RB

Metro Report

Measure 26-29 Technical Report

Assessment of the impacts of the June 2004 UGB expansion decision on property owners

METRO

PEOPLE PLACES
OPEN SPACES

Metro
People places • open spaces

Clean air and clean water do not stop at city limits or county lines. Neither does the need for jobs, a thriving economy and good transportation choices for people and businesses in our region. Voters have asked Metro to help with the challenges that cross those lines and affect the 24 cities and three counties in the Portland metropolitan area.

A regional approach simply makes sense when it comes to protecting open space, caring for parks, planning for the best use of land, managing garbage disposal and increasing recycling. Metro oversees world-class facilities such as the Oregon Zoo, which contributes to conservation and education, and the Oregon Convention Center, which benefits the region's economy.

Your Metro representatives
Metro Council President – David Bragdon

Metro Councilors – Rod Park, deputy council president, District 1; Brian Newman, District 2; Carl Hosticka, District 3; Susan McLain, District 4; Rex Burkholder, District 5; Rod Monroe, District 6.

Auditor – Alexis Dow, CPA

Metro's web site
www.metro-region.org

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EXECUTIVE SUMMARY

Measure 26-29 Reporting Requirements[1]

This executive summary provides a synopsis for policy makers and citizens regarding the information available in the Measure 26-29 Technical Report. The report has been prepared to address the requirements found in the Metro Charter amendment contained in Measure 26-29 passed by the voters on May 21, 2002. The Charter amendment requires that the Metro Council implement the new requirements within one calendar year. In preparation for the June 2004 urban growth boundary (UGB) expansion decision, this is the first time that the requirements of the measure are being implemented.

The reporting requirements in Measure 26-29 pertain to all UGB changes greater than 100 acres. The report must provide information to all households within a one mile area of the lands effected about the impacts of the proposed amendment, specifically addressing any resulting increases in traffic congestion, commute times and air quality; the potential addition of parks and open space protection to the benefit of existing and future residents located within the territory to be added to the UGB; and the costs to existing residents for providing public services to the new urban areas.

The summary version of this technical report will be distributed to over 65,000 households located within one mile of the UGB. The summary document outlines the information required by the legislation, a brief description of the impacts of the Metro Council's proposed UGB expansion, on lands both inside of the UGB and potential areas that may be added to the UGB, as well as information on the public outreach efforts and the length of the open comment period.

This technical report provides more detailed information to meet the requirements of the legislation and information on a number of studies and background papers that explain how areas were chosen for study and other factors that will be considered as part of the Metro Council's decision making process.

The technical report and summary document are general in nature and provide estimates of the anticipated impacts and costs of delivering services to new urban areas. The most current information available was used for this analysis. Much work is needed to plan for new urban areas. Only after a detailed plan is completed, can design estimates for public facilities actually, be determined.

Scope of the UGB Amendment Decision

Areas Under Consideration

Metro is required to forecast for, and provide, a 20-year land supply for residential, commercial and industrial uses. The capacity of the UGB is required to be assessed every five years. The most recent assessment of the UGB was partially completed in 2002. The Metro Council forecasted a shortage of 38,700 dwelling units, 140 acres of commercial land and 4,285 acres of industrial land. In December 2002 the Metro Council added 18,638 acres of land to satisfy the demand for residential and commercial land and a portion of the need for industrial land.

[1] The full text of Ballot Measure 56 is available in the appendix.

At this time, approximately 29,000 acres are under consideration for possible inclusion in the UGB for industrial use to fulfill the 1,968 net acre shortfall of industrial land. The lands under consideration are located in the following general areas: East of Gresham and Boring; South of Damascus and Oregon City; North and South of I-205 (southern portion of the Stafford Basin), Wilsonville (South of the Willamette River, North and West); East and West of Tualatin; West and South of Sherwood; South of Hillsboro/Tualatin Valley Highway; North of Cornelius Forest Grove and North of Hillsboro.

The Metro Council adopted Resolution No. 03-3386B to reduce the study areas from approximately 65,000 acres of UGB expansion to the 29,000 acres for industrial purposes. These areas are shown in Map A of the Appendix. Additionally, the Metro Council must resolve the issue of protection of existing industrial lands through adoption of amendments to the Urban Growth Management Functional Plan, Title 4.[2]

The Metro Council is expected to make a decision on the UGB by June 2004.

Impact Analysis Summary

Areas currently being studied for UGB expansion have been rated according to the difficulty of providing public facilities. The ratings are general in nature and include easy, moderately difficult or difficult to serve. The difficulty of serving an area is rated according to the distance that services have to be extended, the type of improvement and thereby a relative measure of cost.

Over half of all the areas were difficult to serve with sanitary sewer. One third of the areas were difficult to provide transportation access to based on the level of improvements that are required. Very few areas had any difficulty in providing storm sewer.

The most difficult parts of the region to serve with the following public facilities were:

Eastern portion of the region – (includes these subareas: Gresham, Pleasant Home, Bluff Road, Boring, Noyer Creek and Damascus). This area is moderately difficult to provide access and all other services with the exception of storm water. Overall sanitary sewer is very difficult to provide for this area due to difficult terrain, distance from the developed urban portion of the UGB, the lack of facilities and treatment capacity issues.

Southern portion of the region – (includes these subareas: Oregon City/Beavercreek, Borland road, Norwood, Wilsonville, Coffee Creek, Tualatin and Sherwood/Brookman Road). Very little of this area is easy to serve with the exception of storm water. In portions of this area even storm water is difficult to provide which is unlike any other part of the region. The southern portion of the region has substantial areas that are difficult to serve. More than half of the area is difficult to provide transportation access.

Western portion of the region – (includes these subareas: Farmington, Hillsboro, Cornelius, Forest Grove, Jackson School Road, Evergreen, Helvetia and West Union). This area has a moderate rating for transportation and most other public facilities although there are portions of this part of the region that are easy to serve. Small areas are rated difficult for sanitary sewer.

[2] Title 4: Retail in Employment and Industrial Areas in Metro's Functional Plan is available for review on the website at www.metro-region.org.

Transportation Impacts

In general, transportation impacts were evaluated based on: 1) potential trip generation; 2) impacts on the existing transportation system; 3) current availability of transportation facilities; and 4) environmental factors that would effect siting of transportation facilities. Each of the potential areas was scored and weighted according to the degree that adding the study area to the UGB had on the overall transportation system. Generally higher scores are indicative of more constraints and higher costs in serving an area.

The priority Regional Transportation Plan (RTP) was used as a base line to estimate impacts on transportation systems likely to be constructed during the planning period 2002-2025 at a cost of $7.6 billion. The priority system includes street, highway, pedestrian, transit and Willamette River bridge projects at a cost totaling $7.6 billion. This includes most projects needed to implement the 2040 Growth Concept and attempts to balance funding limitations with future transportation needs. The priority system includes only a portion of the projects needed and improvements emphasize specific areas such as the central city, regional centers and intermodal facilities.

Based on the methodology described above, the following areas are most difficult and expensive to serve: Boring, Oregon City (south, east and Beavercreek) and in the Borland Road areas.

Air Quality Impacts

Metro, as the region's metropolitan planning organization (MPO), is required to address the air quality impacts as part of approval of the RTP. The financially constrained RTP differs from the priority RTP in that it reflects the region's ability to fund only a portion of the needed system improvements. The most recent update of the RTP addressed the region-wide air quality impacts based on the financially constrained RTP. The planning period for the RTP update and the air quality analysis is virtually identical to the analysis period used for this UGB decision. The region's conformity budgets for carbon monoxide and ozone precursors have been met based on the system improvements contained in the financially constrained RTP.

Region-wide, the air quality impacts of adding an additional 2,000 net acres of land to the UGB has been considered in the RTP air quality analysis and the region meets the air quality conformance standards.

Park Impacts and Possible Open Space Protection

Park impacts are generally minimal with UGB expansion for industrial purposes. Generally industrial development increases a government's tax base without requiring the need for additional services. Siting of residential development has a greater demand for recreational services and less of a positive tax base impact than industrial or commercial development. Development associated with urbanization typically pays system development fees that can help fund capital improvements for park construction.

Areas added to the UGB would be subject to the Urban Growth Management Functional Plan Title 3 regulations protecting water quality that may represent an opportunity to protect areas for open space. Until Metro's Habitat Protection Program is adopted, local programs will cover regulations providing habitat protection.

Generally, areas under consideration that are concentrated in the Boring, Oregon City and portions of South and West Wilsonville contain a greater percentage of natural resources therefore may provide greater opportunities for preserving open space through regulations protecting water resources and wildlife habitats.

Cost of Providing Public Facilities

New urban areas need public facilities like sanitary sewer, domestic water, storm water and transportation facilities to develop to urban densities. These capital projects are funded by a variety of financing mechanisms and various sources of revenue. The timing for providing services is determined by the demand for services, local plans and policies, and availability of regional funds for large projects.

The cost of extending urban services varies based on the size, the length of the improvements and complexity of a project. Development of additional treatment and storage facilities for sanitary sewer and water are system-wide improvements that can be expensive long-term investments and may be necessary in the Wilsonville, Boring and Oregon City areas.

Regional transportation improvements including new interchanges, overpasses, and additional lanes of travel can also be classified as system-wide improvements that are very costly. These types of projects are constructed with federal transportation dollars, state gas taxes, vehicle registration fees and local funding sources. Projects are funded through a competitive region-wide process called the Metropolitan Transportation Improvement Program (MTIP) which evaluates the overall system needs.

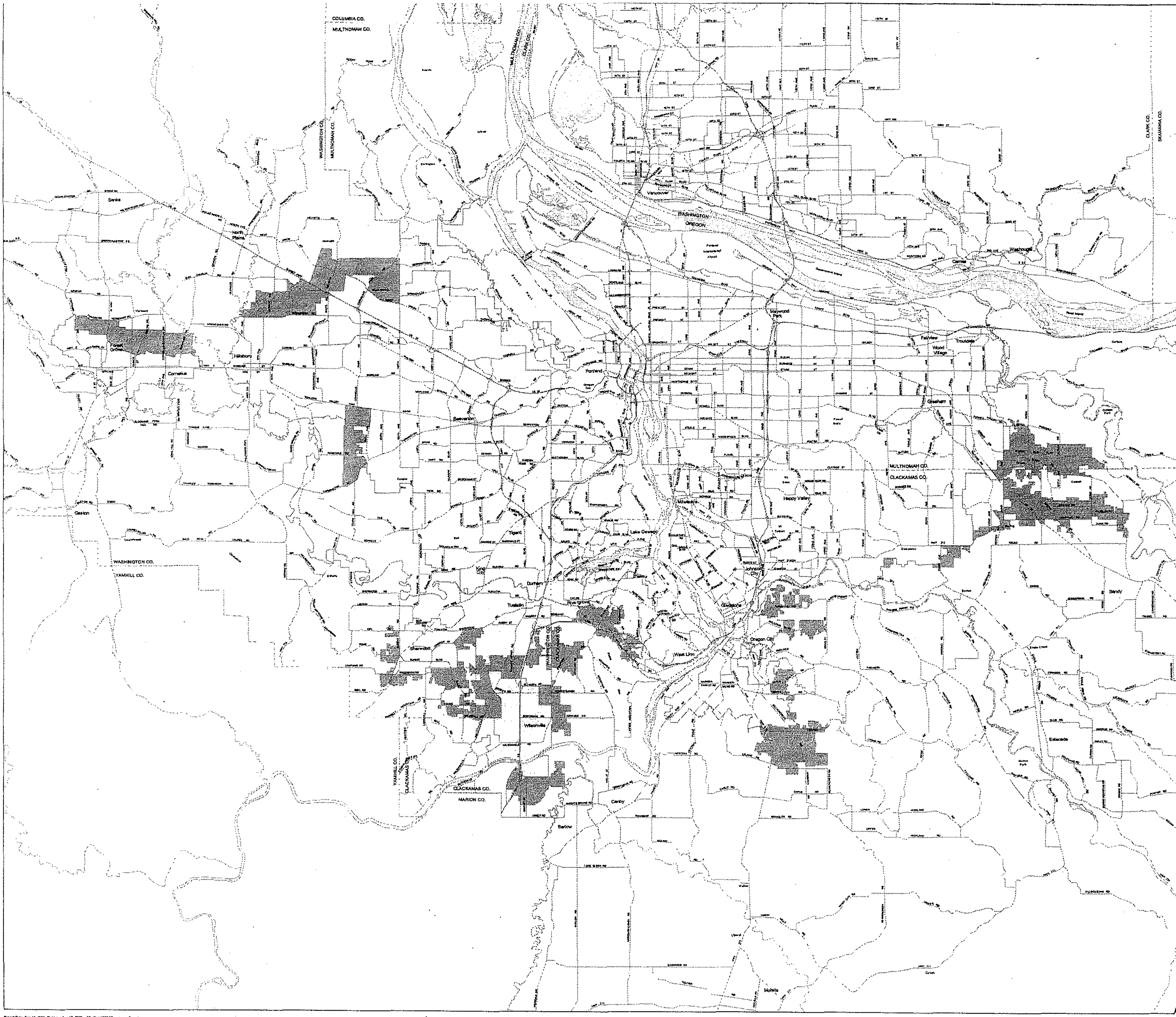
Other Public Facilities

Public service costs relating to police, fire, library services and recreation typically have more limited capital costs to establish but require ongoing operating revenues to provide services. These services are provided at urban levels as areas fully develop and annex to cities. The types and intensity of uses that develop in these areas would determine the level of service needed. These services are minimally impacted by the expansion of the UGB for industrial purposes.

Financing Mechanisms

Infrastructure construction can be financed through system development fees, federal funding, formation of local improvement districts and in lieu of fees, the sale of revenue bonds payable from user fees and local option levies. Typically these costs are estimated and assessed when concept and capital planning has been completed for areas and they annex to adjoining cities. Very few of the areas under consideration have had detailed plans or have had public infrastructure feasibility studies completed to estimate the costs of urbanization.

A copy of the full report as well as all of the technical documents referred to in this report are available on Metro's website @ www.metro-region.org.



RLIS
REGIONAL LAND INFORMATION SYSTEM

Proposed Alternatives Analysis Study Areas

Resolution 03-3386

B

Revised Study Areas

Areas removed based upon:

* Slopes > 10% and floodplains

* Areas largely composed of developed 5 acre parcels.

* Areas not contiguous to the UGB and are less than 300 acres.

* Areas not located within one mile of existing Title 4 / or Industrially zoned lands that are more than 2 miles of an Interchange, Hwy. 99 or TV Hwy.

1 inch equals 1.2 miles

0 1 2 4 Miles

Location Map

Clark Co.
Washington Co.
Multnomah Co.
Clackamas Co.

METRO

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Chapter 1

Background

The Measure 26-29 Technical Report herein after referred to as "the Report" has been prepared to address the requirements found in the Metro Charter amendment contained in Measure 26-29 passed by the voters on May 21, 2002; a copy of the requirements can be found in the Appendix as Exhibit 1. The Charter amendment requires that the Metro Council implement the new requirements within one calendar year. In preparation for the June 2004 urban growth boundary (UGB) expansion decision this Report is being prepared for the first time to meet the measure's requirements.

The reporting requirements in Measure 26-29 pertain to all UGB changes that are greater than 100 acres. The report provides information to all households within a one mile radius of a potential UGB change, detailing the impacts of a proposed UGB amendment and specifically addresses any anticipated changes in traffic congestion, commute times and air quality. The Report must also address the potential addition of parks and open space protection to benefit existing and future residents located within the territory that has been added to the UGB. Finally, as required by Measure 26-29, an estimate of the costs to existing residents for providing public services to the new urban areas is also included.

The Report is by design very technical. The Report provides detailed information to meet the requirements of the legislation and information on a number of studies and background papers that explain how areas were chosen for study and other factors that will be considered as part of the Metro Council's decision making process.

A summary version of the Report will be distributed to over 65,000 households located within one mile of the UGB. This document provides:

- an outline of the information required by the legislation,
- a brief description of the impacts of the Metro Council's proposed UGB expansion decision, on land inside of the UGB,
- potential areas that may be added to the UGB, and
- information on the public outreach efforts and the length of the open comment period.

I. Project History

2002 UGB Expansion Decision and Corresponding Policy Changes

Metro is required to evaluate the capacity of the UGB every five years under State statute. Metro has chosen to complete this review under the direction of the Department of Land Conservation and Development in a process called Periodic Review.

The capacity of the UGB for the period from 2002 to 2022 was evaluated as part of Metro's Periodic Review work program. The Metro Council's December 2002 UGB expansion decision brought into the UGB 2,850 net acres of job land split between the three 2040 design types; 533 net acres of employment land, 818 net acres of industrial land and 1,499 net acres of Regionally Significant Industrial Area (RSIA) land which is a newly adopted industrial lands category. Thus, there is a current industrial land need of 1,968 net acres and a commercial land surplus of 393 net acres.

Policy Updates Completed in 2002
The Metro Council is considering changes to the region's industrial land policy. In December 2002, the Metro Council placed restrictions on industrial land to limit non-industrial uses. At the time of the Report, the Metro Council was still considering refinements to the regulations.

Addressing the Remaining Industrial Land Need
The Metro 2002-2022 Urban Growth Report: An Employment Land Need Analysis Updated December 2002 (UGR) identified a demand for industrial land of 4,285 net acres and a demand for commercial land of 140 net acres. The Metro Council's December 2002 UGB decision included roughly half of the industrial land need identified in the UGR. *The remaining industrial land need is 1,968 net acres.*

Lands considered for inclusion in the UGB must meet the requirements in statewide Planning Goal 14 and priority land statute ORS 197.298 shown in the Appendix labeled "Goal 14 Hierarchy of Lands Chart" (Exhibit 2). The hierarchy of lands consists of five tiers of land beginning with exception lands and progressing through resource lands from the poorest to the best soils. For example, Tier 5 lands contain the best soils for agriculture, Class I and II soils.

The remaining work is to be completed under Periodic Review Remand Work Order 03-WK Task 001524 requires the remaining industrial land need be satisfied by June 30, 2004.

II. Defining Areas Under Study

A comparative analysis was completed of potential land suitable for industrial purposes in the 2002 and 2003 Alternatives Analysis Studies (available on Metro's website). The studies were completed in two phases to address the need for residential, employment and industrial land.

2002 and 2003 Alternatives Analysis Studies
The 2002 Alternatives Analysis studied 77,901 acres for urbanization. After the December 2002 UGB expansion decision adding over 18,000 acres, a total of 59,263 acres of land remained. This land is separated into a hierarchy of five tiers, as outlined by the priority of land statute ORS 197.298.

The tiers of land are defined as follows:

- Tier 1 – exception land contiguous to the UGB and non-high value resource land completely surrounded by exception land;
- Tier 1a – exception land not contiguous to the UGB (within the one mile extent of study area boundaries);
- Tier 2 – marginal land, a unique classification of non-resource land in Washington County that allows dwelling units on EFU land;
- Tier 3 – resource land that may be needed to serve exception land; and
- Tier 4 – resource land, majority of class III & IV soils, some class I & II soils.

In order to satisfy the remaining industrial land need, the remaining study areas in the 2002 Alternatives Analysis were re-evaluated for industrial use. The methodology for assessing location and site characteristics for key industrial sectors can be found in "Understanding Technical Land Needs" (Exhibit 6). In addition, the resource lands containing class I and II

soils that were excluded from the 2002 study were again analyzed in the new 2003 Alternatives Analysis to assess their potential to fulfill the industrial land shortfall.

III. Application of Industrial Suitability Characteristics

Exhibit 7 in the Appendix contains a discussion of the assessment of site characteristics of key industrial sectors. Common characteristics/factors include:

- Access is a critical component for warehouse and distribution industries although it is also important for general industrial and tech flex where access is more focused on the movement of people rather than on the movement of goods.
- Mid-day access to the airport within 45 minutes is important for general industrial and Industrial sites need land that is sloped no more than 5% (3-5% is preferable).
- Tech flex mainly for the movement of people. The Portland International Airport and to a certain to degree the Hillsboro Airport satisfies some of the passenger traffic demand. The Hillsboro Airport is currently limited to smaller aircraft due to runway limitations. The master plan for the Hillsboro Airport is being updated during which future improvements and its function will be re-evaluated.
- It is clear that industries desire to be located near similar uses due to underlying common site characteristics, the need for access to suppliers and to provide access to a workforce.

More detailed information can be found in the Appendix as Exhibits ii and iii, "Aggregation Study" and "Formation of Industrial Neighborhoods."

Applying Suitability Factors to 2002 and 2003 Alternatives Analysis Study Lands
The 2002 Alternatives Analysis has approximately 59,263 acres of land remaining for possible inclusion into the UGB. The 2003 Alternatives Analysis Study added to the analysis approximately 18,000 acres of land that might be suitable for industrial uses. The 2003 Study areas were selected according to suitability factors so they are likely to meet industries' needs. In all likelihood a small percentage of the remaining 2002 Study lands will be suitable for industrial purposes due to the specific needs of industry. The parcel size demand information and location siting criteria was applied to the remaining study area lands (2002 Alternatives Analysis) as well as to lands studied in supplemental 2003 Alternatives Analysis Study to reduce the areas under consideration.

IV. Defining Land for Study in the 2003 Alternatives Analysis

A methodology was developed based on the industrial suitability factors to determine an appropriate amount of potential land to be included in the study based on the suitability for industrial purposes.

Areas included in the 2003 Alternatives Analysis were based on geographic parameters:

- Land within two miles of selected interchanges on Interstates 5, 84 and 205 and Highway 26, in both Washington and Clackamas Counties. Only interchanges in which the two-mile radius included land outside the UGB were included.
- Land located within one mile of existing industrial areas designated on the Title 4 employment and industrial area map.

Lands excluded from the 2003 Alternatives Analysis were based on:

- Slopes greater than 10 percent and areas containing large expanses of floodplain. The consideration of floodplain areas as a site constraint is consistent with past alternatives analysis studies.

The amount and level of analysis dictate that the lands will be assessed as areas and not individual parcels. Prior to finalizing the 2003 Alternatives Analysis study, area boundaries staff met with representatives of the affected local jurisdictions to review and delineate the study area boundaries. The study areas did not have to meet both geographic site factors; for example, a potential area could be within two miles of an interchange and not within one mile of an existing industrial area. The boundary of individual study areas were limited to within approximately one mile of the current UGB consistent with the 2002 Alternatives Analysis.

Additional research was undertaken to assess sustainability of study areas to meet the identified need for large sites, 50 acres or greater, a critical land size for creating new industrial areas and the financial constraints of development of sites with slopes greater than 10 percent. See "Aggregation Study" (Additional Research and Study Papers (i)) for the results of this search.

The Metro Council in December 2003 reduced the overall number of acres to be considered for job land using the location criteria described above.

Areas Not Considered for Inclusion in the UGB for Industrial Purposes

A number of areas around the region were removed from further consideration based on failing to meet at least two of the following three factors: 1) Located within two miles of an interchange, 2) Located within one mile of existing Title 4 industrial land; and 3) Containing slopes less than 10 percent and no floodplain. In some instances there were small areas that may have met the factors but were still removed from consideration due to intervening residential uses between existing and potential industrial areas or were separated from the existing industrial area by a river and without a direct connection. A total of 48,901 acres were removed from study through the Metro Council's adoption of Resolution No. 03-3386B, which reduced the areas under consideration to 29,000 acres. The following is a descriptive summary of the areas that were removed from further consideration.

<u>Gresham</u>

This area is located east of the Gresham city limits, in 2002 Alternatives Analysis Study Area 2 and south of the Sandy River. This area is within one mile of an existing industrial area, however, the industrial area is small and isolated and there is a residential area between the industrial land and the existing and proposed study areas. Additionally, there are large areas of slopes greater than 10 percent that extend east from study area 2 as well as near the Sandy River.

<u>Boring</u>

This area is located to the southeast of study area 10 and south of SE Richey Road. It is within one mile of an existing industrial area that was included in the Metro Council's December 2002 UGB decision. Located between the area and expanded UGB industrial land is a very large area of slopes greater than 10 percent associated with the North Fork Deep Creek. The area itself also contains large areas of slopes greater than 10 percent.

Damascus
This area is located south of Damascus near the junctions of SE Royer Road and SE Curtis Road. It is within one mile of an existing industrial area that was included in the Metro Council's December 2002 UGB decision. The top portion of the area contains slopes greater than 10 percent that extend into the new UGB area, effectively isolating any flatter land further south.

Clackamas
This area is located on the south side of the Clackamas River, north of study area 22. This area is within one mile of the industrial land along Highway 212/224, however, it is mostly floodplain and separated from the industrial area by the river.

Oregon City
This area is located directly adjacent to the south of Oregon City between study areas 28 and 31. South Leland Road forms the western edge of the area. The northern portion of the area is within one mile of existing industrial land, however, there are some intervening residential areas. Almost the entire area is made up of slopes greater than 10 percent.

Wilsonville 1
This area is located to the north of Elligsen Road between study areas 44 and 47. The area is within one mile of existing industrial land and within two miles of an interchange on I-5. There is large area of slopes greater than 10 percent near the Wilsonville UGB where connection to services would originate. City of Wilsonville staff confirmed that the area should not be considered.

Wilsonville 2
This area is located south of the Willamette River and west of I-5 and study area 46. This area is within two miles of an interchange on I-5 and within one mile of existing industrial land. A large portion of the area is floodplain and also contains some areas of slopes greater than 10 percent. City of Wilsonville staff confirmed that the area should not be considered.

Wilsonville 3
This area is located west of the city limits and north of the Willamette River, just south of the Dammasch property. This area is within two miles of an interchange on I-5 and within one mile of existing industrial land. Metro's Regional Parks and Greenspaces Department purchased three parcels in this area as part of the Greenspaces bond measure. Two of the parcels, 165 and 63 acres respectively, are directly adjacent to the UGB effectively isolating the remaining area from the UGB. In addition, there are some locations of slopes greater than 10 percent within the area.

Tualatin/Sherwood
This area is located to the west of Tualatin and north of Sherwood straddling Highway 99W. The area is within one mile of existing industrial land; however, almost the entire area is floodplain.

Hillsboro
This area consists of a number of small areas all along the southern border of Hillsboro. The area that is within one mile of existing industrial land extends beyond the UGB for an average of less than ¼ mile. There are some fairly large residential areas between the

existing industrial land and the potential area. Almost all of the area is in the floodplain. A portion of the area is developed as the Reserve Vineyards and Golf Club.

Hillsboro/Cornelius
This area is located north and south of Tualatin Valley Highway between Hillsboro and Cornelius. The area is within one mile of existing industrial land. The area north of the highway is floodplain. The area south of the highway contains some floodplain and is separated from the existing industrial land in Cornelius by residential land and the B&W Railroad.

Cornelius/Forest Grove
This area south of Cornelius and Forest Grove is within one mile of existing industrial land, however, almost the entire area is floodplain.

Northwest Portland/Sauvie Island
The Willamette River effectively isolates the potential industrial area on Sauvie Island that is within one mile of the existing industrial land in Rivergate. The area on the south side of Highway 30 that is within one mile of existing industrial land is entirely composed of slopes greater than 10 percent and has adjacent residential uses.

Northwest Portland
There is a small portion of land near NW Cornell and Thompson Roads that is within one mile of the industrial land along Highway 30 and NW Yeon Avenue. This area is entirely composed of slopes greater than 10 percent and Forest Park lies directly between the two areas.

Remaining 2002/2003 Alternatives Analysis Areas Under Study
Approximately 29,000 acres remain in consideration for possible inclusion in the UGB for industrial use after the Metro Council adopted Resolution No. 03-3386B to reduce the Alternative Analysis areas.

Areas Identified as Additional Industrial Land Study Areas
The study areas being considered for industrial use totals 29,071 gross acres of which 130 acres are Tier 1 exception land. The remaining land is a combination of Tier 4 and Tier 5 – resource land, majority of class I & II soils, some class III & IV soils and prime timberland. Tier 5 lands are the lowest priority land under ORS 197.298 to be considered for urbanization. A discussion of the tier hierarchy can be found in Chapter 1, Section II. A total of 77,901 acres were reviewed (59,263 acres remained from the 2002 Alternatives Analysis).

The lands are located in the following general areas and are being considered to fulfill the 1,968 net acre shortfall of industrial land: East of the City of Gresham, Boring, south of Damascus, Oregon City, north and south of I-205 (southern portion of the Stafford basin), Wilsonville (south of the Willamette River, north and west), east and west of Tualatin, west and south of the City of Sherwood, south of Hillsboro/Tualatin Valley Highway, north of Cornelius and Forest Grove, north of the City of Hillsboro.

The study areas have been grouped by area for discussion purposes. A breakdown of acreages for the areas included in the combined 2002/2003 Alternatives Analysis Study Areas are as follows:

- Gresham (2,3,6p,7,A) – 1,490 acres
- Pleasant Home (5) – 1,696 acres
- Boring (9,10p,B) – 2,786 acres
- Bluff Road (8) – 704 acres
- Noyer Creek (10p,C) – 381 acres
- Damascus (D) – 82 acres
- Oregon City (north,east,south- 21p,22p,23p, 24p,26p) – 1,611 acres
- Beavercreek (28,30) – 2,540 acres
- Borland Road South and North (35p,36p,38p,41p,42p) – 1,320 acres
- Norwood/Stafford (43p,44p,47p) – 1,253 acres
- Wilsonville (east, south, west- 44p,E,,46,F,49p,51p,52,p,53p) – 3,288 acres
- Coffee Creek (48p,49p) – 442 acres
- Tualatin (47p) – 646 acres
- Quarry (48p) – 472 acres
- Sherwood East and West (50p,51p,54p) – 1,096 acres
- Brookman Road (54p,57p,58p) – 385 acres
- Farmington (68p,69p,70) – 713 acres
- Hillsboro South (G) – 791acres
- Cornelius (76,H)– 1,154 acres
- Forest Grove East and West (I,J) – 1,374 acres
- Jackson School (78,K) – 1,044 acres
- Evergreen (79,80,L) - 985 acres
- Helvetia (81,N) – 1,339 acres
- West Union (81,83,M) – 1,499 acres

V. Metro Policies Governing Management of the UGB

Metro's management of the UGB is guided by standards and procedures that are consistent with the goals and objectives contained in the policies identified in Sections 1-6 of the Metro Regional Framework Plan (Framework Plan). These policies were formulated to guide the decision making regarding expansion of the UGB, growth management, protection of natural resources and urban form issues. These policies will be applied to the remaining 2002 and 2003 Alternatives Analysis study areas as part of the evaluation of lands for possible inclusion into the UGB. These policies do not take precedence over standards in State Goal 14 but can be applied within the decision making process to lands that are located within the same class of soils or tier classification of lands.

Regional Framework Plan, Section 1 – Land Use

Land Use contains specific goals and objectives adopted to guide Metro in future growth management land use planning. There are three policies that may have an impact on identifying additional industrial lands. The Metro Council will need to address the question of how these policies will be applied after meeting Statewide Planning Goal 2, Land Use Planning and Goal 14, Urbanization as applied to the Metro UGB. Listed below in full or in part are the applicable policies:

Policy 1.7 Urban/Rural Transition states "There should be a clear transition between urban and rural land that makes best use of natural and built landscape features and that recognizes the likely long-term prospects for regional urban growth.

Boundary Features – The Metro UGB should be located using natural and built features, including roads, rivers, creeks, streams, drainage basin boundaries, floodplains, power lines, major topographic features and historic patterns of land use or settlement."

Policy 1.11 Neighbor Cities states "Growth in cities outside the Metro UGB, occurring in conjunction with the overall population and employment growth in the region, should be coordinated with Metro's growth management activities through cooperative agreements which provide for:

Separation – The communities within the Metro UGB, in neighbor cities and in the rural areas in between will all benefit from maintaining the separation between these places as growth occurs. Coordination between neighboring cities, counties and Metro about the location of rural reserves and policies to maintain separation should be pursued."

Policy 1.12 Protection of Agriculture and Forest Resource Lands states "Agricultural and forest resource land outside the UGB shall be protected from urbanization, and accounted for in regional economic and development plans, consistent with this plan. However, Metro recognizes that all the statewide goals, including Statewide Goal 10, Housing and Goal 14, Urbanization, are of equal importance to Goals 3 and 4, which protect agriculture, and forest resource lands. These goals represent competing and, sometimes, conflicting policy interests which need to be balanced.

Rural Resource Lands – Rural resource lands outside the UGB that have significant resource value should actively be protected from urbanization. However, not all land zoned for exclusive farm use is of equal agricultural value.

Urban Expansion – Expansion of the UGB shall occur in urban reserves, established consistent with the urban rural transition objective. All urban reserves should be planned for future urbanization even if they contain resource lands.

Farm and Forest Practices – Protect and support the ability for farm and forest practices to continue. The designation and management of rural reserves by the Metro Council may help establish this support, consistent with the Growth Concept. Agriculture and forestry require long-term certainty of protection from adverse impacts of urbanization in order to promote needed investments."

These policies will be used by the Metro Council during the UGB expansion process to guide decision-making between similarly situated lands.[3] Goal 14 requires a weighing and balancing of a number of different factors to decide which lands are most suitable for urbanization.

[3] Similarly situated lands are those lands that are located within the same Tier classification. For example- if Metro Council was deliberating between exception lands (Tier 1) they would be able to apply Policy 1.1 that discusses neighboring cities and maintaining a physical separation of communities within the Metro UGB.

Chapter 2

Measure 26-29 Reporting Requirements

The reporting requirements in Measure 26-29 pertain to all UGB changes that are greater than 100 acres and must be provided to all households within one-mile of a UGB change. The Report provides information to citizens about the impacts of a proposed UGB amendment and specially address any anticipated changes in traffic congestion, commute times and air quality. The Report must also address the potential addition of parks and open space protection to benefit existing and future residents located within the territory that has been added to the UGB. Finally, as required by Measure 26-29, an estimate of the costs to existing residents for providing public services to the new urban areas is also included although the information available is limited.

This section of the Report addresses specific feasibility studies that have been completed for several areas, policies regarding the extension of services to new urban areas, general financing mechanisms and the timing of when urban services are extended. The best available information was used for this assessment.

The general discussion section is followed by sections providing specific discussion by area that is divided by police, fire, library and recreation and then the remaining public facilities of sanitary sewer, water and storm water facilities. Transportation impacts are discussed separately followed by air quality impacts. The cost of providing services is discussed in the last section of this Chapter.

I. Financing Mechanisms

Infrastructure construction can be financed through system development charges, federal funding, formation of local improvement districts, in-lieu-of fees, sale of revenue bonds that are payable from user fees and local option levies.

II. Public Facility Feasibility Studies and Policies

County and City policies- service provision and financing
Clackamas County adopted a concurrency policy on March 14, 2002. The policy requires that essential public facilities be in place (with the exception of transportation) within three years of development. To date Multnomah and Washington Counties do not have concurrency requirements and have not produced similar studies for urbanizing land.

Feasibility Studies
Clackamas County produced a "Preliminary Financial Analysis" (Financial Analysis) in June 2003 for the Damascus/Boring areas to assess the requirements for sanitary sewer, storm sewer, domestic water and transportation facilities. In addition to these traditional public facilities a less detailed analysis was performed to identify the need and cost for library, school, park and recreation, police and fire services. The information in this report is taken from the County's study for Damascus/Boring area. The Financial Analysis includes an area that is approximately 15 times the size of the land under consideration for industrial expansion around the Damascus/Boring areas (1,255 acres versus 18,520 acres).

The financial analysis assumes that the sequencing of development would occur from west to east due to the location of wastewater treatment facilities and the construction of the Sunrise Highway. The Damascus/Boring area was divided into sub-areas for planning purposes. Drainage basin boundaries were used to define sub-areas because sanitary sewer and storm sewer planning typically correspond to this geography. Further phasing was developed after the basin planning was completed. A map of the phasing plan is included in the Appendix as Map - Clackamas County Damascus/Boring Phasing Plan.

The City of Wilsonville produced an extensive study that details the potential cost and difficulty of servicing a number of study areas under consideration in the Wilsonville area. That study was completed in November 2003.

More specific costs for providing public facilities and services cannot be obtained until specific area planning including zoning and public facility plans are developed.

**Need for library and recreational services will not be analyzed unless information was provided by local providers.*

III. General Provision of Services (Fire, Police, Library and Recreation)

Fire and Police – General Discussion

Fire and police service are typically provided at urban levels as areas develop. Fire services are more capital-intensive because these services require specialized equipment and buildings to house people and equipment. Depending upon the type of industrial use, specialized fire services may be required. Construction and siting of these facilities will occur when the areas are fully developed. Police have similar needs but are less intensive than fire.

Residential development generates a higher demand for fire and police services than industrial or commercial employment. All of these study areas are currently supported by the county sheriff and by rural fire districts. These areas would continue to be supported by these rural providers until the land is either annexed to a city and urbanized or annexed to a fire district that provides an urban level of service.

Clackamas County and the Tualatin Valley Fire and Rescue Districts provide services to cities as well as rural areas within Clackamas and Washington Counties.

Recreation, Library and Schools – General Discussion

Recreation or the maintenance and development of park facilities has the potential to be effected by the expansion of the UGB for industrial purposes, not because of an increase in the demand for services, but due to funding opportunities. Potential demand for services is balanced by the potential for revenue generation. Additional land for industrial expansion has a relatively low impact on park services although this use generates property tax revenues and systems development charges to fund operating expenses and capital improvements. Three park districts border the potential expansion areas: Tualatin Hills Park and Recreation District, Blue Heron Recreation District and the North Clackamas Park District No.2.[4] A number of cities have park districts that could potentially serve areas as they are annexed into the city. Generally, as these areas are brought into the UGB either

[4] Blue Heron District was formed over 25 years ago for the expressed purpose of providing a pool for the City of Canby. The City of Canby maintains the pool and the district is currently inactive.

park districts and/or cities provide recreational services through the collection of system development charges (SDCs) or by bonding for improvements. Because system development fees must be related to the level of service that the use generates rates for, industrial uses would be charged the lowest SDCs.

Existing residents may benefit positively from the tax base increase from industrial development and fees paid at the time of development. Potentially, any new facilities have the potential to benefit the existing urban area as well as newly developing areas.

Until the adoption of a Wildlife Habitat Program, no additional protection will be provided to natural resource areas.[5] An adopted program has the potential for providing additional open space through resource protection and open space acquisition. This effort to protect natural resources will occur after expansion of the UGB. Areas added to the UGB will receive protection for water quality areas through Metro's existing regulation in Title 3.[6] The size of these areas protected through Title 3 likely have limited open space recreational value.

Library – Library services are provided through the counties.

Schools – School districts raised the following concerns regarding urbanization of land for industrial purposes: 1) industrial development would decrease the potential land available for schools; 2) job growth would serve as an attractor for residential growth; and 3) competition for land between school districts and other uses drives the acquisition price for school sites up. On a positive note, school districts saw the location of industry as a positive due to tax base increases and a diversification of communities.[7]

Library and recreational services are typically provided as areas develop and residential population increases which creates a demand for services. Industrial development is unlikely to generate a demand for these types of services.

**Need for library and recreational services will not be discussed unless information is provided by local providers.*

IV. Study Areas - Discussion of Fire, Police, Recreation, Library & Schools

A map showing each study area can be found in the Appendix labeled "Alternatives Analysis Study Area Groupings." The following is a discussion of each grouping of study area will be provided fire, police, recreation and school services.

Boring, Damascus, Bluff Road and Noyer Creek (Study Areas: Ap, B,8,9p,10p,C,D)
Fire and Police – These areas would receive fire services from the North Clackamas Fire District and police service from the Clackamas County Sheriff.

Recreation – The North Clackamas Parks District would provide recreational services to these areas as they urbanize. The demand for parks is based on a 2.5/acre requirement for

[5] Goal 5 Habitat and wildlife protection program is expected late 2004.
[6] Title 3 is a Metro Urban Growth Management Functional Plan requirement that includes protection of natural areas for water quality purposes.
[7] Information was obtained from a series of interviews with school districts that could potentially be impacted by a UGB expansion decision. The following districts were contacted: Banks, Forest Grove, Hillsboro, Sherwood, Beaverton, Tigard-Tualatin, West Linn-Wilsonville, Canby, Oregon City, North Clackamas, Gresham Barlow, Portland, Estacada, Oregon Trail and Newberg.

neighborhood parks and a .65/acres requirement for community parks per 1,000 residents. Costs for senior and aquatic centers were not included.

Library – Library services would be provided by Clackamas County. Demand is based on an American Library benchmark of 38,750 square feet for the first 50,000 people locating in an area and then .61 square feet for the population over 50,000 people and is the standard for assessing library system needs. Average square foot construction costs are estimated at $450/square foot.

Schools – Demand for schools is based on elementary schools that will accommodate 600 students, middle schools accommodating 900 students and high schools accommodating 1,800 students[8] These projections were made for the overall area that includes residential uses. Potentially some of these school facilities could be located on land zoned for industrial purposes.

Gresham and Pleasant Home (Study Areas: Ap,2p,3p,5p,6p,7,10p)
Fire and Police – The City of Gresham Fire Department will provide fire protection and police service for these areas as they annex to the City.

Recreation – The City of Gresham has a parks and recreation department that could provide recreational services to these areas when annexed to the City.

Library – Multnomah County will be the library provider for this area.

Schools – The two school districts that could potentially serve this area are Gresham/Barlow and Oregon Trail.

No specific information is available that indicates that industrial development would generate an impact on existing library and recreational services or generate additional demand for these services.

Oregon City (north, east and south) and Beavercreek
(Study Areas: 21p, 22p, 23p, 28p, 30p)
Fire and Police – Fire protection will be provided by Clackamas County for all of these areas. The Oregon City Police Department will provide police service to areas as they annex to the City.

Recreation – Oregon City has a Parks and Recreation Department, which most likely serve this area with recreational services particularly if this area was annexed to the City. North Clackamas Park District #2 could potentially provide services if this area was annexed in its boundary.

Library – Clackamas County is the library provider for these areas.

Schools – Areas 24, 28 and 30 are located within the Oregon City and Canby School Districts.

[8] Assumes 2.5 persons per dwelling unit.

No specific information is available that indicates that industrial development would generate an impact on existing library and recreational services or generate additional demand for these services.

Borland Road (south and north)
(Study Areas: 35p, 36p, 38p, 41p, 42)
Fire and Police – Police service could be provided by one of the adjoining cities (West Linn, Lake Oswego or Tualatin). Fire service could either be provided by the Tualatin Valley Fire and Rescue District or possibly the corresponding city.

Recreation - The areas under consideration for industrial purposes are located closest to the cities of Tualatin and Lake Oswego. Both cities have park and recreation departments that could provide services. It is most likely that park service providers would be coterminous with city limit boundaries.

Library – Library service would be provided by Clackamas County.

Schools - The governance within the basin has implications on the service boundaries of the adjacent school districts. The West Linn-Wilsonville School district's boundary encompasses all of the area in the Stafford Basin. Study areas 35, 38 and 42 abut the cities of West Linn, Lake Oswego and Tualatin. Currently the City of Lake Oswego's city limits are coterminous with the Lake Oswego School District. The City has expressed an interest in maintaining this relationship if the UGB was amended and the City was to annex a portion of these areas.

No specific information is available that indicates that industrial development would generate an impact on existing library and recreational services or generate additional demand for these services.

Wilsonville (east, south, west) and Coffee Creek
(Study Areas: E, F, 44p, 46, 49p, 51p, 52, 53)
Fire and Police- Fire protection will be provided by the Tualatin Valley Fire and Rescue District. Police service will be provided by the City of Wilsonville when the City annexes the area.

Recreation – The Wilsonville South area, which is located south of the Willamette River borders the Blue Heron Recreation District, which is currently inactive. Wilsonville would most likely annex areas to the City and would provide recreational services.

Library – Library services would be provided by Clackamas County.

Schools – The majority of the areas under consideration (Area E,F,44p) are located in the West Linn-Wilsonville School District. The South Willamette Area located south of the Willamette River are served by the Canby School District. Areas 49,51,52 and 53 are located within the Sherwood School District.

No specific information is available that indicates that industrial development would generate an impact on existing library and recreational services or generate additional demand for these services.

Tualatin, Quarry, Norwood and Stafford
(Study Areas: 43p, 44p, 47p, 48p, 49p)
Fire and Police - Fire protection will be provided by the Tualatin Valley Fire and Rescue District. Police service will be provided by the City of Tualatin when annexed to the City.

Recreation – Recreational services would likely be provided by the City of Tualatin for any areas annexed to the city limits.

Library – Washington County will provide library services.

Schools – These areas are located within the Sherwood School District.

No specific information is available that indicates that industrial development would generate an impact on existing library and recreational services or generate additional demand for these services.

Sherwood (east, west) and Brookman Road
(Study Areas: 48p, 49p, 50p, 51p, 54p, 57p, 58p, 59p)
Fire and Police - Fire protection will be provided by the Tualatin Valley Fire and Rescue District Police service will be provided by the City of Tualatin when annexed to the City.

Recreation – Recreational services would likely be provided by the City of Tualatin for any areas annexed to the City limits.

Library – Washington County will provide library services.

Schools – These areas are located within the Sherwood School District.

No specific information is available that indicates that industrial development would generate an impact on existing library and recreational services or generate additional demand for these services.

Hillsboro South and Farmington
(Study Area: G, 68p, 69p,70)
Fire and Police – These areas will be provide fire and police service as the area is annexed to the City of Hillsboro.

Recreation – The City of Hillsboro could provide recreational services to both areas if this area was annexed to the City. The area could be served by the Tualatin Hills Recreation District if its boundary was amended to include the area.

Library – Washington County will provide library services.

Schools – The Hillsboro School District will serve South Hillsboro and Farmington Road areas if necessary.

No specific information is available that indicates that industrial development would generate an impact on existing library and recreational services or generate additional demand for these services.

Forest Grove (east, west) and Cornelius
(Study Areas: H, I, J, 75, 76)
Fire and Police – The City of Cornelius will provide police and fire service to the areas as they annex to the City. The City of Cornelius already provides fire protection to an area outside of the city limits. Areas located adjacent to the City of Forest Grove will be provided fire and police service by the City.

Recreation – Both cities can provide recreational services to areas that are annexed to their boundaries.

Library – Washington County will provide library services.

Schools – The eastern portion of area located adjacent to the City of Cornelius will be serviced by the Hillsboro School District. Forest Grove east and west will be served by the Forest Grove School District.

No specific information is available that indicates that industrial development would generate an impact on existing library and recreational services or generate additional demand for these services.

Jackson School Road, Evergreen, Helvetia, West Union
(Study Areas: K, L, M, 78p,79, 80, 81, 83p)
Fire and Police – These areas would be provided police and fire service by the City of Hillsboro as the areas annex to the City. A portion of the West Union area may be included in the City of Beaverton city limits and provided service by that city.

Recreation – The City of Hillsboro could provide recreational services to Area G if this area was annexed to the City. The West Union area could be served by the Tualatin Hills Recreation District if its boundary was amended to include the area.

Library - Washington County will provide library services.

Schools - The majority of these areas are located in the Hillsboro School District. A small portion of area 83 is located in the Beaverton School District.

No specific information is available that indicates that industrial development would generate an impact on existing library and recreational services or generate additional demand for these services.

Regulation of areas for protection under Title 3 and eventually Goal 5 purposes (if adopted) may provide open space recreational opportunities. The areas with the highest percentage of constrained acres due to Title 3 regulations are portion of the Boring, Oregon City South and North and Wilsonville South and West study areas.

V. Discussion of Public Facilities - Sanitary Sewer, Water and Storm Sewer

Boring, Damascus, Bluff Road and Noyer Creek
(Study Areas: Ap, B, 8, 10p, C, D)
Sanitary sewer – All sanitary sewer service will be provided by Clackamas County Water and Environmental Services (WES). Treated wastewater cannot be discharged directly to the Clackamas River due to the Three Basin Rule. All treated water must be pumped to facilities

located on the Willamette River.[9] The major system improvements will require trunk sewer lines and pump stations, expanded treatment and collection capacity. Lateral sewer lines extending from trunk lines are assumed to be provided by the developer. A portion of the Sunshine Valley would most likely be served more efficiently by the City of Gresham due to topography.

Water – The majority of the domestic water service will be provided by the Sunrise Water Authority. Improvements include storage facilities, major transmission lines (12-24 inch diameter). Distribution facilities smaller than 12 inches in diameter are assumed to be provided by individual developers.

Storm sewer – A storm sewer system serving urban type development will consist of a mix of larger regional and sub-regional facilities. Improvements to accommodate urbanization will likely require storm detention ponds, in-stream pollution control facilities, some piping and rehabilitation of streamside vegetation. Phasing can more gradually developed due to the small size of these facilities.

Gresham and Pleasant Home
(Study Areas: Ap, 2p, 3p, 5p, 6p, 7,10p)
Sanitary sewer – Overall the area is difficult to serve. Portions of the area would be served by Clackamas County Water and Environmental Services and is located five miles from current service boundaries. Creeks traversing this area contribute to the service difficulties. Service upgrades would be required to ensure that existing systems would not be over-burdened. The portion of the area to be served by the City of Gresham is being incorporated into the master plan for the Springwater area.

Water – Overall this area is easy to moderately easy to serve. Portions of this area are easy to serve due to the condition of existing facilities. In general, upgrades to existing systems are needed, from transmission lines and storage facilities to pump stations. In area A the southern portion is located in the proposed annexation area for the Boring Water District. The Lusted and the Pleasant Home Water Districts will serve a portion of this area.

Storm sewer – Storm water service is easily provided and most likely would require construction of detention and water quality facilities.

Oregon City (north, east and south) and Beavercreek
(Study Areas: 22p, 23p 24p, 26p, 28p)
Sanitary sewer – Sanitary sewer is moderately difficult to serve. All sewer in this area drains to the Tri-Cities Treatment Plant which requires a pump station, a river crossing and a capacity upgrade. Sub-grade rock may increase the difficulty of providing services. Additional trunk lines are also needed.

Water – This area is easy to moderately difficult to serve. There are some water mains and storage facilities may need to be upgraded. Clackamas Water District would serve a portion of this area.

Storm sewer – Storm water service is easily provided and most likely would require construction of detention and water quality facilities.

[9] Oregon City and the City of West Linn have a water intake on the Clackamas River for domestic water, which limits discharges that may impact that water supply.

Borland Road (south and north)
(Study Areas: 35p, 36p, 38p, 41p, 42)
Sanitary sewer – This area is moderately difficult to serve. Steep slopes increase the difficulty of serving this area. A number of pump stations and force mains may be required to cross the Tualatin River and I-205 to reach the treatment facilities. These improvements are needed to create additional capacity so that the existing system is not overwhelmed.

Water – This area is easy to moderately easy to serve. Existing water storage is inadequate, increased treatment is needed and additional pump stations are required. A portion of the area is easy to serve because existing infrastructure is adequate.

Storm sewer – Storm water service is easily provided and most likely would require construction of detention and water quality facilities.

Wilsonville (east, south, west) and Coffee Creek
(Study Areas: E, F, 44p, 46, 49p, 51p, 52, 53)
The City of Wilsonville would likely be the service provider for all of these areas.
Sanitary sewer – Overall the area is moderately difficult to serve. The overall system is currently not adequate. The City anticipates that new force mains, pump stations and additional treatment capacity are needed.[10] A portion of the area may need to drain to the Tri-Cities Treatment Plant. A portion of the area would be served by the City of Wilsonville treatment plant and may not have enough capacity to accommodate expansion.

Water – Overall the area is difficult to moderately difficult to serve. Topography makes this area difficult to serve. The overall city system is inadequate for the current projected build-out prior to 2020. System upgrades are needed to upsize existing trunk lines, install new lines, upgrade a reservoir and booster station.

Storm sewer – Overall this stormwater service is easy to provide. This area is regulated by Clean Water Services and is required to be treated by installing detention and water quality facilities to limit downstream impacts.

Tualatin, Quarry, Norwood and Stafford
(Study Areas: 43p, 44p, 47p, 48p, 49p)
Sanitary sewer – The Tri-cities Treatment facility is located more than five miles away making this area moderately difficult to serve. A portion of the area is relatively flat, as well as containing other topographic challenges, which contribute to the difficulty of serving the area.

Water – Overall the area is easy to serve. Minor system improvements are needed including increasing storage facilities, pump stations, main lines and treatment plant capacity. Topography may make portions of the area difficult to serve.

Storm sewer – Overall this area is easy to serve. Infrastructure is in acceptable condition to develop the area. Stormwater is required to be treated with detention or water quality facilities.

[10] A study by Group MacKenzie indicated that the area may be able to be served by upgrading trunk lines versus installing new lines.

Sherwood (east, west) and Brookman Road
(Study Areas: 48p, 49p, 50p, 51p, 54p, 57p, 58p, 59p)
Sanitary sewer – This area is moderately difficult to serve. Infrastructure is in place in a portion of the area but service in other areas is made difficult due to slopes. Clean Water Service is the provider for sewer in this area.

Water – A good portion of the area is difficult to serve. Additional storage reservoirs are required. Portions of the area have infrastructure in place but require upgrades to prevent the system from being overwhelmed. Tualatin Valley Water District is the water provider.

Storm sewer – This area is mostly easy to serve although there is an area that may be difficult to serve due to steep slopes.

South Hillsboro and Farmington Road
(Study Areas: G, 68p, 69p, 70)
Sanitary sewer – Overall the area is difficult to serve. There are no sanitary sewer facilities that are located adjacent to the property that could provide gravity sewer service. As a result several pump stations are required to be constructed which makes this area difficult to serve. Portions of the area are flat making service provision difficult. This area is served by Clean Water Services.

Water – Overall this area is east to moderately difficult to serve. This area is easy to provide water service to because there is a 42-inch transmission line located adjacent to the site in Tualatin Valley Highway with distribution capabilities. The area is located within the Tualatin Valley Water District Area.

Storm sewer – Overall the area is easy to moderately easy to serve. New development requires construction of detention and possibly water quality treatment facilities on site making off site impacts minimal. The area is located in the Clean Water Service District.

Forest Grove (east,west) and Cornelius
(Study Areas: I, J, 76)
Sanitary sewer – This area is easy to serve because this area can be gravity fed. There are some planned sewer upgrades that could easily incorporate additional areas into the planning and construction. Minimal service upgrades are needed. Clean Water Service District is the service provider.

Water – Overall this area is easy to serve. The area located adjacent to the City of Cornelius is easy to serve based on the location of existing transmission lines and an existing storage reservoir. An additional reservoir is planned to be constructed in 2005-07 that would provide additional capacity. A portion of the area is moderately difficult to serve because the area lacks major transmission lines. The City of Forest Grove has excess capacity that could be used to service industrial land. Water treatment and storage capacity would need to be increased to meet industrial demands.

Storm sewer – Storm water detention and water quality systems will be required when development occurs. All of these study areas are easy to serve.

Jackson School Road, Evergreen, Helvetia, West Union
(Study Areas: K, L, M, 78p, 79, 80, 81, 83p)
Sanitary sewer – Areas K, L and M are difficult to moderately difficult to serve with sanitary sewer because downstream gravity facilities need to be upgraded. Some of the upgrades need to occur in an adjacent residential area because there are no existing large diameter sewer facilities in the area.

Water – This area is easy to moderately easy to serve. These areas are easy to provide service to because of large distribution lines located in NW Evergreen, NW Jacobson and NW West Union Roads.

Storm sewer –Overall this area is easy to serve. Storm water detention and water quality systems will be required when development occurs. All of these study areas are easy to serve.

VI. Transportation System Impacts

Study Approach
Transportation system impacts were estimated by applying the following methodology to a grouping of study areas.

Transportation methodology focused on four criteria:
- Potential trip generation;
- Expected volume to capacity ratio;
- 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)[11]. Weighting and factors were selected based on the rational that a potential developer would control the density, land use mix, internal employment and resulting trip generation. The resulting composite scores (determined by multiplying rating times weight) ranged from 11 (best) to 21 (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 build-out of each industrial study area.

The following sections outline the process used to develop transportation ratings for each criterion used to evaluate the study areas. In each component 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 gross vacant buildable acre figures that were generated for the productivity portion of the study. Trip generation rates were calculated based on the Institute of Transportation Engineers (ITE) Trip Generation Manual. The industrial acreage was assigned a peak PM period rate of 10.47

[11] This weighting system was developed by Parametrix, Inc. for use in the 2002 Alternatives Analysis Study. The methodology was replicated for the 2003 Alternatives Analysis Study.

trips/acre which represents the peak PM one-hour period trip rate for industrial parks that could include such uses as general light industrial and manufacturing. In addition this rate is comparable for the peak PM one-hour period trip generation rate for warehouse use. This trip rate provides a conservative rate that represents general industrial uses for the study areas, as this alternatives analysis does not designate expected industrial uses for each study area.

Potential Impact to the Committed Transportation System
This criterion provides an estimate of how developing the study area with industrial uses could affect the regional transportation system.

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 capacity of 900 vehicles per hour per lane (1,800 vehicles per lane over the two-hour peak period). 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 lanes. A rating of '3' was assigned to study areas with potential trip generation equivalent to more than 2 arterial lanes.

Potential off-site impacts on the transportation system were assessed using the above information together with Metro's 2020 year travel demand volume-to-capacity plots that incorporate Regional Transportation Plan (RTP) priority 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
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 (auto, transit, bike and pedestrian) as shown in the current RTP. A qualitative rating of '1' to '3' was assigned to each study area based on the combination of 3 factors; distance to the nearest city or county arterial, state highway or freeway; the number and type of transportation projects in close proximity to study areas as identified in the current RTP; and the distance of transportation projects to each study area. A rating of '3' was assigned to study areas that have greater distances to higher-level transportation facilities and have few or no transportation projects near study areas that would benefit industrial uses. A moderate rating of '2' was assigned to study areas in close proximity to

higher-level transportation facilities and have some transportation projects that may benefit industrial uses. A rating of '1' was assigned to areas that are close to higher-level transportation facilities and have many transportation projects within close proximity that would directly benefit industrial uses.

Environmental Factors

Environmental factors potentially affecting future siting of 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 one fourth 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 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. Weighting factors were selected based on the rationale that a potential developer would control the 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 and, as a result, would be more difficult to overcome. The final relative scores are assigned qualitative overall ratings of "easy", "moderate" or "difficult" to serve

Each of the study area groups were evaluated for potential transportation service and assigned a rating. Lower scores indicate the area would face fewer constraints to transportation service and be relatively less expensive to serve. Higher scores indicate an increased number of constraints, greater impacts to the existing system, and higher costs of providing transportation services to serve the study area.

VII. Regional Transportation System – Priority System

The Priority RTP was used as a base line to estimate impacts on transportation systems likely to be constructed during the planning period at a cost of $7.6 billion dollars. The priority RTP includes approximately $2.1 billion for freeway/highway projects, $1.8 billion for roads/bridges, $513 million for bike/pedestrian improvements and $3.1 billion for transit. The less expensive option (priority versus the preferred system) has approximately $4.4 billion shortfall in revenue to construct the region's most critical transportation facilities. Although approximately 50 percent of the system improvement costs do not directly facilitate freight movement that is needed to support industrial development, the remaining projects are important for workforce access and to free up capacity for industrially related trips.

The priority RTP includes most projects needed to implement the 2040 Growth Concept and attempts to balance funding limitations with future transportation needs. Because this system includes only a portion of the projects needed, improvements are focused on specific areas such as the central city, regional centers and intermodal facilities.

VIII. Air Quality Impacts

Air quality impacts of a potential UGB amendment are analyzed in relationship to the analysis that was completed for the update to the constrained RTP[12] completed in December 2003. The Federal Clean Air act provides a framework for determining standards for levels of pollutants to protect the health of the most sensitive population groups including the elderly, children and people with respiratory diseases. The 2004 RTP and the 2004-07 Metropolitan Transportation Improvement Program (MTIP) are subject to the conformity regulations in federal regulation (40 CFR Parts 51) and under state administrative rules (OAR 340 Division 252). Transportation plans and programs are required to not result in any air quality violations.

Even though the Portland/Vancouver area is one air shed, the Oregon side of the air shed has been treated differently based on established geographic areas and identified air pollutants. The map establishing Metro Air Quality boundaries (see "Metro Air Quality Boundaries" in the Appendix) covers an area that extends beyond the Metro jurisdictional boundary on the West, North and the majority of the Southern portions of the region. This air quality boundary does not cover the Boring area, Beavercreek or South Wilsonville study areas. More than 95 percent of the areas under study are included in the RTP Air Quality Analysis area.

The Metro Council will adopt the 2004 RTP, 2004-07 MTIP and the conformity determination for both plans in January 2004. To ensure that the 2004 RTP is in compliance with the air quality requirements, the conformity determination was based on the financially constrained system. The conformity requirements and findings of compliance must demonstrate consistency with the most recent planning assumptions that are derived from Metro's approved estimates of current and future population, employment, travel and congestion. The quantitative portion of this analysis uses a base year of 2000 and an out year of 2025, which is roughly consistent with the forecast used for the UGB assessment (2002 to 2022). Travel and congestion forecasts are derived from the population/employment data from Metro's travel demand model. Future travel estimates from the model produce future travel, motor vehicle congestion with outputs of the EPA emissions model to estimate regional vehicle emissions.

The quantitative analysis must demonstrate that emissions resulting from the entire transportation system fall within the budgets established in the maintenance plan for criteria pollutants. In the Portland-Vancouver Air Quality Maintenance Area these include ozone precursors (HC and Nox) and carbon monoxide (CO). The 2004 RTP must conform with mobile emission budgets established for winter carbon monoxide and for two summer ozone

[12] The financially constrained system is based on a system of projects that is based on current funding sources and those sources are expected to be reasonably available during the 20-year planning period. The constrained system is the source of transportation projects that are available to be funded through the MTIP.

precursors: Nitrogen oxides and hydrocarbons. Modeling results indicated that all budgets have been met in each year measured for the region as well as identified sub-areas.[13]

The addition of land to accommodate the remaining industrial land need within the UGB has been included in the forecast used for air quality modeling purposes; therefore there are no additional anticipated effects on air quality related to the upcoming UGB decision.

IX. Study Areas – Discussion of Transportation System Impacts

The transportation impacts on the following areas are discussed in detail based on the methodology used in the 2002 and 2003 Alternatives Analysis.

Boring, Damascus, Bluff Road and Noyer Creek
(Study Areas: Ap, B, 8, 10p, C, D)
The Damascus/Boring Preliminary Financing Study assumes that local street improvements will be completed by individuals as development occurs. The Sunrise Highway improvements are assumed to be needed for full urbanization of this area and that project will require a $34 million dollar local match for the projected total cost of $340 million dollar project. [14]

The Damascus area received a moderate rating for overall transportation assessment due to its low potential trip generation, the availability of transportation facilities, a low expected volume to capacity ratio, and potential environmental constraints that could restrict transportation service provision.

The Boring area received a moderate rating for overall transportation assessment due to its relatively low potential trip generation, the availability of transportation facilities, and a low expected volume to capacity ratio. The development of transportation facilities could be made more difficult due to slopes in the area.

The Bluff Road area received a moderate rating for overall transportation assessment due to its relatively low potential trip generation, the availability of transportation facilities and a low expected volume to capacity ratio.

Gresham and Pleasant Home
(Study Areas: Ap, 2p, 3p, 5p, 6p, 7, 10p)
The Gresham area received a moderate rating for overall transportation assessment primarily due to its high potential trip generation and moderate ratings for availability of transportation facilities and environmental factors. The area has no transportation-related projects slated for future development according to the 2000 RTP which contributed to its rating as moderate.

The Pleasant Home area received a moderate rating for overall transportation assessment primarily due to its high potential trip generation and moderate ratings for availability of transportation facilities and environmental factors. The area has no transportation-related projects slated for future development according to the 2000 RTP which contributed to its rating as moderate.

[13] Detailed information on all conformity modeling is available in the 2004 Regional Transportation Plan Air Quality Conformity Document.
[14] 2003 dollars assume a 3% inflation factor spread over a year to year basis.

Oregon City (north, east and south) and Beavercreek
(Study Areas: 21p, 22p, 23p, 28p, 30p)
The Oregon City North area received a moderate rating for overall transportation assessment due to its relatively low potential trip generation and a low expected volume to capacity ratio. It received moderate scores for availability of transportation facilities and environmental factors which may reduce the feasibility of transportation service provision in the area.

The Oregon City east area received a difficult rating for overall transportation assessment due to a high volume to capacity ratio. It received moderate scores on potential trip generation, availability of transportation facilities and environmental factors, potentially reducing the feasibility of servicing the area for transportation.

The Oregon City south area received an overall rating of moderate for transportation services due to a relatively low potential trip generation, expected volume to capacity ratio and limited environmental factors. The area did receive an easy rating for the availability of transportation facilities, which includes infrastructure improvements that potentially benefit industry.

The Beavercreek area was given a difficult overall rating for transportation services primarily due to a high potential trip generation rate and high-expected volume to capacity ratio. It received moderate ratings for transportation facility availability and environmental factors.

Borland Road (north, south)
(Study Areas: 35p, 36p, 38p, 41p, 42)
The Borland road north area received moderate ratings on individual factors but received a difficult overall transportation rating due to the relative weighting criteria applied to each factor. The combination of moderate scores cumulatively resulted in a difficult rating.

The Borland Road south area received a difficult overall rating for transportation services primarily due to a high-expected volume to capacity ratio. The area received moderate ratings for potential trip generation, availability of transportation facilities and environmental factors.

Wilsonville (east, south, west) and Coffee Creek
(Study Areas: E, F, 44p, 46, 49p, 51p, 52, 53)
The Wilsonville east area received an overall rating of moderate for transportation services due to a moderate availability level of transportation facilities, a relatively low expected volume to capacity ratio and moderate environmental factors. This area did receive a difficult score for a high potential trip generation rate.

This area received an overall transportation rating of difficult primarily due to high potential trip generation, a higher volume to capacity ratio, and less availability of transportation facilities as well as the presence of some environmental factors such as slopes and Title 3, which may affect the development of transportation facilities.

The Wilsonville west area received an overall transportation rating of difficult primarily due to a high-expected volume to capacity ratio. It received moderate ratings for potential trip generation and environmental factors. The area did receive an easy rating for availability of

transportation facilities due to the number and location of transportation projects within close proximity to the area.

The Coffee Creek area received a difficult overall transportation assessment rating due to significant environmental factors including slopes and Title 3 land. The area also has a high-expected volume to capacity ratio. It received moderate scores for the availability of transportation facilities and potential trip generation.

Tualatin, Quarry, Norwood and Stafford
(Study Areas: 43p, 44p, 47p, 48p, 49p)
The Tualatin area received a difficult overall transportation assessment rating due to significant environmental factors including slopes and Title 3 land. The area also has a high-expected volume to capacity ratio. It did receive an easy score for the availability of transportation facilities due to the future construction of a limited access toll way which could improve the freight movement capacity in the area.

The Quarry area received an easy overall rating for transportation services due to a low expected volume to capacity ratio and the availability of transportation facilities in the area, particularly the future construction of a limited access toll way. The area received moderate scores for potential trip generation and environmental factors.

The Norwood area received a moderate overall rating for transportation services primarily due to moderate ratings for availability of transportation facilities and environmental factors. The area has a relatively low expected volume to capacity ratio but has high potential trip generation.

Sherwood (east, west) and Brookman Road
(Study Areas: 48p, 49p, 50p, 51p, 54p, 57p, 58p, 59p)
The Sherwood east area received a difficult overall transportation assessment primarily due to a high-expected volume to capacity ratio. The area scored moderately for potential trip generation and environmental factors and received an easy score for availability of transportation facilities in part due to the future construction of a limited access toll way.

The Sherwood west area received moderate ratings on individual factors but received a difficult overall transportation rating due to the relative weighting criteria applied to each factor. The combination of moderate scores cumulatively resulted in a difficult rating.

The Brookman Road area received an easy overall transportation assessment primarily due to its low expected volume to capacity ratio and the availability of transportation facilities including the future construction of a limited access toll way near the area. The area received moderate ratings for potential trip generation and environmental factors.

Hillsboro South and Farmington
(Study Areas: G, 68p, 69p, 70)
The south Hillsboro area received a moderate overall transportation rating due to a moderate availability level of transportation facilities, a relatively low expected volume to capacity ratio and moderate environmental factors. This area did receive a difficult score for a high potential trip generation rate.

The Farmington Road area received a moderate overall transportation assessment primarily due to a relatively low potential trip generation rate, moderate availability of transportation

facilities and environment factors. The area did receive an easy rating for expected volume to capacity ratio.

Forest Grove (east, west) and Cornelius
(Study Areas: I, J, 76)
The Forest Grove east area received a moderate overall transportation rating due to a higher availability level of transportation facilities, a relatively low expected volume to capacity ratio and moderate environmental factors. This area did receive a difficult score for a high potential trip generation rate.

The Forest Grove west area received a moderate overall transportation rating due to a higher availability level of transportation facilities, a relatively low expected volume to capacity ratio and moderate environmental factors. This area did receive a difficult score for a high potential trip generation rate.

The Cornelius area received a moderate overall transportation rating due to a higher availability level of transportation facilities, a relatively low expected volume to capacity ratio and moderate environmental factors. This area did receive a difficult score for a high potential trip generation rate.

Jackson School Road, Evergreen, Helvetia, West Union
(Study Areas: K, L, M, 78p, 79, 80, 81, 83p)
The Jackson School Road area received a moderate overall transportation rating due to a higher availability level of transportation facilities, a relatively low expected volume to capacity ratio, and moderate environmental factors. This area did receive a difficult score for a high potential trip generation rate.

The Evergreen area received a moderate overall transportation rating due to a moderate availability level of transportation facilities, a relatively low expected volume to capacity ratio and moderate environmental factors. This area did receive a difficult score for a high potential trip generation rate. The Helvetia area received a moderate overall transportation rating due to a higher availability level of transportation facilities, a relatively low expected volume to capacity ratio and moderate environmental factors. This area did receive a difficult score for a high potential trip generation rate.

The West Union area received a moderate overall transportation rating due to a low expected volume to capacity ratio and an easy rating for availability of transportation facilities. The area did receive difficult ratings for potential trip generation and environmental factors.

X. Costs of Providing Urban Services

Costs for providing urban services is related to the extent and difficulty of developing sewer, water and transportation systems. Fire, police, library and park services are generally provided once development has occurred and an area becomes populated. Although these services are less critical to physical construction or urban development, they are still important to the development of complete and functional communities. System costs cannot be determined until public facility planning is completed based on how an area is planned for development.

Boring, Damascus, Bluff Road and Noyer Creek
(Study Areas: Ap, B, 8, 10p, C, D)

The Damascus and Boring Study areas were analyzed in a study completed by Clackamas County in June 2003 entitled "A Preliminary Financial Analysis." The study compared the potential costs and revenues generated from urbanizing these areas over a 20-year period from 2004-2024. Rough costs for construction of major sanitary sewer, storm sewer, domestic water and transportation facilities were developed in the study. This area has had the benefit of several planning studies that determined preliminary land uses which were used in the cost analysis. It was assumed that local street and facility improvements would be provided by individual property owners. In addition a less detailed analysis was provided for library, schools, park and recreation, fire and police services. However, all costs were estimated on a much larger area than the study areas currently under consideration. The total acreage in this area are estimated to include approximately 6.7 percent of the total area included within this facility study because the majority of the area was included in the UGB in 2002.

Sanitary Sewer, Transportation, Water and Storm Water – The costs for providing sanitary sewer services are more front loaded than either transportation or storm facilities and revenues are projected to be insufficient to cover the costs. Total costs for sanitary sewer are approximately $17 million dollars. Transportation costs are estimated to exceed $635 million dollars. Costs to provide water service is estimated at $99 million dollars. Revenue sources from in-lieu of fees for storm water management are likely to cover costs required to provide the service.

The total shortfall in revenue for sanitary sewer, water and transportation are estimated at $760 million in 2003 dollars. The current areas represent 6.7 percent of the total study area or $50 million of the estimated shortfall.

Schools, Police, Fire, Recreation and Library Services – Industrial development will produce a limited need for school, recreation and library services. This area will require one new police station at a cost of $2 million dollars that does not include any costs for community policing. It is estimated that four fire stations at 2.5 acres per fire station will be required at a cost of $10 million dollars. The demand for parks services was assumed to be based on a 2.5 acre requirement for a neighborhood park and a .65 acre requirement for development of a community park per 1,000 residents. In 2003 dollars it is estimated that it will cost $750,000 for a neighborhood park and $300,000 for a community park. These costs do not reflect demand for senior centers or aquatic facilities. Industrial expansion that does not include residential acreage will place minimal demand on the existing park system or pressure for new parks. It is estimated that $53.8 million are needed to fund parks for this area. Library services are estimated to cost $22.4 million.

Oregon City (north, east, south) and Beavercreek
(Study Areas: 21p, 22p, 23p, 28p, 30p)

Sanitary Sewer, Transportation, Water and Storm Water – No cost information is available for these system improvements.

Schools, Police, Fire, Recreation and Library Services – Industrial development will produce a limited need for school, recreation and library services. No cost information is available for these services.

Borland Road (south, north)
(Study Areas: 35p, 36p, 38p, 41p, 42)
Sanitary Sewer, Transportation, Water and Storm Water – No cost information is available for these system improvements.

Schools, Police, Fire, Recreation and Library Services – Industrial development will produce a limited need for school, recreation and library services. No cost information is available for these services.

Wilsonville (east, south, west) and Coffee Creek
(Study Areas: E, F, 44p, 46, 49p, 51p, 52, 53)
The City of Wilsonville conducted a "Public Facility Feasibility Analysis for the South Metro Industrial Study Areas" published on October 19, 2003 to provide information to Metro for the 2003 Alternatives Analysis. The study provided information on necessary public improvements and costs major system improvements for sanitary sewer, storm water, transportation and water. No cost estimates or capital facilities planning were completed for fire, police, recreation or library services in this study. No estimates were made of potential revenue sources that would offset system improvement costs.

Sanitary Sewer, Transportation, Water and Storm Water – Sanitary sewer costs are expected to exceed $63.8 million dollars. Transportation costs may cost as much as $69.3 million dollars to serve these areas. Water costs are projected to exceed $76.2 million dollars most due to additional construction of storage and treatment facilities. Storm water facilities are the least expensive services to at $6.2 million dollars.

Schools, Police, Fire, Recreation and Library Services – Industrial development will produce a limited need for school, recreation and library services. No cost information is available for these services.

Tualatin, Quarry, Norwood and Stafford
(Study Areas: 43p, 44p ,47p, 48p, 49p)
Sanitary Sewer, Transportation, Water and Storm Water – No cost information is available for these system improvements.

Schools, Police, Fire, Recreation and Library Services – Industrial development will produce a limited need for school, recreation and library services. No cost information is available for these services.

Sherwood (east, west) and Brookman Road
(Study Areas: 48p, 49p, 50p, 51p, 54p, 57p, 58p,59p)
Sanitary Sewer, Transportation, Water and Storm Water –
No cost information is available for these system improvements.

Schools, Police, Fire, Recreation and Library Services – Industrial development will produce a limited need for school, recreation and library services. No cost information is available for these services.

Hillsboro South and Farmington (Study Area: G, 68p, 69p, 70)
Sanitary Sewer, Transportation, Water and Storm Water – No cost information is available for these system improvements.

Schools, Police, Fire, Recreation and Library Services – Industrial development will produce a limited need for school, recreation and library services. No cost information is available for these services.

Forest Grove (east, west) and Cornelius
(Study Areas: I, J, 76)
Sanitary Sewer, Transportation, Water and Storm Water – No cost information is available for these system improvements.

Schools, Police, Fire, Recreation and Library Services – Industrial development will produce a limited need for school, recreation and library services. No cost information is available for these services.

Jackson School Road, Evergreen, Helvetia, West Union
(Study Areas: K, L, M, 78p, 79, 80, 81, 83p)
Sanitary Sewer, Transportation, Water and Storm Water – No cost information is available for these system improvements.

Schools, Police, Fire, Recreation and Library Services – Industrial development will produce a limited need for school, recreation and library services. No cost information is available for these services.

Chapter 3

Completing Periodic Review

Metro is required to complete Periodic Review by June 2004 unless an extension is sought from the Land Conservation and Development Commission (LCDC). The remaining tasks completed in 2004 will focus on engaging the public in the process of determining which lands are suitable for urbanization for industrial use.

Process to Complete Expansion of the UGB

Recommendation of Lands for Council Action
After the release of this Report and the conclusion of a series of community open houses, a recommendation on which lands to consider for inclusion into the UGB will be formulated. The recommendation will result from testimony from interested parties, discussion of impacts on agriculture and natural resources, application of Metro policies and State Goal 14 factors.

Outreach Efforts
The Metro Council will be seeking comments on the proposed UGB expansion through a series of open houses located around the region scheduled during March of 2004. These open houses will provide information to the public and provide a forum for citizens, property owners, businesses and interested parties to address the Metro Council before a recommendation is formulated.

Public Hearings
Public hearings on a proposed ordinance to amend the UGB will begin April 2004 and conclude no later than June 30, 2004.

Acknowledgement by Land Conservation and Development Commission
All Periodic Review work must be acknowledged by LCDC after adoption by the Metro Council. Acknowledgement of Metro's amendment to the UGB and adoption of policies to protect industrial land will occur within the balance of 2004 by the Land Conservation and Development Commission.

APPENDIX

Exhibits

1. Ballot Measure 26-29 Text
2. Goal 14 Hierarchy of Lands Chart
3. Map – Clackamas County – Damascus/Boring Phasing Plan
4. Map – Alternatives Analysis Study Area Groupings
5. Map – Metro Air Quality Boundaries
6. Understanding Industrial Land Needs
7. Assessing Site Characteristics of Key Industrial Sectors
8. Map – Regional Freight Network
9. Map – Title 4

Additional Research Studies and Discussion Papers

i. Aggregation Study
ii. Formation of Industrial Neighborhoods
iii. Industrial Development on Sloped Land
iv. Reduction of Alternative Analysis Lands Under Consideration

EXHIBIT 1

Ballot Measure 56 Notice Requirements

197.047 Notice to local governments of changes to commission rules or certain statutes; form; distribution of notice; costs. (1) At least 50 days prior to the effective date of a new or amended administrative rule of the Land Conservation and Development Commission or a new or amended land use planning statute enacted by the Legislative Assembly, as described in subsection (3) of this section, the Department of Land Conservation and Development shall cause a written notice of land use change, in substantially the form described in subsection (2) of this section, to be mailed to every local government that exercises land use planning authority under ORS 197.175.

(2) The notice shall contain substantially the following language in the body of the notice:

(a) On (date of rule adoption), the Land Conservation and Development Commission adopted administrative rule (number). The commission has determined that this rule will affect the permissible uses of property in your jurisdiction and may reduce the value of subject property.

Rule (number) is available for inspection at the Department of Land Conservation and Development located at (address). A copy of the rule (number) also is available for purchase at a cost of _____.

For additional information, contact the Department of Land Conservation and Development at (telephone number); or

(b) On (date of enactment) the Legislative Assembly adopted (House/Senate bill number). The Department of Land Conservation and Development has determined that enactment of (House/Senate bill number) will affect the permissible uses of property in your jurisdiction and may reduce the value of subject property.

A copy of (House/Senate bill number) is available for inspection at the Department of Land Conservation and Development located at (address). A copy of (House/Senate bill number) also is available for purchase at a cost of_____.

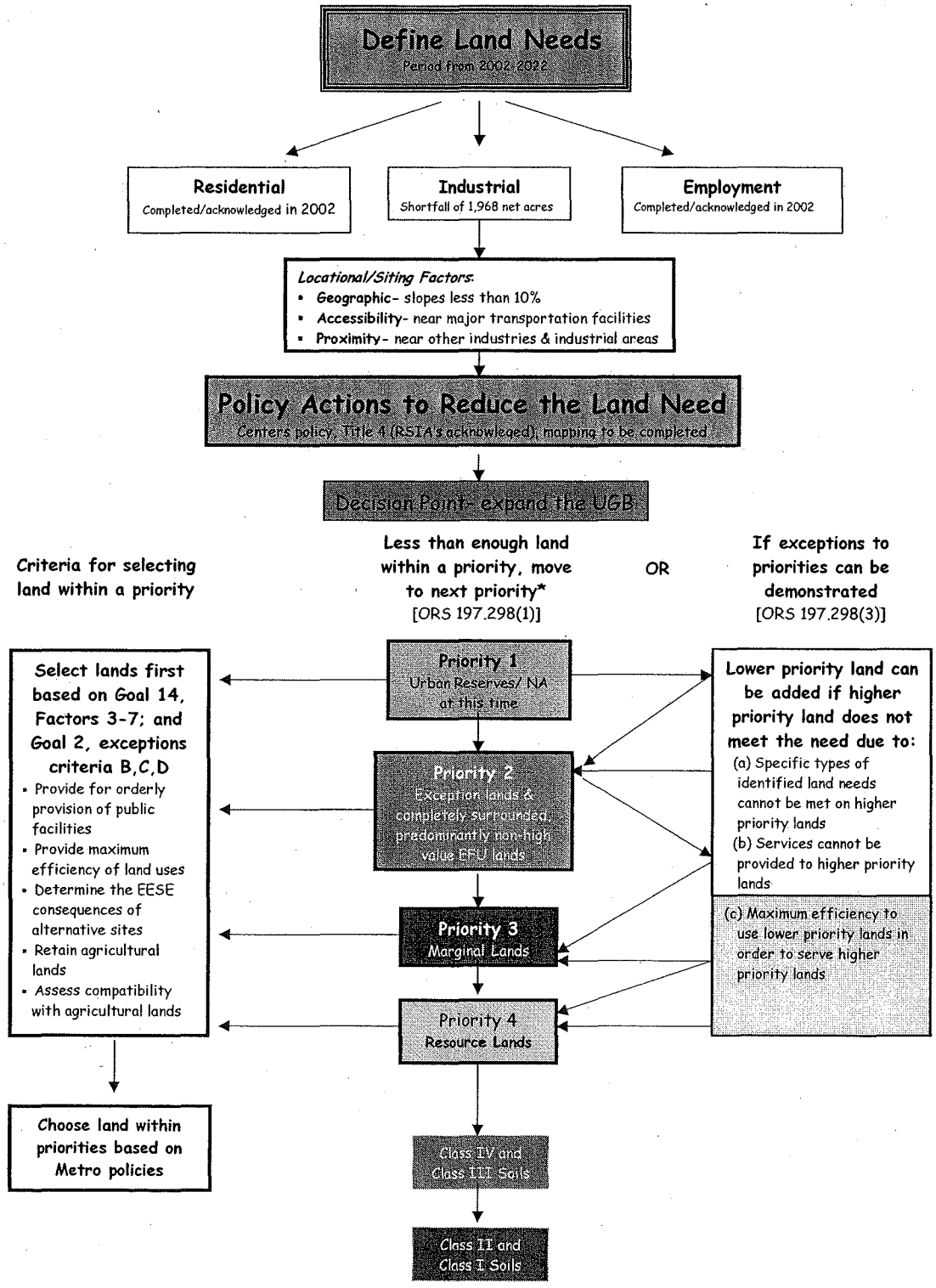
For additional information, contact the Department of Land Conservation and Development at (telephone number).

(3) The provisions of this section apply to all statutes and administrative rules of the Land Conservation and Development Commission that limit or prohibit otherwise permissible land uses.

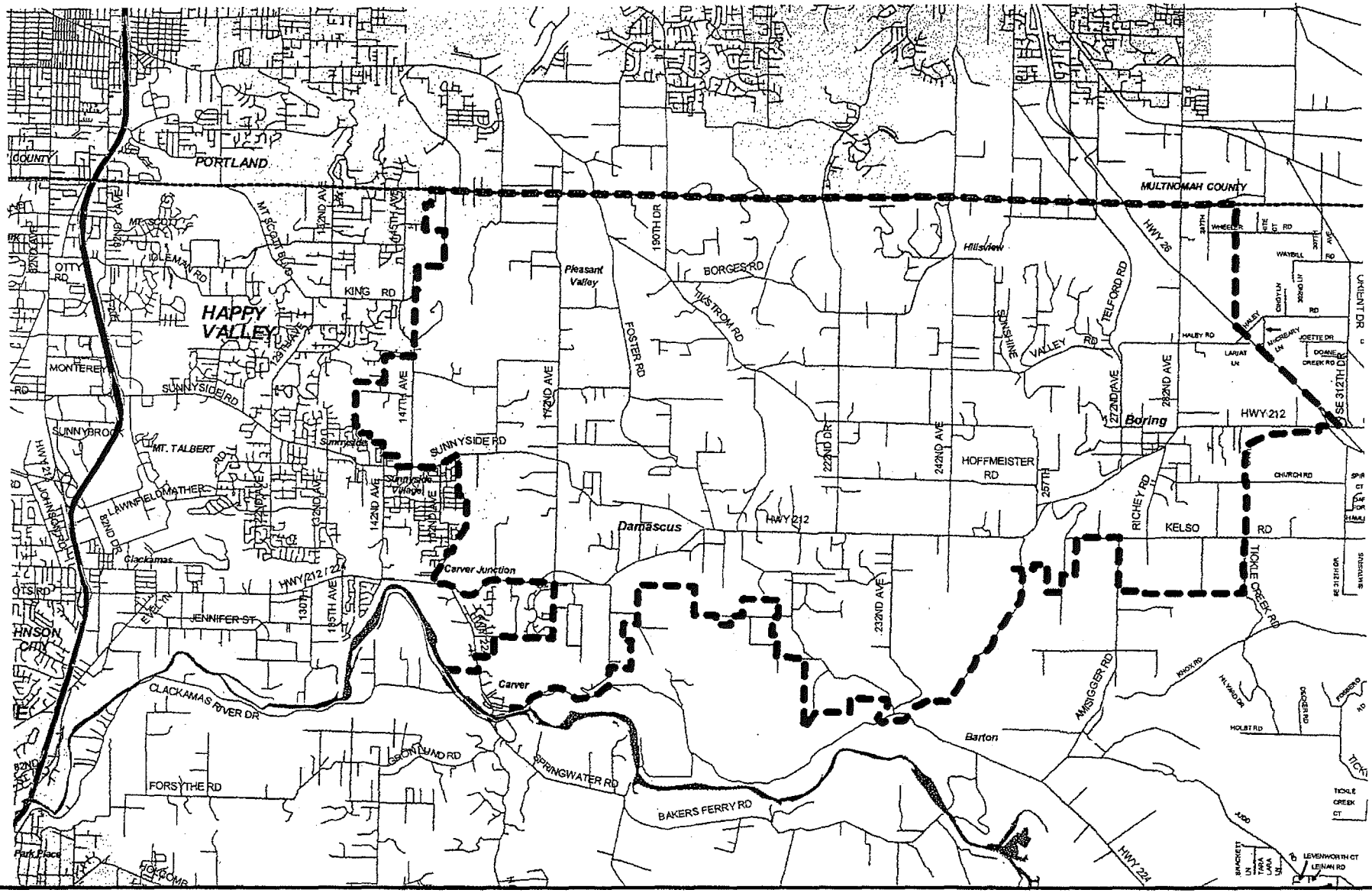
(4) A local government that receives notice under this section shall cause a copy of the notice to be mailed to every owner of real property that will be rezoned as a result of the adoption or enactment of the rule or statute. Notice to a landowner under this subsection shall be mailed at least 30 days prior to the effective date of the subject rule or statute.

(5) The department shall reimburse the local government for all usual and reasonable costs of providing notice required under subsection (4) of this section. [1999 c.1 §5]

Satisfying the Region's 20-Year Urban Land Needs



* To select land for UGB expansion within a priority follow Goal 14.

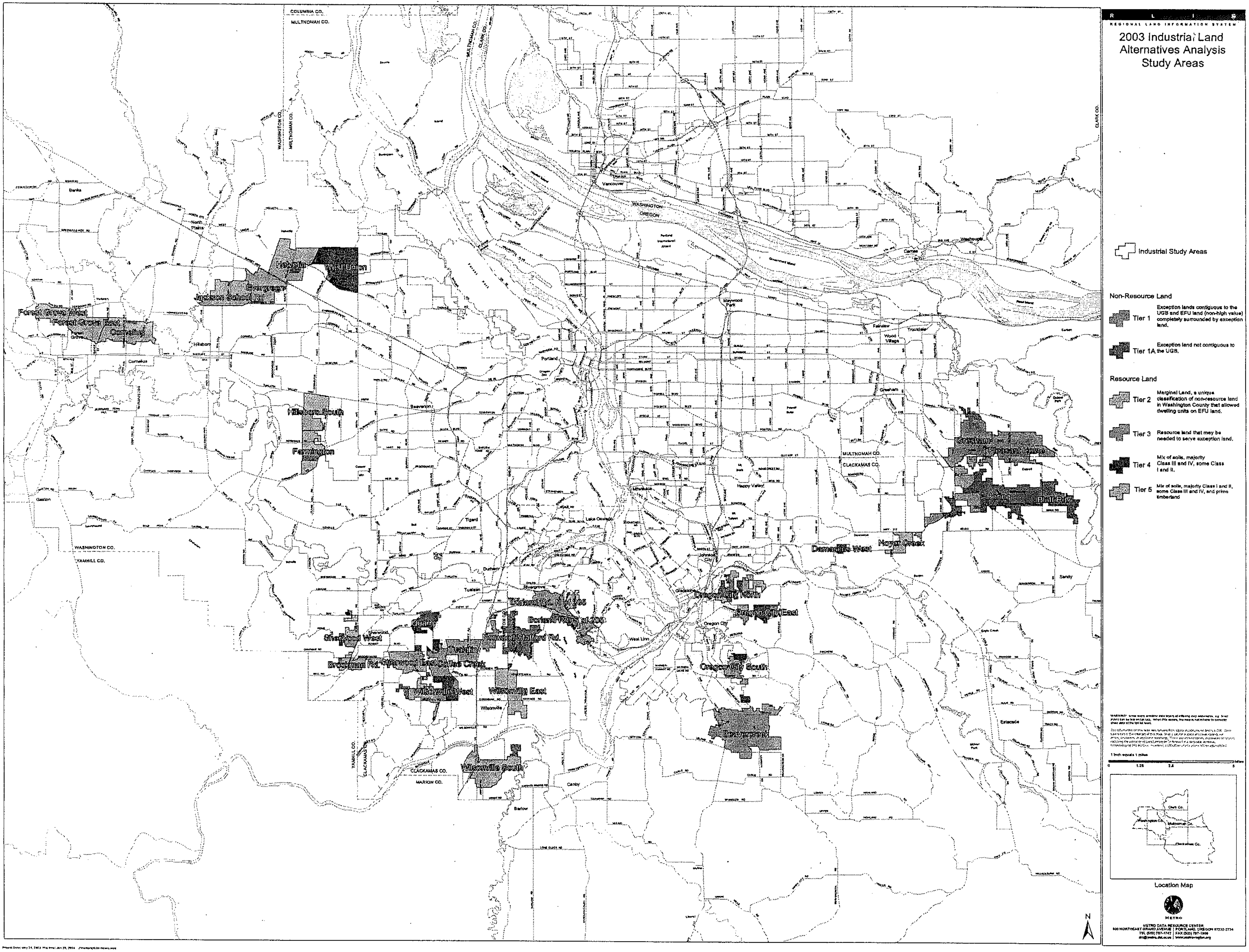


Clackamas County

FIGURE 1
Study Area

County Line
Study Area
Cities

DEPARTMENT OF TRANSPORTATION
AND DEVELOPMENT
9101 SE Sunnybrook Blvd
Clackamas, OR 97015
4/3/03 / y2002/financedamascus/reportmaps.apr


RLIS
REGIONAL LAND INFORMATION SYSTEM
2003 Industrial Land Alternatives Analysis Study Areas
Industrial Study Areas
Non-Resource Land
Tier 1 Exception lands contiguous to the UGB and EFU land (non-high value) completely surrounded by exception land.
Tier 1A Exception land not contiguous to the UGB.
Resource Land
Tier 2 Marginal Land, a unique classification of non-resource land in Washington County that allowed dwelling units on EFU land.
Tier 3 Resource land that may be needed to serve exception land.
Tier 4 Mix of soils, majority Class III and IV, some Class I and II.
Tier 5 Mix of soils, majority Class I and II, some Class III and IV, and prime timberland
1 inch equals 1 miles
0 1.25 2.5 5 Miles
Clark Co.
Washington Co.
Multnomah Co.
Clackamas Co.
Location Map
METRO
METRO DATA RESOURCE CENTER
600 NORTHEAST GRAND AVENUE
PORTLAND, OREGON 97232-2736
TEL (503) 797-1742
FAX (503) 797-1909
N
Forest Grove West
Forest Grove East
Cornelius
Jackson School Rd.
Evergreen
West Union
Hillsboro South
Farmington
Sherwood West
Quarry
Tualatin
Wilsonville West
Wilsonville East
Wilsonville South
Norwood/Stafford Rd.
Damascus West
Noyer Creek
Oregon City North
Oregon City East
Oregon City South
Beavercreek
Boring
Bluff Rd.
Gresham
WASHINGTON
OREGON
COLUMBIA CO.
MULTNOMAH CO.
WASHINGTON CO.
YAMHILL CO.
CLACKAMAS CO.
MARION CO.
CLARK CO.
Vancouver
Portland
Beaverton
Tigard
Tualatin
Lake Oswego
Milwaukie
Happy Valley
Oregon City
West Linn
Wilsonville
Canby
Sandy
Estacada
Hillsboro
Cornelius
Banks
Gaston
Sherwood
Durham
Fairview
Troutdale
Wood Village
Camas
Washougal
Barlow

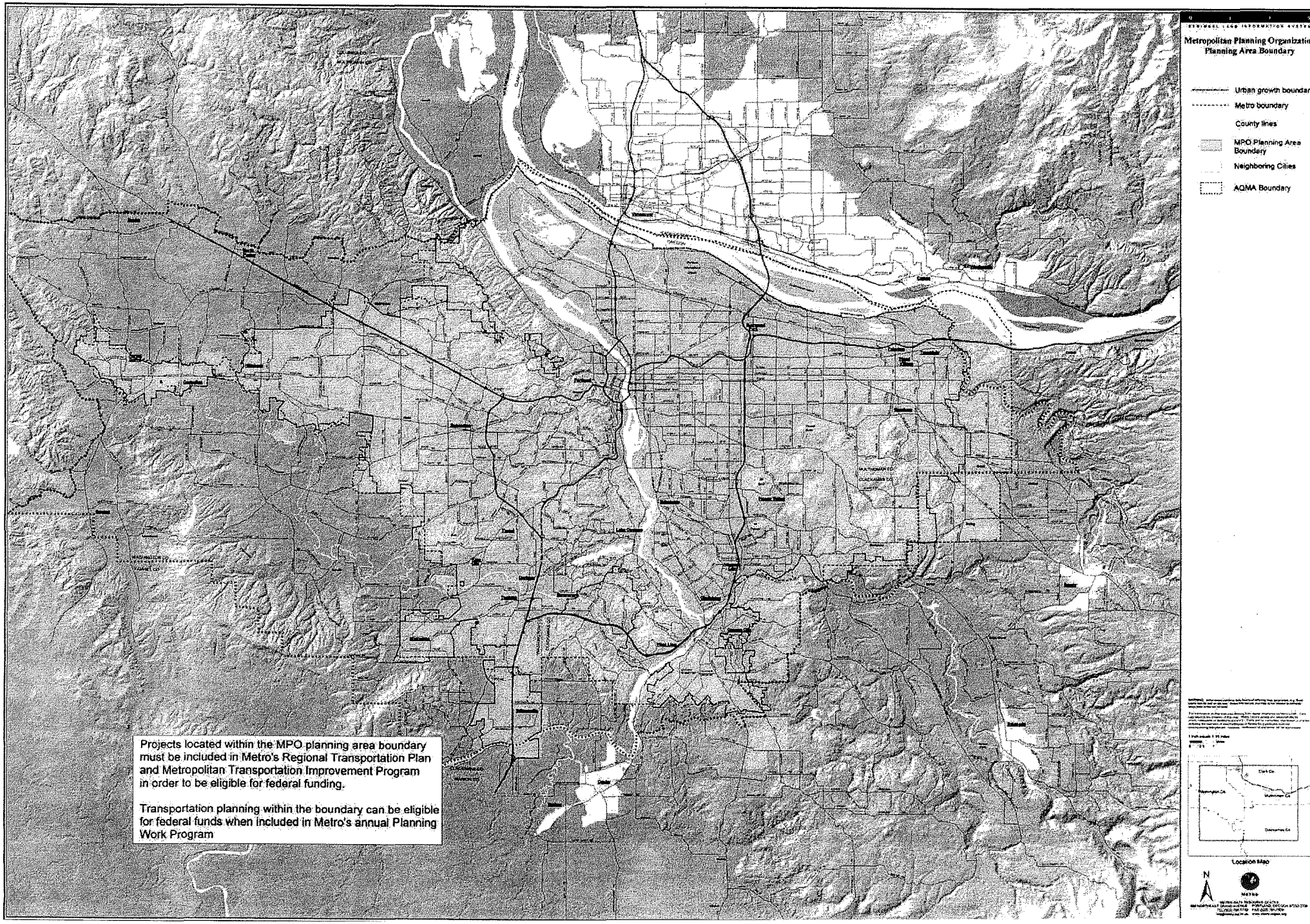

Metropolitan Planning Organization
Planning Area Boundary
Urban growth boundary
Metro boundary
County lines
MPO Planning Area Boundary
Neighboring Cities
AQMA Boundary
Projects located within the MPO planning area boundary must be included in Metro's Regional Transportation Plan and Metropolitan Transportation Improvement Program in order to be eligible for federal funding.
Transportation planning within the boundary can be eligible for federal funds when included in Metro's annual Planning Work Program
Location Map
N
Metro

EXHIBIT 6 – Understanding Industrial Land Needs

The region is uniquely positioned for industries associated with the movement of goods and services due to port access for ocean going shipping and in-land barging, location of two transcontinental railroads lines and an international airport. Consequently, 60 percent of all jobs in the region are related to the movement of freight. Portland is the third largest tonnage port on the west coast, the second largest wheat exporter in the US and is also the 2nd largest grain export area in the world.

The Portland International Airport ranks 26th in the nation in air cargo shipments. These activities generate economic activity on their own but also act to support industries that manufacture products exported from our region. A key component of the region's economy is based on supply chain management and productivity gains realized through transportation investments. Today, industrial competitiveness is focused on logistics rather than obtaining gains through manufacturing innovation or pure sales growth of products. The Regional Freight Network Map (Exhibit 8) illustrates the location of port facilities, truck terminals, distribution facilities and the road and rail networks that serve industry.

The key to maintaining a strong job base in the region requires that the region:

- Develop in areas to maximize use of existing or planned transportation investments;
- Maintain an adequate supply of quality industrial land located close-in to the central core rather than located at the edge of the region except in areas that have concentrations of industrial employers;
- Provide multiple modes of transportation to move products efficiently to maintain a competitive edge for the region; and
- Cluster industry for supplier access, access to transportation improvements and taking advantage of the synergy of like firms located in key areas.

To identify potential locations for future industrial lands, Metro first focused on evaluating lands around existing locations of industrial employment. A four-step approach was outlined. This research approach focused on defining key employment areas, location and accessibility to land from existing transportation investments, parcel size and the location constraints for key industrial sectors.

Concept of Clusters

The clustering of like employers in different parts of the region results from geographic advantages, the location of suppliers attracted to these companies, complementary firms that produce related products and the base of intellectual talent necessary to continue to innovate. They tend to flourish in close proximity to each other. Although many of these companies are classified as manufacturers, they are unlike the manufacturers of decades past that relied on business advantages gained from access to raw materials, cheaper shipping or labor for increased profitability. Different parts of the region will play different roles in the regional economy based on natural features, infrastructure investments and location of existing industries.

Examination of existing industry clusters and economic activity clearly points to specific geographic areas of the region that specialize in the high tech industries, warehouse and distribution and traditional heavy manufacturing activities. The west side economy is dominated by hi-tech industry which accounts for one fourth of all economic activity in the Oregon portion of the Portland region. The hi-tech cluster has reached a critical mass,

primarily located in the western portion of the region.[15] Intel, Oregon's largest private employer located in Hillsboro, is estimated to have an effect totaling $6.1 billion on the Washington County economy (that includes trickle down effects).[16] The hi-tech industry is a knowledge-based industry clustered in a crescent shaped area extending from the Hillsboro airport, southeast along Sunset highway, along Highway 217 and I-5 to Wilsonville. More than 70 percent of Intel's employees live in this crescent.[17] The growth trend within the high-tech industry in these areas is to export the lowered skilled manufacturing jobs offshore and keep the research-intensive jobs in our region. One example is that the number of patents filed by Intel from its Oregon campus exceeds the rest of its US operations combined. Intel uses an exact copy manufacturing process that is developed in Oregon and then replicated in other manufacturing facilities both in the US and around the world.

Four key west-side industry clusters have been identified that significantly contribute the regional economy:[18]

- High-tech
- Apparel/Sporting goods
- Nursery products
- Metals, some of which support the high-tech industry

The west side of the region is beginning to cultivate a sporting goods and apparel presence due to the location of Nike, Columbia Sportswear, Adidas, Soloflex and other equipment manufacturers. Like the high-tech cluster, these industries rely on changes in design and innovation to stay at the top of their industry and continue to generate increased sales of their products. The bulk of the actual manufacturing of athletics products occurs offshore although these manufacturers design prototypes here and manufacture key components in this region. These jobs are typically high wage jobs in a fast growing industry segment.

The nursery industry needs access to transportation for shipping products and fulfills some local market demand within the UGB. There is a substantial cluster of nursery producers located on the east side of the region located both inside of the UGB and outside of the UGB. The nursery industry is the fastest growing component of agriculture on the Westside with a 3.6 percent growth rate.

The metals industry is made up of a variety of firms that partially serve the high-tech industry by manufacturing specialized machinery and specializing in fabrication. There are other industries that may be emerging as clusters in the future due to economic development efforts and changes in the make up of our economy.

The east-side and centrally located clusters are characterized by the nursery industry and freight and distribution. Freight and distribution are located around transportation infrastructure advantages. The warehouse and distribution cluster is concentrated around Port of Portland facilities providing access to the Willamette and Columbia Rivers, rail yards, transload facilities, Portland International Airport and along I-84, I-5 and I-205. Convenient access within three miles of a freeway interchange is essential to access national markets and international ports. Trends in this industry have required larger sites to accommodate

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[15] A cluster is defined as a geographic concentration of competing, complementary or interdependent firms with common needs for talent, technical support and infrastructure.
[16] Oregonian, February 27, 2003
[17] Westside Economic Study Final Report, June 2002
[18] Source: Westside Economic Study Final Report, June 2002

larger trucks and containers for shipping and taller one-story buildings which has caused some shifts in the way that some centrally located industrial areas are being used.

Eastern Multnomah and Clackamas County have a thriving nursery cluster that takes advantage of transportation facilities located in the region to ship products.

Identifying Key Employment Areas

By examining available census data, building permit information and MetroScope data we can assess which employment areas are generating the highest demand for land.[19] Industrial development is forecasted to be concentrated in five main locations within the region. These areas are: 1) Portland, 2) Sunrise Corridor, 3) South Metro (Tualatin and Wilsonville areas), 4) Westside and 5) East Metro. These locations are highlighted as concentrations of industrial activity in MetroScope data, which indicates industrial investment gains from 1997 through 2002.[20] This data was obtained from building permit activity from the most recent five-year period. Each of these areas has comparative advantages based on accessibility to transportation facilities that are key to business, location of intellectual talent, access to specialized suppliers and existing locations of similar firms.

These areas correspond with concentrations of industrial lands that have been identified for protection in Title 4 (Exhibit 9). The objective of Title 4 is to direct commercial development to centers, preserve key interchange capacity for industrial uses by limiting intervening non-employment uses and preserve larger lots for industrial uses in areas recently included in the UGB.

[19] MetroScope is an integrated land use and transportation model developed by Metro to evaluate the effect of land use decisions.
[20] Source: Base Case MetroScope study.

EXHIBIT 7 – Addressing Site Characteristics of Key Industrial Sectors

Based on Metro's reconciliation of the supply of industrial land and the demand by industry types, the following industrial types have land needs that need to be accommodated in the upcoming UGB expansion. The following industrial sectors have specific site characteristics that are determined by building types for warehouse and distribution, general industrial and tech-flex.[21] These industry types were identified in the adopted Regional Economic and Population Forecast and the UGR for the period from 2000-2022.

In order to identify the land characteristics suitable for warehouse and distribution, general industrial and tech-flex, a number of interviews were conducted with industry professionals that specialize in land acquisition, site development and facility management. A detailed discussion of each sector's land needs follows.

Warehouse and Distribution

Access is key to the warehouse and distribution industry. Warehouse and distribution requires freeway access via an arterial or collector street system. Since transportation of goods is the primary purpose of these businesses, ease of access and the ability to move goods on-site is of primary concern. Businesses relying on freight movement choose I-5, I-84 and I-205 locations to maximize the movement of goods. The value or premium that a business places on access is somewhat dependent upon whether the movement of goods is in bulk or results from primary manufacturing. Bulk suppliers and users tend to locate close to Port of Portland facilities that utilize rail, barge and container operators. Local distributors place a higher premium on sites that are centrally located and as a result are willing to trade off congestion for a location that can reach a number of places in the region. Manufacturers that manufacture precision products that are small in nature may require access to the airport for shipping rather than utilizing ship or truck modes. In terms of air freight shipments in the region, the top five companies are Tektronix, Hewlett Packard, Intel, Nike and Sun Micro Systems.[22] The majority of these companies are located in the western and southern portions of the region.

The region is served by several transportation corridors that provide relative advantages for the movement of goods. I-5 is key for inter and intra-state travel and the movement of containers to and from Terminal 6 at the Port of Portland. I-84 provides access to the eastern portion of the region and to airport facilities. Highway 26 provides access to the western portion of the region but is not a desirable location for distribution businesses unless they are servicing the industries already located in this corridor. Time is a greater determinant than actual distance for these types of businesses. Congestion and intervening non-compatible land uses impede the ability of these businesses to distribute products. Ideally, access to a freeway interchange would not occur through a residential or commercial area. Some firms stagger trips to avoid peak travel times when congestion is heaviest to avoid some of the negative consequences of congestion.

Typically warehouse and distribution buildings are single story, concrete tilt-up structures located on relatively flat sites accessed by trucks. Buildings can range from 100,000 to 200,000 square feet and typically have lot coverage of 35 percent. The sites need to be large enough to accommodate staging, truck turning, backing and loading. Over the past 10 years the industry has changed to include larger vehicles (width and length) and a trend in

[21] Tech-flex development is a building type that provides flexible space to accommodate a variety of users from light assembly, product storage and research.

[22] Source: Port of Portland

building design to provide greater clearstory heights for staging material. This industry has some of the lowest job densities that are somewhat offset by companies that run multiple shifts. Some of these sites handle container traffic that requires large outdoor storage areas.

Suitable sites for warehouse/distribution should contain the following characteristics:

- Freeway access within 3-5 miles of an interchange via an arterial street, no intermediate conflicting uses such as residential, schools and high traffic generating commercial uses;
- Development of new warehouse/distribution locations need to provide enough area for a number of uses not just one single site;
- Slopes of less than 5%, larger buildings are more difficult to accommodate on sites with greater slopes;
- Highway routes are key: I-5, I-84, I-205; and
- Highway 26 on the west side is not desirable due to congestion unless a firm serves the local market, including the high-tech cluster.

General Industrial

General industrial building types can accommodate light to heavy manufacturing activities and encompass a wide range of activities from research, development and manufacturing and fabrication. Buildings can be as large as 400,000 square feet in size. The buildings range from custom built projects for single user company operations to more general spaces that are built as speculative facilities. Heavy manufacturing activities that require bulk materials locate adjacent to rail and port facilities to take advantage of cost savings from these types of transportation facilities.

General industrial sites need the following site characteristics:

- Freeway access within 3 miles of an interchange via an arterial street;
- Net parcel sizes: varies between 1-5 acres and 10-20 acres, depending upon the shape of the lot and constraints;
- Location near other firms to provide access to an adequate labor pool;
- Stable soils, flat sites to reduce required site work, allow truck access and interaction between businesses;
- Manufacturing sites greater than 20 acres must have slopes less than 2 to 3 percent; the large the building the less likely a project can accommodate slopes greater than 3 percent; and
- Manufacturing sites between 1-5 acres – slopes no more than 5 to 10%

Tech Flex

As the name implies, tech flex buildings are constructed to be flexible in nature and be easily configured to meet different space requirements. They can accommodate light assembly, product or material storage, research activities and may contain a small amount of office. Buildings used for high-tech purposes require stable soils to minimize vibration and specialized public facilities like specialty gases, triple redundant power, high volume water and fire/emergency response units. High-tech firms are knowledge-based industries and tend to rely on agglomeration as a resource for intellectual talent, supplies and supportive technology available from like firms.

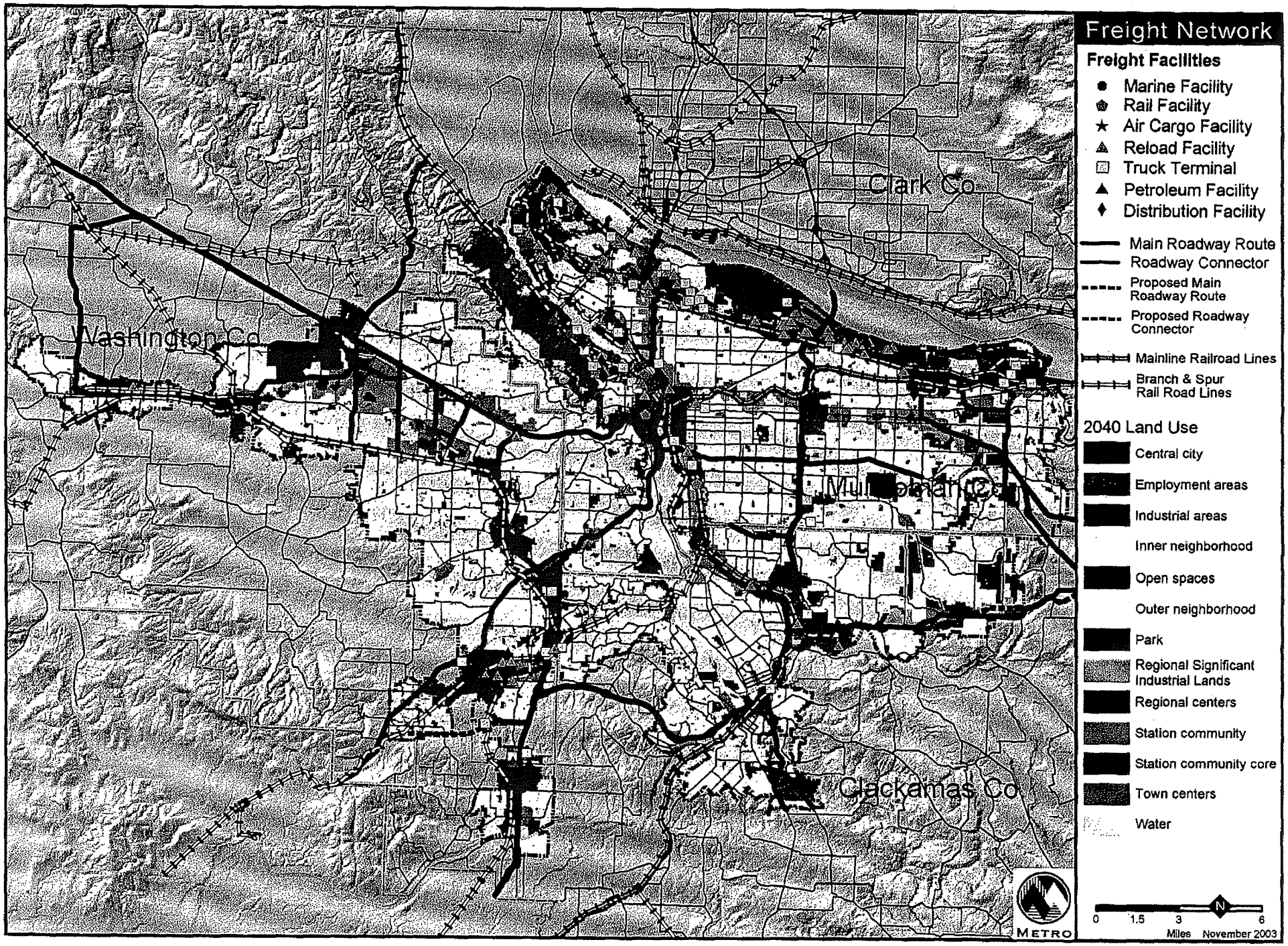
These buildings may not be constructed to meet the specialized needs of a single firm. They fulfill a space need for smaller firms, start-ups and growing companies. Generally, the site requirements are not as restrictive as the requirements of warehouse and distribution or general industrial sites. A site that is developed for tech-flex use can tolerate greater

variations in slope by utilizing multiple buildings to accommodate topographic constraints or rolling topography. The area required to accommodate truck movements is not as great.

Tech flex users have the following site needs:

- Congestion is not as great an issue for tech flex when compared to warehouse and distribution, although shipments must reach Portland on time during the PM peak in order to meet carriers' nationwide schedules;
- Net parcel size greater than 10 acres;
- Ideal parcel size depends upon the type of use, can vary from 10 to 20 acres;
- Availability of specialized utilities such as specialty gases, triple redundant power, abundant water, dedicated fire and emergency response services;
- Stable soils;
- Located within close proximity of existing high-tech companies and suppliers;
- Must have access to airport, no more than 45 minute mid-day travel time for passenger purposes;
- Can tolerate some rolling topography within a site sloped no more than 5 percent; slopes approaching 5 percent make meeting ADA requirements difficult

Accessibility is a key component for most businesses because it allows access to customers, suppliers and other modes of transportation to move goods. Approximately 60 percent of all commodities shipped to, from and within our region, use the regional road system. Delay has direct impacts on regional competitiveness. Different types of firms place different values on moving people and goods. An analysis of potential lands for industrial uses will need to assess the accessibility to key facilities within the regional freight system.


Freight Network
Freight Facilities
Marine Facility
Rail Facility
Air Cargo Facility
Reload Facility
Truck Terminal
Petroleum Facility
Distribution Facility
Main Roadway Route
Roadway Connector
Proposed Main Roadway Route
Proposed Roadway Connector
Mainline Railroad Lines
Branch & Spur Rail Road Lines
2040 Land Use
Central city
Employment areas
Industrial areas
Inner neighborhood
Open spaces
Outer neighborhood
Park
Regional Significant Industrial Lands
Regional centers
Station community
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Town centers
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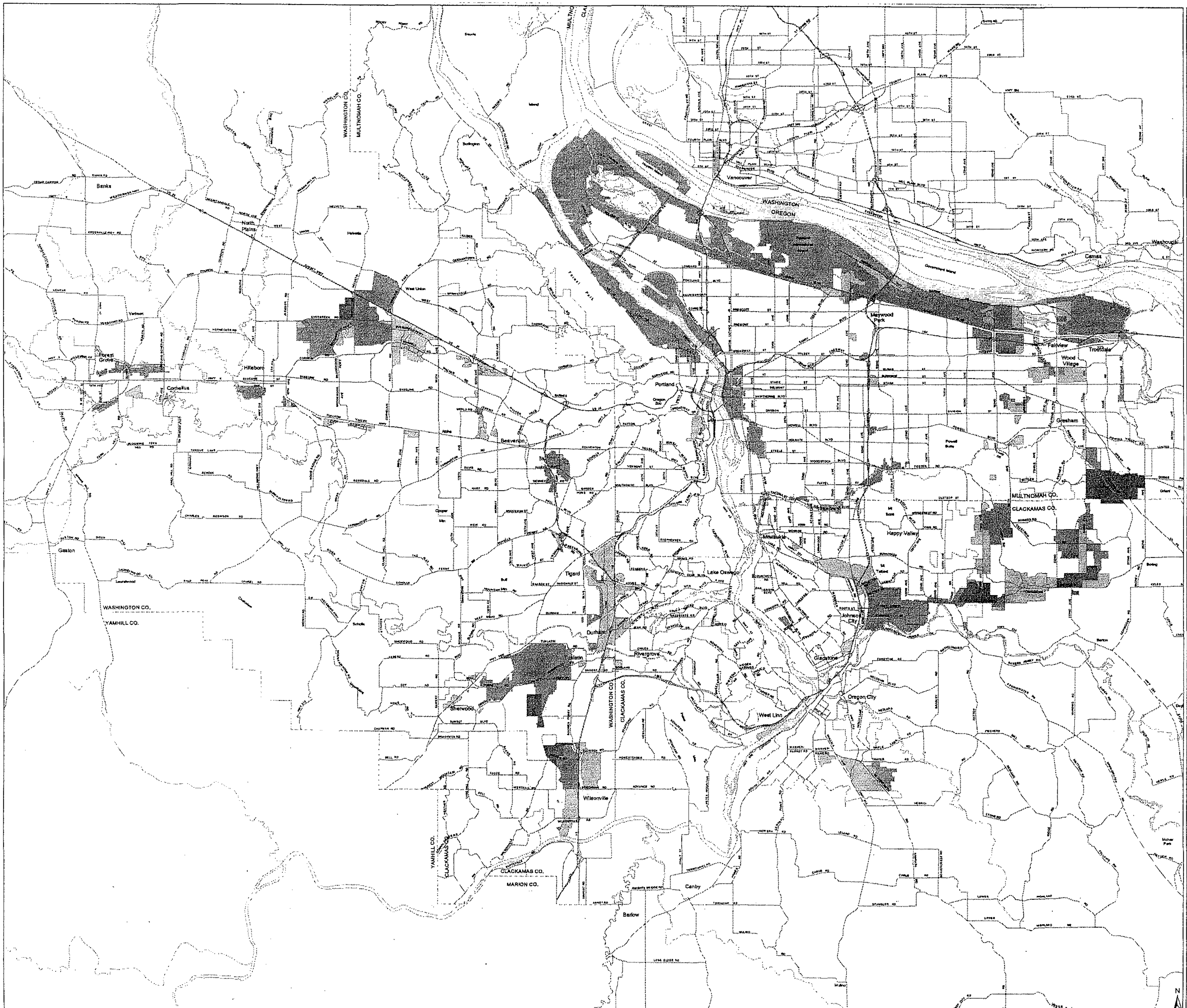
November 2003



RLIS

REGIONAL LAND INFORMATION SYSTEM

Title 4

Employment and Industrial Land

Employment Land

Industrial Land

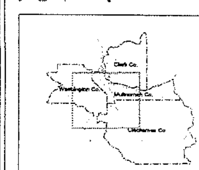
Regionally Significant Industrial Area

SOURCES:

TAX LOT MAP

1 inch equals 1.04 miles

Miles 0 0.5 1 2



Location Map

METRO

METRO DATA RESOURCE CENTER
800 NORTHEAST GRAND AVENUE | PORTLAND, OREGON 97232-2736
TEL (503) 797-1742 | FAX (503) 797-1909
drc@metro.dst.or.us | www.metro-region.org

ADDITIONAL RESEARCH STUDIES AND DISCUSSION PAPERS

The following research was undertaken in order to evaluate land studied in the 2002/2003 Alternatives Analysis. These technical papers attempt to assess how well these lands meet the demand for large lots, determine the ideal sizes for forming new industrial neighborhoods and review the slopes needs/constraints of targeted growth industries. Information obtained from these studies will assist policy makers in choosing between lands that are similarly situated within the State Goal 14 hierarchy.

i. Aggregation Study – Forming Larger Lots for Industrial Development

The purpose of this analysis is to develop an aggregation methodology to apply to lands being considered to fulfill the industrial land shortfall. A consistent methodology is needed to determine the likelihood of consolidating small parcels of land in study areas to fulfill the large parcel needs. The demand for specific sizes of land for different industrial sectors is based on the adopted 2002-2022 Population and Employment Forecast (Forecast) and the Employment Urban Growth Report (UGR). These adopted reports have been supplemented by MetroScope modeling results to provide an indication of the rate of use of land that would be added to the UGB.

There remained after the 2002 UGB land additions a need for over 1,968 net developable acres of industrial land for the forecast period from 2000 through 2022.[23] The land need was estimated by three building types or sectors and by different lot size categories. The three building types are warehouse/distribution, general industrial and tech-flex. The location and siting factors outlined lot size categories: Under 1 acre, 1-5 acres, 5-10 acres, 10-25 acres, 25-50 acres, 50-100 acres and 100+ acres by sector. For purposes of broadly determining the potential for land aggregation, these lot size categories have been collapsed into four categories. The lot size ranges are 5-25 acres, 25-50 acres and 50-100 and 100+ acre sizes.

A number of common themes emerged from development of the location and siting factors pertaining to slope, access, and proximity to other like uses. See Chapter 2, Section V for a more through discussion of the factors. In general, industrial uses prefer slopes of less than 5 percent, access to a major transportation facility such as I-5, I-205, I-84 and Highway 26, mid-day access to the airport within a 45-minute time frame and physical proximity to other similar industries and work force. These industry preferences have been translated into location and siting factors that have been modeled for the lands being studied and they include: 1) slopes that are less than 10%, 2) location near other industry; and 3) access to major transportation facilities such as I-5, I-205, Highway 26 and I-84 with an emphasis on the regional freight network.

Larger lot sizes are desirable because they have better potential for meeting competitive market needs. Although the focus has been placed on attracting and landing the "big fish" that represents a new firm locating in the region, the largest demand for industrial land will come from companies already located within the region. Existing companies that are

[23] The total need for UGB expansion to provide industrial land was 4,284 net acres. Approximately 2,850 net acres of employment land was added to the UGB in December 2002. The employment land category includes both industrial and commercial land. A total of 1,968 net acres of industrial land was added in the 2002 UGB expansion decision.

growing and expanding have similar needs for land as do new companies that might chose to relocate to this region.

Parcels over 50+ acres are desirable for the following reasons:

- *Ease of development* – They allow more opportunities to accommodate natural resources, slopes, odd shapes, internal circulation challenges and access requirements.
- *Flexibility* – Lots can be configured into smaller parcels to meet individual firm needs, provide additional opportunities for financing and be responsive to changing market demands.
- *Growth potential* – Allows expansion opportunities for existing firms so they can remain in a single location and still have opportunities to grow their business. This provides the region a competitive advantage for the retention of existing firms.
- *Site Planning on larger parcels* – Allows more efficient and cohesive site development to occur and allows the opportunity for phasing and greater land utilization.

Total Industrial Demand

The total regional demand for industrial land indicates the greatest demand exists in the small to mid-size parcel range (under 1 acre to 25 acres). However, even though the total number and acreage of large lots demanded is small relative to other lot size categories, it is critical that there are opportunities provided for location of a large user. By creating a supply around the region, the region as a whole is better positioned to attract new firms and accommodate the expansion needs of existing firms. The region needs to accommodate the possibility of attracting a large company with the potential to enhance job creation. Smaller size parcels can be more easily produced due to fewer ownership issues and more limited aggregation costs associated with assembling land.

Industrial Land Supply Available to Meet Demand

The supply of vacant land to meet the industrial need is calculated for the land inside of the UGB and for the areas added to the UGB in December 2002. The gross acres have been calculated by removing only Title 3 regulated areas.[24]

[24] Title 3 limits the impacts on natural resources for the purposes of regulating development in floodplains and water quality areas.

Table 1. 2002-2022 Need For Land by Parcel Size (excludes lots under 5 acres in size)

Comparison of supply and demand - within the UGB and expansion areas (Gross Acres)	5 to 25	25 to 50	50 to 100+	*Total*
Total Supply	4,047	187	647	4,881
Total Demand	4,735	890	1,371	6,996
Surplus/Deficit in acres	**(688)**	**(703)**	**(724)**	**(2,115)**[25]

Analysis Methodology

The objective is to assess the opportunity for aggregating parcels into larger units to meet the industrial land need.

Listed below are the steps that staff has taken to assess the 2002 Alternatives Analysis Study area to determine which meet the industrial land location and siting factors. [26]

Steps to determine areas meeting location and siting factors:

- Query parcel database within study areas for contiguous ownership patterns
- Overlay potential committed uses: schools, churches, higher value residential
- Map buildable areas and overlay tax lots, slopes over 10% and Title 3 coverage
- Assess site constraints, buildings, natural resources, slopes and the shape of potential parcels
- Manually audit data to form units of lots that could be classified as a 5-25 acre, 25-50 acre or 50-100+ acre sites for development purposes.

Summary of the Methodology and Key Assumptions

The following summary of the methodology used and the key assumptions used to analyze the study areas to determine their aggregation potential:

- Aggregation potential is characterized by lot size ranges of 5-25 acres, 25-50 acres and 50-100+ acres,
- Begin first by aggregating to the largest lot sizes possible and then move down by each lot size category,
- Assume that separate contiguous tax lots under a common ownership can be treated as a single site,
- Apply the following decision rules: 1) no more than two separate property owners for lots 5-25 acres, 2) three property owners for lots 25-50 acres and 3) four property owners 50-100+ acres to assemble lots within this size range, and
- Create aggregated lots in square or rectangular shapes wherever possible and consider how natural resources and slopes divide the property.

Financial Considerations of Land Aggregation

Generally the marketability of sites for industrial development is driven by land and site preparation costs, cost of services and of site requirements, surrounding uses, site amenities and if the parcel is not vacant, the added costs associated with redevelopment.

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[25] The total acres of land demanded is comparable to the demand of 1,968 acres of land in the 2002-2202 Employment UGR.

[26] The source data is from Regional Land Information System. Tax lots provide an estimation (at the regional level) of legal lots that can be treated as separate parcels of land for sale purposes. It is not possible to conduct an analysis based on examining legal lots at this scale analysis.

In general terms, most industrial developers need land to be valued at or less than $5.00/sq.ft.[27] The $5.00/sq.ft. cost includes land acquisition cost, remediation of existing structures and services to the site. Delivery of services to rural areas can vary widely and can cost between $1.00 to 2.00 per square foot, leaving between $3.00 to $4.00 for site acquisition. The price of land will vary by location, proximity to services, system development charges and whether there are other amenities associated with the site. Delivery of public facilities is predicated on the linear footage from existing facilities and the breadth of the type of services that need to be provided. Transportation appears to be one of the larger public facility expenses followed by sewer and water. System wide improvements such as increases in sewer treatment facilities or construction of water storage tanks are not assumed to be born by individual developers.[28]

Application of Aggregation Results

The aggregation factors will be used to evaluate each area under consideration to determine the ability of the area to provide different size lots for industrial development. The analysis was applied initially to all 2003 Alternatives Analysis Study areas and then to the 2002 study areas that meet the location and siting factors for industrial land.

The data resulting from the analysis is one more piece of information when considering suitable land for industrial purposes that is similarly situated and within the same hierarchy classification. This information may be useful for service providers that are estimating potential uses in these areas to identify the appropriate costs to provide public facilities. The data is not suitable for site-specific development decisions. The analysis is designed as a gross assessment of lands in a variety of different locations.

Study Results

Tax lots can be aggregated into one of four lot size categories (5-25, 25-50, 50-100 and 100+ acres) and the average assessed values of land and improvements in the 2002/2003 Alternative Analysis Study areas. Tax lots under 5 acres were mapped to illustrate which areas will be more difficult to develop for industrial purposes and to aggregate to form larger lots (mapped areas and data tables are available within the Aggregation Study Paper available on Metro's website).

The results of the aggregation study include:

- The largest average lot sizes occur in three areas: Cornelius/South Hillsboro (H,75,76), North Hillsboro (L,80), North HWY 26 (M, 81,83).
- The largest average building sizes (improvements) are located in Area S, 43 and 44 (east of Wilsonville) and Area D (south of Damascus).
- The largest average lot size and the lowest land values are located in Area A (Hwy 26, south of Gresham).
- The range in land values range from an average of $50,926 to $257,135 per acre.
- Areas 28,30 (Oregon City), 25,36 and 42 (Stafford Basin) have the highest per dollar acre values and the smallest average lot sizes.
- The greatest building value per acre is located in Areas 43 and 44 G (east of Wilsonville) and corresponds to one of the smallest average lot size areas, conversely Area A (south of Gresham, Hwy 26) has the lowest dollar per square foot value and is ranked as one of the largest in average lot size.

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[27] Land acquisition costs include the value of land and existing improvements.

[28] Site acquisition costs were developed from a series of interviews with development professionals and cities with urban renewal experience.

- The range in the average building values (improvements) per acre varies from between a low of $3,100 to $68,190 dollars per acre.

Study Conclusions
The following conclusions were reached from the aggregation study:

- The smaller the study area size the less likely it is to be able to form large lots (50-100+ acres). Study areas over 500 acres provided greater potential for achieving a range of larger lot sizes.
- Areas with the greatest large lot potential are (M, 81) and Areas 5 and 6.
- Exception areas generally have more limited aggregation potential because of committed uses (rural residential, churches, schools) and they contain smaller parcels than EFU areas.
- Generally the areas containing the greatest aggregation potential also have some of the lowest per acre value for land.

ii. Study - Formation of New Industrial Neighborhoods

A study of existing industrial neighborhoods was conducted to provide information on the ideal minimum size for establishing a new industrial area neighborhood. Existing data was examined to identifying optimal sizes and characteristics of industrial neighborhoods based on MetroScope modeling, mapping of existing Title 4 areas, an analysis of current business conditions and from information obtained from the land aggregation study.

Staff examined a number of different areas to identify characteristics associated with thriving industrial neighborhoods. The existing UGB contains a number of older industrial neighborhoods, some of which are concentrated around the central city that developed historically around transportation infrastructure. These neighborhoods range from 575 to 4,500 acres in size and are primarily located within the City of Portland. The largest areas are located in the Columbia South Shore and the Portland Harbor areas. The Columbia South Shore area is really a collection of four industrial neighborhoods each having a different focus and access to different types of transportation facilities. These areas are heavily focused on the traded sector and transportation and logistics concentrated around rail, marine and airport access and on traded sector industries and transportation.

Examination of Newer Industrial Areas
Emerging industrial neighborhoods in general are less transportation-dependent and are clustered around supporting suppliers and concentrations of knowledge-based companies. Newer industrial areas that have developed within the last 20 years are generally smaller than the traditional areas that encompass Portland Harbor and the Columbia Corridor. These new neighborhoods have formed in Hillsboro, Tualatin and Gresham and contain a mix of traditional industry types as well as a new focus on knowledge-based industries. All of the newer industrial areas have linkages to the movement of goods and services both within and outside of the region.

For example, Ronler Acres was assembled by the City of Hillsboro during the 1990s. It included over 698 lots converted from an under-utilized platted residential subdivision to a mixture of industrial, employment and mixed uses. Today the neighborhood is anchored by a 250 acre Intel development that forms a nucleus for high-tech development at the

intersection of Shute and Evergreen Roads.[29] Approximately 200 acres were added to the UGB in December 2002 northwest of the intersection of Shute and Evergreen Roads for industrial use due to the location of very specialized public facilities that serve the high-tech industry.

Linkages to Employment Areas

Employment areas often border industrial neighborhoods because these uses provide a buffer between less intensive residential uses and are less sensitive to topographic constraints. These areas are predominately office, medical facilities, retail and limited retail. The retail located within these areas typically serves adjoining industrial and residential areas. Examples include: Corporate headquarters, office uses, light manufacturing, business services and small-site manufacturing. Kruse Way and the Oregon Health Science University Campus are examples of destination employment areas because of the large concentrations of similar uses.

Medium to smaller size industrial neighborhoods have connections to nearby employment and residential markets or provide a support function to other industrial areas. One example is the Central Eastside neighborhood. This area contains small distribution, wholesale and light industrial uses mainly located north of the viaduct. South of the viaduct has more of traditional industrial industry base that focuses on aggregate processing, dairy product refinement, heavy equipment rental, storage and lumber wholesale. Examples of uses typically located in these neighborhoods include: Wholesale, quasi-retail, small site manufacturing facilities, construction and industrial services.

Examination of Data- MetroScope Gain and Loss Areas

Using the MetroScope modeling conducted in 2002 to evaluate industrial investment and industrial employment gains/losses indicate a number of areas that are thriving industrial neighborhoods. Based on this modeling, substantial investment is projected to be concentrated in the Rivergate area, Columbia South shore east of I-205, Tualatin, Wilsonville and the Highway 212/224 area in Clackamas County.

Using the mapped Title 4 areas and results from the 2002 MetroScope modeling characterizations of existing industrial uses can be drawn in terms of size, location, adjacency to employment areas and level of investment.

Title 4 Areas- Lot Size Characteristics

Title 4 areas located in newly added urban areas and those areas at the edge of the UGB tend to have fewer parcels and a higher average lot size. Smaller areas located close to the center of the region have smaller average lot sizes due to the existing street grid pattern and historical development patterns.

Areas highlighted in the table below represent the areas with the highest projected demand based on MetroScope modeling. Of these areas, some of the largest industrial neighborhoods (723 to 6,215 acres) generally have excellent access to transportation, port facilities, or are heavily concentrated with particular types of uses like heavy manufacturing, high-tech or warehouse and distribution uses.

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[29] The City of Hillsboro completed the consolidation and replatting of the Ronler Subdivision by forming an urban renewal district. They had assistance from OECDD. The 30 million dollar public investment has leveraged a $610 million dollar return to the tax roles and several billion dollars of capital investment.

Table 2. Title 4 Areas- lot size characteristics

Area Number	Total Acres	Number of Tax Lots	Average Lot Size (in acres)
1- Forest Grove and Cornelius	476	185	2.56
2- Hillsboro	2,687	45	15.67
3- South Hillsboro	267	173	1.54
4- HWY 217 Beaverton	414	141	2.92
5- HWY 217 Beaverton	256	87	2.92
6- Tualatin/Sherwood	2,336	479	4.87
7- Wilsonville	723	190	3.79
8- Rivergate/I-5	4,139	613	6.74
9- Portland Harbor	2,521	1,367	1.84
10- North/eastside	322	887	.36
11- South/eastside	255	292	.87
12- Hwy 212/Milwaukie	435	173	1.51
13- Clackamas	2,269	829	2.73
14- Oregon City	263	55	4.70
15- I-84/Gresham	518	70	4.12
16- Troutdale	1,589	254	6.23
17- Gresham-east	267	63	4.18
18- Sunnyside	655	119	5.46
19- Damascus	764	94	10.62
20- Columbia South Shore/airport	6,215	1,769	3.29
21- Columbia South Shore	1,766	592	2.98
22- Gresham/Springwater	1,148	339	3.38

Creating New Industrial Neighborhoods

New industrial neighborhoods need to be a minimum size and contain core attributes that allow these areas to function as complete industrial areas. The areas should contain a minimum of 300 to 500 gross acres.[30] Gross acres do not take into account deductions necessary to obtain net buildable acres. The minimum neighborhood size range allows for efficient development patterns, development of a functional street network, platting of a range of lot sizes, appropriate buffers from other uses and adequate protection of natural resources. Minimum area sizes are important because development of these areas require substantial investments in public facilities that can be used efficiently in areas that have opportunities to grow over time and contain enough users to absorb the infrastructure costs.

Key Components of Viable Industrial Neighborhoods:

- Contain a minimum of 300 acres up to 1,500 acres
- May be located adjacent to employment areas due to synergy of uses
- Employment areas provide good buffers between industrial and less intensive residential areas
- Require good transportation access
- Areas should be sized with room to grow
- Areas should be large enough to make infrastructure investments worthwhile

[30] Based on minimum sizes from Title 4 areas.

Summary of Neighborhood Study Results
In summary, the region contains a multitude of industrial neighborhoods focused around specific industries and key transportation connections. The size of the neighborhood varies from area to area but there appears to be a threshold size (300-1,500) that equates to opportunities for future growth and making infrastructure investments worthwhile.

iii. Industrial Development on Sloped Land

A case study approach was used to develop technical information on siting industrial buildings on land with slopes ranging from 3-10 percent. This analysis provides information on possible limitations on building sizes, amount of earth removal and its associated costs as well as overall costs per square foot.

Location and site characteristics have been used to define which lands being considered for UGB expansion are suitable for industrial development. A slope factor of less than 10 percent has been used as a cut-off for identifying which lands would be viable for industrial development.

Case Study Interviews
This analysis was produced from a series of discussions with a National Association of Industrial and Office Properties (NAIOP) industrial real estate brokers and an engineering firm that specializes in industrial construction. Five sketches were produced both in plan and in section format to illustrate the site constraints associated with developing industrial buildings with various slope conditions. The purpose of this analysis is not to demonstrate that sites cannot be developed on steeper sloped sites but to examine the additional costs and the corresponding decreases in site efficiencies. Industrial users have clearstory requirements, clear span needs and site circulation needs that dictate building sizes, shape of sites and construction types.

These same inefficiencies are often not associated with commercial development because these structures have more flexible building types that can be stepped into slopes and have less of a need for large turning radius for truck movement, outdoor storage or the movement of raw materials and products.

Methodology
The methodology was developed by taking a hypothetical 10 acre site and examining different slope conditions and evaluating the site work and construction costs.

The effects of developing a sloped site were examined by considering:
- Percent of slope across a site: 3-10 percent
- Maximum building size that could be constructed on the site
- Land to building ratio
- Cubic yards of earth moved to create a flat site
- Construction cost impacts and overall per square foot building costs

The following chart that contains information on the relationship between slope, earth moved and costs is based on several assumptions including: 1) land costs for a 10 acre parcel of $5.00/square foot; and 2) hard construction costs of $22.00/square foot. The hard construction costs do not include interior tenant improvements.

The chart below illustrates the relative cost impact of developing a single industrial building on a site of increased topographical slopes.

Table 3. 10- Acre Industrial Case Studies- slopes ranging from 3-10 percent

	Slope	Max. Building Size- sq.ft.	Land to Building ratio	Cubic yards of earth moved[31]	Construction dollar costs[32]	Build Cost/ sq. ft.
Sketch 1	3%	180,000	41%	60,000	$105,000	$49.38
Sketch 2	6%	171,000	39%	160,000	$520,000	$53.11
Sketch 3	8%	148,400	34%	220,000	$720,000	$58.80
Sketch 4 (includes/retaining walls)	10%	148,400	34%	250,000	$1,310,000	$62.78
Sketch 5	10%	122,200	28%	300,000	$975,000	$68.23

Other Factors Relating to Site Work

Any site with more than 130,000 cubic yards of material to be moved would require at least two months of additional construction time which would be factored into the overall construction costs. In addition to the extra construction time, there is a limited window of time when these quantities of earth can be moved due to wet weather constraints. Economically, earth can only be moved during the summer and fall months under most soil conditions. Rock outcroppings located below grade and cause actual variations in topography can add significantly to the costs of site preparation. Market factors determine whether the increased site costs can be absorbed in the overall square foot costs of a project and ultimately determine whether a site/project will be developed.

iv. Reduction of Alternative Analysis Lands Under Consideration

The Metro Council took the first step in December 2003 by adopting Resolution No. 03-3386 and deciding which lands should still be under consideration for inclusion in the UGB for industrial purposes. The reduction in the 2002/2003 study areas was based on a technical assessment based on the location and siting factors (slope, proximity to industry and access), size of areas, proximity to the UGB, size and committed uses of parcels. The reduction in the lands under consideration will focus discussion on areas that are more suitable for industry and allow a more thorough analysis to be completed for the impact analysis included in this report.

Three industrial land location and siting factors were identified to indicate which lands are most suitable for industrial purposes. The 2002 and 2003 Alternatives Analysis Study areas were evaluated using the location and siting factors:

- slopes of less than 10% and/or location in a floodplain,
- proximity to other industrial uses and Title 4 areas (within one mile), and
- good access to transportation facilities (two miles from an interchange or access to the Tualatin Valley Highway or Highway 99).

All of the 2003 Alternatives Analysis areas meet the location and siting factors because they were chosen for study based on these factors. The 2002 Alternatives Analysis areas were

[31] Earth moved beyond that required for construction on a flat site.

[32] Includes the additional cost of construction due to schedule extension that is required due to the extra site work.

identified for general land need purposes and prior to the development of the location and siting factors so there may be areas that do not meet these factors. The 2002 areas were analyzed using these factors, resulting in a number of areas that have been dropped from further consideration because they are not suitable for industrial development. The areas remaining either meet some or all of the suitability factors or they contain exception lands that would not necessarily be suitable for industrial purposes but could facilitate the extension of services to industrial areas.

Methodology for Reducing Study Areas

The objectives of removing areas from consideration include:

- Apply the three location and siting factors to all lands (slope, proximity and access to transportation facilities), include all areas to identify lands suitable for industrial purposes,
- Capture as much of the exception lands as possible that meet the 10% slope and floodplain threshold (floodplain areas were excluded),
- Evaluate exception lands that may not be ideal for industrial development but could be important for providing services to industrial areas, and
- Identify areas in terms of the minimum size necessary to establish a new industrial neighborhood (300 acres).

Steps to Remove Areas from Consideration

The methodology includes the use of location and siting factors, determination of minimum necessary to form industrial neighborhoods and size and development patterns.

- Apply 10 percent slope and floodplain coverage to all study areas and remove tax lots from study areas that do not have a majority of the area remaining outside of floodplains and/or meet the 10 percent slope threshold
- Remove areas that contain a majority of parcels that are 5 acres or less and are already developed
- Remove areas that are isolated from existing industrial areas and contain less than 300 acres.
- Remove areas that may be contiguous to the UGB but are not located within one mile of existing Title 4 areas and/or industrial areas and are more than two miles from an interchange (Highway 99 or Tualatin Valley Highway) unless these areas may be needed to provide services to areas suitable for industrial uses.

Remaining Areas Considered for Industrial UGB Expansion

The Metro Council adopted Resolution No. 03-3386B reducing the areas under consideration for UGB expansion. The map is contained in the Executive Summary on pages 1-4. The areas proposed to remain under consideration have been reduced from the combined 2002/2003 Alternatives Analysis Study areas as follows:

- 2002/2003 areas- 77,901 acres
- Acreage removed from study based on steps above- 48,901
- Final areas left for consideration- 29,000 acres

The remaining areas under consideration for UGB expansion includes a portion of the 2002 Alternatives Analysis areas and the areas examined in the 2003 Alternatives Analysis. These areas are summarized in the chart below for public facility feasibility.

Table 4. Combined 2002 and 2003 Alternative Analysis Study Area Scores[33]

Area	Total Acres	Employ. Acres	Trans. Score	Sanitary Sewer Score	Water Score	Storm Sewer Score
Gresham	1,490	852	moderate	difficult	moderate	easy
Pleasant Home	1,696	1,022	moderate	difficult	moderate	easy
Bluff Road	704	398	moderate	difficult	difficult	easy
Boring	2,786	1,379	moderate	difficult	difficult	easy
Noyer Creek	381	266	easy	difficult	moderate	easy
Damascus	82	60	moderate	difficult	moderate	easy
Oregon City North	690	432	moderate	difficult	easy	easy
Oregon City East	510	303	difficult	difficult	moderate	easy
Oregon City South	411	139	moderate	difficult	easy	easy
Beavercreek	2,540	1,095	difficult	difficult	moderate	easy
Borland Rd South	453	203	difficult	difficult	difficult	easy
Borland Rd North	777	301	difficult	moderate	moderate	easy
Norwood	1,253	737	moderate	difficult	difficult	easy
Wilsonville East	911	633	moderate	difficult	difficult	moderate
Wilsonville South	1,327	651	difficult	difficult	difficult	moderate
Wilsonville West	1,050	474	difficult	difficult	difficult	moderate
Coffee Creek	442	89	difficult	moderate	moderate	moderate
Tualatin	646	339	difficult	moderate	easy	easy
Quarry	472	215	easy	moderate	easy	easy
Sherwood East	717	475	difficult	moderate	moderate	easy
Brookman Rd	385	200	easy	moderate	moderate	easy
Sherwood West	379	253	difficult	easy	easy	easy
Farmington	713	521	moderate	difficult	easy	easy
Hillsboro South	791	695	moderate	difficult	easy	easy
Cornelius	1,154	857	moderate	easy	easy	easy
Forest Grove East	878	682	moderate	easy	moderate	easy
Forest Grove West	496	398	moderate	easy	moderate	easy
Jackson School Rd.	1,044	750	moderate	difficult	easy	easy
Evergreen	985	730	moderate	difficult	easy	easy
Helvetia	1,339	1,065	moderate	moderate	easy	easy
West Union	1,499	844	moderate	moderate	moderate	easy

Additional Policy Considerations

There are a number of areas studied in the 2002 Alternatives Analysis that are not suitable for industrial development due to slopes, access constraints, committed uses and/or size of lots. Some of these areas are located between the existing UGB and potential areas suitable for industrial development. The location of these areas raises two policy issues: 1) should public facilities be extended through exception lands to industrial areas without bringing them into the UGB; and 2) if these exception areas were to be included in the UGB to create a logical boundary and to ease extension of services, does this create an residential over-supply problem? Metro has not faced this issue before and the Land Conservation and Development Commission (LCDC) has not directly ruled on this issue.

[33] Details on all study area scores can be found in the 2002 and 2003 Alternative Analysis documents.