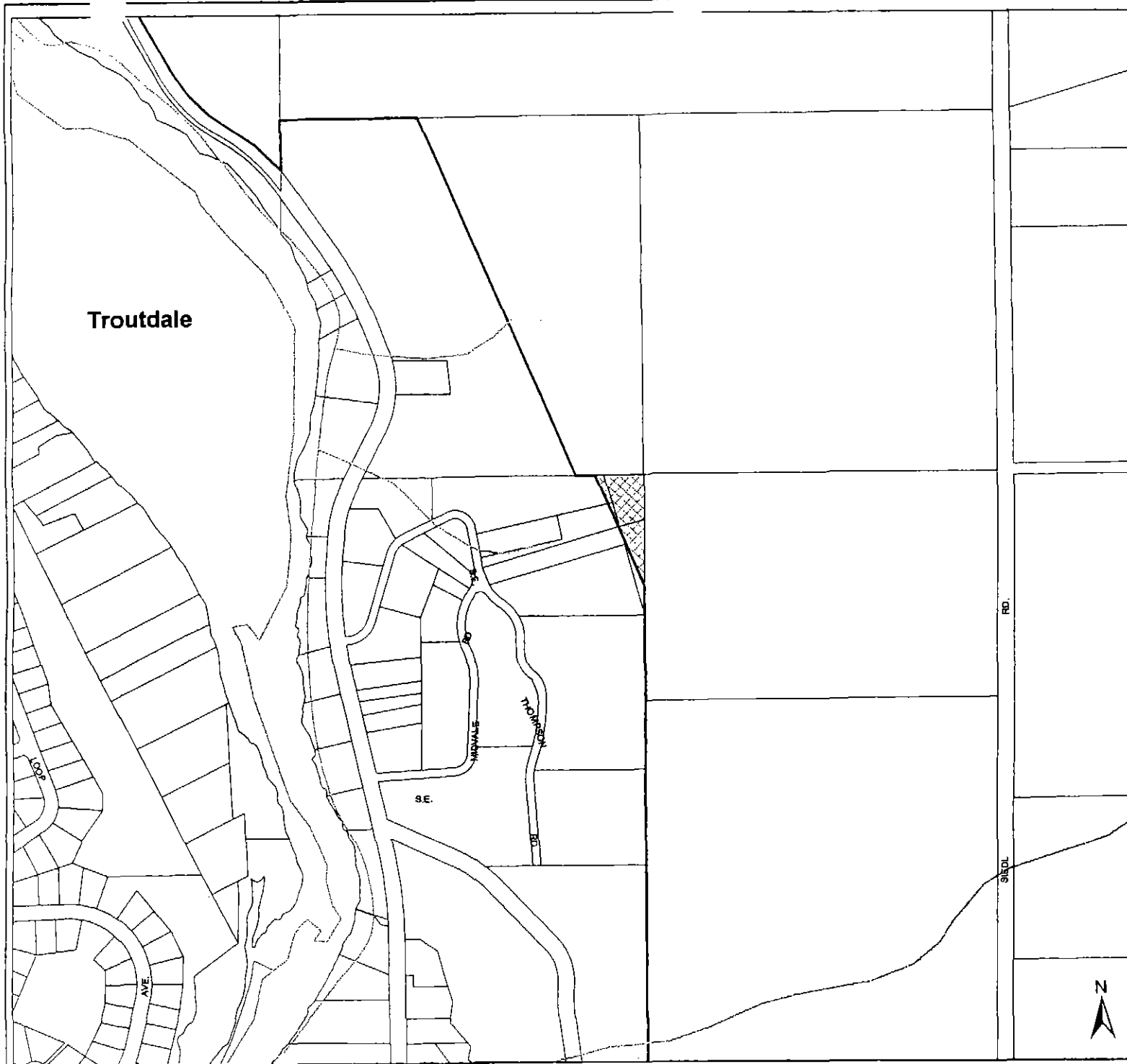


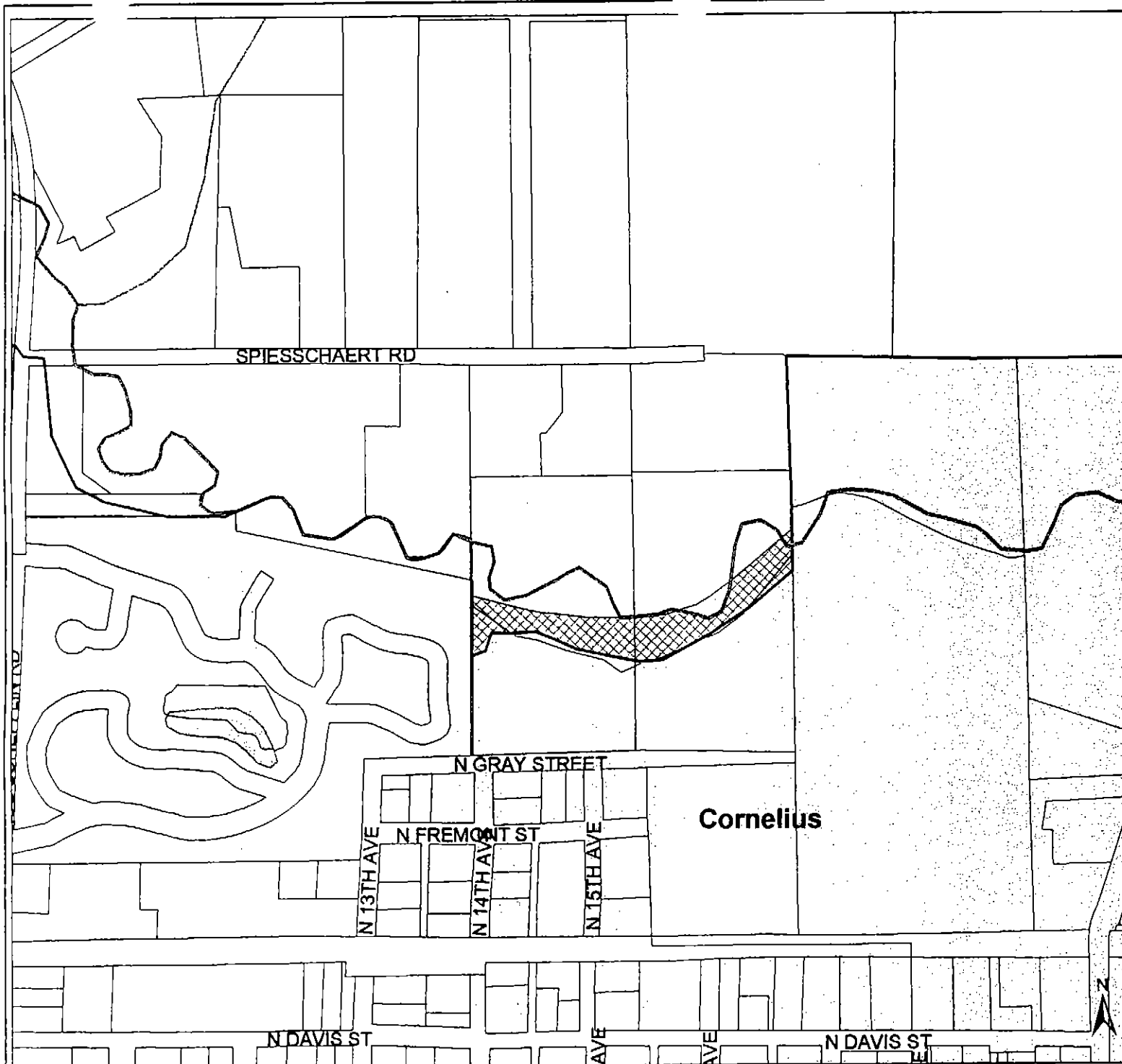
SOURCES:
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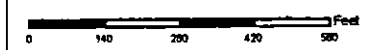




Area 7 (Map 5)
Cornelius

UGB Technical Amendments
July 2002

- UGB
- ▨ Proposed UGB Amendment
- Metro Jurisdictional Boundary



SOURCES:
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County Assessment and Taxation office, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

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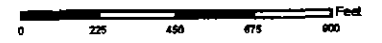
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Area 8, 9, 10 (Map 6) Cornelius

UGB Technical Amendments
July 2002

-  UGB
-  Proposed UGB Amendment
-  Metro Jurisdictional Boundary

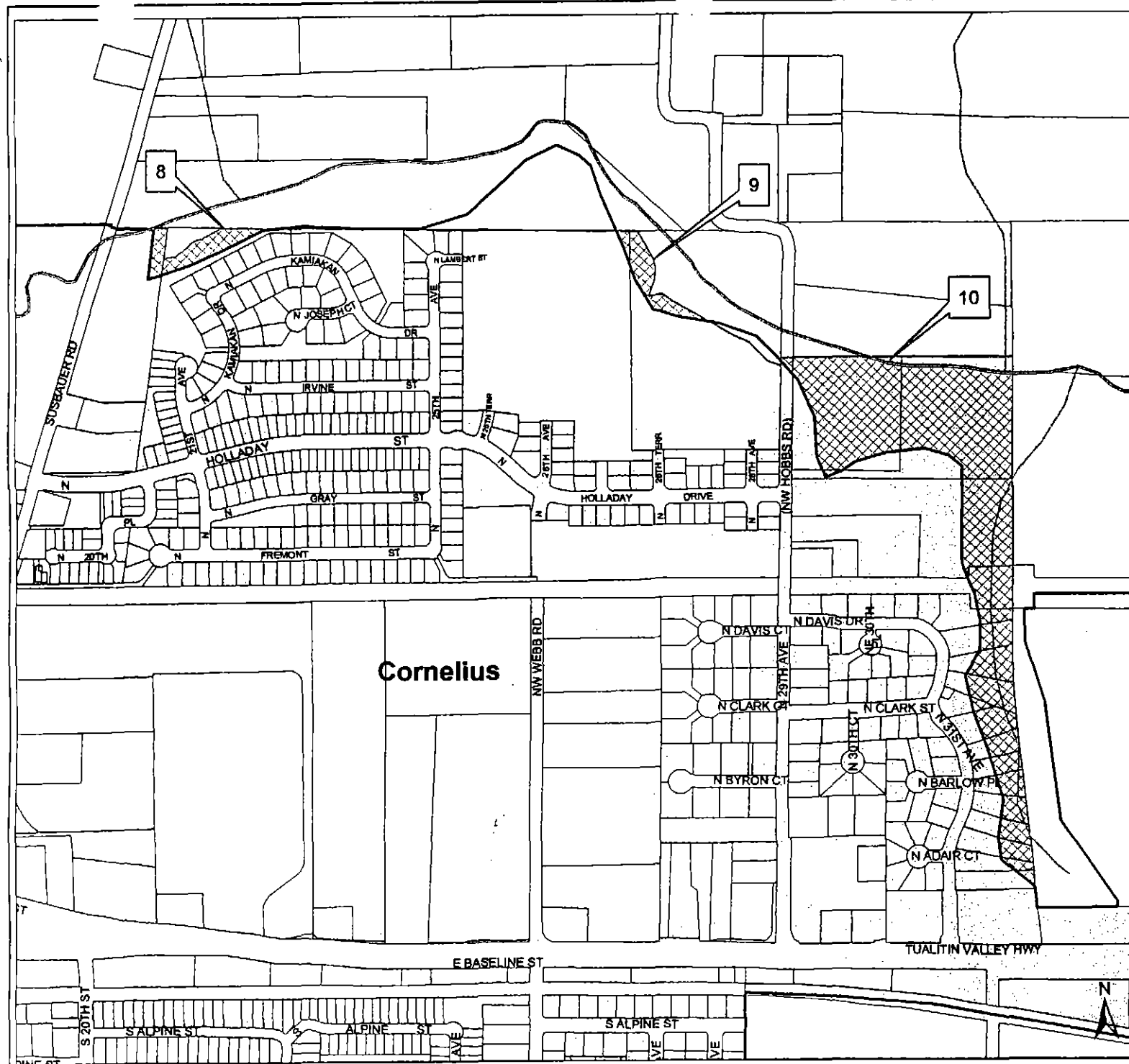


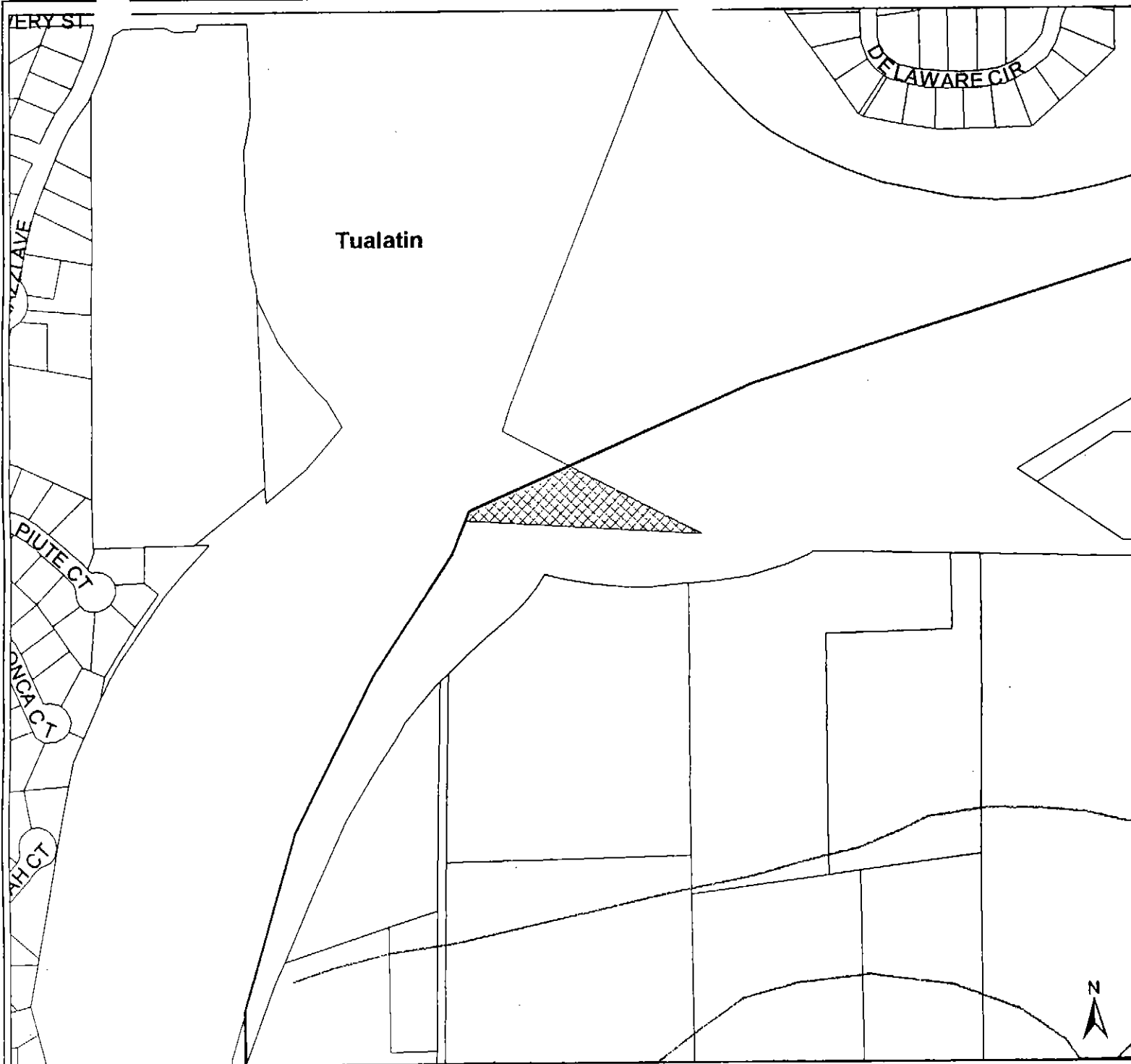
SOURCES:
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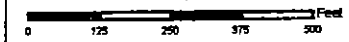




Area 11 (Map 7)
Tualatin

UGB Technical Amendments
July 2002

-  UGB
-  Proposed UGB Amendment
-  Metro Jurisdictional Boundary



SOURCES:
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Area 12 (Map 8)

Tualatin

UGB Technical Amendments
July 2002

-  UGB
-  Proposed UGB Amendment
-  Metro Jurisdictional Boundary

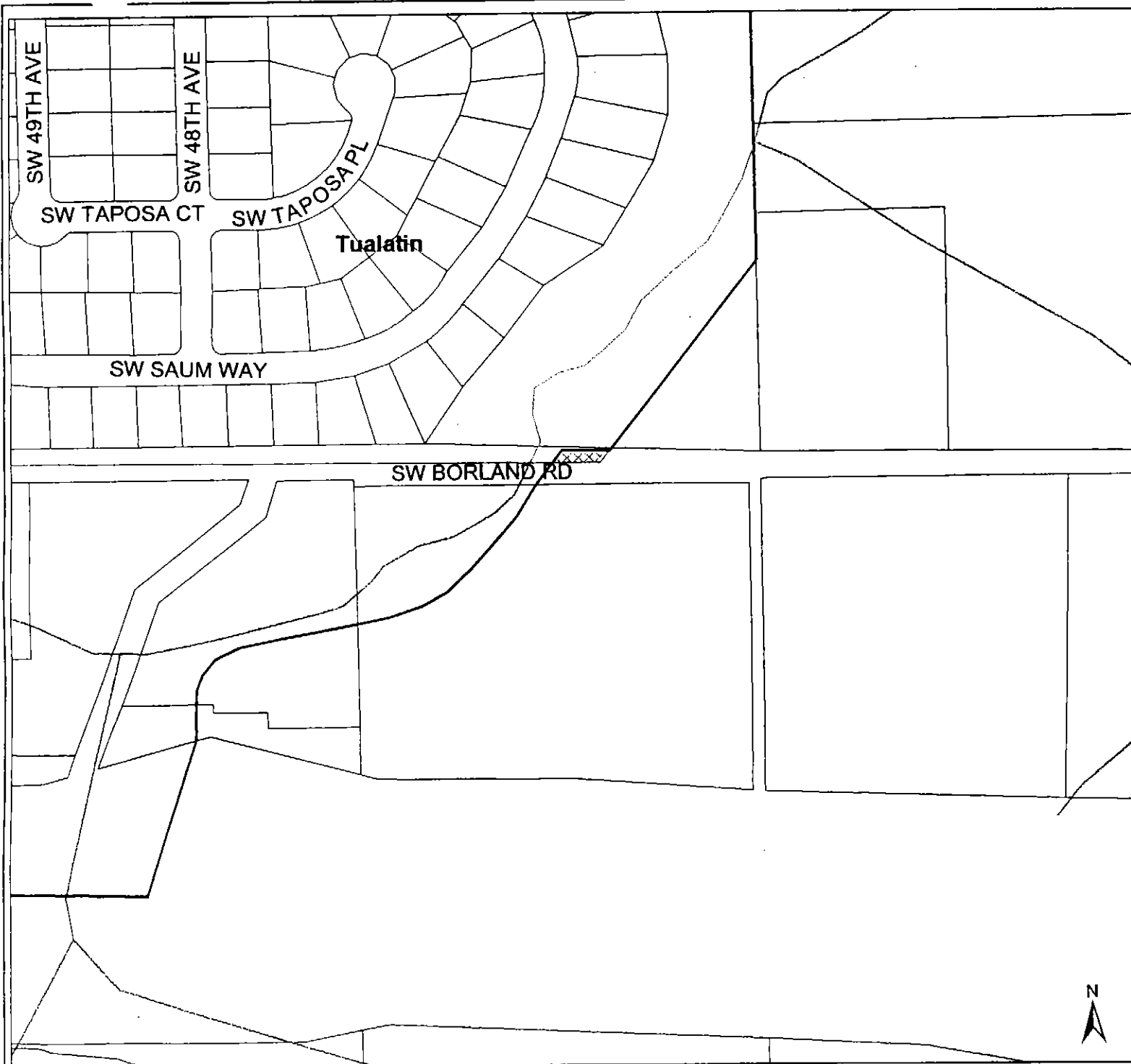


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Area 13 (Map 9) West Linn

UGB Technical Amendments July 2002

- UGB
- Proposed UGB Amendment
- Metro Jurisdictional Boundary

0 100 200 400 800 Feet

SOURCES:
 TAKLOT MAP
 County Assessment and Taxation offices, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Clatsop, Multnomah, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.




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Area 14 (Map 10) West Linn

UGB Technical Amendments July 2002

-  UGB
-  Proposed UGB Amendment
-  Metro Jurisdictional Boundary

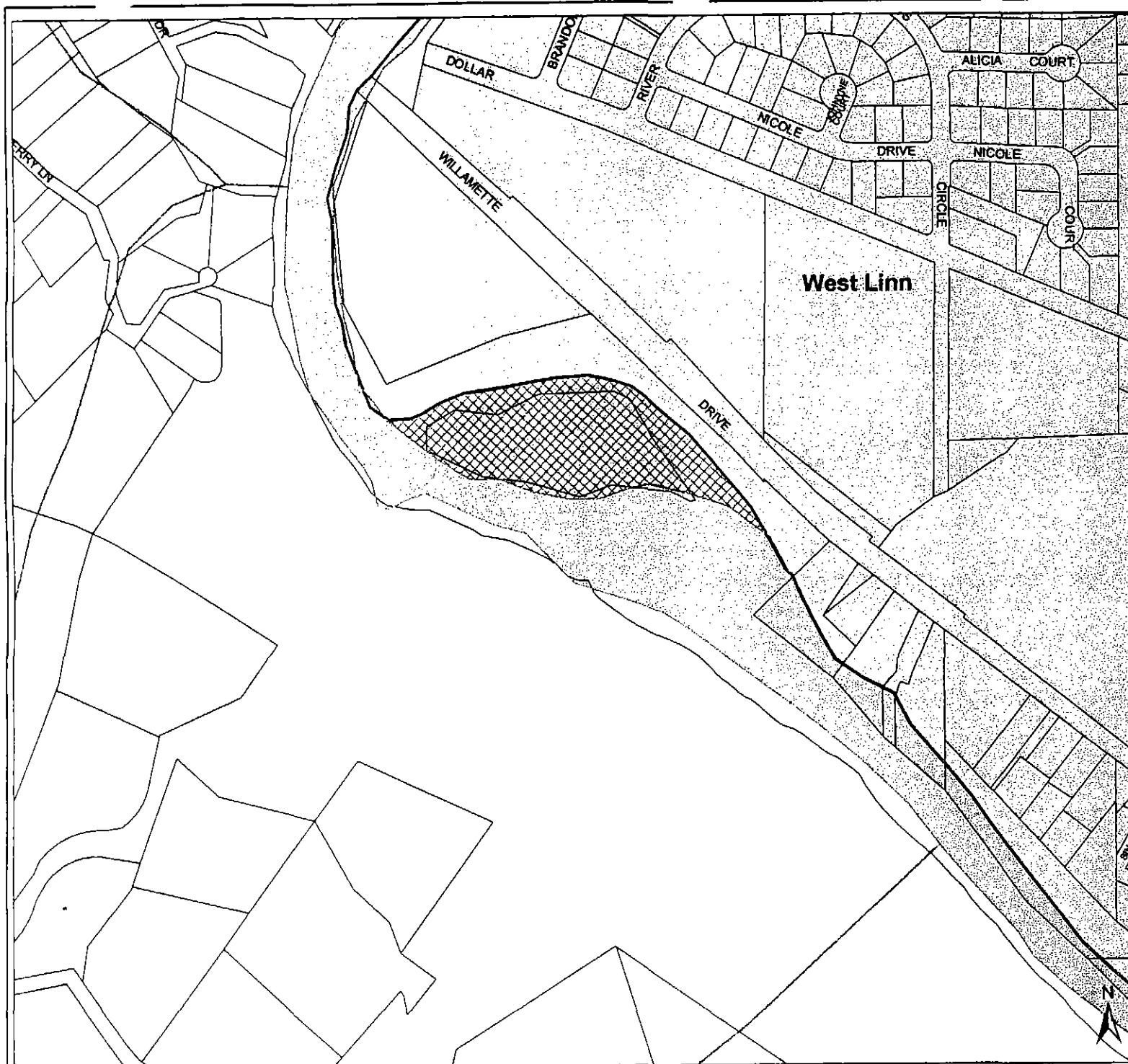


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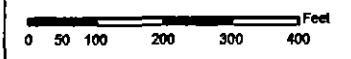
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Area 15 (Map 11) Oregon City

UGB Technical Amendments July 2002

-  UGB
-  Proposed UGB Amendment
-  Metro Jurisdictional Boundary

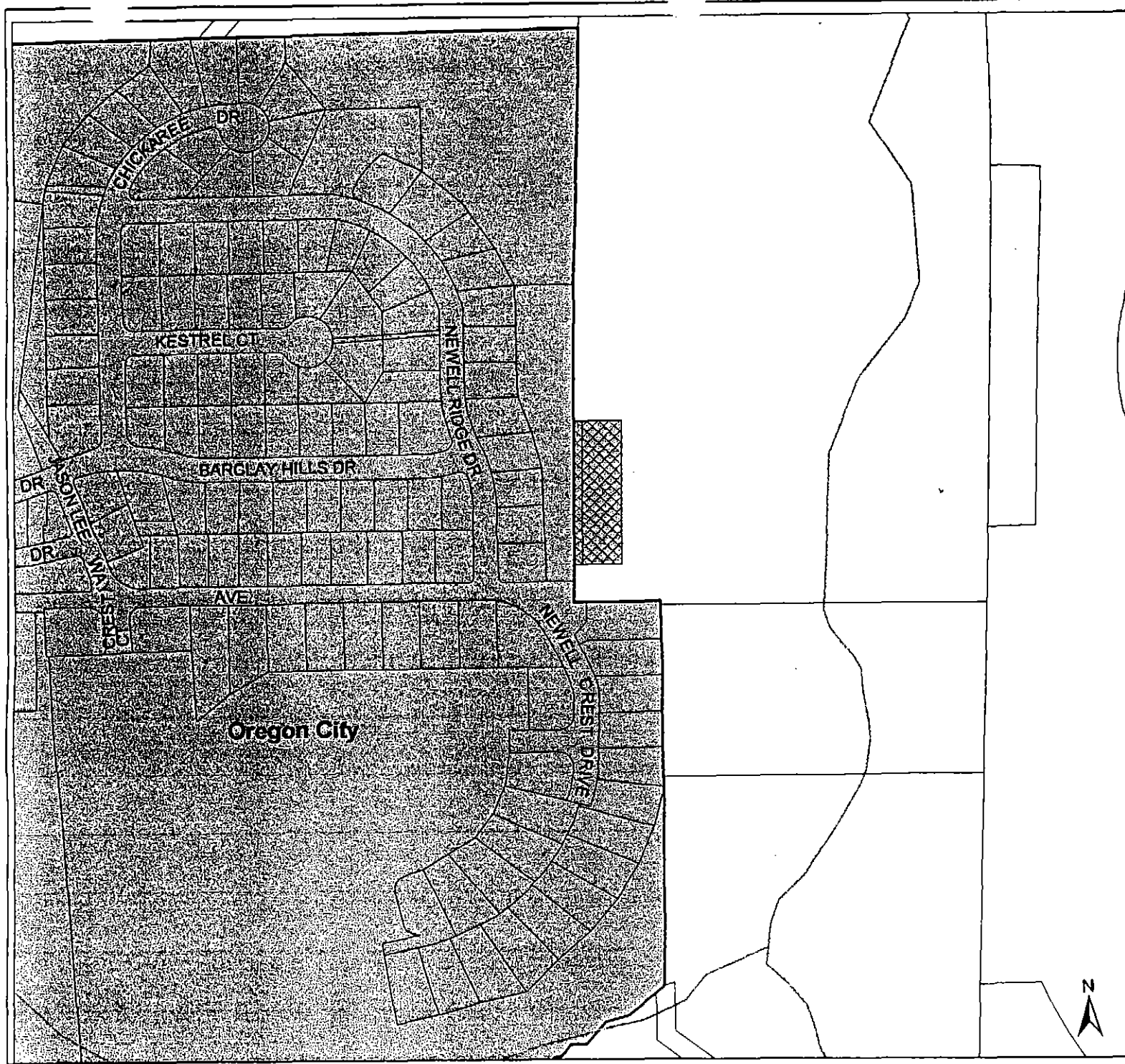


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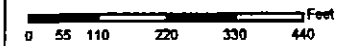
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Area 16 (Map 12)
Happy Valley

UGB Technical Amendments
July 2002

- UGB
- ▣ Proposed UGB Amendment
- Metro Jurisdictional Boundary



SOURCES:

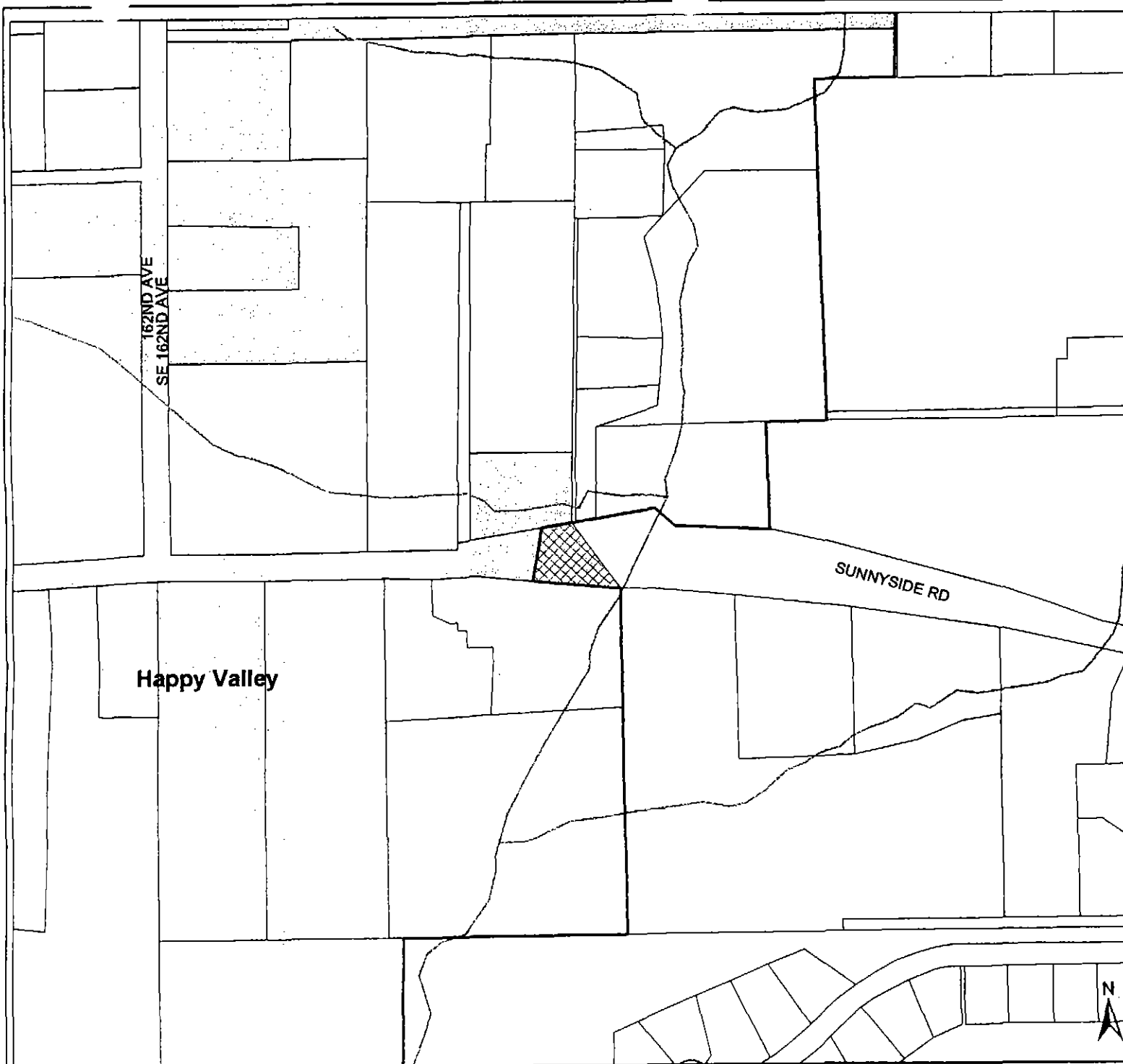
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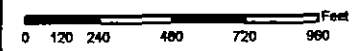
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Area 17 (Map 13) Gresham

UGB Technical Amendments July 2002

-  UGB
-  Proposed UGB Amendment
-  Metro Jurisdictional Boundary

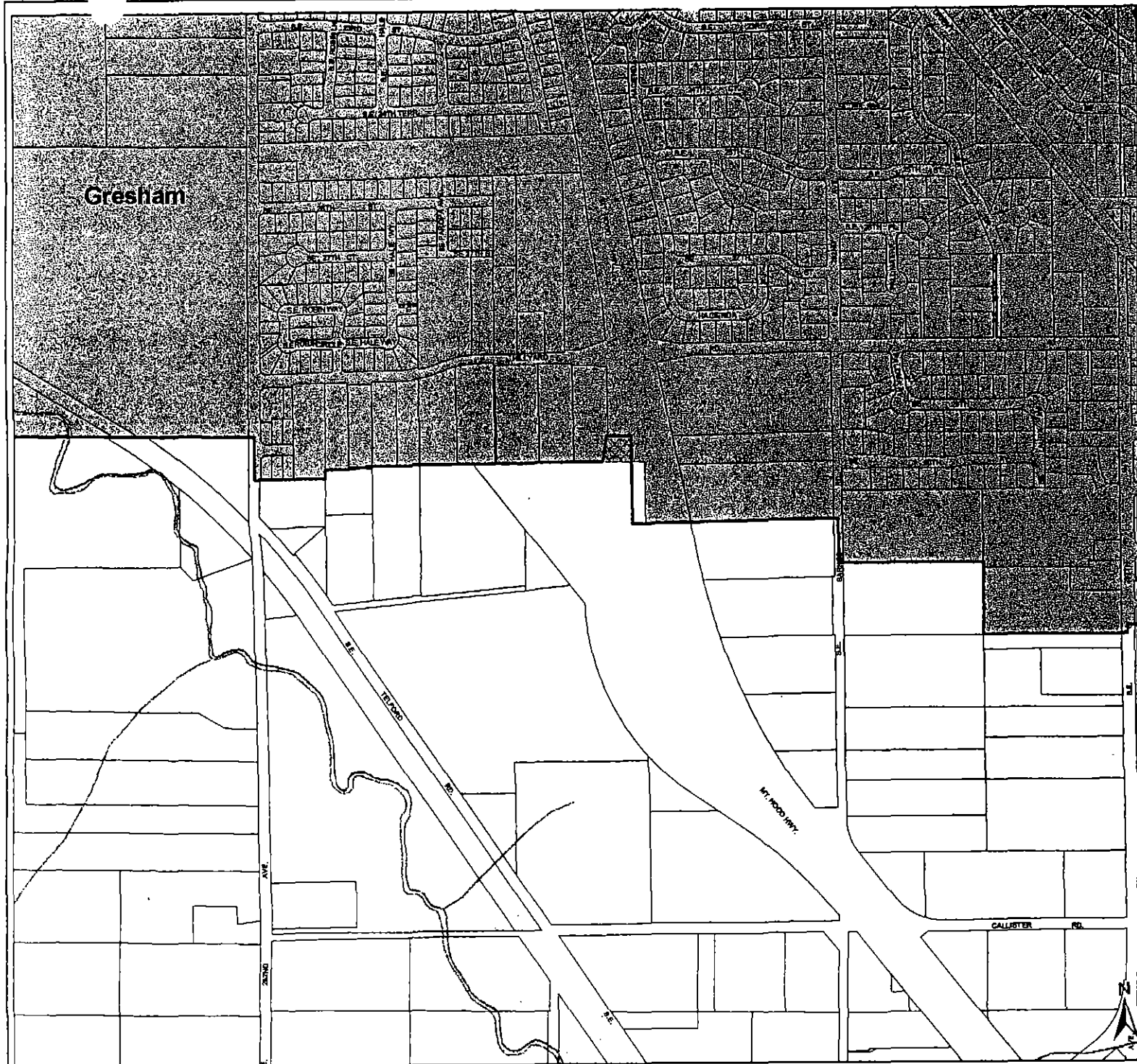


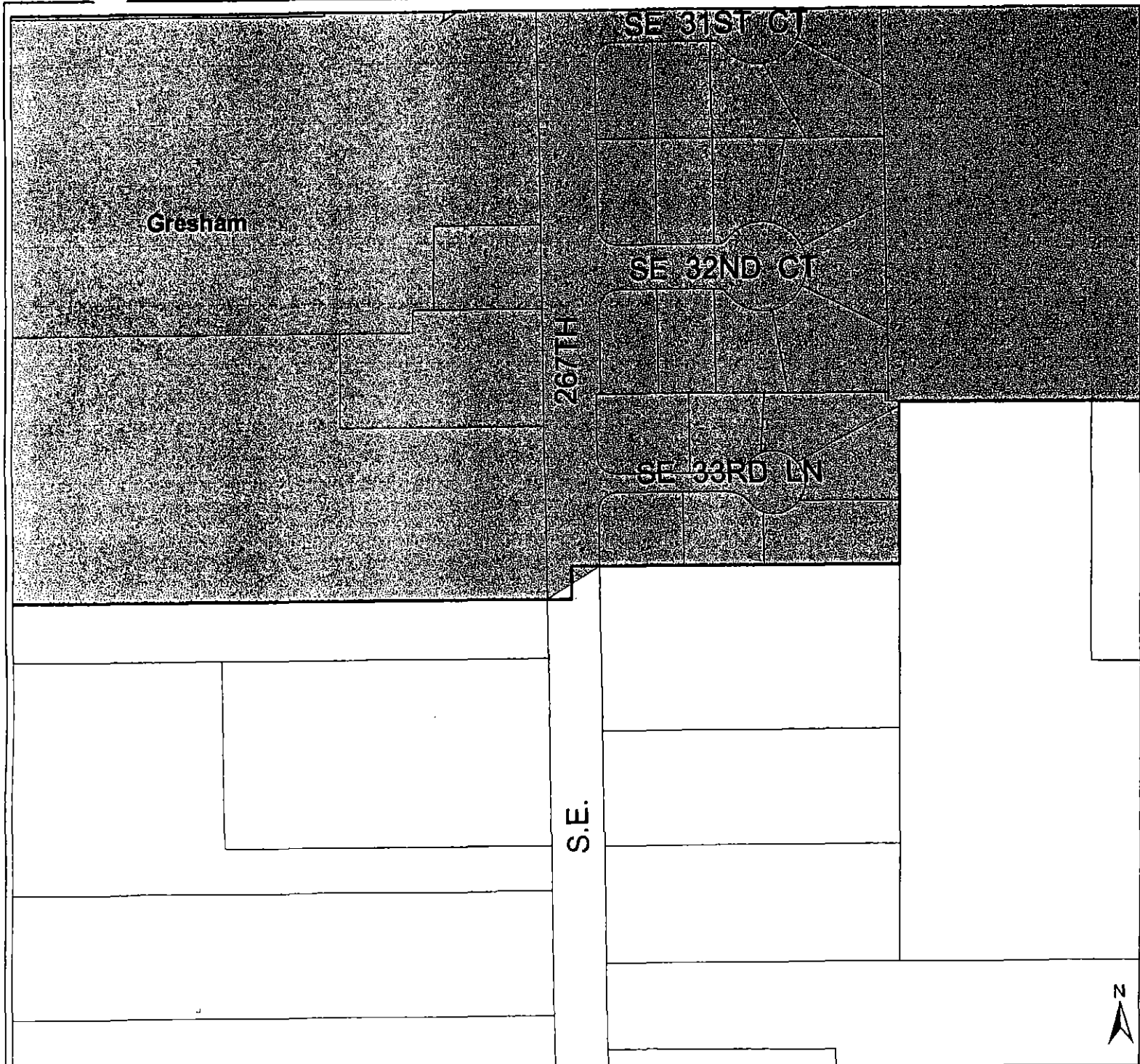
SOURCES:
TAX LOT MAP
 County Assessment and Taxation office, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Seawater, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

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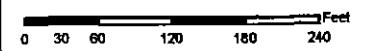




Area 18 (Map 14)
Gresham

UGB Technical Amendments
July 2002

- UGB
- ▨ Proposed UGB Amendment
- Metro Jurisdictional Boundary



SOURCES:
TAXLOT MAP
 County Assessment and Taxation Office, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Clatsop, Multnomah, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.




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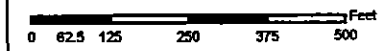


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Area 19 (Map 15) Gresham

UGB Technical Amendments July 2002

-  UGB
-  Proposed UGB Amendment
-  Metro Jurisdictional Boundary

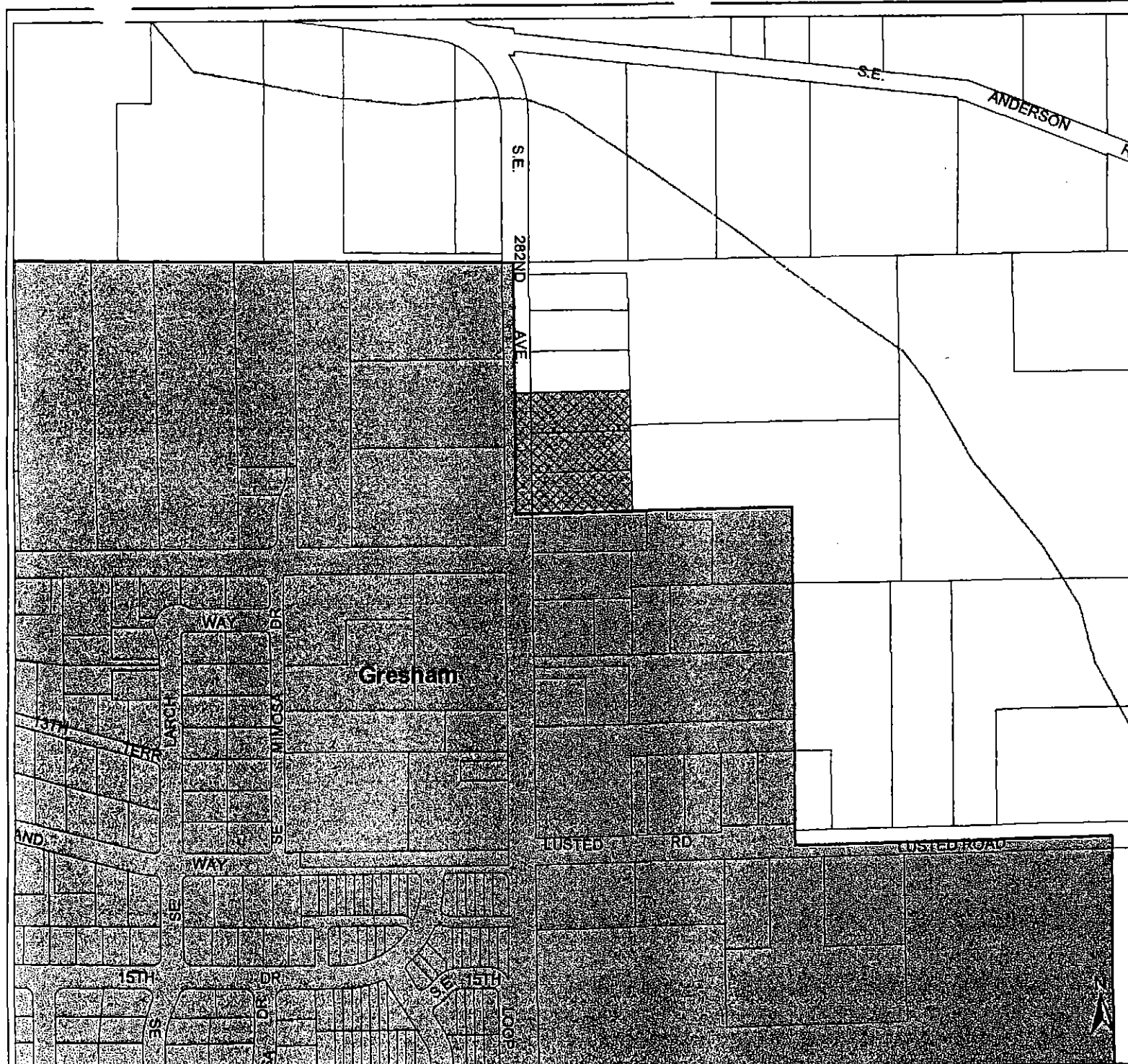


SOURCES:
TAX LOT MAP:
 County Assessment and Taxation office, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

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R L I S
 REGIONAL LAND INFORMATION SYSTEM

Area 20 (Map 16)

Tualatin


UGB Technical Amendments
 November 2002

— UGB
 — Metro Jurisdictional Boundary
 Proposed UGB Amendment
 Tualatin

0 60 120 180 240 Feet

SOURCES:
 TAX LOT MAP
 County Assessment and Taxation office, 2001. Data collection scale is 1"=100' in urban areas and 1"=200' or 1"=400' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Milwaukie, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.





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N

Area 21 (Map 17) Hillsboro

UGB Technical Amendments
November 2002

-  UGB
-  Metro Jurisdictional Boundary
-  Proposed UGB Amendment
-  Hillsboro



SOURCES:
TAX LOT MAP
County Assessor and Taxation offices, 2001. Data obtained under 1"=100' in urban areas and 1"=200' in rural areas. Horizontal accuracy is plus or minus five feet or better in Beaverton, Hillsboro, Oregon City, Tigard and Multnomah County. Other areas are plus or minus ten feet.

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REVISED
HOUSING NEEDS ANALYSIS

January 24, 2003

I. REPORT PURPOSE AND SUMMARY

This Housing Needs Analysis provides the details behind the housing need and capacity assumptions in the "Urban Growth Report: A Residential Land Need Analysis" (UGR). This analysis compares housing needs with observed trends in housing mix, density and cost and provides an assessment of present and future housing affordability.

The analysis confirms the importance of comparing long-term and short-term data, particularly as part of a decision that looks 20 years into the future. Recent trends in density and mix of housing types, for example, show that the region is falling short of some of its density and housing mix goals: the density of residential development has achieved only 86 percent of the assumptions in the UGR. During a portion of that period (1996 – 98), however, actual residential density exceeded density goals. Data reveal that density tracks closely with economic cycles and with the percentage of multi-family construction in the housing mix. During periods of strong economic growth, as in 1996-98, residential density and the multi-family share of residential construction increase. In periods of economic slowdown, as experienced recently, density and multi-family share decrease.

Longer-term data show shrinking lot sizes (7,000 sq. ft. to less than 6,000 sq. ft. since 1995), an increasing percentage of attached single family housing units in the housing mix (from 4 – 6 percent of all housing to 15 – 20 percent since 1995), increasing density among single family attached units, and higher rates of residential infill and redevelopment. Given that Metro forecasts a return to economic growth during the 20-year planning period, the data support the long-term assumptions underlying the UGR. Metro's performance measurement program will provide regular indications to help determine whether Metro's actions to increase housing and employment density in Centers, Station Communities, Main Streets and Corridors are succeeding and whether "corrective action", as that term is used in ORS 197.302, is necessary.

Relation to Legal Requirements and Formatting

The attached figures contain the information required to address "housing needs" requirements in ORS 197.296 and 197.303. For ease of reference, the figures are numbered to correspond to the sections of those statutes:

- Figures 3.1 through 3.3 address the housing capacity and need requirements of ORS 197.296(3)(a) and (b)
- Figures 4.1 AB, C and D address the "buildable lands" inventory requirements of ORS 197.296(4)(a)(A), (B), (C) and (D)
- Figures 5.1 through 5.6 address the housing capacity and need requirements of ORS 197.296(5)(a)(A) and (B)
- Figures 5E.1 and 5E.2 address the housing trend requirements of ORS 197.296(5)(a) (E) for which data are available
- Figure 6.1 reconciles the calculations of housing land need in this analysis and the UGR
- Figures 303.1 through 303.4 address the "needed housing" requirements of ORS 197.303.

Note on Statutory Requirements

ORS 197.296(5)(a)(E) requires Metro to provide the number, density and mix of housing types that have occurred on vacant, partially vacant, mixed-use, and infill and redevelopment lands. Not all of this information is presently available to Metro. Metro will generate the data using special retrospective studies later in 2003. These studies will provide useful information about various housing sub-markets. But the data are supplementary only to the density trends and housing mix depicted in this report and will not affect Metro's analysis of capacity or need, the

assumptions in the UGR, or the policy decisions in Task 2 to expand the UGB and achieve a higher rate of infill and redevelopment (“refill”).

II. ANALYSIS OF DATA

Figures 3.1 through 3.3

Figure 3.1 displays actual housing demand and supply by type and tenure for the year 2000 and Metro projections for the year 2022. In the year 2000, for owner tenure, single-family detached units dominate, while apartments dominate for renter tenure. It is noteworthy that 21 percent of rental dwellings are single-family detached units. Overall, single family detached units comprise 61 percent of housing stock; multi-family units comprise about 33 percent; single-family attached and manufactured dwellings comprise the remainder.

By the year 2022, Metro projections indicate that higher density housing types will increase their market share of both owner-occupied and renter-occupied dwellings. Single-family market share drops from 61 to 57 percent; attached housing and manufactured housing shares increase from 7 to 10 percent. Of all the housing constructed between the year 2000 and 2022, single family housing will comprise 47 percent and higher density housing will constitute 53 percent. This shift in housing mix reflects the market response to the land regulation and transportation investment policies of Task 2 decisions and Metro's 2040 Growth Concept.

Exhibit 3 (b): Data Satisfying ORS 197.296 (3) (b)

Figure 3.1: Regional Housing Demand and Supply 2022, By Type and Tenure (Occupied Units)

Owner	Year 2000	Percent 2000	Year 2022	Percent 2022
Single Family Detached	270,766	88.7%	372,135	78.9%
Single Family Attached	10,395	3.4%	37,597	8.0%
Townhouse/Condominium	9,814	3.2%	37,845	8.0%
Manufactured	14,366	4.7%	23,839	5.1%
Subtotal	305,341	100.0%	471,415	100.0%
Renter				
Single Family Detached	43,924	20.8%	41,216	16.0%
Single Family Attached	7,663	3.6%	9,789	3.8%
Apartment	158,172	74.8%	202,730	78.7%
Manufactured	1,713	0.8%	3,864	1.5%
Subtotal	211,472	100.0%	257,598	100.0%
Total				
Single Family Detached	314,690	60.9%	413,350	56.7%
Single Family Attached	18,058	3.5%	47,386	6.5%
Townhouse/Condo./Apt.	167,986	32.5%	240,574	33.0%
Manufactured	16,079	3.1%	27,702	3.8%
Total	516,813	100.0%	729,013	100.0%

Sources: Year 2000 Bureau of Census and MetroScope. Year 2020 and 2025 MetroScope.

Figure 3.2 presents the density ranges, median lot sizes and median density per net and gross buildable acre used to calculate capacity by housing type. Figure 3.2 also shows the gross density to net density adjustment factor, observed refill rates, assumed vacancy rates and assumed under-build rates applied to determine housing capacity by type for the period 2000 – 2022.

Exhibit 3 and 7: data satisfying ORS 197.296 (3) (b) and part of (7)

Figure 3:2 Regional Housing Land Demand Factors 2000 – 2022, By Type (Occupied Units)

	Density Range in Square Feet	Median Lot Size (sq.ft.) Base Case 2000 -22	Median Number of Units per Net Buildable Acre	Average Gross to Net Adjustment Factor	Average Refill Factor	Average Vacancy Rate Adjustment	Average Underbuild Factor Adjustment	Observed Density Per Gross Buildable Acre
Single Family Detached	4,350 - 43,500	5,500	7.9	0.65	0.764	1.04	0.8	5.6
Single Family Attached	1,750 - 4,350	3,500	12.4	0.55	0.764	1.04	0.8	7.5
Townhouse/Condominium	450 - 3,500	1,400	31.1	0.55	0.711	1.04	0.8	20.0
Manufactured	1,750 - 43,500	3,600	12.1	0.55	0.711	1.04	0.8	7.8
Average Weighted Density in Units per Net Acre:(43,560/lot size)			16.7	"Observed" Average Weighted Density in Units per Gross Acre:($L*M/N*O*P$)				10.9

Source: 2000 - 2022 Urban Growth Report and MetroScope Base Case Summary

The final column of Figure 3.2, Observed Density Per Gross Buildable Acre, and shows the gross buildable acres of residential consumption in a given year divided by the total building permits issued for that year. The number displayed includes housing built on vacant land (seven to eight units per gross buildable acre) and housing built on “refill” (developed) land (29 percent refill rate), yielding the weighted average of 10.9 units per gross acre (Metro’s assumed long-term, overall density).

Figure 3.3 shows the gross buildable acres used to accommodate the 212,200 occupied units (220,700 units when adjusted for a four percent vacancy rate). After adjusting for the refill rate, vacancy rate and under-build factors, total vacant land required in gross buildable acres amounts to 28,825 acres. Of that amount, single family detached housing consumes 66 percent. Below, the analysis compares this land requirement to the inventory of buildable land within the UGB prior to the Task 2 expansion.

Figure 3:3 Regional Housing Land Demand Gross Buildable Acres 2000 - 2022

	Unadjusted Gross Acres	Gross Acres Adjusted Refill, Vacancy & Underbuild
Single Family Detached	19,165	19,034
Single Family Attached	4,284	4,255
Townhouse/Condominium	4,242	3,921
Manufactured	1,747	1,614
Total	29,438	28,825

Exhibit 6: Data Satisfying ORS 197.296 (6), by type (occupied units)

Figures 4.1AB, C and D

Figures 4.1AB, C and D contain the inventory of gross buildable acres. Figure 4.1AB depicts the gross buildable acres of residential land by “vacant” and “partially vacant” categories. Of the nearly 24,000 acres of land, 9,000 acres are vacant and 15,000 acres are partially vacant. Mixed-use land comprises a subset of vacant and partially vacant land. Figure 4.1C shows the distribution of over 4,000 acres of mixed-use land between vacant and partially vacant. The 4,000 acres of mixed-use land is a resource for both residential and nonresidential development.

Figure 4.1 AB: Vacant and Partially Vacant Land Inside the UGB - Year 2000

ZONE_CODE	Vacant	Partially Vacant	Total
MFR2/MUC3	159	178	337
MFR1/MUC2	1,177	1,363	2,540
SFR7/MUC1	683	719	1,402
SFR6	186	245	432
SFR5	169	184	353
SFR4	1,487	1,853	3,341
SFR3	1,859	2,695	4,554
SFR2	1,037	2,576	3,613
SFR1	412	785	1,198
RUR2	1,732	4,448	6,180
Grand Total	8,904	15,050	23,954

Figure 4.1 C: Mixed Use Subset of Vacant & Partially Vacant Land - Year 2000

ZONE_CODE	Vacant	Partially Vacant	Total
MFR2/MUC3	159	178	337
MFR1/MUC2	1,177	1,363	2,540
SFR7/MUC1	683	719	1,402
Grand Total	2,020	2,260	4,280

Figure 4.1D presents developed acres within the UGB (prior to the Task 2 expansion) with potential for additional residential development during the planning period through infill or redevelopment (refill). The amount of refill depends on owner preferences, prices, regional growth and government policy. As a result of existing new Metro policies (explained in UGR, pp. 25-29), Metro expects 38,000 new dwelling units on 6,300 refill acres. Metro anticipates another 17,000 units to be produced within existing urban renewal districts during the same time frame. Urban renewal district land is not conventionally zoned residential and is not displayed in Figure 4.1D. However, experience and modeling indicate substantial residential capacity in mixed-use, urban renewal districts.

Figure 4.1 D: "Refill Land" in Acres - Year 2000

ZONE_CODE	"Refill Acres"	Estimated DU Capacity
MFR1	722	11,148
MFR2	138	4,262
SFR1	15	19
SFR2	611	1,321
SFR3	1,260	3,890
SFR4	2,178	8,741
SFR5	135	628
SFR6	869	5,366
SFR7	365	2,704
Grand Total	6,295	38,084

Figures 5.1 through 5.6

Figures 5.1 through 5.6 establish the actual measured and observed development data for comparison with the "planned or projected" data contained in Figures 3.1 through 3.3. The figures provide at least five years of data on the number, density and average mix of housing types and the trends in density and average mix of housing types that have occurred in the urban area.

Figure 5.1 provides historical data beginning in 1979 on land consumption within the UGB. During the 22 years covered by the data, land use data collection has undergone a number of reclassifications and labeling changes. To the extent possible, the analysis normalizes the past history to be consistent with the land use classification and monitoring procedures used in the 2001 land inventory. There is, however, insufficient detail to adjust all land accounts for 1979 to be consistent with present land accounting procedures. Also, Figure 5.1 does not contain data for the years 1993 and 1999, though measurement methods account for land consumption during those years. Figure 5.1 indicates that 35,015 gross buildable residential acres were vacant in 1992. By 2001, vacant buildable land had declined to 22,549, a consumption rate of almost 1,400 acres per year over the nine-year period. Similarly, in 1992, nonresidential gross buildable vacant acres amounted to 17,045. By 2001, the amount was 12,496, indicating a consumption rate of 500 acres a year over the period. Together, residential and nonresidential consumption amounted to 1,900 gross buildable acres per year over the nine-year period. In fact, total gross buildable acres consumed for the entire period 1979 – 2001 amounts to a little over 1,900 acres per year.

Exhibit 5 (a) (A) (B):satisfies ORS 197.296 5(a) (A) and (B)

FIGURE 5.1: METRO UGB HISTORICAL LAND USE CONSUMPTION: 1979 - 2001

Major Land Uses	Year									
	1979	1992	1994	1995	1996	1997	1998	2000	2001	
Developed Land	146,719	173,537	179,501	182,173	184,757	186,777	188,763	191,795	193,260	
Vacant Land	85,856	61,788	55,826	53,155	50,569	48,549	46,563	43,531	42,068	
Total	232,575	235,325	235,327	235,328	235,326	235,326	235,326	235,326	235,328	
Vacant Land Detail	1979	1992	1994	1995	1996	1997	1998	2000	2001	
Residential Vacant	55,268	35,015	32,016	29,903	28,348	27,150	26,097	23,954	22,549	
Nonresidential Vacant	14,788	17,045	15,503	15,014	14,289	13,934	13,133	12,646	12,496	
Open Space, Agriculture, Rural Residential	7,982	715	626	633	682	375	242	263	349	
Total Gross Buildable Acres	78,037	52,775	48,145	45,550	43,319	41,458	39,472	36,863	35,394	
Constrained Acres	7,819	9,013	7,681	7,605	7,250	7,091	7,091	6,668	6,668	
Total Vacant Land	85,856	61,788	55,826	53,155	50,569	48,549	46,563	43,531	42,062	

**Acreages may not add within 5 - 50 acres due to differences in vacant and developed land coverages.

Historical data are adjusted to be consistent with 2001 land classification system and procedures except 1979.

Notes: 2000 developed land increased 1,096 acres to reflect reclassification from constrained land to parks developed in 2001.

YR 2000 constrained ac. reduced 1,472 to 6,668: due to reclass of parks to developed, 376 ac. for back out of Bethany/Stafford UGB exp.

YR 2001 residential vacant increase 6,760 acres to show rural residential and agriculture inside UGB in the proper future zone class.

YR 2000 residential vacant reduced 885 ac. to account for loss of Bethany/Stafford & reclassification of 319 ac. to mixed use commercial.

YR 2000 nonresidential vacant increase 319 acres to account for reclassification of residential vacant to mixed use commercial.

YR 1998 increased to account for 215 constrained acres to parks and 876 developed acres from Pleasant Valley, et al UGB expansion.

YR 1998 increased 423 acres to account for constrained acres in Pleasant Valley, et.al. UGB expansion.

Source: MSD, Tech. Memo No. 6, Land Use and Vacant Land Inventory: Methodology and Data Summaries, (January 1979), p. 12, p.25, p.34. Metro Regional Data Book, 1998 Edition, pp. 93-94.

Figure 5.2 displays residential density in gross buildable acres over the period 1992 – 2001. The figure presents data for all possible combinations of base year and period length. Starting on the row entitled "Density with 92 Base", 17,414 units were built in 1993 and 1994 at 5.8 dwelling units per gross buildable acre. The cumulative density for the 1993 - 1995 period is 5.7 units per acre. For the nine-year period 1993 to 2001, the cumulative density is 7.5 units per

gross buildable acre. To derive the average density for the last five years, begin on the row entitled "Density with 96 Base" and read the number in the 2001 column: 8.8 units per gross buildable acre, the average rate for the last five years. To derive one-year rates, start with the row of the previous year and read the number in the column for the chosen year. For instance, the rate for 1998 is on the row entitled "Density with 97 Base" in the 1998 column: 11.7 units.

Figure 5.2 shows a period of increasing density from 1995 through 1998 and a period of decreasing density that began in 1999 and continues through 2001. This pattern owes to changes in the single family and multi-family mix that, in turn, relates to the regional economic growth cycle. 1995 - 1998 was a period of rapid growth and a high level of multi-family construction. Since 1999, the regional economy reduced its rate of growth and multi-family construction slowed considerably. This is reflected in lower densities in this short period.

FIGURE 5.2: DWELLING UNIT DENSITY TRENDS BY BASE YEAR FOR 1992 - 2001								
	Year							
	1992	1993 & 1994	1995	1996	1997	1998	1999 & 2000	2001
Estimated UGB Dwelling Units	NA	17,414	11,692	13,105	13,086	12,286	17,298	8,209
Density with 92 Base	NA	5.8	5.7	6.3	7.0	7.6	7.7	7.5
Density with 94 Base	NA	NA	5.5	6.8	7.8	8.5	8.4	8.0
Density with 95 Base	NA	NA	NA	8.4	9.5	10.1	9.4	8.7
Density with 96 Base	NA	NA	NA	NA	10.9	11.3	9.7	8.8
Density with 97 Base	NA	NA	NA	NA	NA	11.7	9.3	8.2
Density with 98 Base	NA	NA	NA	NA	NA	NA	8.1	7.2
Density with 00 Base	NA	NA	NA	NA	NA	NA	NA	5.8
Density with 01 Base	NA	NA	NA	NA	NA	NA	NA	NA

Source: Metro 1996-97 Population-Households-Dwelling Units, (1998), Metro Regional Data Book 2002 (Available on line at metro-region.org), Metro 1995, Population-Households-Dwelling Units (1996); Metro 1994 Population-Households-Dwelling Units (1995); Metro 1990 - 2040 Regional Forecast (1993); Real Estate Report for Metropolitan Portland (Spring 1998), pp 4 - 13; Metro Regional Data Book Sept. 2002, Data Resource Center (www.metro-region.org) pages 77 - 87.

Notes: Dwelling unit count is estimated for UGB by factoring down 3 County dwelling unit counts by subtracting.

A comparison of Figures 5.2 and 3.2 shows that Metro expects residential density to increase during the period 2000 to 2022 from the observed rate between 1995 and 2001. The average, observed residential density 1995 to 2001 in Figure 5.2 is 9.4 units per acre, although density topped 10 units per acre in 1997 and 1998. The Figure 3.2 target is 10.9 units per acre for the planning period. (Note: both figures include refill development.) A combination of new policies, described in the UGR (pp. 25-29), together with the projected improvement in the economy (see Regional Employment Forecast, 2000 to 2030), will increase density to 10.9 units.

Figure 5.3 explains the 1992 - 2001 density trends observed in Figure 5.2 above. Figure 5.3 presents the number of single family and multi-family units constructed within the UGB during the period 1992 - 2001. In the 1992 - 1994 period, when the regional economy was recovering, single-family dwellings comprised 70 percent of regional construction and overall densities were relatively low. By contrast, in the 1995 - 1998 period of quickening economic development, the single family share of the housing market dropped below 54 percent and densities rapidly rose above 10 units per gross buildable acre. Starting in 1999, regional economic growth slowed, single family market share climbed over 71 percent and residential density declined to 7.2 units per gross buildable acre (1999 - 2001). Although changes in the size of new lots, the gross to net ratio and the refill rate affect residential density, a change in the mix of dwelling unit types has the most significant effect on density and land consumption. During the entire nine-year period 1995 - 2001, multi-family units comprised 38.6 percent of total

production. By way of comparison, Figure 3.1 indicates that multi-family units will comprise 34.2 percent of production for the period 2000-2022. An increase in the density of multi-family dwellings will offset this smaller multi-family dwelling share of the market.

FIGURE 5.3: DWELLING UNIT NUMBER AND AVERAGE MIX BY TYPE 1992 - 2001

Dwelling Unit Type	Year								
	1992	1993 & 1994	1995	1996	1997	1998	1999 & 2000	2001	Total
Total Est. UGB Dwelling Units	NA	17,414	11,692	13,105	13,086	12,286	17,298	8,209	93,090
Single Family	NA	12,147	6,293	6,781	6,731	7,033	12,109	6,067	57,161
Multi-Family	NA	5,267	5,399	6,324	6,355	5,253	5,189	2,142	35,929
Percent Multi-Family	NA	30.2%	46.2%	48.3%	48.6%	42.8%	30.0%	26.1%	38.6%

Source: Metro Regional Data Book Sept. 2002, Data Resource Center (www.metro-region.org) pages 77-87. Metro 1996-97 Population-Households-Dwelling Units, (1998); Metro 1995, Population households-Dwelling Units, (1996); Metro 1994, Population-Households-Dwelling Units, (1995); Metro 1990 - 2040 Regional Forecast, (1993); Real Estate Report for Metropolitan Portland (Spring 1998), pp 4-13. Notes: Dwelling unit count is estimated for UGB by factoring down 3 County dwelling unit counts by subtracting Districts 18, 19 and 20 from County totals.

Figure 5.4 shows sales price, median house size, lot size and imputed density trends for new single-family homes. From 1995 to 2000, the trend was rising home prices and declining lot sizes. (The year 2001 data are incomplete; more complete data will probably show less dramatic declines in price, home size and lot size.) As prices rose, lot size decreased and number of units per gross acre increased. Throughout this period building permit data indicate total single-family construction has been relatively steady, between 6,000 and 7,000 units per year. Data in Figure 5.4 include single family attached as well as detached housing. The year 2000 density of 4.8 units per acre compares to a target density of 6.0 (weighted average derived from Figure 3.2) for the combination of detached and attached single family dwellings measured in this series. The trend toward increasing density shown on Figure 5.4 will be reinforced by the new policies described in the UGR (pp. 25-29).

**FIGURE 5.4 SINGLE FAMILY PRICE, HOUSE SIZE AND DENSITY 95 - 2001
County Assessor Single Family Home Sales Data and Building Permit Data**

Year Sold	Median Sale Price	Median House Size	Median Lot Size	Units per Gross Acre	New Permits
1995	169,000	1,858	6,738	4.2	6,293
1996	179,000	1,896	6,698	4.2	6,781
1997	191,000	1,957	6,481	4.4	6,731
1998	192,000	1,882	5,996	4.7	7,033
1999	204,000	1,958	6,151	4.6	6,055
2000	204,000	1,982	5,857	4.8	6,055
2001	187,000	1,792	5,132	5.5	6,067

Source: 95-96, 97-99 and 99-2001 Single Family Home Price Studies (Metro, DRC), Metro Regional Data Book.
Note: Includes single family attached data shown separately in Figure 5.6

Figure 5.5 provides data similar to Figure 5.4 for multi-family units. Here, median rent applies to all multi-family units rather than only newly constructed units. Data are based upon observations of density for newly built units in three years, 1995, 1999 and 2001. The 1995 density per gross buildable acre is higher than 1999 or 2000. Significantly, multi-family output in 1995 was double multi-family output in 1999 or 2000. The average weighted density for the limited data series is 17.7 units per gross buildable acre, below the Figure 3.2 target density for multi-family of 20 units per acre. The new policies, described in the UGR (pp. 25-29), together with forecast economic improvement, will increase density to 20 units per acre during the planning period.

Exhibit 5 (a) (A) (B): satisfies ORS 197.296 5(a) (A) and (B)

FIGURE 5:5 AVAILABLE MULTI-FAMILY RENT AND DENSITY DATA 94 - 2000

Year Permitted	Median Rent	Units per Gross Acre	New Permits
1994	529	no data	2,634
1995	572	22.0	5,399
1996	599	no data	6,324
1997	616	no data	6,355
1998	634	no data	5,253
1999	658	11.4	2,595
2000	716	15.1	2,595
Weighted Average Density (95,99 & 00)		17.7	

Sources: Metro Regional Data Book, Baseline Urban Growth Data (DRC, 1997), HUD, Fair Market Rents Fiscal Year 2000.

Figure 5.6 lists attached and detached single-family units by year built. Data come from the home sales survey and make the assumption that all homes built on lots of less than 3,500 square feet are attached units. Figure 5.6 indicates that the attached share of single-family home

construction has been steadily increasing over the period 1995-2000. (The year 2001 reflects an incomplete sample in the home sales record.) In 1995 small lot or attached housing comprised 6.2 percent of the newly built single-family stock. By the year 2000 small lot comprised almost 20 percent of that stock. Over the entire period 1995-2001, attached single-family units comprise 11.9 percent of production. The percentage will rise to the 13.8 percent target derived from Figure 3.1 by 2022.

Exhibit 5 (a) (A) (B): satisfies ORS 197.296 5(a) (A) and (B)

FIGURE 5:6 SINGLE FAMILY DETACHED, ATTACHED, AVERAGE MIX AND DENSITY 95- 2001

3 County Assessor Single Family Home Sales Data

Year Built	Attached Units	Detached Units	Total Units	Percent Attached	Percent Attached on Lots less than 3500 Sq. Ft.
1995	144	2,187	2331	6.2%	100%
1996	225	4,840	5065	4.4%	100%
1997	265	3,373	3638	7.3%	100%
1998	324	2,533	2857	11.3%	100%
1999	751	3,671	4422	17.0%	100%
2000	807	3,314	4121	19.6%	100%
2001	233	464	697	33.4%	100%
Totals:	2,749	20,382	23,131	11.9%	100%

Figures 5E.1 and 5E.2

Figures 5E.1 and 5E.2 are place-holders for data on the number, density and average mix of housing types by the land categories specified in sections ORS 197.296(4)(a). Other than two years of data on refill reported in Figure 5E.2, Metro has no data collected by these land categories. These data will be collected on a net-acre basis using special retrospective studies and sampling techniques in 2003.

FIGURE 5E:1 NUMBER, DENSITY & AVERAGE MIX OF HOUSING TYPES ON VACANT, PARTIALLY VACANT, MIXED USE & INFILL LAND

Year	Single Family						Multi-Family					
	Other Vacant		Partially Vacant		Mixed Use Vacant		Partially Vacant		Mixed Use Vacant		Total Vacant	
	Number	Units/Acre	Number	Units/Acre	Number	Units/Acre	Number	Units/Acre	Number	Units/Acre	Number	Units/Acre
1995-				no		no						no
1996	no data	no data	no data	data	no data	data	no data	data	no data	data	5,036	data
1996-				no		no						no
1997	no data	no data	no data	data	no data	data	no data	data	no data	data	no data	data
1997-				no		no						no
1998	no data	no data	no data	data	no data	data	no data	data	no data	data	3,709	data
1998-				no		no						no
1999	no data	no data	no data	data	no data	data	no data	data	no data	data	no data	data
1999-												
2000	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
2000-												
2001	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD

FIGURE 5E:2 AVAILABLE REDEVELOPMENT AND INFILL DATA

Year	Single Family				Multi-Family			Overall Total	Units per Acre
	Redevelopment	Infill	Total	Units per Acre	Redevelopment	Infill	Total		
1995 - 96	331	1,645	1,975	no data	327	961	1,288	3,263	no data
1996 - 97	no data	no data	no data	no data	no data	no data	no data	no data	no data
1997 - 98	315	1,373	1,688	no data	823	721	1,544	3,231	no data
1998 - 99	no data	no data	no data	no data	no data	no data	no data	no data	no data
1999 - 00	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
2000 - 01	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD

TBD = "To Be Determined"; Data will be provided by retrospective study conducted in 2003.

Figure 6.1

Figure 6.1 provides reconciliation between the land demand (need) depicted in Figure 3.3, the available residential land resource for the year 2000 shown in Figure 5.1, and the capacity estimate in the Urban Growth Report (UGR, Table 1, p. 3). Figure 3.3 shows 28,825 gross buildable acres of residential demand, given the product mix in Figure 3.1 and the assumptions for density, gross to net ratio, refill, vacancy and underbuild shown in Figure 3.2. Figure 6.1 shows 23,954 acres of vacant, gross buildable acres available for housing, a shortfall of 4,871 acres. At the target of 7.95 units per gross acre for vacant land (no adjustment for refill), this yields a shortfall of 38,700 units, compared to the UGR deficit of 37,400 units.¹

Figure 6:1 Regional Housing Land Demand and Supply Gross Buildable Acres from 2000 - 2022

Reconciliation to Urban Growth Report Capacity Estimate and Need	
Gross Buildable Acres of Supply	23,954
Gross Buildable Acres of Demand	28,825
Difference:	(4,871)
Equivalent Number of Dwelling Units at an Average Density per Gross Acre	38,723
UGR Dwelling Unit Need:	37,400
Difference:	1,323

Source: 2000 - 2022 Urban Growth Report

¹ Slight differences between the Housing Needs Report and the Urban Growth Report Assumptions in refill rates by housing type and density by housing type yield the 1300 dwelling unit difference. For purposes of comparison with actual observed trends, we do not consider this a material discrepancy.

Overview for Figures 303.1 through 303.3

These figures provide supporting documentation to determine the amount of land necessary to accommodate housing for a 20-year time span. "Housing need" must, under state law, be determined by type and rent/housing price ranges. Accordingly, Figure 303.1 presents total dwelling units within the UGB in 2000 and projections for 2022 by rent/price range and type. Figure 303.2 depicts details of housing type by tenure for 2000 and 2022. Figure 303.3 contains an "affordability analysis" using the 30 percent of income standard for the year 2000 and 2022.

Data for the year 2000 and earlier years come primarily from the Year 2000 Census STF-3 files and data published for the Portland Metropolitan Area in the American Housing Survey. These data are supplemented by detailed data available from the year 2000 calibration run of MetroScope, Metro's integrated land use and transportation model. Year 2022 estimates are obtained from the MetroScope Base Case run.

The data presented in the accompanying figures and tables derive primarily from MetroScope modeling. In this sense "need" takes on an explicit economic definition that, from a regional real estate perspective, is consistent and complete. On the demand side of "need", the housing quantities - along with the accompanying prices/rents, tenure and housing type choices - represent what consumers are willing to pay given their income, age and household size and preferences for neighborhood, housing quantity and travel time to work. On the supply side of "need", the housing quantities, types, price and rents represent the adjustment of the vintage housing stock to demand prices and suppliers' responses to housing prices throughout the region given land availability, land prices, zoning, economies of scale factors and development costs. Responses of consumers and suppliers are statistically estimated based on actual data. MetroScope inputs are the Base Case assumptions that provide a 20-year supply of vacant residential land within the UGB, the Priority Regional Transportation Plan, and UGB expansion only onto land designates as exception areas.

Figure 303.1

Figure 303.1 summarizes the UGB total dwelling units in 2000 and estimates for 2022 by price/rent category. The figure also reports on the number of housing units by type in 2000 and estimates for 2022. In the year 2000, 542,000 dwelling units were located inside the UGB. By 2022, Metro estimates 763,000 dwelling units inside the UGB, an increase of 221,000 units.

Most notable from Figure 303.1 is the shift in numbers by price/rent category. Compared to the year 2000, the 2022 distribution is much more concentrated toward the higher end of the price/rent distribution. The result is that there are absolute decreases in the number of dwelling units with lower rents and prices. The number of units in all rent categories below \$600 -750 per month and price categories below \$115,000 declines between 2000 and 2022. The shift upward in the price/rent distribution reflects a combination of increasing real incomes between 2000-2022 and very limited supply in high demand areas within the UGB² Accordingly, these factors increase UGB housing costs 47 percent over the period. This cost increase works out to 1.6 percent per year over the assumed 3 percent inflation rate. However, the owner occupied housing price increases are not out of line with past experience. Between 1980 and 2000 Metro housing prices increased 32 percent in real terms – a rate 1.4 percent per year over the inflation rate.

² **MetroScope Case Study Simulation**, July 2002, page 31 Figure 12, Year 2000 Spatial Pattern of Demand and Supply Mismatch and Figure 13, Year 2025 Spatial Patter of Demand and Supply Mismatch.

Figure 303.1: Regional Housing Demand and Supply 2022, Base Case Assumptions (All Housing Units)

Monthly Rent	Approximate House Value	Total Number of Units Year 2000	Total Number of Units Year 2022	Total Difference Units 2000 - 22	Detached Housing		Attached Housing	
					Single Family & Manu. Units on Detached Lots	Manu. Units in Parks	Attached Single Family	Apartments Townhouses Condominiums
\$0 - 299	< \$50,000	13,877	-	(13,877)	N/A	N/A	N/A	A,R
300 - 399	50,000 - 59,999	16,171	1,692	(14,479)	N/A	N/A	N/A	A,R
400 - 499	60,000 - 74,999	17,864	8,353	(9,511)	N/A	N/A	N/A	A,R
500 - 599	75,000 - 89,999	46,425	40,663	(5,762)	O	O	A,R	A,R
600 - 749	90,000 - 114,999	91,137	89,126	(2,011)	O	O	A,R	A,R
750 - 999	115,000 - 149,999	109,710	119,593	9,883	O	O	O,A,R	O,A,R
1,000 - 1,165	150,000 - 174,999	58,101	99,618	41,517	O	O	O,R	O,R
1,166 - 1,330	175,000 - 199,999	58,101	76,004	17,904	O	O	O,R	O,R
1,330 +	200,000 and over	130,630	327,665	197,035	O	O	O,R	O,R
Total Units		542,015	762,715	220,700	113,962		30,761	75,977

"O" - housing that is expected to be primarily owner occupied.

"R" - housing that is expected to be primarily renter occupied

"A" - assisted housing

Data are for housing units and include both occupied housing and vacant housing assuming a 4% vacancy rate.

* Metro presently does not forecast location & quantity of manufactured homes w/ UGB but includes them in single family detached forecast.

Sources: Year 2000 Bureau of the Census, STF-3 and MetroScope (Years 2020 and 2025).

We expect 114,000 detached and manufactured dwelling units to be constructed, comprising roughly 52 percent of total housing output. Attached and multi-family units will amount to 107,000 units, 48 percent of housing output. In 2000, detached housing comprised 64 percent of occupied housing, while attached housing accounted for 36 percent. The shift toward higher density housing types reflects the increase in price/rent and a relative lack of single-family detached capacity in high-demand central city areas.

Figure 303.2

Figure 303.2 provides details of occupied housing by tenure and housing type for years 2000 and 2022. As noted earlier, higher density housing types are expected to increase market share substantially. This is particularly true for owner-occupied units: attached housing and townhouses/condominiums are expected to triple in number from year 2000 levels. Though housing prices are increasing, higher incomes and, in particular, greater wealth accumulation associated with increasing age will increase the home ownership rate from 59 to 65 percent. Price competition within the vintage housing stock results in an absolute decrease in the number of single-family detached homes being rented. In total, Metro expects an additional 46,000 renter-occupied single-family detached units to be constructed compared to 166,000 owner-occupied units.

Figure 303.2 summarizes the regional affordability analysis. Data are displayed for year 2000 and estimates are displayed for the year 2022. MetroScope estimates that 70,000 owners and 111,000 renters, 181,000 in total, are paying 30 percent or more of their income for housing in the year 2000. The year 2000 Census and the 1995 American Housing Survey (AHS) provide estimates of 163,000 and 193,000, respectively. The Census and AHS data are based on survey estimates while the MetroScope data are derived within the model from price indices for each location and tenure and from expenditure share equations calibrated with *Survey of Consumer Expenditure* data. The MetroScope methodology cannot account for subsidies. As a consequence, the MetroScope estimates for those renters spending more than 30 percent of their income on housing are probably 20,000 to 30,000 too high. However, the 2000

MetroScope results calibrate well with the 1995 and 2000 survey data and are a reliable basis to forecast 2022 conditions.

Figure 303.2: Regional Housing Affordability 2022, By Type and Tenure (Occupied Units)

<i>Owner</i>	Year 2000	Year 2022	Change 2000 - 22
Less Than 30% Income	235,708	325,753	90,046
Greater Than 30% Income	69,633	145,662	76,028
Total	305,341	471,415	166,074
<i>Median % of Income</i>	21.2%	23.1%	1.9%
Renter			
Less Than 30% Income	100,049	89,799	(10,251)
Greater Than 30% Income	111,423	167,799	56,377
Total	211,472	257,598	46,126
<i>Median % of Income</i>	31.3%	35.5%	4.2%
Total			
Less Than 30% Income	335,757	415,552	79,795
Greater Than 30% Income	181,056	313,461	132,405
Total	516,813	729,013	212,200
<i>Median % of Income</i>	25.3%	27.5%	2.2%

Sources: Year 2000 Bureau of Census, 1995 American Housing Survey & MetroScope Year 2025

By 2022, MetroScope estimates that an additional 76,000 owners and 56,000 renters will be paying in excess of 30 percent of their income on housing. The number of renters does not reflect the Metro Affordable Housing Technical Advisory Committee (H-TAC)³ expectation that 36,000 affordable rental units will be provided. By way of comparison, the 1990 and 1995 AHS data indicated that an additional 45,000 owners and renters were paying 30 percent or more of their income on housing within the period 1995-2000.

In assessing the affordability estimates, the distinction between owners and renters is noteworthy. Though owners are paying more for housing, they are also being compensated more in wealth accumulation owing to rising home prices. This explains why, paradoxically, home ownership (like stock market purchases), increases during times of rising home prices. Consequently, the renter data provide a more reliable assessment of housing affordability in terms of its social impact. However, Metro expects the region's anticipated⁴ affordable housing programs to offset much of the 56,000 renter household increase.

Another dimension of the social impact of rising housing cost is change in location utility, the value people put on housing quality and neighborhood location. People often move to avoid rising cost, but accept poorer quality housing in neighborhoods farther from their jobs. Estimates indicate that the number of single-family detached houses available to renters will decline by 3,000. In general, single-family price pressure may act to limit housing choice in terms of type and location for lower income households.

Figure 303.3 Discussion

Figure 303.3 compares year 2000 and year 2022 housing price/rent distributions with price/rent distributions computed using the 30 percent-of-income standard: if all households paid exactly 30 percent of their incomes for housing, the housing price/rent distribution would be as it appears in Figure 303.3. Comparing the 30 percent distribution to the actual year 2000 distribution, note a shortage of 49,000 housing units in the less-than-\$500 rent and less-than-

³ H-TAC, Regional Affordable Housing Strategy, Metro Growth Management Services Department, June 2000, 88 pages.

⁴ This underscores the importance of implementing the Metro affordable housing recommendations. To this end we have attached Metro's Title 7 (Affordable Housing) Compliance Report Summary as an Appendix to this report. The full report (Annual Urban Growth Management Functional Plan Compliance Report, December, 2002, may be obtained from Metro Growth Management.

\$75,000 purchase categories that would be occupied by households earning 50 percent or less of median household income. Census 2000 data suggest that 163,000 households pay more than 30 percent of income for housing. Comparing the number for year 2022, note a shortfall of 120,000 units in the same categories. MetroScope estimates that more than 300,000 households will be paying 30 percent or more of their incomes for housing by 2022. For a variety of reasons, many households choose to pay more than 30 percent of their income on housing; others choose to pay less. As a consequence, actual market behavior of households is substantially different from estimates of affordability obtained by applying the 30 percent standard to the income distribution. Nonetheless, the income method does substantiate modeling results that indicate a large increase in households paying more than 30 percent of their income for housing over the period 2000-2022.

**Figure 303.3: Regional Housing Affordability 2022 - 30% of Income Standard
By Type and Tenure (All Dwelling Units)**

Monthly Rent	Approximate House Value	Number of Units Year 2000	Number if 30% Standard	Mismatch with 30% Standard	Number of Units Year 2022	Number if 30% Standard	Mismatch with 30% Standard
\$0 - 299	< \$50,000	13,877	49,831	(35,954)	-	66,367	(66,367)
300 - 399	50,000 - 59,999	16,171	23,069	(6,897)	1,692	30,719	(29,027)
400 - 499	60,000 - 74,999	17,864	24,503	(6,639)	8,353	32,626	(24,273)
500 - 599	75,000 - 89,999	46,425	24,503	21,922	40,663	32,626	8,037
600 - 749	90,000 - 114,999	91,137	41,419	49,719	89,126	56,995	32,131
750 - 999	115,000 - 149,999	109,710	64,644	45,066	119,593	91,004	28,589
1,000 - 1,165	150,000 - 174,999	58,101	18,516	39,585	99,618	26,503	73,115
1,166 - 1,330	175,000 - 199,999	58,101	60,295	(2,195)	76,004	86,602	(10,597)
1,330 +	200,000 and over	130,630	235,236	(104,606)	327,665	339,272	(11,607)
	Total Units	542,015	542,015		762,715	762,715	

Sources: Based on income data reported in the Year 2000 Census and MetroScope income estimates for year 2025.

I:\gm\community_development\share\Revised HOUSING NEEDS ANALYSIS\Jan2403.doc

Draft Goal 10 Housing Needs Analysis Report

Sonny Conder, Principal Planner

Purpose

Oregon's State Land Use Planning Goal 10: Housing, supplies guidance for providing balanced housing opportunities.¹ This report is submitted to be in compliance with ORS 197.296.3(a) and (b), 5(a) and 197.303. The report constitutes part of the supporting documentation in accordance with statewide planning goals and rules relating to housing to determine the number of units and amount of land necessary to accommodate each of the needed housing types for a 20-year time span. "Housing need" as specified in State Law must be determined by type and by rent/housing price ranges. Accordingly, we have included Figure 1.1 that presents total dwelling units within the UGB in 2000 and projections for 2022 by rent/price range and type. Figure 1.2 depicts details of housing type by tenure for 2000 and 2022. Figure 1.3 contains an "affordability analysis" using the 30 percent of income standard for the year 2000 and 2022. Figure 1.4 provides further affordability information based on an alternative estimation methodology. Tables 1 through 8 in the Appendix provide additional details related to the computations depicted in Figures 1.1 through 1.3.

Origin of Data

Data for the year 2000 and earlier years come primarily from the Year 2000 Census STF-3 files and data published for the Portland Metropolitan Area in the American Housing Survey. These data are supplemented by detailed data available from the year 2000 calibration run of MetroScope, Metro's integrated land use and transportation model. Year 2022 estimates are obtained from the Base Case run of MetroScope.

Basis for Data Calculation

The data presented in the accompanying figures and tables derive primarily from MetroScope modeling. In this sense "need" takes on an explicit economic definition that from a regional real estate perspective is consistent and complete. On the demand side of "need" the housing quantities along with the accompanying prices/rents, tenure and housing type choices represent what consumers are willing to pay given their income, age and household size and preferences for neighborhood, housing quantity and travel time to work. On the supply side of "need" the housing quantities, types, price and rents represent the market adjustments to the vintage housing stock to demand prices and suppliers' responses to housing prices throughout the region given land availability, land prices, zoning, economies of scale factors and development costs. Responses of consumers and suppliers are statistically estimated based on actual data. MetroScope inputs are the Base Case assumptions that provide a 20-year supply of vacant residential land within the UGB, use the Priority Regional Transportation Plan, and limit UGB expansion to "exception areas."

Figure 1.1 Discussion

Figure 1.1 summarizes the Metro UGB total dwelling units in 2000 and estimates for 2022 by price/rent category. Figure 1.1 also reports on the number of housing units by type in 2000 and estimates for 2022. In the year 2000, 542,000 dwelling units were located inside the Metro UGB. By 2022 we estimate 765,000 dwelling units inside the Metro UGB assuming further expansion over time, an increase of 223,000. Table 1 in the Appendix provides additional detail by tenure.

¹ Goal 10 states that "plans shall encourage the availability of adequate numbers of needed housing units at price ranges and rent levels which are commensurate with the financial capabilities of Oregon households and allow for flexibility of housing location, type and density."

Most notable from Figure 1.1 is the shift in dwelling unit numbers by price/rent category. Compared to the year 2000, the 2022 distribution is much more concentrated toward the higher end of the price/rent distribution. The result is that there are absolute decreases in the number of dwelling units with lower rents and prices. All rent categories below \$600-\$750 per month and price categories below \$115,000 decline between 2000 and 2022. The shift upward in the price/rent distribution reflects a combination of increasing real incomes between 2000 – 2022 and very limited supply capacity in high demand areas within the Metro UGB. Accordingly, these factors increase UGB housing costs 47% over the period. This cost increase over the 22.5 year period works out to 1.6% per year over the assumed 3% inflation rate.

Historically, median home prices in the Tri-county region have steadily risen as household income and the accumulation of wealth in the region has increased. In 1970, the median price of a single family dwelling was about \$18,300. As of 2001, the median home price in the region has increased over 800% to an average sales price of \$169,900. During the last 30 years, the average annual rate of growth in the sale price of the median home in the region has been 7.5% per year while personal income has averaged 8.5% per year.

We expect 115,000 detached and manufactured dwelling units to be constructed for the period between 2000 - 2022; comprising roughly 52 percent of the housing output. Attached and multi-family units will amount to 108,000 units, 48 percent of the housing output. In the year 2000 detached housing comprised 64 percent of occupied housing while attached accounted for 36 percent. The shift toward higher density product types reflects the increase in price/rent and a relative lack of single-family detached capacity in high demand central city areas.

**Figure 1.1: Regional Housing Demand and Supply 2022
With Base Case Assumptions (All Housing Units)**

Monthly Rent	Approximate House Value	Total Number of Units Year 2000	Total Number of Units Year 2022	Total Difference Units 2000-22	Detached Housing		Attached Housing	
					Single Family and Manufactured on Detached Lots	Manufactured in Parks	Attached Single Family	Apartments Townhouses Condominiums
\$0 - 299	< \$50,000	13,877	-	(13,877)	N/A	N/A	N/A	A,R
300 - 399	50,000 - 59,999	16,171	1,697	(14,474)	N/A	N/A	N/A	A,R
400 - 499	60,000 - 74,999	17,864	8,376	(9,488)	N/A	N/A	N/A	A,R
500 - 599	75,000 - 89,999	46,425	40,775	(5,650)	O	O	A,R	A,R
600 - 749	90,000 - 114,999	91,137	89,371	(1,766)	O	O	A,R	A,R
750 - 999	115,000 - 149,999	109,710	119,922	10,213	O	O	O,A,R	O,A,R
1,000 - 1,165	150,000 - 174,999	58,101	99,892	41,791	O	O	O,R	O,R
1,166 - 1,330	175,000 - 199,999	58,101	76,213	18,113	O	O	O,R	O,R
1,330 +	200,000 and over	130,630	328,567	197,937	O	O	O,R	O,R
	Total Units	542,015	764,815	222,800	115,046		31,054	76,700

"O" means that housing is expected to be primarily owner occupied.

"R" means that the housing is expected to be primarily renter occupied.

"A" means assisted housing.

Data are for housing units and include both occupied housing and vacant housing assuming a 5 % vacancy rate.

Sources: Year 2000 Bureau of the Census, STF-3 and MetroScope. Year 2020 and 2025 MetroScope.

Metro presently does not forecast location and quantity of manufactured homes within UGB but includes them in single family detached forecast.

Figure 1.2 Discussion

Figure 1.2 provides details of occupied housing by tenure and housing type for the year 2000 and 2022. Tables 2 through 4 in the Appendix contain additional data. As noted earlier higher density housing products are expected to substantially increase market share. This is particularly true for owner occupied products where attached housing and townhouses/ condominiums are expected to triple in number from year 2000 levels. Though housing prices are increasing, higher incomes and in particular greater wealth accumulation associated with increasing age increase home ownership from 59 percent to 65 percent. Price competition within the vintage housing stock results in an absolute decrease in the number of single family detached homes being rented. In total we expect an additional 46,000 renter occupied units to be constructed versus 166,000 owner occupied units.

Density ranges are implicit in the housing type production depicted in Figure 1.2. Single family detached and manufactured not in parks had a median lot size of 5,100 sq. ft. (5.5 units per gross acre, 8.5 per net acre) in 1999-2001. The lot size range was from 3,500 sq. ft. to over 1 acre. Lot size of manufactured housing in parks may generally range from 1,000 sq. ft. to 2,500 sq. ft. (11 to 28 units per gross acre, 17 – 43 per net acre). Single family attached housing lot size ranges from 2,000 – 3,500 sq. ft. (8-14 per gross acre, 12-21 per net acre) and multi-family ranges from 12 to over 100 units per net acre.

Figure 1.2: Regional Housing Demand and Supply 2022 By Type and Tenure (Occupied Units)

	Year 2000	Year 2022	Change 2000 - 22
Owner			
Single Family Detached	270,766	372,135	101,369
Single Family Attached	10,395	37,597	27,202
Townhouse/Condominium	9,814	37,845	28,031
Manufactured	14,366	23,839	9,473
Subtotal	305,341	471,415	166,074
Renter			
Single Family Detached	43,924	41,216	(2,708)
Single Family Attached	7,663	9,789	2,126
Apartment	158,172	202,730	44,558
Manufactured	1,713	3,864	2,151
Subtotal	211,472	257,598	46,126
Total			
Single Family Detached	314,690	413,350	98,660
Single Family Attached	18,058	47,386	29,328
Townhouse/Condo./Apt.	167,986	240,574	72,588
Manufactured	16,079	27,702	11,623
Total	516,813	729,013	212,200

Sources: Year 2000 Bureau of Census and MetroScope. Year 2020 and 2025 MetroScope.

Figure 1.3 Discussion

Figure 1.3 summarizes the regional affordability analysis. Data are displayed for the year 2000 and estimates for the year 2022. Tables 5 through 8 in the Appendix provide additional details. MetroScope estimates that 70,000 owners and 111,000 renters, 181,000 in total in the year 2000, are paying 30 percent or more of their income in housing costs. Table 8 in the Appendix provides estimates from the year 2000 census and the 1995 American Housing Survey of 163,000 and 193,000, respectively. The Census and AHS data are based on survey estimates while the MetroScope data are derived internally within the model using price indices for each location and tenure and expenditure share equations calibrated with *Survey of Consumer Expenditure* data. The MetroScope methodology cannot account for subsidies and as a consequence the MetroScope estimates for renters spending greater than 30 percent of their income on housing are probably 20,000-30,000 too high. However, the 2000 MetroScope results calibrate well with the 1995 and 2000 survey data and should be considered a reliable basis to forecast 2022 conditions.

By 2022, the MetroScope estimates are that an additional 76,000 owners and 56,000 renters will be paying in excess of 30 percent of their income on housing. The additional 56,000 renters do not account for the Metro Affordable Housing Technical Advisory Committee (HTAC)² expectation that 36,000 affordable units will be provided. By way of comparison the 1990 and 1995 AHS data indicated that an additional 45,000 owner and renters were paying 30 percent or more of their income on housing within the five-year period.

In assessing the affordability estimates we would emphasize the distinction between owners and renters. Though owners are paying out more in current income on housing, they are also being compensated more in wealth accumulation owing to rising home prices. This is why somewhat paradoxically home ownership (just like stock market purchases) increases during times of rising home prices. Consequently, the renter data provide a more reliable assessment of housing affordability in terms of its social impact. In this regard we note that we expect 56,000 additional renter households to be paying more than 30 percent of their income on housing. However, we anticipate that affordable housing programs in place and anticipated³ will offset much of that increase. Another dimension of housing cost social impact is change in location utility. What we mean by location utility is the value people put on housing quality and neighborhood location. Oftentimes people may pay the same in housing costs but end up in poorer quality housing and in neighborhoods more remote from jobs. Estimates indicate that the number of single family detached houses available to renters will decline by 3,000. In general single family price pressure may act to limit housing choice in terms of type and location for lower income households.

² H-TAC, *Regional Affordable Housing Strategy*, Metro Growth Management Services Department, June 2000, 88 pages.

³ This underscores the importance of implementing the Metro affordable housing recommendations.

Figure 1.3: Regional Housing Affordability 2022 By Type and Tenure (Occupied Units)			
	Year 2000	Year 2022	Change 2000 - 22
Owner			
Less Than 30% Income	235,708	325,753	90,046
Greater Than 30% Income	69,633	145,662	76,028
Total	305,341	471,415	166,074
Median % of Income	21.2%	23.1%	1.9%
Renter			
Less Than 30% Income	100,049	89,799	(10,251)
Greater Than 30% Income	111,423	167,799	56,377
Total	211,472	257,598	46,126
Median % of Income	31.3%	35.5%	4.2%
Total			
Less Than 30% Income	335,757	415,552	79,795
Greater Than 30% Income	181,056	313,461	132,405
Total	516,813	729,013	212,200
Median % of Income	25.3%	27.5%	2.2%
Sources: Year 2000 Bureau of Census, 1995 American Housing Survey and MetroScope			
Year 2025 MetroScope			

Figure 1.4 Discussion

Figure 1.4 compares the Year 2000 and Year 2022 housing price/rent distributions with price/rent distribution computed using the "30% standard." What "30% standard" means is that if all households paid exactly 30 percent of their income for housing this is what the housing price/rent distribution would look like. Comparing the 30 percent distribution to the actual year 2000 distribution we note a shortage of 49,000 housing units in the less than \$500 rent or \$75,000 house categories that would be occupied by households earning 50 percent or less of the median household income. Census 2000 data suggest about 163,000 households pay more than 30 percent of income for housing. Looking at the Figure 1.4, 2022 comparison we note a shortfall of 120,000 units in the same categories. MetroScope estimates are over 300,000 households paying 30 percent or more by 2022. For a variety of reasons many households pay more than 30 percent of their income on housing while other households chose to pay much less. As a consequence actual market behavior of households is substantially different than estimates of affordability obtained by applying the 30 percent standard to the income distribution. However, the income method does substantiate the modeling results that indicate a large increase in households paying more than 30 percent of their income over the period 2000-2022.

Figure 1.4: Regional Housing Affordability 2022 - 30% of Income Standard By Type and Tenure (All Dwelling Units)

Monthly Rent	Approximate House Value	Total Number of Units Year 2000	Number if 30% Standard	Mismatch with 30% Standard	Total Number of Units Year 2022	Number if 30% Standard	Mismatch with 30% Standard
\$0 - 299	< \$50,000	13,877	49,831	(35,954)	-	66,550	(66,550)
300 - 399	50,000 - 59,999	16,171	23,069	(6,897)	1,697	30,804	(29,107)
400 - 499	60,000 - 74,999	17,864	24,503	(6,639)	8,376	32,716	(24,340)
500 - 599	75,000 - 89,999	46,425	24,503	21,922	40,775	32,716	8,059
600 - 749	90,000 - 114,999	91,137	41,419	49,719	89,371	57,152	32,219
750 - 999	115,000 - 149,999	109,710	64,644	45,066	119,922	91,255	28,667
1,000 - 1,165	150,000 - 174,999	58,101	18,516	39,585	99,892	26,576	73,316
1,166 - 1,330	175,000 - 199,999	58,101	60,295	(2,195)	76,213	86,840	(10,627)
1,330 +	200,000 and over	130,630	235,236	(104,606)	328,567	340,206	(11,639)
	Total Units	542,015	542,015		764,815	764,815	

Sources: Based on income data reported in the Year 2000 Census and MetroScope income estimates for year 2025.



Table 1: Year 2000 - 2022 Housing Production by Rent/Value Class

Monthly Rent	Approximate House Value	Owner Number of Units Year 2000	Renter Number of Units Year 2000	Total Number of Units Year 2000	Owner Number of Units Year 2022	Renter Number of Units Year 2022	Total Number of Units Year 2022	Owner Difference Units 2000 - 22	Renter Difference Units 2000 - 22	Total Difference Units 2000 - 22
\$0 - 299	< \$50,000	1,933	11,944	13,877	-	-	-	(1,933)	(11,944)	(13,877)
300 - 399	50,000 - 59,999	3,386	12,786	16,171	8	1,689	1,697	(3,378)	-(11,097)	(14,474)
400 - 499	60,000 - 74,999	5,078	12,786	17,864	12	8,364	8,376	(5,066)	(4,421)	(9,488)
500 - 599	75,000 - 89,999	5,078	41,347	46,425	1,735	39,040	40,775	(3,343)	(2,307)	(5,650)
600 - 749	90,000 - 114,999	29,117	62,020	91,137	1,965	87,406	89,371	(27,152)	25,386	(1,766)
750 - 999	115,000 - 149,999	60,041	49,669	109,710	47,583	72,339	119,922	(12,457)	22,670	10,213
1,000 - 1,165	150,000 - 174,999	49,919	8,181	58,101	75,328	24,564	99,892	25,408	16,383	41,791
1,166 - 1,330	175,000 - 199,999	49,919	8,181	58,101	67,919	8,294	76,213	18,000	113	18,113
1,330 +	200,000 and over	117,185	13,445	130,630	300,015	28,552	328,567	182,830	15,107	197,937
	Total Units	321,656	220,359	542,015	494,566	270,249	764,815	172,910	49,890	222,800

Table 2: Year 2000 Distribution of Occupied Housing by Tenure and Type

	Single Family Detached	Single Family Attached	Multi-family	Manuf./Other	Total
Owner	270,766	10,395	9,814	14,366	305,341
% of Tenure	88.7%	3.4%	3.2%	4.7%	
Renter	43,924	7,663	158,172	1,713	211,472
% of Tenure	20.8%	3.6%	74.8%	0.8%	
Total	314,690	18,058	167,986	16,079	516,813
% of Type	60.9%	3.5%	32.5%	3.1%	

Table 3: Year 2022 Distribution of Occupied Housing by Tenure and Type

	Single Family Detached	Single Family Attached	Multi-family	Manuf./Other	Total
Owner	372,135	37,597	37,845	23,839	471,415
% of Tenure	78.9%	8.0%	8.0%	5.1%	
Renter	41,216	9,789	202,730	3,864	257,598
% of Tenure	16.0%	3.8%	78.7%	1.5%	
Total	413,350	47,386	240,574	27,702	729,013
% of Type	56.7%	6.5%	33.0%	3.8%	

Table 4: 2000 - 22 Change in Distribution of Occupied Housing by Tenure and Type

	Single Family Detached	Single Family Attached	Multi-family	Manuf./Other	Total
Owner	101,369	27,202	28,031	9,473	166,074
% of Tenure	61.0%	16.4%	16.9%	5.7%	
Renter	(2,708)	2,126	44,558	2,151	46,126
% of Tenure	-5.9%	4.6%	96.6%	4.7%	
Total	98,660	29,328	72,588	11,623	212,200
% of Type	46.5%	13.8%	34.2%	5.5%	

Table 5: Year 2000 "Housing Affordability" by Income Class and Tenure						
Renters 2000						
Income Level	<30%	30 - 35%	35 - 40%	40% Plus	Total >30%	Total
0 - 17499	-	-	17,925	69,047	86,972	86,972
17500 - 28999	29,346	21,829	2,622	-	24,451	53,797
29000 - 40499	36,666	-	-	-	-	36,666
40500 +	34,037	-	-	-	-	34,037
Subtotals	100,049	21,829	20,547	69,047	111,423	211,472
Median Housing % of Inc.: 31.3%						
Owners 2000						
Income Level	<30%	30 - 35%	35 - 40%	40% Plus	Total >30%	Total
0 - 17499	-	-	14,036	31,972	46,008	46,008
17500 - 28999	24,732	20,795	2,831	-	23,626	48,357
29000 - 40499	61,289	-	-	-	-	61,289
40500 +	149,687	-	-	-	-	149,687
Subtotals	235,708	20,795	16,867	31,972	69,633	305,341
Median Housing % of Inc.: 21.2%						

Table 6: Year 2022 "Housing Affordability" by Income Class and Tenure						
Renters 2022						
Income Level	<30%	30 - 35%	35 - 40%	40% Plus	Total >30%	Total
0 - 17499	-	-	-	107,227	107,227	107,227
17500 - 28999	6,505	34,685	21,630	1,970	58,285	64,790
29000 - 40499	43,058	2,287	-	-	2,287	45,345
40500 +	40,236	-	-	-	-	40,236
Subtotals	89,799	36,972	21,630	109,197	167,799	257,598
Median Housing % of Inc.: 35.5%						
Owners 2022						
Income Level	<30%	30 - 35%	35 - 40%	40% Plus	Total >30%	Total
0 - 17499	-	-	-	72,998	72,998	72,998
17500 - 28999	9,355	35,465	24,346	4,184	63,995	73,349
29000 - 40499	86,350	8,670	-	-	8,670	95,020
40500 +	230,048	-	-	-	-	230,048
Subtotals	325,753	44,134	24,346	77,181	145,662	471,415
Median Housing % of Inc.: 23.1%						

Table 7: Year 2022 Change in "Housing Affordability" by Income Class and Tenure

Renters 2000 - 22						
Income Level	<30%	30 - 35%	35 - 40%	40% Plus	Total >30%	Total
0 - 17499	-	-	(17,925)	38,180	20,255	20,255
17500 - 28999	(22,841)	12,856	19,008	1,970	33,834	10,993
29000 - 40499	6,392	2,287	-	-	2,287	8,679
40500 +	6,199	-	-	-	-	6,199
Subtotals	(10,251)	15,143	1,083	40,150	56,377	46,126
Owners 2000 - 22						
Income Level	<30%	30 - 35%	35 - 40%	40% Plus	Total >30%	Total
0 - 17499	-	-	(14,036)	41,026	26,990	26,990
17500 - 28999	(15,377)	14,670	21,515	4,184	40,369	24,992
29000 - 40499	25,061	8,670	-	-	8,670	33,730
40500 +	80,361	-	-	-	-	80,361
Subtotals	90,046	23,339	7,479	45,210	76,028	166,074

Table 8: "Year 2000" Affordability Comparisons

	Renter Units Greater than 30% of Income	Owner Units Greater than 30% of Income	Total Units Greater than 30% of Income
MetroScope	111,423	69,633	181,056
Census 2000	85,526	77,593	163,119
1995 AHS	99,600	93,000	192,600
1990 AHS	81,300	66,600	147,900

Sources: U.S. Bureau of Census, DP-3 Profile of Selected Economic Characteristics: 2000, STF-3. HUD, American Housing Survey for the Portland Metropolitan Area in 1995, (CHR H170/95-34), Tables 3-21 & 4-20, and 1990 American Housing Survey, Tables 3-20 and 4-20.

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**Exhibit P to Ordinance No. 02-969B
Findings of Facts, Conclusions of Law**

I. General Findings for Task 2 Decision

A. Coordination with Local Governments

These findings address Goal 2, Coordination. Metro worked closely with the local governments and special districts that comprise the metropolitan region. The Metro Charter provides for a Metropolitan Policy Advisory Committee (MPAC) composed generally of representatives of local governments, special districts and school districts in the region. MPAC reviewed all elements of this Task 2 of periodic review decision. MPAC made recommendations to the Metro Council on most portions of the decision. All recommendations were forwarded formally to the Council and the Council responded. Metro Councilors and staff held countless meetings with local elected officials in the two years of effort leading to this decision.

There was steady correspondence among Metro and local governments. The record of this decision includes that volume of correspondence, including Metro's responses to concerns and requests from local governments and local districts related to Task 2.

Metro accommodated the requests and concerns of local governments as much as it could, consistent with state planning laws and its own Regional Framework Plan.

B. Citizen Involvement

These findings address Goal 1 and Regional Framework Plan Policy 1.13.

To gather public input on this Task 2 decision, Metro conducted one of the most extensive citizen involvement in its history. Metro began its "Let's Talk" effort in September, 2001, including 93 "Coffee Talks" throughout the region that attracted 1,200 participants. "Let's Talk" included a regional conference and five public workshops on March 15-16, 2002. Some 1,200 people attended. In June and July of 2002, Metro conducted five public workshops around the region, with 800 participants. Media coverage of this early effort included a one-hour "Let's Talk" show on KGW Channel 8 on March 15, 16 television news stories on network news programs, 62 articles in local papers and three stakeholder surveys.

Since August, 2002, after Metro's Executive Officer released his recommendation on Task 2 (measures to increase efficiency of land use and to expand UGB), Metro sent mailed notices to 105,000 property owners and interested persons, placed 120,00 utility inserts to area ratepayers, placed four quarter-page advertisements in the Oregonian, and single quarter-page ads in local papers. The Metro Council's Community Planning Committee (composed of all Council members) held seven public hearings in October; there were over 1,100 participants at these hearings. Media briefings since August yielded 175 articles (since June, 2002). Metro held organizational briefings, opened a 24-hour information and comment line, published a monthly newsletter, distributed fact sheets, place booths at county fairs, translated its UGB flyer into Spanish, Russian, Chinese and Vietnamese, keep an active and up-to-date website and sponsored two official tours of UGB study areas for local elected officials.

These efforts bring Metro into compliance with Goal 1 and Metro's Regional Framework Plan. More important, this work to involve Metro area citizens has contributed greatly to their understanding of the importance of this set of decisions for the region and have brought Metro invaluable comment on options available to it.

C. Need for Land

These findings address ORS 197.296; ORS 197.732(1)(c)(A); Goal 2, Exceptions, Criterion (c)(1); Oregon Administrative Rules 660-004-0010(1)(c)(B)(i) and 660-004-0020(2)(a); Goal 9 (local plan policies); Goal 10; Goal 14, Factors 1 and 2; Metro Regional Framework Plan (RFP) Policies 1.2 and 1.4; and Metro Code 3.01.020(b)(1) and (2).

Metro conducted an analysis of the need for housing in the region in order to provide a supply through the year 2022. The Urban Growth Report-Residential (UGR-R) provides the details of that analysis. The analysis indicates that the region will need capacity for an additional 220,700 dwelling units.

Metro analyzed the capacity of the existing Urban Growth Boundary (UGB) to accommodate 220,700 dwelling units. The analysis, the details of which are in the UGR-R, determined that the 24,400 acres of net vacant buildable land within the UGB could accommodate 177,300 additional dwelling units, leaving a shortfall of approximately 43,400 units.

Metro also conducted an analysis of the need for land for new jobs through the year 2022. The Urban Growth Report-Employment (UGR-E) provides the details of that analysis. The analysis indicates that the region will need approximately 14,240 acres to accommodate an additional 355,000 jobs.

Metro analyzed the capacity of the existing UGB to accommodate this employment growth. The analysis determined that the UGB contained a surplus of land (759.6 acres) for commercial employment and a deficit of land (5,684.9 acres) for industrial development. The UGR-E provides the details of this analysis. Overall, the existing UGB does not have the capacity to accommodate the forecasted employment.

D. Alternatives: Increase Capacity of the UGB

These findings address ORS 197.732(c)(B); Goal 14, Factors 3 and 4; Goal 2, Exceptions, Criterion 2; OAR 660-004-0010(1)(B)(ii) and 660-004-0020(2)(b); Metro Code 3.01.020(b)(1)(E); and RFP Policies 1.2, 1.3, 1.6, 1.7 and 1.8.

To address the shortfall in residential capacity, Metro first considered actions it could take to increase the efficiency of the existing supply of land. Metro's Urban Growth Management Functional Plan (UGMFP), adopted in 1996 and acknowledged on December 8, 2000, required most local governments in the region to make significant increases in the efficiency of their supplies of residential land. Metro explored the possibility of further efficiencies in downtowns and town centers. Studies advised that non-regulatory measures would be most likely to increase residential development in centers. Metro tested the long-range effects of selected non-regulatory measures on the rate of infill and redevelopment ("refill") and found that the measures would increase refill.

Based upon this analysis, Metro developed a strategy to increase the refill rate in centers. This strategy, contained in RFP Policy 1.5 and new UGMFP Title 6 and described more fully in the UGR-R, will increase the capacity of the existing UGB by 6,000 dwelling units, reducing the shortfall to 37,400 units. The UGR-R demonstrates the likelihood that the region will achieve the higher refill rate.

To address the shortfall in employment capacity, Metro considered measures to increase the efficiency of land use within the UGB designated for employment. Metro's UGMFP Title 4 limits non-employment uses in areas designated for employment use. Title 4 also limits commercial retail uses in areas designated for industrial employment. Analysis of results of local implementation of Title 4 indicates that commercial uses and other non-industrial uses are converting land designated for industrial use to non-industrial use.

In response to this information, the Metro Council amended the RFP (Exhibit D, Policies 1.4.1 and 1.4.2) and Title 4 (Exhibit F) to improve the protection of the existing industrial land base. The Council created a new 2040 Growth Concept design type – "Regionally Significant Industrial Land" (RSIA) – and developed new limitations on commercial office and commercial retail uses in RSIA's. Metro estimates that these new measures will reduce the shortfall in industrial land by 1,400 acres by reducing encroachment by commercial uses. These measures will, however, also reduce the capacity of employment land to accommodate commercial office and retail uses, converting the small surplus of commercial land to a small deficit of land. The overall net effect is a remaining, but smaller deficit (4,425.3 acres) in the capacity of the existing UGB to accommodate all of the forecast employment.

E. Alternatives: Expand the UGB

These findings address ORS 197.732(c)(B), (C) and (D) and Goal 2, Exceptions; ORS 197.298(1); Goal 11; Goal 14, Factors 3-7; OAR 660-004-0010(1) and 660-004-0020(2); RFP Policies 1.2 and 1.7; and Metro Code 3.01.020(b)(3) through (7) and 3.01.020(d)

The measures taken by the Council to increase the capacity of the existing UGB, described above, reduced housing need by 6,000 acres and reduced the need for employment land by approximately 1,200 acres. The measure leave an unmet need for land for 37,400 dwelling units and for 4,400 acres of employment land.

Metro began the search for the most appropriate land for inclusion in the UGB by applying the priorities in ORS 197.298(1). Because Metro has not re-designated "urban reserve" land since its 1997 designation was invalidated on appeal, the highest priority for addition of land is exception land. Metro mapped all exception land within one mile of the existing UGB, extending beyond the mile to catch exception lands that themselves extended beyond one mile. Metro mapped those resource lands surrounded by or intermingled with exception land to determine whether they must be included in order to urbanize the exception lands. In all, Metro looked at approximately 80,000 acres to find the most appropriate land.

Once Metro mapped land by its statutory priority, Metro analyzed the suitability of the land for urbanization, considering the locational factors of Goal 14, the consequences and compatibility criteria of the Goal 2 and statutory exceptions process, the policies of the Regional Framework Plan (RFP) and the criteria in the Metro Code that are based upon Goal 14. Metro estimated the housing and employment capacity of each "study area." This analysis is set forth in the 2002 Alternatives Analysis Study, Item 6 in Appendix A of Ordinance No. 02-969.

Ultimately, by Ordinance No. 02-969, the Council added 17,458 acres to the UGB, 15,047 acres for housing and 2,411 acres for employment. The Council was able to accommodate most of the unmet housing need (37,400 dwelling units) and much of the need for employment land (4,284 acres) on exception land. The Council added resource land (3,352 acres) only where it found inclusion necessary in order to urbanize exception land. Together with the dwelling unit capacity added by Ordinance No. 02-987, the Council accommodated the full 20-year need for housing.

The Council was unable to accommodate the full 20-year need for employment land. As noted in Resolution No. 02-3236C, directing the Executive Officer to seek modification of Metro's periodic review work program, Metro was unable to find enough exception land with needed characteristics (parcel size, proximity to essential services, etc.) within the 80,000 acres it studied. During its analysis it became clear to the Council that it would be forced to turn to resource land to find land with these characteristics. Metro did not study enough resource land and found itself, in the absence of a regional economic strategy, unprepared to weigh the need for industrial land against the loss of the land base for another industry – agriculture. It is for these reasons that Metro will ask for a new periodic review work task to complete the accommodation of the region's need for industrial land.

Nonetheless, the Council included enough employment land in the Gresham and Damascus area to allow a complete and sufficient new Damascus Town Center to emerge. This will help the entire region.

The Council found that the region will be able to urbanize the lands it has added to the UGB in an efficient and orderly fashion. The Council concluded that the overall consequences of urbanization of these lands are acceptable, especially given the protections in place in the RFP and Metro Code for sensitive resources. Through mitigation measures required by the conditions in Exhibit M, the Council believes it can achieve compatibility between urbanization of the land added to the UGB and adjacent land outside the UGB.

The Council also believes that it was able to maintain separations between communities at the urban fringe sufficient to allow each community to retain a sense of place. The Council chose ridgelines, streams, powerlines, roads and property lines to define the boundaries of the UGB in an effort to provide a distinct boundary and a clear transition between urban and rural uses.

F. Water Quality

Each local government responsible for an area added to the UGB must complete the planning requirements of Title 11, Urban Growth Management Functional Plan (UGMFP), including compliance with the water quality provisions of Title 3 of the UGMFP.

G. Areas Subject to Natural Disasters and Hazards

The Council has excluded environmentally constrained areas from the inventory of buildable land (see UGRs) and from its calculation of the housing and jobs capacity of each study area (see Alternatives Analysis). Each local government responsible for an area added to the UGB must complete the planning requirements of Title 11, Urban Growth Management Functional Plan (UGMFP), including compliance with Title 3 of the UGMFP on floodplains and erosion control.

H. Economic Development

As part of Task 2 of periodic review, Metro reviewed the economic development elements of the comprehensive plans of each of the 24 cities and three counties that comprise the metro area. Metro used the review in its determination of the region's need for employment land and for coordination with local governments of its choices to add land to the UGB for employment purposes. The review also helped the Council reach the conclusion mentioned in section E, above, that further work is necessary to reach regional agreement on economic strategy before adding to the UGB all the employment land needed to the year 2022. The review will be one of the building blocks of the strategy.

Revisions to Title 4 (Industrial and Other Employment Areas) of the UGMFP (Exhibit F of this ordinance) and General Conditions IA(C) and (F), and Specific Conditions IIA(7) and (8) and II(E)(2) and (3) (Exhibit M of this ordinance) add significant protection to sites designated for industrial use, both those added to the UGB and those within the UGB prior to expansion, to help ensure their availability for that purpose.

II. Specific Findings for Particular Areas

A. Gresham and Damascus Area, Study Areas 6 (partial), 10 (partial), 11, 12, 13, 14, 15, 16, 17, 18 and 19 (partial)

These findings address ORS 197.298; ORS 197.732(1)(c)(B), (C) and (D); Goal 2, Exceptions, Criteria (c)(2), (3) and (4); Oregon Administrative Rules (OAR) 660-004-0010(1)(B)(ii), (iii) and (iv); OAR 660-004-0020(2)(b), (c) and (d); Goal 5; Goal 11; Goal 12; Goal 14, Factors 3 through 7; Metro Code 3.01.020(b)(3) through (7) and 3.01.020(d); Metro RFP Policies 1.2, 1.3, 1.4, 1.6, 1.7 and 1.11; and Regional Transportation Plan Policies 2.0, 3.0, 4.0 and 14.0.

The Gresham and Damascus study areas (herein called "the Damascus area") include all or portions of Study Areas 6, 10, 11, 12, 13, 14, 15, 17, 18 and 19, as shown on the Exhibit N map. The Council includes this land within the UGB for three principal reasons. First, the Council wants to accommodate as much housing and employment on exception land as possible, to avoid urbanization of farm and forest land. Second, the Council wants to accommodate a significant portion of the region's overall need for land for employment on the east side of the region to improve the jobs/housing ratio, currently "housing rich" and "jobs poor." Third, the Council wants urbanization in this area to support the Gresham Regional Center, the Rockwood Town Center and the Damascus Town Center in a manner consistent with the 2040 Growth Concept. Including the Damascus area in the UGB will bring development that will help pay for infrastructure for these communities and the Inner and Outer Neighborhoods that surround them.

The Damascus area includes 10,027 acres of exception land. The Council includes this exception land in the Damascus area because it is the highest priority for inclusion in the UGB under ORS 197.298(1) and because the Council wants to protect the region's agricultural industry. Reluctantly, the Council includes 3,352 acres of resource land in the Damascus area because it is intermingled with the exception land. The Council considered maps and analysis of the area produced by the City of Gresham and Clackamas County. The maps and analyses allow comparison between the location of needed sewer, water, storm water and transportation facilities if the resource land is included, and their location if the resource land is excluded. From these analyses the Council concludes that it must include the resource land in the Damascus area because urban services must pass through the resource land in order to provide the services to the exception land in the area.

If the resource land were excluded, the exception land in the Damascus area could not urbanize efficiently. The area as a whole could not produce communities with employment opportunities and the fiscal resources commercial and industrial development provide for urban services. For this reason, the Council concludes that it must include the resource land in the Damascus area in order to maximize the efficiency of urbanization of the exception land.

Finally, without the intermingled resource land, the exception land would accommodate far fewer households and jobs. Metro would have to look to exception lands or resource land in other locations to accommodate the households and jobs not accommodated here.

1. Alternatives

Exception areas outside the UGB cannot reasonably accommodate the jobs and housing slated for the Damascus area. Each of the exception areas included in the UGB in the Task 2 decision, both within and outside the Damascus area, will accommodate the jobs and housing densities assigned to the 2040 Growth Concept Design Type on the buildable land in the exception area. LCDC has previously acknowledged these densities and the design types. The jobs and housing density requirements of Title 1 of the Urban Growth Management Functional Plan (UGMFP), aimed at increasing the efficiency of the use of urban land within the UGB, have also been acknowledged. These same Title 1 requirements will apply to the land added to the UGB, including the Damascus Area. Ordinance No. 02-969 takes further action to improve the efficiency of employment land by amending Title 4 (Industrial and Other Employment Land) of the UGMFP (Exhibit F) and of residential and mixed use land by adopting a strategy to increase the number of housing units accommodated on developed land ("refill" rate) (Exhibits G and H). These amendments and this strategy will apply to exception land included in the UGB.

As indicated in the Alternatives Analysis in Appendix A, the exception areas included within the UGB and those studied for possible inclusion have topographic characteristics that limit the overall density (dwelling unit yield) at which it can be developed. The areas also contain plant and wildlife habitat (particularly streams and riparian habitat) and development patterns that prevent accommodation of higher numbers of jobs or housing than the numbers allocated to the exceptions areas by Ordinance No. 02-969.

Metro studied nearly 40,000 acres of exception lands that have not been included in the UGB by Ordinance 02-969. These lands compared unfavorably with the exception lands that the Council included, for reasons explained in these findings. On the whole, the exception lands not included cannot reasonably accommodate the jobs and housing allocated to the resource land in the Damascus area because the lands cannot urbanize efficiently or be provided efficiently with urban services, and natural resources present on the lands would be more adversely affected by urbanization.

Metro also considered other resource land to accommodate the jobs and housing allocated by this decision to the resource land in the Damascus area and rejected those other resource lands. As indicated by the soil maps that are part of Metro's Alternatives Analysis, the included resource land in the Damascus Area is predominantly Class III and IV on the Natural Resource and Conservation Service (NRCS) capability classification system. Other areas of resource land in the region generally have higher capability soils than the soils present in the Damascus area. Only in the Damascus area are resource lands so fully interspersed with exception lands.

Including the resource lands interspersed with exception lands in the Damascus area will also have less adverse social and economic consequences when compared with including other resource lands in the UGB. Urbanization of the Damascus area as a whole can, consistently with the statutory requirement to include exception land as highest priority, be done more efficiently and economically, and can provide a more complete and livable urban environment, than including other exception lands or other resource lands.

2. Orderly Services

The Council considered whether public facilities and services could be provided in an orderly and economic fashion to the Damascus area. The Council relied upon the Water, Sewer and Stormwater Feasibility Analysis and the Transportation Services Feasibility Analysis contained in its Alternatives Analysis (Appendix A, Item 6) for its determination that these services can be provided to the Damascus area in an orderly and economic manner. The Council also considered maps showing likely public service facility layouts provided by the City of Gresham and Clackamas County, and the vision produced by the Damascus Area Design Workshop. The Council further considered more detailed analysis of serviceability from the City of Gresham indicating that the city can provide services to the northern portion of the Damascus area (Study Areas 6 and 12 north of the Multnomah County line) immediately and the remainder of the study areas within the watershed of Johnson Creek within five years of inclusion within the UGB. Condition IIA(1) of Exhibit M calls for transportation and public facility and service plans within four years after the effective date of this ordinance. Condition IIA(4) calls for phasing and timing of service provision to allow the emergence of town centers in the Damascus area.

The Alternatives Analysis sets forth the likely service provider for sewer, water and storm-water services and assigns a serviceability rating for each study area within the Damascus area. Serviceability generally ranges from "moderate" to "easy" to serve (Table A-3) and compares favorably with exception areas not included (such as outlying Study Areas 5, 9, the excluded portion of 10, 29, 30, 36 and 52).

Transportation services will be difficult to provide in parts of the Damascus area due to the varied topography. However, Metro's 2000 Regional Transportation Plan (RTP) anticipated inclusion of the Damascus area within the UGB. The RTP's "Priority System" of planned transportation facilities, for which funding is expected, shows how the region will provide transportation services to the area. The City of Gresham provided more detailed analysis of serviceability showing that it will be easier to provide transportation services to the Damascus area than indicated in the Alternatives Analysis.

3. Efficiency

The Council considered whether the Damascus area could be urbanized in an efficient manner. The Council relied the same information on provision of essential services mentioned above. This information convinced the Council that the area can urbanize efficiently, achieving the housing and job density targets associated with the 2040 Growth Concept design types assigned to the Damascus area.

The Council recognizes that the Damascus area, characterized by pockets of small parcels, hilly topography, riparian and floodplain areas and limited transportation services, cannot achieve the overall densities that might be achieved on large tracts of flat resource land adjacent to the UGB. The Council, however, has compared the efficiency of urbanizing the Damascus area not with flat farmland, but with other exception lands. In that comparison, the Council concludes that it better

achieves Goal 14 to include the exception land in the Damascus area because that area offers a better opportunity to urbanize fully, efficiently, economically and to establish a complete community of housing, employment and community services than does any other large area of exception land (such as Study Areas 5, 8, 9, 29, 30, 36 or 53) or than a large number of small areas of exception land along the fringe of the UGB (such as 59 through 67, 69-71, 77-80 and 82).

The Council also concludes that adoption of RFP Policy 1.5 (Exhibit G), new Title 6 (Centers) of the UGMFP (Exhibit H), and the Centers Strategy (Appendix A, Item 3) will not only increase the efficiency of urbanization within the UGB as it stood before Ordinance No. 02-969, but also within the Damascus area, given the design types (including a Town Center) assigned to the area by this ordinance. Adoption of RFP Policies 1.4.1 and 1.4.2 (Exhibit D) and revision of Title 4 of the UGMFP (Exhibit F), both dealing with Regionally Significant Industrial Areas (RSIAs), will increase the efficiency of urbanization within the UGB as it stood prior to this ordinance and within the Damascus area.

4. Consequences

The Council considered the consequences of urbanization on the people and land of the Damascus area. The area is characterized geographically by hills, valleys and streams. It is characterized socially by rural residences, small farms and woodlots and several small-town concentrations of businesses and community services. The Alternatives Analysis and materials presented to the Council during public hearings offer the information and analysis upon which the Council relied in its consideration of the consequences of urbanization.

Urbanization will affect all characteristics of the Damascus area. The social effects of urbanization are unavoidable. Some of these effects could be avoided by urbanizing resource land. But the Council wants to minimize the urbanization of resource land, so it has compared the social consequences among optional exception areas. The Council concludes that the social effects of urbanizing the Damascus area will be less adverse than urbanization of any of the large exception areas (such as Study Areas 5, 8, 9, 29, 30, 36 or 53) or of a large number of smaller exception areas along the fringe of the UGB (such as 59 through 67, 69-71, 77-80 and 82) because the Damascus area offers the best opportunity to establish a complete community of housing, employment and community services and an orderly, economic and efficient network of sewer, water, storm-water and transportation infrastructure. Land designated for employment, especially RSIAs, offers the best choice for substantial employment opportunities on the east end of the region with the least impact on commercial agriculture.

Environmental consequences are also unavoidable, as noted in the Alternatives Analysis. They range from "high" to "moderate" to "low." There are study areas in other parts of the region not included in the UGB where consequences of urbanization fall lower on the range. But these areas are scattered across the region and cannot accommodate the larger number of dwelling units and jobs, or the balance of housing and jobs, that the Damascus area can accommodate. In order to find sufficient capacity on other lands for the housing and jobs that this area can accommodate, the Council would have to include resource land and other exception land with more adverse consequences.

The Damascus Area Design Workshop showed how urbanization of the area could minimize adverse environmental consequences in the area. It is unlikely that the measures considered in the workshop could be undertaken in other large or small exception areas because the measures require a concentration of urban development in the buildable areas in order to reduce the effects

of urbanization on unbuildable areas, such as streams, riparian areas, wetlands and steep slopes (to provide the funds, transfer of development rights opportunities, etc.). The Council further considered that Title 3 of the UGMFP and the conditions in Exhibit M will apply to the Damascus area to protect the streams, wetlands, floodplains and steep slopes of the area.

Adverse economic and energy consequences of urbanization in the Damascus area are "moderate" to "low." The Council concludes that, notwithstanding the noted adverse consequences, the positive consequences of accommodating urbanization in a complete fashion – housing, employment and community services and an orderly, economic and efficient network of sewer, water, storm-water and transportation infrastructure – outweigh the more adverse economic and energy consequences of scattering this development along the perimeter of the UGB and urbanizing resource land.

5. Compatibility

The Agricultural Compatibility Analysis shows that the study areas that comprise the Damascus area are moderately to highly compatible with nearby agriculture. The included resource land in Area 11 borders excluded resource land on the south side of Area 11. Evaluation of compatibility for this area (Alternatives Analysis, Appendix A, Item 6, p. A-25) determined that it is "moderate", meaning that there is some incompatibility. Ordinance No. 02-969 of the Task 2 decision imposes Condition IE upon urbanization of this part of Area 11 in order to reduce conflict and improve compatibility between urban use on the included land and agricultural use on the excluded land to the south.

The included resource land in Study Areas 12 and 13 borders exception land that is included in the UGB. Urbanization of these lands will have no significant adverse effect upon excluded resource land. This ordinance designates the included portion of Study Area 6 for industrial use, generally more compatible with agricultural activities. The ordinance imposes Condition IE upon urbanization of Area 6 to reduce conflict and improve compatibility between urban use on the included land and agricultural use on the excluded land to the south. An included portion of Study Area 12 borders designated forest land to the east. Condition IE also applies to Area 12.

6. Natural and Cultural Resources

Metro's alternatives analysis addresses the Goal 5 resources protected in the Damascus area by Multnomah and Clackamas Counties in their acknowledged comprehensive plans. The counties will be responsible for protecting inventoried Goal 5 resources in the area when they amend their comprehensive plans and zoning ordinances to implement expansion of the UGB. Condition IIA(2) of Exhibit M requires the counties to consider Metro's inventory of Goal 5 resources in their application of Goal 5 to the Damascus area. Title 3 (Water Quality, Flood Management and Fish and Wildlife Conservation) of the UGMFP requires Clackamas County to protect water quality and floodplains in the area. Title 11 of the UGMFP, section 3.07.1120G, requires the counties to protect fish and wildlife habitat and water quality. Title 11, section 3.07.1110, protects the status quo in the interim period of county planning for the area.

The counties' inventories of Goal 5 resources protected by land use regulations include one mining (aggregate) site, Kelly Creek in Study Area 13, Johnson Creek in Study Area 12, one upland habitat site and historic buildings in Study Areas 12, 17 and 19. Under Metro's Title 11, current county land use regulations will remain in place until the counties adopt new plan

provisions and land use regulations to allow urbanization of the Damascus area, at which time the responsible local government will apply Goal 5 to these resources. Urbanization may affect the inventoried sites. If so, the local governments will determine whether to limit urbanization near the sites, or to re-evaluate their earlier decisions to protect the sites.

7. Public Utilities and Services

Under statewide Planning Goal 11, Metro is responsible for coordination of the preparation of public facility plans within the district. Metro will fulfill this responsibility through implementation of Title 11 of the UGMFP, which (1) prohibits Multnomah and Clackamas Counties from upzoning and from dividing land into resulting lots or parcels smaller than 20 acres until the counties revise their comprehensive plans and zoning ordinances to authorize urbanization of land Metro brings into the UGB; and (2) requires the counties to develop public facilities and services plans and urban growth diagrams with the general locations of necessary public facilities such as sanitary sewers, storm sewers and water lines for the Damascus area. Metro and the counties began this work with the evaluation of the serviceability of the Damascus area in the Alternatives Analysis and consideration of how to provide services as part of the analysis required to satisfy ORS 197.298(3)(c) and Goal 14, factors 3 and 4.

8. Transportation

Metro has responsibility to ensure that its Task 2 decision for the Damascus area does not significantly affect a transportation facility or allow uses that are inconsistent with the identified function, capacity and performance standards of transportation facilities. Metro fulfills this responsibility through implementation of Title 11 of the UGMFP, which (1) prohibits Multnomah and Clackamas Counties from upzoning and from land divisions into resulting lots or parcels smaller than 20 acres in the area until the counties revise their comprehensive plans and zoning ordinances to authorize urbanization of land Metro brings into the UGB; and (2) requires the counties to develop conceptual transportation plans and urban growth diagrams with the general locations of arterial, collector and essential local streets for the area. Metro and the counties began this work with the evaluation of the serviceability of the Damascus area in the Alternatives Analysis and consideration of how to provide services as part of the analysis required to satisfy ORS 197.298(3)(c) and Goal 14, factors 3 and 4.

Metro's 2000 Regional Transportation Plan (RTP) anticipated inclusion of the Damascus area within the UGB. The plan's "Priority System" of planned transportation facilities shows improvements planned for the area to serve anticipated growth. Condition IIA(6) of Exhibit M calls for protection of the rights-of-way for the Sunrise Highway, the most significant improvement in the Priority System for the area.

9. Regional Framework Plan

The Council has included the Damascus area as the best option before it to comply with state planning laws and the policies of the RFP. Taking this land into the UGB allows Metro to accommodate a large number of jobs and housing units in an integrated and complete community with the least impact on agriculture in the three-county area. The area will not only provide employment opportunities for new residents of the Damascus area, but also improve the ratio between jobs and housing in the east side of the region.

The Council has applied conditions (Exhibit M) to the addition of the Damascus area to ensure full consideration of the affordability of housing in light of anticipated employment opportunities. The conditions also require measures to ensure the emergence of distinct communities, including the designated Damascus Town Center. The conditions make reference to Title 11 of the Urban Growth Management Functional Plan (UGMFP), which requires the counties and, possibly, a newly incorporated city, to plan for concentrations of housing that will support an efficient arrangement of public facilities and services, including transportation.

10. Regional Transportation Plan

Through its Joint Policy Committee on Transportation, Metro has coordinated transportation planning and funding of transportation improvements with local governments in the region. The Regional Transportation Plan adopted a "Priority System" of improvements through the year 2020. The Priority System includes the most critical improvements needed to implement the 2040 Growth Concept. Among the improvements are the "East Multnomah County Transportation Projects" and the "Pleasant Valley and Damascus Transportation Projects" that will provide the basic transportation services to the area (pages 5-49 to 5-57). Figures 1.4, 1.12, 1.16, 1.17, 1.18 and 1.19 of the RTP show how the region's street design, motor vehicle, public transportation, freight, bicycle and pedestrian systems will extend into the Damascus area.

B. Oregon City Area, Study Areas 24 (partial), 25 (partial), 26 (partial), and 32 (partial)

These non-contiguous portions of Study Areas 24, 25, 26 and 32 included by the Council, but for 17.5 acres of forest land, are exception areas. The areas are mostly designated for housing on the 2040 Growth Concept map (Exhibit N), but Area 26 includes designated industrial land and Area 32 includes designated employment land. The Council included a small tract of forest land to avoid splitting a parcel owned by the Oregon City School District and used for school purposes. Metro has a conservation easement over a portion of this forest land.

The City of Oregon City indicates that the areas can be provided with water, sewer and storm-water services and transportation. The included portions are contiguous to the city and can be served in an orderly manner. The areas rate from "easy" to "difficult" to serve; portions that contain steeper slopes are more difficult. The portions of the areas included are the more serviceable portions. In particular, inclusion of portions of Areas 24 and 26 will allow a road connection between Holcomb Boulevard and Redland Road that will improve transportation in the area.

Adverse economic, energy, environmental and social consequences of urbanization in the areas range from relatively low to relatively high. Compliance with Title 3 of the UGMFP, however, will reduce adverse consequences to water quality, streams, and riparian area. Also, urbanization of the areas would be relatively compatible with agricultural activities. Much of the nearby resource land is designated for forestry. Application of General Condition 5 in Exhibit M will reduce incompatibility with farm practices.

Inclusion of these areas will add needed housing and employment to the UGB at the south end of the region with little impact on agricultural activities or forest practices outside the UGB.

C. West Linn Area, Study Area 37

Study Area 37 – all exception land - lies to the west of the City of West Linn. The area can be provided with water, sewer and storm-water services and transportation, but it rates “difficult” to “moderately difficult” to serve, largely due to steep slopes in the southern and western portions of the area. On the other hand, the area is adjacent to the city; services can be extended in an orderly manner. Adverse economic, energy, environmental and social consequences of urbanization will be relatively low. Also, urbanization of the area will be relatively compatible with agricultural activities in the Stafford basin to the west.

Most of Study Area 37 lies within a basin that drains and orients toward West Linn, making a relatively distinct transition between the study area and the rest of the Stafford basin to the west. Urban development in the area will enhance the nearby “Civic Center” by expanding its service market. The area will produce housing that will help address the need on the southern end of the region.

In sum, the Council included this area because it is exception land, because it can address part of the need for housing, and it can enhance the city’s Civic Center.

D. Wilsonville Area, Study Area 45

Study Area 45 – all exception land - lies to the east of the City of Wilsonville. The area can be provided with water, sewer and storm-water services and transportation, but it rates “moderately difficult” to serve. Nonetheless, the city indicates readiness to provide services and has plans in place to do so. Because the area is adjacent to the city, services can be extended in an orderly manner. Adverse economic, energy, environmental and social consequences of urbanization will be relatively low. Also, urbanization of the area will bring urban development near agricultural activities. Application of General Condition 5 in Exhibit M will reduce incompatibility with farm practices.

Study Area 45 includes three parcels that comprise the site of new school facilities planned by the West Linn-Wilsonville School District. The district conducted an exhaustive search for a suitable site on the east side of Wilsonville and settled on Area 45, in part because it is exception land.

Inclusion of Study Area 45 will bring a significant number of new dwelling units to Wilsonville and improve the “jobs-rich” jobs/housing ratio.

E. Wilsonville Area, Study Area 49 (partial)

This portion of Study Area 49 lies adjacent to and northwest of the City of Wilsonville. It is all exception land. The Council designated the included portion as Regionally Significant Industrial Area (RSIA) on the 2040 Growth Concept Map (Exhibit N) and on the map of RSIA's (Exhibit E). The city indicated a willingness to provide the area with water, sewer and storm-water services and transportation and has plans in place to do so. Because this portion of Area 49 is adjacent to the city, services can be extended in an orderly manner. The portion rates “easy” to “moderately difficult” to serve.

Adverse economic, energy, environmental and social consequences of urbanization rate from “moderate” to “high”. Compliance with Title 3 of the UGMFP, however, will reduce adverse consequences to water quality and the streams, wetlands and riparian areas present. Also, urbanization of the area would bring urban development near agricultural activities. However,

industrial development is generally more compatible with agricultural activities than residential or commercial development. Application of General Condition 5 in Exhibit M will reduce incompatibility with farm practices.

Among the reasons the Council included Study Area 49 is the severe regional shortage of industrial land and the suitability of this area for industrial use. Inclusion of this area allows addition of land in this part of the region without intruding into the area that separates Wilsonville from Tualatin.

F. Tualatin Area, Study Areas 47 (partial), 49 (partial)

These contiguous portions of Study Areas 47 and 49 lie adjacent to and southwest of the City of Tualatin. It is all exception land and excludes the aggregate sites in a farm zone to the north that are protected in Washington County's Goal 5 program. The Council designated the included portions as Regionally Significant Industrial Area (RSIA) on the 2040 Growth Concept Map (Exhibit N) and on the map of RSIA's (Exhibit E). The included portions are generally easy to serve and can be served in an orderly manner from the city. The city indicates a willingness to provide the area with water, sewer and storm-water services and transportation.

Adverse economic, energy, environmental and social consequences of urbanization rate from "low" to "high." Compliance with Title 3 of the UGMFP will reduce adverse consequences to water quality and the identified wetland and the streams and riparian areas present. Urbanization of the area will bring urban development near agricultural zoning and activities. However, the farm-zoned land to the north is dominated by aggregate extraction. Industrial development is generally more compatible with agricultural activities than residential or commercial development. Also, application of General Condition 5 in Exhibit M will reduce incompatibility with farm practices.

Among the reasons the Council included these portions of Study Areas 47 and 49 are the severe regional shortage of industrial land and the suitability of this area for industrial use. Inclusion of these portions closes the separation between the cities of Tualatin and Sherwood, but an extensive separation remains. The power line on the west edge of Study Area 47 offers a clear transition from industrial use in the study areas and agriculture on the west.

G. Sherwood Area, Study Areas 54 (partial) and 55 (partial)

These contiguous portions of Study Areas 54 and 55 – all exception land - lie to the south of the City of Sherwood. The portions can be provided with water, sewer and storm-water services and transportation; they rate "easy" to serve. Because the area is adjacent to the city, services can be extended in an orderly manner. Adverse economic, energy, environmental and social consequences of urbanization in these portions of the area will be relatively low. Urbanization of this area will bring urban development near agricultural activities, largely separated from the activities by Brookman Road. Application of General Condition 5 in Exhibit M will reduce incompatibility with farm practices.

The Council included these exception lands because the area is adjacent to Sherwood and is the likely corridor for the Tualatin-Sherwood Connector. The Council has placed a condition upon inclusion of this area to protect the rights-of-way in Exhibit M. The connector will provide a clear transition from urban to rural use.

H. Sherwood Area, Study Area 59 (partial)

This portion of Study Area 59 lies adjacent to and west of the City of Sherwood. It is all exception land. The Council designated the included portion as Inner Neighborhood on the 2040 Growth Concept Map (Exhibit N), but the area includes a school site, protected for that purpose by a condition upon inclusion in the UGB in Exhibit M.

The city indicates a willingness to provide the area with water, sewer and storm-water services and transportation. This portion of the study area rates "easy" (sewer, water, storm-water) to "moderately difficult" (transportation) to serve. Because this portion of Areas 59 is adjacent to the city, services can be extended in an orderly manner.

Adverse economic, energy, environmental and social consequences of urbanization in this small portion of Study Area 59 will be relatively low. Compliance with Title 3 of the UGMFP will reduce the consequences to water quality, streams and riparian areas.

Part of the northern boundary of this portion of Area 59 borders land zoned for farm use. Urbanization of the area will bring urban development near agricultural activities. Edy Road will separate urban development from farm activities to the north. Application of General Condition 5 in Exhibit M will reduce incompatibility with farm practices.

The Council included this land because it is exception land, adjacent to and bordered on most of its perimeter the city and other exception land, relatively easy to serve with public services and contains a site for public school facilities.

J. Tualatin Area, Study Area 61 (partial)

These two portions of Study Area 61 lie adjacent to the City of Tualatin. The northern portion sits along Highway 99W and has been designated for industrial use on the 2040 Growth Concept Map (Exhibit N). The Council did not include the portion of Study Area 61 on the north side of Highway 99W because it is close to the Tualatin River National Wildlife Refuge. The small southern piece has also been designated for industrial use.

These portions of the study area rate "easy" to "moderately difficult" to serve. However, they are adjacent to the city and the city indicates a willingness to provide the area with water, sewer and storm-water services and transportation.

Adverse economic, energy, environmental and social consequences of urbanization in these small portions of Study Area 61 will be relatively low. Compliance with Title 3 of the UGMFP will reduce the consequences to water quality, streams and riparian areas.

The Council included these portions of Study Area 61 because they are exception areas adjacent to the City of Tualatin, because the northern piece can provide much-needed industrial land, and because the southern piece joins the portion of a split parcel outside the UGB to the portion inside the UGB.

K. Westside Area, Study Areas 62 (partial), 63, 64, 67, 69 (partial), 71 and 0

These non-contiguous study areas lie west of and adjacent to the UGB as it existed prior to this expansion. The portions included are all exception lands and designated Inner Neighborhood on the 2040 Growth Concept Map (Exhibit N). Part of the included portion of Study Area 62 will be used by the City of King City as a park and storm-water retention area. The cities of Tigard, Beaverton and Hillsboro will use the other portions of the Westside Area to provide housing.

Study Areas 63, 64, 67, 69 (partial), 71 and 0 rate "easy" to "difficult" for sewer, water, storm-water and transportation services. The cities of Tigard, Beaverton and Hillsboro, Clean Water Services and the Tualatin Valley Water District will be the service providers; all have expressed a willingness to provide the services. These areas are adjacent to the UGB as it existed prior to this expansion; services can be extended in an orderly manner.

Adverse economic, energy, environmental and social consequences of urbanization in these areas will be relatively low. Compliance with Title 3 of the UGMFP will reduce the consequences to water quality and the few wetlands, streams, floodplains and riparian areas present.

Urbanization of the areas will bring urban development near agricultural activities to the west and south of the UGB. However, most of the areas are already developed in a rural residential pattern. Application of General Condition 5 in Exhibit M will reduce incompatibility with farm practices.

The Council included these exception lands to provide opportunities for a wide range of housing types in a part of the region that is relatively "housing-poor."

L. Cornelius Area, Study Areas 77 (partial)

This small portion (16 acres) of Study Area 77 is entirely exception land and lies between the cities of Cornelius and Hillsboro. It has been designated as Employment Area on Exhibit N of this ordinance.

This portion of the study area rates "easy" to serve with water, sewer and storm-water services and transportation. The City of Cornelius and Clean Water Services both indicate a readiness to provide these services; both have plans to do so.

Adverse economic, energy, environmental and social consequences of urbanization in these small portion of Study Area 77 will be relatively low. Compliance with Title 3 of the UGMFP will reduce the consequences to water quality, streams and riparian areas.

Urbanization of the area will bring urban development near agricultural activities to the west and south of the UGB. However, most of the area is already developed in commercial and rural residential uses. Application of General Condition 5 in Exhibit M will reduce incompatibility with farm practices.

The Council included this portion of Study Area 77 because it can help meet the shortfall in employment land and enhance the capability of the City of Cornelius to provide urban services at the east end of the city.

M. Forest Park Area, Study Areas 89 (partial), 93 (partial) and 94

Study Area 94 and portions of Study Areas 89 and 93 are nearly surrounded by the UGB as it existed prior to this amendment. These exception lands are characterized by low-density residential development on relatively steep slopes and are designated Outer Neighborhood on the 2040 Growth Concept Map (Exhibit N). It will be difficult to provide services to the areas, but the likely providers, except for the City of Portland, have plans to extend services or have expressed willingness to do so.

Adverse economic, energy, environmental and social consequences of urbanization in these areas will be "moderate." Compliance with Title 3 of the UGMFP will reduce the consequences to water quality and the riparian areas present.

There is little agricultural activity adjacent or near these areas, which are largely forested. Consequently, there will be little impact from further low-density residential development in the areas.

The Council included these areas because they are nearly surrounded by the UGB and provide an opportunity for lower-density housing within two miles of the Bethany Town Center.

**Exhibit P to Ordinance No. 02-969B
Findings of Facts, Conclusions of Law**

I. General Findings for Task 2 Decision

A. Coordination with Local Governments

These findings address Goal 2, Coordination. Metro worked closely with the local governments and special districts that comprise the metropolitan region. The Metro Charter provides for a Metropolitan Policy Advisory Committee (MPAC) composed generally of representatives of local governments, special districts and school districts in the region. MPAC reviewed all elements of this Task 2 of periodic review decision. MPAC made recommendations to the Metro Council on most portions of the decision. All recommendations were forwarded formally to the Council and the Council responded. Metro Councilors and staff held countless meetings with local elected officials in the two years of effort leading to this decision.

There was steady correspondence among Metro and local governments. The record of this decision includes that volume of correspondence, including Metro's responses to concerns and requests from local governments and local districts related to Task 2.

Metro accommodated the requests and concerns of local governments as much as it could, consistent with state planning laws and its own Regional Framework Plan.

B. Citizen Involvement

These findings address Goal 1 and Regional Framework Plan Policy 1.13.

To gather public input on this Task 2 decision, Metro conducted one of the most extensive citizen involvement in its history. Metro began its "Let's Talk" effort in September, 2001, including 93 "Coffee Talks" throughout the region that attracted 1,200 participants. "Let's Talk" included a regional conference and five public workshops on March 15-16, 2002. Some 1,200 people attended. In June and July of 2002, Metro conducted five public workshops around the region, with 800 participants. Media coverage of this early effort included a one-hour "Let's Talk" show on KGW Channel 8 on March 15, 16 television news stories on network news programs, 62 articles in local papers and three stakeholder surveys.

Since August, 2002, after Metro's Executive Officer released his recommendation on Task 2 (measures to increase efficiency of land use and to expand UGB), Metro sent mailed notices to 105,000 property owners and interested persons, placed 120,00 utility inserts to area ratepayers, placed four quarter-page advertisements in the Oregonian, and single quarter-page ads in local papers. The Metro Council's Community Planning Committee (composed of all Council members) held seven public hearings in October; there were over 1,100 participants at these hearings. Media briefings since August yielded 175 articles (since June, 2002). Metro held organizational briefings, opened a 24-hour information and comment line, published a monthly newsletter, distributed fact sheets, place booths at county fairs, translated its UGB flyer into Spanish, Russian, Chinese and Vietnamese, keep an active and up-to-date website and sponsored two official tours of UGB study areas for local elected officials.

These efforts bring Metro into compliance with Goal 1 and Metro's Regional Framework Plan. More important, this work to involve Metro area citizens has contributed greatly to their understanding of the importance of this set of decisions for the region and have brought Metro invaluable comment on options available to it.

C. Need for Land

These findings address ORS 197.296; ORS 197.732(1)(c)(A); Goal 2, Exceptions, Criterion (c)(1); Oregon Administrative Rules 660-004-0010(1)(c)(B)(i) and 660-004-0020(2)(a); Goal 9 (local plan policies); Goal 10; Goal 14, Factors 1 and 2; Metro Regional Framework Plan (RFP) Policies 1.2 and 1.4; and Metro Code 3.01.020(b)(1) and (2).

Metro conducted an analysis of the need for housing in the region in order to provide a supply through the year 2022. The Urban Growth Report-Residential (UGR-R) provides the details of that analysis. The analysis indicates that the region will need capacity for an additional 220,700 dwelling units.

Metro analyzed the capacity of the existing Urban Growth Boundary (UGB) to accommodate 220,700 dwelling units. The analysis, the details of which are in the UGR-R, determined that the 24,400 acres of net vacant buildable land within the UGB could accommodate 177,300 additional dwelling units, leaving a shortfall of approximately 43,400 units.

Metro also conducted an analysis of the need for land for new jobs through the year 2022. The Urban Growth Report-Employment (UGR-E) provides the details of that analysis. The analysis indicates that the region will need approximately 14,240 acres to accommodate an additional 355,000 jobs.

Metro analyzed the capacity of the existing UGB to accommodate this employment growth. The analysis determined that the UGB contained a surplus of land (759.6 acres) for commercial employment and a deficit of land (5,684.9 acres) for industrial development. The UGR-E provides the details of this analysis. Overall, the existing UGB does not have the capacity to accommodate the forecasted employment.

D. Alternatives: Increase Capacity of the UGB

These findings address ORS 197.732(c)(B); Goal 14, Factors 3 and 4; Goal 2, Exceptions, Criterion 2; OAR 660-004-0010(1)(B)(ii) and 660-004-0020(2)(b); Metro Code 3.01.020(b)(1)(E); and RFP Policies 1.2, 1.3, 1.6, 1.7 and 1.8.

To address the shortfall in residential capacity, Metro first considered actions it could take to increase the efficiency of the existing supply of land. Metro's Urban Growth Management Functional Plan (UGMFP), adopted in 1996 and acknowledged on December 8, 2000, required most local governments in the region to make significant increases in the efficiency of their supplies of residential land. Metro explored the possibility of further efficiencies in downtowns and town centers. Studies advised that non-regulatory measures would be most likely to increase residential development in centers. Metro tested the long-range effects of selected non-regulatory measures on the rate of infill and redevelopment ("refill") and found that the measures would increase refill.

Based upon this analysis, Metro developed a strategy to increase the refill rate in centers. This strategy, contained in RFP Policy 1.5 and new UGMFP Title 6 and described more fully in the UGR-R, will increase the capacity of the existing UGB by 6,000 dwelling units, reducing the shortfall to 37,400 units. The UGR-R demonstrates the likelihood that the region will achieve the higher refill rate.

To address the shortfall in employment capacity, Metro considered measures to increase the efficiency of land use within the UGB designated for employment. Metro's UGMFP Title 4 limits non-employment uses in areas designated for employment use. Title 4 also limits commercial retail uses in areas designated for industrial employment. Analysis of results of local implementation of Title 4 indicates that commercial uses and other non-industrial uses are converting land designated for industrial use to non-industrial use.

In response to this information, the Metro Council amended the RFP (Exhibit D, Policies 1.4.1 and 1.4.2) and Title 4 (Exhibit F) to improve the protection of the existing industrial land base. The Council created a new 2040 Growth Concept design type – "Regionally Significant Industrial Land" (RSIA) – and developed new limitations on commercial office and commercial retail uses in RSIA's. Metro estimates that these new measures will reduce the shortfall in industrial land by 1,400 acres by reducing encroachment by commercial uses. These measures will, however, also reduce the capacity of employment land to accommodate commercial office and retail uses, converting the small surplus of commercial land to a small deficit of land. The overall net effect is a remaining, but smaller deficit (4,425.3 acres) in the capacity of the existing UGB to accommodate all of the forecast employment.

E. Alternatives: Expand the UGB

These findings address ORS 197.732(c)(B), (C) and (D) and Goal 2, Exceptions; ORS 197.298(1); Goal 11; Goal 14, Factors 3-7; OAR 660-004-0010(1) and 660-004-0020(2); RFP Policies 1.2 and 1.7; and Metro Code 3.01.020(b)(3) through (7) and 3.01.020(d)

The measures taken by the Council to increase the capacity of the existing UGB, described above, reduced housing need by 6,000 acres and reduced the need for employment land by approximately 1,200 acres. The measure leave an unmet need for land for 37,400 dwelling units and for 4,400 acres of employment land.

Metro began the search for the most appropriate land for inclusion in the UGB by applying the priorities in ORS 197.298(1). Because Metro has not re-designated "urban reserve" land since its 1997 designation was invalidated on appeal, the highest priority for addition of land is exception land. Metro mapped all exception land within one mile of the existing UGB, extending beyond the mile to catch exception lands that themselves extended beyond one mile. Metro mapped those resource lands surrounded by or intermingled with exception land to determine whether they must be included in order to urbanize the exception lands. In all, Metro looked at approximately 80,000 acres to find the most appropriate land.

Once Metro mapped land by its statutory priority, Metro analyzed the suitability of the land for urbanization, considering the locational factors of Goal 14, the consequences and compatibility criteria of the Goal 2 and statutory exceptions process, the policies of the Regional Framework Plan (RFP) and the criteria in the Metro Code that are based upon Goal 14. Metro estimated the housing and employment capacity of each "study area." This analysis is set forth in the 2002 Alternatives Analysis Study, Item 6 in Appendix A of Ordinance No. 02-969.

Ultimately, by Ordinance No. 02-969, the Council added 17,458 acres to the UGB, 15,047 acres for housing and 2,411 acres for employment. The Council was able to accommodate most of the unmet housing need (37,400 dwelling units) and much of the need for employment land (4,284 acres) on exception land. The Council added resource land (3,352 acres) only where it found inclusion necessary in order to urbanize exception land. Together with the dwelling unit capacity added by Ordinance No. 02-987, the Council accommodated the full 20-year need for housing.

The Council was unable to accommodate the full 20-year need for employment land. As noted in Resolution No. 02-3236C, directing the Executive Officer to seek modification of Metro's periodic review work program, Metro was unable to find enough exception land with needed characteristics (parcel size, proximity to essential services, etc.) within the 80,000 acres it studied. During its analysis it became clear to the Council that it would be forced to turn to resource land to find land with these characteristics. Metro did not study enough resource land and found itself, in the absence of a regional economic strategy, unprepared to weigh the need for industrial land against the loss of the land base for another industry – agriculture. It is for these reasons that Metro will ask for a new periodic review work task to complete the accommodation of the region's need for industrial land.

Nonetheless, the Council included enough employment land in the Gresham and Damascus area to allow a complete and sufficient new Damascus Town Center to emerge. This will help the entire region.

The Council found that the region will be able to urbanize the lands it has added to the UGB in an efficient and orderly fashion. The Council concluded that the overall consequences of urbanization of these lands are acceptable, especially given the protections in place in the RFP and Metro Code for sensitive resources. Through mitigation measures required by the conditions in Exhibit M, the Council believes it can achieve compatibility between urbanization of the land added to the UGB and adjacent land outside the UGB.

The Council also believes that it was able to maintain separations between communities at the urban fringe sufficient to allow each community to retain a sense of place. The Council chose ridgelines, streams, powerlines, roads and property lines to define the boundaries of the UGB in an effort to provide a distinct boundary and a clear transition between urban and rural uses.

F. Water Quality

Each local government responsible for an area added to the UGB must complete the planning requirements of Title 11, Urban Growth Management Functional Plan (UGMFP), including compliance with the water quality provisions of Title 3 of the UGMFP.

G. Areas Subject to Natural Disasters and Hazards

The Council has excluded environmentally constrained areas from the inventory of buildable land (see UGRs) and from its calculation of the housing and jobs capacity of each study area (see Alternatives Analysis). Each local government responsible for an area added to the UGB must complete the planning requirements of Title 11, Urban Growth Management Functional Plan (UGMFP), including compliance with Title 3 of the UGMFP on floodplains and erosion control.

H. Economic Development

As part of Task 2 of periodic review, Metro reviewed the economic development elements of the comprehensive plans of each of the 24 cities and three counties that comprise the metro area. Metro used the review in its determination of the region's need for employment land and for coordination with local governments of its choices to add land to the UGB for employment purposes. The review also helped the Council reach the conclusion mentioned in section E, above, that further work is necessary to reach regional agreement on economic strategy before adding to the UGB all the employment land needed to the year 2022. The review will be one of the building blocks of the strategy.

Revisions to Title 4 (Industrial and Other Employment Areas) of the UGMFP (Exhibit F of this ordinance) and General Conditions IA(C) and (F), and Specific Conditions IIA(7) and (8) and II(E)(2) and (3) (Exhibit M of this ordinance) add significant protection to sites designated for industrial use, both those added to the UGB and those within the UGB prior to expansion, to help ensure their availability for that purpose.

II. Specific Findings for Particular Areas

A. Gresham and Damascus Area, Study Areas 6 (partial), 10 (partial), 11, 12, 13, 14, 15, 16, 17, 18 and 19 (partial)

These findings address ORS 197.298; ORS 197.732(1)(c)(B), (C) and (D); Goal 2, Exceptions, Criteria (c)(2), (3) and (4); Oregon Administrative Rules (OAR) 660-004-0010(1)(B)(ii), (iii) and (iv); OAR 660-004-0020(2)(b), (c) and (d); Goal 5; Goal 11; Goal 12; Goal 14, Factors 3 through 7; Metro Code 3.01.020(b)(3) through (7) and 3.01.020(d); Metro RFP Policies 1.2, 1.3, 1.4, 1.6, 1.7 and 1.11; and Regional Transportation Plan Policies 2.0, 3.0, 4.0 and 14.0.

The Gresham and Damascus study areas (herein called "the Damascus area") include all or portions of Study Areas 6, 10, 11, 12, 13, 14, 15, 17, 18 and 19, as shown on the Exhibit N map. The Council includes this land within the UGB for three principal reasons. First, the Council wants to accommodate as much housing and employment on exception land as possible, to avoid urbanization of farm and forest land. Second, the Council wants to accommodate a significant portion of the region's overall need for land for employment on the east side of the region to improve the jobs/housing ratio, currently "housing rich" and "jobs poor." Third, the Council wants urbanization in this area to support the Gresham Regional Center, the Rockwood Town Center and the Damascus Town Center in a manner consistent with the 2040 Growth Concept. Including the Damascus area in the UGB will bring development that will help pay for infrastructure for these communities and the Inner and Outer Neighborhoods that surround them.

The Damascus area includes 10,027 acres of exception land. The Council includes this exception land in the Damascus area because it is the highest priority for inclusion in the UGB under ORS 197.298(1) and because the Council wants to protect the region's agricultural industry. Reluctantly, the Council includes 3,352 acres of resource land in the Damascus area because it is intermingled with the exception land. The Council considered maps and analysis of the area produced by the City of Gresham and Clackamas County. The maps and analyses allow comparison between the location of needed sewer, water, storm water and transportation facilities if the resource land is included, and their location if the resource land is excluded. From these analyses the Council concludes that it must include the resource land in the Damascus area because urban services must pass through the resource land in order to provide the services to the exception land in the area.

If the resource land were excluded, the exception land in the Damascus area could not urbanize efficiently. The area as a whole could not produce communities with employment opportunities and the fiscal resources commercial and industrial development provide for urban services. For this reason, the Council concludes that it must include the resource land in the Damascus area in order to maximize the efficiency of urbanization of the exception land.

Finally, without the intermingled resource land, the exception land would accommodate far fewer households and jobs. Metro would have to look to exception lands or resource land in other locations to accommodate the households and jobs not accommodated here.

1. Alternatives

Exception areas outside the UGB cannot reasonably accommodate the jobs and housing slated for the Damascus area. Each of the exception areas included in the UGB in the Task 2 decision, both within and outside the Damascus area, will accommodate the jobs and housing densities assigned to the 2040 Growth Concept Design Type on the buildable land in the exception area. LCDC has previously acknowledged these densities and the design types. The jobs and housing density requirements of Title 1 of the Urban Growth Management Functional Plan (UGMFP), aimed at increasing the efficiency of the use of urban land within the UGB, have also been acknowledged. These same Title 1 requirements will apply to the land added to the UGB, including the Damascus Area. Ordinance No. 02-969 takes further action to improve the efficiency of employment land by amending Title 4 (Industrial and Other Employment Land) of the UGMFP (Exhibit F) and of residential and mixed use land by adopting a strategy to increase the number of housing units accommodated on developed land ("refill" rate) (Exhibits G and H). These amendments and this strategy will apply to exception land included in the UGB.

As indicated in the Alternatives Analysis in Appendix A, the exception areas included within the UGB and those studied for possible inclusion have topographic characteristics that limit the overall density (dwelling unit yield) at which it can be developed. The areas also contain plant and wildlife habitat (particularly streams and riparian habitat) and development patterns that prevent accommodation of higher numbers of jobs or housing than the numbers allocated to the exceptions areas by Ordinance No. 02-969.

Metro studied nearly 40,000 acres of exception lands that have not been included in the UGB by Ordinance 02-969. These lands compared unfavorably with the exception lands that the Council included, for reasons explained in these findings. On the whole, the exception lands not included cannot reasonably accommodate the jobs and housing allocated to the resource land in the Damascus area because the lands cannot urbanize efficiently or be provided efficiently with urban services, and natural resources present on the lands would be more adversely affected by urbanization.

Metro also considered other resource land to accommodate the jobs and housing allocated by this decision to the resource land in the Damascus area and rejected those other resource lands. As indicated by the soil maps that are part of Metro's Alternatives Analysis, the included resource land in the Damascus Area is predominantly Class III and IV on the Natural Resource and Conservation Service (NRCS) capability classification system. Other areas of resource land in the region generally have higher capability soils than the soils present in the Damascus area. Only in the Damascus area are resource lands so fully interspersed with exception lands.

Including the resource lands interspersed with exception lands in the Damascus area will also have less adverse social and economic consequences when compared with including other resource lands in the UGB. Urbanization of the Damascus area as a whole can, consistently with the statutory requirement to include exception land as highest priority, be done more efficiently and economically, and can provide a more complete and livable urban environment, than including other exception lands or other resource lands.

2. Orderly Services

The Council considered whether public facilities and services could be provided in an orderly and economic fashion to the Damascus area. The Council relied upon the Water, Sewer and Stormwater Feasibility Analysis and the Transportation Services Feasibility Analysis contained in its Alternatives Analysis (Appendix A, Item 6) for its determination that these services can be provided to the Damascus area in an orderly and economic manner. The Council also considered maps showing likely public service facility layouts provided by the City of Gresham and Clackamas County, and the vision produced by the Damascus Area Design Workshop. The Council further considered more detailed analysis of serviceability from the City of Gresham indicating that the city can provide services to the northern portion of the Damascus area (Study Areas 6 and 12 north of the Multnomah County line) immediately and the remainder of the study areas within the watershed of Johnson Creek within five years of inclusion within the UGB. Condition IIA(1) of Exhibit M calls for transportation and public facility and service plans within four years after the effective date of this ordinance. Condition IIA(4) calls for phasing and timing of service provision to allow the emergence of town centers in the Damascus area.

The Alternatives Analysis sets forth the likely service provider for sewer, water and storm-water services and assigns a serviceability rating for each study area within the Damascus area. Serviceability generally ranges from "moderate" to "easy" to serve (Table A-3) and compares favorably with exception areas not included (such as outlying Study Areas 5, 9, the excluded portion of 10, 29, 30, 36 and 52).

Transportation services will be difficult to provide in parts of the Damascus area due to the varied topography. However, Metro's 2000 Regional Transportation Plan (RTP) anticipated inclusion of the Damascus area within the UGB. The RTP's "Priority System" of planned transportation facilities, for which funding is expected, shows how the region will provide transportation services to the area. The City of Gresham provided more detailed analysis of serviceability showing that it will be easier to provide transportation services to the Damascus area than indicated in the Alternatives Analysis.

3. Efficiency

The Council considered whether the Damascus area could be urbanized in an efficient manner. The Council relied the same information on provision of essential services mentioned above. This information convinced the Council that the area can urbanize efficiently, achieving the housing and job density targets associated with the 2040 Growth Concept design types assigned to the Damascus area.

The Council recognizes that the Damascus area, characterized by pockets of small parcels, hilly topography, riparian and floodplain areas and limited transportation services, cannot achieve the overall densities that might be achieved on large tracts of flat resource land adjacent to the UGB. The Council, however, has compared the efficiency of urbanizing the Damascus area not with flat farmland, but with other exception lands. In that comparison, the Council concludes that it better

achieves Goal 14 to include the exception land in the Damascus area because that area offers a better opportunity to urbanize fully, efficiently, economically and to establish a complete community of housing, employment and community services than does any other large area of exception land (such as Study Areas 5, 8, 9, 29, 30, 36 or 53) or than a large number of small areas of exception land along the fringe of the UGB (such as 59 through 67, 69-71, 77-80 and 82).

The Council also concludes that adoption of RFP Policy 1.5 (Exhibit G), new Title 6 (Centers) of the UGMFP (Exhibit H), and the Centers Strategy (Appendix A, Item 3) will not only increase the efficiency of urbanization within the UGB as it stood before Ordinance No. 02-969, but also within the Damascus area, given the design types (including a Town Center) assigned to the area by this ordinance. Adoption of RFP Policies 1.4.1 and 1.4.2 (Exhibit D) and revision of Title 4 of the UGMFP (Exhibit F), both dealing with Regionally Significant Industrial Areas (RSIAs), will increase the efficiency of urbanization within the UGB as it stood prior to this ordinance and within the Damascus area.

4. Consequences

The Council considered the consequences of urbanization on the people and land of the Damascus area. The area is characterized geographically by hills, valleys and streams. It is characterized socially by rural residences, small farms and woodlots and several small-town concentrations of businesses and community services. The Alternatives Analysis and materials presented to the Council during public hearings offer the information and analysis upon which the Council relied in its consideration of the consequences of urbanization.

Urbanization will affect all characteristics of the Damascus area. The social effects of urbanization are unavoidable. Some of these effects could be avoided by urbanizing resource land. But the Council wants to minimize the urbanization of resource land, so it has compared the social consequences among optional exception areas. The Council concludes that the social effects of urbanizing the Damascus area will be less adverse than urbanization of any of the large exception areas (such as Study Areas 5, 8, 9, 29, 30, 36 or 53) or of a large number of smaller exception areas along the fringe of the UGB (such as 59 through 67, 69-71, 77-80 and 82) because the Damascus area offers the best opportunity to establish a complete community of housing, employment and community services and an orderly, economic and efficient network of sewer, water, storm-water and transportation infrastructure. Land designated for employment, especially RSIAs, offers the best choice for substantial employment opportunities on the east end of the region with the least impact on commercial agriculture.

Environmental consequences are also unavoidable, as noted in the Alternatives Analysis. They range from "high" to "moderate" to "low." There are study areas in other parts of the region not included in the UGB where consequences of urbanization fall lower on the range. But these areas are scattered across the region and cannot accommodate the larger number of dwelling units and jobs, or the balance of housing and jobs, that the Damascus area can accommodate. In order to find sufficient capacity on other lands for the housing and jobs that this area can accommodate, the Council would have to include resource land and other exception land with more adverse consequences.

The Damascus Area Design Workshop showed how urbanization of the area could minimize adverse environmental consequences in the area. It is unlikely that the measures considered in the workshop could be undertaken in other large or small exception areas because the measures require a concentration of urban development in the buildable areas in order to reduce the effects

of urbanization on unbuildable areas, such as streams, riparian areas, wetlands and steep slopes (to provide the funds, transfer of development rights opportunities, etc.). The Council further considered that Title 3 of the UGMFP and the conditions in Exhibit M will apply to the Damascus area to protect the streams, wetlands, floodplains and steep slopes of the area.

Adverse economic and energy consequences of urbanization in the Damascus area are "moderate" to "low." The Council concludes that, notwithstanding the noted adverse consequences, the positive consequences of accommodating urbanization in a complete fashion – housing, employment and community services and an orderly, economic and efficient network of sewer, water, storm-water and transportation infrastructure – outweigh the more adverse economic and energy consequences of scattering this development along the perimeter of the UGB and urbanizing resource land.

5. Compatibility

The Agricultural Compatibility Analysis shows that the study areas that comprise the Damascus area are moderately to highly compatible with nearby agriculture. The included resource land in Area 11 borders excluded resource land on the south side of Area 11. Evaluation of compatibility for this area (Alternatives Analysis, Appendix A, Item 6, p. A-25) determined that it is "moderate", meaning that there is some incompatibility. Ordinance No. 02-969 of the Task 2 decision imposes Condition IE upon urbanization of this part of Area 11 in order to reduce conflict and improve compatibility between urban use on the included land and agricultural use on the excluded land to the south.

The included resource land in Study Areas 12 and 13 borders exception land that is included in the UGB. Urbanization of these lands will have no significant adverse effect upon excluded resource land. This ordinance designates the included portion of Study Area 6 for industrial use, generally more compatible with agricultural activities. The ordinance imposes Condition IE upon urbanization of Area 6 to reduce conflict and improve compatibility between urban use on the included land and agricultural use on the excluded land to the south. An included portion of Study Area 12 borders designated forest land to the east. Condition IE also applies to Area 12.

6. Natural and Cultural Resources

Metro's alternatives analysis addresses the Goal 5 resources protected in the Damascus area by Multnomah and Clackamas Counties in their acknowledged comprehensive plans. The counties will be responsible for protecting inventoried Goal 5 resources in the area when they amends their comprehensive plans and zoning ordinances to implement expansion of the UGB. Condition IIA(2) of Exhibit M requires the counties to consider Metro's inventory of Goal 5 resources in their application of Goal 5 to the Damascus area. Title 3 (Water Quality, Flood Management and Fish and Wildlife Conservation) of the UGMFP requires Clackamas County to protect water quality and floodplains in the area. Title 11 of the UGMFP, section 3.07.1120G, requires the counties to protect fish and wildlife habitat and water quality. Title 11, section 3.07.1110, protects the status quo in the interim period of county planning for the area.

The counties' inventories of Goal 5 resources protected by land use regulations include one mining (aggregate) site, Kelly Creek in Study Area 13, Johnson Creek in Study Area 12, one upland habitat site and historic buildings in Study Areas 12, 17 and 19. Under Metro's Title 11, current county land use regulations will remain in place until the counties adopt new plan

provisions and land use regulations to allow urbanization of the Damascus area, at which time the responsible local government will apply Goal 5 to these resources. Urbanization may affect the inventoried sites. If so, the local governments will determine whether to limit urbanization near the sites, or to re-evaluate their earlier decisions to protect the sites.

7. Public Utilities and Services

Under statewide Planning Goal 11, Metro is responsible for coordination of the preparation of public facility plans within the district. Metro will fulfill this responsibility through implementation of Title 11 of the UGMFP, which (1) prohibits Multnomah and Clackamas Counties from upzoning and from dividing land into resulting lots or parcels smaller than 20 acres until the counties revise their comprehensive plans and zoning ordinances to authorize urbanization of land Metro brings into the UGB; and (2) requires the counties to develop public facilities and services plans and urban growth diagrams with the general locations of necessary public facilities such as sanitary sewers, storm sewers and water lines for the Damascus area. Metro and the counties began this work with the evaluation of the serviceability of the Damascus area in the Alternatives Analysis and consideration of how to provide services as part of the analysis required to satisfy ORS 197.298(3)(c) and Goal 14, factors 3 and 4.

8. Transportation

Metro has responsibility to ensure that its Task 2 decision for the Damascus area does not significantly affect a transportation facility or allow uses that are inconsistent with the identified function, capacity and performance standards of transportation facilities. Metro fulfills this responsibility through implementation of Title 11 of the UGMFP, which (1) prohibits Multnomah and Clackamas Counties from upzoning and from land divisions into resulting lots or parcels smaller than 20 acres in the area until the counties revise their comprehensive plans and zoning ordinances to authorize urbanization of land Metro brings into the UGB; and (2) requires the counties to develop conceptual transportation plans and urban growth diagrams with the general locations of arterial, collector and essential local streets for the area. Metro and the counties began this work with the evaluation of the serviceability of the Damascus area in the Alternatives Analysis and consideration of how to provide services as part of the analysis required to satisfy ORS 197.298(3)(c) and Goal 14, factors 3 and 4.

Metro's 2000 Regional Transportation Plan (RTP) anticipated inclusion of the Damascus area within the UGB. The plan's "Priority System" of planned transportation facilities shows improvements planned for the area to serve anticipated growth. Condition IIA(6) of Exhibit M calls for protection of the rights-of-way for the Sunrise Highway, the most significant improvement in the Priority System for the area.

9. Regional Framework Plan

The Council has included the Damascus area as the best option before it to comply with state planning laws and the policies of the RFP. Taking this land into the UGB allows Metro to accommodate a large number of jobs and housing units in an integrated and complete community with the least impact on agriculture in the three-county area. The area will not only provide employment opportunities for new residents of the Damascus area, but also improve the ratio between jobs and housing in the east side of the region.

The Council has applied conditions (Exhibit M) to the addition of the Damascus area to ensure full consideration of the affordability of housing in light of anticipated employment opportunities. The conditions also require measures to ensure the emergence of distinct communities, including the designated Damascus Town Center. The conditions make reference to Title 11 of the Urban Growth Management Functional Plan (UGMFP), which requires the counties and, possibly, a newly incorporated city, to plan for concentrations of housing that will support an efficient arrangement of public facilities and services, including transportation.

10. Regional Transportation Plan

Through its Joint Policy Committee on Transportation, Metro has coordinated transportation planning and funding of transportation improvements with local governments in the region. The Regional Transportation Plan adopted a "Priority System" of improvements through the year 2020. The Priority System includes the most critical improvements needed to implement the 2040 Growth Concept. Among the improvements are the "East Multnomah County Transportation Projects" and the "Pleasant Valley and Damascus Transportation Projects" that will provide the basic transportation services to the area (pages 5-49 to 5-57). Figures 1.4, 1.12, 1.16, 1.17, 1.18 and 1.19 of the RTP show how the region's street design, motor vehicle, public transportation, freight, bicycle and pedestrian systems will extend into the Damascus area.

B. Oregon City Area, Study Areas 24 (partial), 25 (partial), 26 (partial), and 32 (partial)

These non-contiguous portions of Study Areas 24, 25, 26 and 32 included by the Council, but for 17.5 acres of forest land, are exception areas. The areas are mostly designated for housing on the 2040 Growth Concept map (Exhibit N), but Area 26 includes designated industrial land and Area 32 includes designated employment land. The Council included a small tract of forest land to avoid splitting a parcel owned by the Oregon City School District and used for school purposes. Metro has a conservation easement over a portion of this forest land.

The City of Oregon City indicates that the areas can be provided with water, sewer and storm-water services and transportation. The included portions are contiguous to the city and can be served in an orderly manner. The areas rate from "easy" to "difficult" to serve; portions that contain steeper slopes are more difficult. The portions of the areas included are the more serviceable portions. In particular, inclusion of portions of Areas 24 and 26 will allow a road connection between Holcomb Boulevard and Redland Road that will improve transportation in the area.

Adverse economic, energy, environmental and social consequences of urbanization in the areas range from relatively low to relatively high. Compliance with Title 3 of the UGMFP, however, will reduce adverse consequences to water quality, streams, and riparian area. Also, urbanization of the areas would be relatively compatible with agricultural activities. Much of the nearby resource land is designated for forestry. Application of General Condition 5 in Exhibit M will reduce incompatibility with farm practices.

Inclusion of these areas will add needed housing and employment to the UGB at the south end of the region with little impact on agricultural activities or forest practices outside the UGB.

C. West Linn Area, Study Area 37

Study Area 37 – all exception land - lies to the west of the City of West Linn. The area can be provided with water, sewer and storm-water services and transportation, but it rates “difficult” to “moderately difficult” to serve, largely due to steep slopes in the southern and western portions of the area. On the other hand, the area is adjacent to the city; services can be extended in an orderly manner. Adverse economic, energy, environmental and social consequences of urbanization will be relatively low. Also, urbanization of the area will be relatively compatible with agricultural activities in the Stafford basin to the west.

Most of Study Area 37 lies within a basin that drains and orients toward West Linn, making a relatively distinct transition between the study area and the rest of the Stafford basin to the west. Urban development in the area will enhance the nearby “Civic Center” by expanding its service market. The area will produce housing that will help address the need on the southern end of the region.

In sum, the Council included this area because it is exception land, because it can address part of the need for housing, and it can enhance the city’s Civic Center.

D. Wilsonville Area, Study Area 45

Study Area 45 – all exception land - lies to the east of the City of Wilsonville. The area can be provided with water, sewer and storm-water services and transportation, but it rates “moderately difficult” to serve. Nonetheless, the city indicates readiness to provide services and has plans in place to do so. Because the area is adjacent to the city, services can be extended in an orderly manner. Adverse economic, energy, environmental and social consequences of urbanization will be relatively low. Also, urbanization of the area will bring urban development near agricultural activities. Application of General Condition 5 in Exhibit M will reduce incompatibility with farm practices.

Study Area 45 includes three parcels that comprise the site of new school facilities planned by the West Linn-Wilsonville School District. The district conducted an exhaustive search for a suitable site on the east side of Wilsonville and settled on Area 45, in part because it is exception land.

Inclusion of Study Area 45 will bring a significant number of new dwelling units to Wilsonville and improve the “jobs-rich” jobs/housing ratio.

E. Wilsonville Area, Study Area 49 (partial)

This portion of Study Area 49 lies adjacent to and northwest of the City of Wilsonville. It is all exception land. The Council designated the included portion as Regionally Significant Industrial Area (RSIA) on the 2040 Growth Concept Map (Exhibit N) and on the map of RSIA's (Exhibit E). The city indicated a willingness to provide the area with water, sewer and storm-water services and transportation and has plans in place to do so. Because this portion of Area 49 is adjacent to the city, services can be extended in an orderly manner. The portion rates “easy” to “moderately difficult” to serve.

Adverse economic, energy, environmental and social consequences of urbanization rate from “moderate” to “high”. Compliance with Title 3 of the UGMFP, however, will reduce adverse consequences to water quality and the streams, wetlands and riparian areas present. Also, urbanization of the area would bring urban development near agricultural activities. However,

industrial development is generally more compatible with agricultural activities than residential or commercial development. Application of General Condition 5 in Exhibit M will reduce incompatibility with farm practices.

Among the reasons the Council included Study Area 49 is the severe regional shortage of industrial land and the suitability of this area for industrial use. Inclusion of this area allows addition of land in this part of the region without intruding into the area that separates Wilsonville from Tualatin.

F. Tualatin Area, Study Areas 47 (partial), 49 (partial)

These contiguous portions of Study Areas 47 and 49 lie adjacent to and southwest of the City of Tualatin. It is all exception land and excludes the aggregate sites in a farm zone to the north that are protected in Washington County's Goal 5 program. The Council designated the included portions as Regionally Significant Industrial Area (RSIA) on the 2040 Growth Concept Map (Exhibit N) and on the map of RSIA's (Exhibit E). The included portions are generally easy to serve and can be served in an orderly manner from the city. The city indicates a willingness to provide the area with water, sewer and storm-water services and transportation.

Adverse economic, energy, environmental and social consequences of urbanization rate from "low" to "high." Compliance with Title 3 of the UGMFP will reduce adverse consequences to water quality and the identified wetland and the streams and riparian areas present. Urbanization of the area will bring urban development near agricultural zoning and activities. However, the farm-zoned land to the north is dominated by aggregate extraction. Industrial development is generally more compatible with agricultural activities than residential or commercial development. Also, application of General Condition 5 in Exhibit M will reduce incompatibility with farm practices.

Among the reasons the Council included these portions of Study Areas 47 and 49 are the severe regional shortage of industrial land and the suitability of this area for industrial use. Inclusion of these portions closes the separation between the cities of Tualatin and Sherwood, but an extensive separation remains. The power line on the west edge of Study Area 47 offers a clear transition from industrial use in the study areas and agriculture on the west.

G. Sherwood Area, Study Areas 54 (partial) and 55 (partial)

These contiguous portions of Study Areas 54 and 55 – all exception land - lie to the south of the City of Sherwood. The portions can be provided with water, sewer and storm-water services and transportation; they rate "easy" to serve. Because the area is adjacent to the city, services can be extended in an orderly manner. Adverse economic, energy, environmental and social consequences of urbanization in these portions of the area will be relatively low. Urbanization of this area will bring urban development near agricultural activities, largely separated from the activities by Brookman Road. Application of General Condition 5 in Exhibit M will reduce incompatibility with farm practices.

The Council included these exception lands because the area is adjacent to Sherwood and is the likely corridor for the Tualatin-Sherwood Connector. The Council has placed a condition upon inclusion of this area to protect the rights-of-way in Exhibit M. The connector will provide a clear transition from urban to rural use.

H. Sherwood Area, Study Area 59 (partial)

This portion of Study Area 59 lies adjacent to and west of the City of Sherwood. It is all exception land. The Council designated the included portion as Inner Neighborhood on the 2040 Growth Concept Map (Exhibit N), but the area includes a school site, protected for that purpose by a condition upon inclusion in the UGB in Exhibit M.

The city indicates a willingness to provide the area with water, sewer and storm-water services and transportation. This portion of the study area rates "easy" (sewer, water, storm-water) to "moderately difficult" (transportation) to serve. Because this portion of Areas 59 is adjacent to the city, services can be extended in an orderly manner.

Adverse economic, energy, environmental and social consequences of urbanization in this small portion of Study Area 59 will be relatively low. Compliance with Title 3 of the UGMFP will reduce the consequences to water quality, streams and riparian areas.

Part of the northern boundary of this portion of Area 59 borders land zoned for farm use. Urbanization of the area will bring urban development near agricultural activities. Edy Road will separate urban development from farm activities to the north. Application of General Condition 5 in Exhibit M will reduce incompatibility with farm practices.

The Council included this land because it is exception land, adjacent to and bordered on most of its perimeter the city and other exception land, relatively easy to serve with public services and contains a site for public school facilities.

J. Tualatin Area, Study Area 61 (partial)

These two portions of Study Area 61 lie adjacent to the City of Tualatin. The northern portion sits along Highway 99W and has been designated for industrial use on the 2040 Growth Concept Map (Exhibit N). The Council did not include the portion of Study Area 61 on the north side of Highway 99W because it is close to the Tualatin River National Wildlife Refuge. The small southern piece has also been designated for industrial use.

These portions of the study area rate "easy" to "moderately difficult" to serve. However, they are adjacent to the city and the city indicates a willingness to provide the area with water, sewer and storm-water services and transportation.

Adverse economic, energy, environmental and social consequences of urbanization in these small portions of Study Area 61 will be relatively low. Compliance with Title 3 of the UGMFP will reduce the consequences to water quality, streams and riparian areas.

The Council included these portions of Study Area 61 because they are exception areas adjacent to the City of Tualatin, because the northern piece can provide much-needed industrial land, and because the southern piece joins the portion of a split parcel outside the UGB to the portion inside the UGB.

K. Westside Area, Study Areas 62 (partial), 63, 64, 67, 69 (partial), 71 and 0

These non-contiguous study areas lie west of and adjacent to the UGB as it existed prior to this expansion. The portions included are all exception lands and designated Inner Neighborhood on the 2040 Growth Concept Map (Exhibit N). Part of the included portion of Study Area 62 will be used by the City of King City as a park and storm-water retention area. The cities of Tigard, Beaverton and Hillsboro will use the other portions of the Westside Area to provide housing.

Study Areas 63, 64, 67, 69 (partial), 71 and 0 rate "easy" to "difficult" for sewer, water, storm-water and transportation services. The cities of Tigard, Beaverton and Hillsboro, Clean Water Services and the Tualatin Valley Water District will be the service providers; all have expressed a willingness to provide the services. These areas are adjacent to the UGB as it existed prior to this expansion; services can be extended in an orderly manner.

Adverse economic, energy, environmental and social consequences of urbanization in these areas will be relatively low. Compliance with Title 3 of the UGMFP will reduce the consequences to water quality and the few wetlands, streams, floodplains and riparian areas present.

Urbanization of the areas will bring urban development near agricultural activities to the west and south of the UGB. However, most of the areas are already developed in a rural residential pattern. Application of General Condition 5 in Exhibit M will reduce incompatibility with farm practices.

The Council included these exception lands to provide opportunities for a wide range of housing types in a part of the region that is relatively "housing-poor."

L. Cornelius Area, Study Areas 77 (partial)

This small portion (16 acres) of Study Area 77 is entirely exception land and lies between the cities of Cornelius and Hillsboro. It has been designated as Employment Area on Exhibit N of this ordinance.

This portion of the study area rates "easy" to serve with water, sewer and storm-water services and transportation. The City of Cornelius and Clean Water Services both indicate a readiness to provide these services; both have plans to do so.

Adverse economic, energy, environmental and social consequences of urbanization in these small portion of Study Area 77 will be relatively low. Compliance with Title 3 of the UGMFP will reduce the consequences to water quality, streams and riparian areas.

Urbanization of the area will bring urban development near agricultural activities to the west and south of the UGB. However, most of the area is already developed in commercial and rural residential uses. Application of General Condition 5 in Exhibit M will reduce incompatibility with farm practices.

The Council included this portion of Study Area 77 because it can help meet the shortfall in employment land and enhance the capability of the City of Cornelius to provide urban services at the east end of the city.

M. Forest Park Area, Study Areas 89 (partial), 93 (partial) and 94

Study Area 94 and portions of Study Areas 89 and 93 are nearly surrounded by the UGB as it existed prior to this amendment. These exception lands are characterized by low-density residential development on relatively steep slopes and are designated Outer Neighborhood on the 2040 Growth Concept Map (Exhibit N). It will be difficult to provide services to the areas, but the likely providers, except for the City of Portland, have plans to extend services or have expressed willingness to do so.

Adverse economic, energy, environmental and social consequences of urbanization in these areas will be "moderate." Compliance with Title 3 of the UGMFP will reduce the consequences to water quality and the riparian areas present.

There is little agricultural activity adjacent or near these areas, which are largely forested. Consequently, there will be little impact from further low-density residential development in the areas.

The Council included these areas because they are nearly surrounded by the UGB and provide an opportunity for lower-density housing within two miles of the Bethany Town Center.

STAFF REPORT

CONSIDERATION OF ORDINANCE 02-969 FOR THE PURPOSE OF AMENDING THE METRO URBAN GROWTH BOUNDARY THE REGIONAL FRAMEWORK PLAN AND THE METRO CODE IN ORDER TO INCREASE THE CAPACITY OF THE BOUNDARY TO ACCOMMODATE POPULATION GROWTH TO THE YEAR 2022; AND DECLARING AN EMERGENCY

Date: November 21, 2002

Presented by: Councilor Rod Park

PROPOSED ACTION

Adoption of Ordinance 02-969 to amend Metro's Urban Growth Boundary, the Regional Framework Plan, and Metro Code

BACKGROUND

Under state law, Metro is responsible for managing the Urban Growth Boundary (UGB) in the Portland metropolitan region. State law requires the Metro Council to assess the capacity of the UGB every five years and, if necessary, increase the region's capacity to accommodate a 20-year supply of buildable land for housing. In 2000, the Council and the Land Conservation and Development Commission agreed that the Council would undertake the assessment and any necessary action to increase the capacity of the UGB as part of the state's periodic review process. As part of the periodic review process, the Council and Commission agreed to an extensive work program to accomplish periodic review work program tasks. The Commission set a final date in the work program for completing all tasks related to Metro's periodic review for December 20, 2002. The Commission will then review Metro's submission to ensure compliance with state law and statewide planning goals.

Ordinance 02-969 contains a series of exhibits that amends Metro Code, the Regional Framework Plan (RFP) and the Urban Growth Boundary to comply with state law.

ANALYSIS/INFORMATION

In 1997, the Metro Council adopted the Regional Framework Plan that created an integrated set of regional planning policies that direct Metro's efforts to manage growth and its impact. Included in the Regional Framework Plan is the 2040 Growth Concept. Metro policies contained in the Framework Plan and 2040 Growth Concept were aggregated into eight 2040 Fundamentals which were adopted by the Metro Council in 2000. The 2040 Fundamentals summarize the goals contained in Metro's growth management policies.

2040 Fundamentals:

Fundamental 1: Encourage the efficient use of land within the UGB by focusing on development of 2040 mixed-use centers and corridors.

Fundamental 2: Protect and restore the natural environment through actions such as protecting and restoring streams and watersheds, improving surface and ground water quality, and reducing air emissions.

Fundamental 3: Provide a balanced transportation system including safe, attractive facilities for bicycling, walking and transit as well as for motor vehicles and freight

Fundamental 4: Maintain separation between the Metro region and neighboring cities by working actively with these cities and their respective counties.

Fundamental 5: Enable communities inside the Metro area to preserve their physical sense of place by using among other tools, greenways, natural areas and built environment elements.

Fundamental 6: Ensure availability of diverse housing options for all residents by providing a mix of housing types as well as affordable homes in every jurisdiction.

Fundamental 7: Create a vibrant place to live and work by providing sufficient, accessible parks, natural areas, improving access to community resources such as schools, community centers and libraries as well as by balancing the distribution of high quality jobs through the region, and providing attractive facilities for cultural and artistic performances and support arts and cultural organizations.

Fundamental 8: Encourage a strong local economy by providing an orderly and efficient use of land, balancing growth around the region and supporting high quality education.

This ordinance changes and adds to Metro's growth management policies in the form of amendments and additions to the Regional Framework Plan. The ordinance also changes Metro Code in the form of amendments to the Urban Growth Management Functional Plan (UGMFP). Listed below is a summary of each exhibit and attachment:

Exhibit A: Amends Metro Code (UGMFP Title 1 related to housing and employment accommodation) to ensure that the UGB continues to provide capacity to accommodate housing and employment growth.

Exhibit B: Adds a new policy to the RFP pursuant to Ballot Measure 26-29 adopted by the region's voters in May 2002 to protect residential neighborhoods.

Exhibit C: Amends Metro Code (adds new title to UGMFP) to implement policy contained in Exhibit B above to protect residential neighborhoods pursuant to Measure 26-29.

Exhibit D: Amends RFP to increase the efficiency of land use with the UGB for industrial use.

Exhibit E: Map showing areas designated as Regionally Significant Industrial Areas.

Exhibit F: Amends Metro Code (UGMFP) to increase the efficiency of the use of land within the UGB for industrial use.

Exhibit G: Adds new policy on Centers to RFP and directs Metro to develop a regional strategy to enhance 2040 Centers.

Exhibit H: Amends Metro Code (UGMFP) to implement policy contained in Exhibit G above by strengthening the roles of centers as the hearts of the region's communities and to improve the efficiency of land use within centers.

Exhibit J: Adds new policy to RFP to ensure that expansion of the UGB will enhance the roles of Regional and Town Centers in the region on Centers.

Exhibit K: Amends Metro Code (UGMFP) to implement policy contained in Exhibit J above and clarify the authority of the Metro Council to place conditions on lands added to UGB.

Exhibit L: Amends Metro Code (UGMFP) to protect land added to UGB as Regionally Significant Industrial Areas from incompatible use during the planning for urbanization.

Exhibit M: Adopts general and specific conditions on UGB expansion areas

Exhibit N: Map showing areas added to UGB in order to accommodate housing and employment that cannot be accommodated within the UGB as it existed before adoption of this ordinance.

Appendix A: Technical studies, analysis and documentation

1. Performance Measures to Evaluate Efforts to Improve Land Use Efficiency
2. Regional Employment Forecast 2000 to 2030
3. 2002-2022 Urban Growth Report: Residential Land Need Analysis
4. 2002-2022 Urban Growth Report: An Employment Land Need Analysis
5. Map Atlas Memorandum and Maps
6. 2002 Alternative Analysis Study
7. Technical Amendments Report
8. Housing Needs Analysis

Exhibit P: Findings of Fact and Conclusions of Law explaining how support documents demonstrate that amendments to Metro Code, RFP and UGB comply with state law and RFP

In adopting this ordinance and the accompanying exhibits and attachments, the Metro Council will be complying with state law requiring Metro to ensure that the region's UGB includes a 20-year supply of buildable land for housing.

BUDGET IMPACT

There is no budget impact.