www.oregonmetro.gov

Appendix 8 – Preliminary Analysis of Potential UGB Expansion Areas

August 2010

Metro | *People places. Open spaces.*

TABLE OF CONTENTS

ANALYSIS OF POTENTIAL UGB EXPANSION AREAS

INTRODUCTION

As part of an integrated community investment strategy, the Metro Council will be considering how to accommodate the region's forecasted 20-year population and employment growth while supporting the region's six desired outcomes, listed below.

- **Vibrant communities** – People live and work in vibrant communities where they can choose to walk for pleasure and to meet their everyday needs.
- **Economic prosperity** – Current and future residents benefit from the region's sustained economic competiveness and prosperity.
- **Safe and reliable transportation** – People have safe and reliable transportation choices that enhance their quality of life.
- **Leadership on climate change** – The region is a leader in minimizing contributions to global warming.
- **Clean air and water** – Current and future generations enjoy clean air, clean water, and healthy ecosystems
- **Equity** – The benefits and burdens of growth and change are distributed equitably.

The urban growth report (UGR), endorsed by the Metro Policy Advisory Committee (MPAC) and accepted by the Metro Council in December 2009, identified the capacity of the region's UGB to accommodate the next 20 years of expected population and employment growth. The 2009 UGR was intended to foster the development of an outcomes-based approach to growth management decision-making by discussing tradeoffs among various policy and investment choices. The UGR identified a gap between the forecast demand and the amount of zoned capacity that is likely to be developed in the next 20 years for residential and large-site industrial parcels that support the traded-sector. No gap was identified in the middle third of the demand forecast for non-industrial and general industrial employment.

The region can fill the identified capacity gap through actions that promote more efficient use of zoned capacity inside the current UGB, or by expanding the UGB, or a combination of both. Metro has been working with local governments individually and through the Metro Technical Advisory Committee (MTAC) and MPAC to identify and adopt local and regional actions that will achieve greater efficiencies within the existing UGB and minimize the need for UGB expansion at the end of the year.

As part of the process to maintain a 20-year land supply for residential and employment uses, Metro completed an assessment of approximately 8,298 acres of urban reserve land adjacent to the current UGB. These 8,289 acres are a subset of the 28,615 acres of urban reserves that Metro, in conjunction with Clackamas, Multnomah and Washington Counties adopted in June 2010 (Attachment 1). The designation of these areas as urban reserves is essentially the first filter in determining that the areas are suitable for urbanization. Metro staff, utilizing information from past studies such as the Great Communities Report and the findings from the urban and rural reserve

process, as well as local jurisdiction input and Metro policies that call for equity and balance in UGB expansions and to consider lands in all parts of the region, narrowed down the urban reserve lands to the 8,298 acres of analysis areas evaluated in this report.

Metro's Chief Operating Officer, Michael Jordan, issued a letter to the mayors and county commission chairs on August 2, 2010, inviting them to submit any additional urban reserve areas that they would like considered as part of the policy discussions in the fall 2010. All additional areas for consideration must be sponsored by local governments, as their support is critical for provision of infrastructure, governance, planning, and more. The additional areas will be considered by MPAC and the Metro Council prior to a final recommendation in October and subsequent public hearings in November.

The purpose of this analysis is to inform the Metro COO Recommendation, 2010 Growth Management Assessment (August 2010), and assist the Metro Council in evaluating the potential expansion areas to meet any identified residential and large-site industrial land need that they determine cannot be met through efficiencies on land inside the UGB. The information in this analysis will help the Metro Council determine which of the selected analysis areas merit further consideration as candidates for inclusion in the UGB. Finally, additional information regarding the effect of the final proposed UGB amendments on existing residential neighborhoods will be developed and sent to all households within one mile of the proposed UGB amendment areas, consistent with Metro Code Section 3.01.015. Figure 1 provides an overview of the UGB analysis area process.

It is beyond the scope of the analysis to provide a detailed, site planning level of analysis for each of the 18 areas. Furthermore, it is not possible to evaluate each potential sequence of urbanization, and the likely effects on surrounding areas under each sequence. This analysis does not compare the results of the UGB amendment factors for the potential expansion areas with the potential for refill or redevelopment of locations that are currently in the UGB.

The structure of this report is based on Metro's UGB Legislative Amendment factors located in Metro Code Section 3.01.020, which implement the boundary locational factors of Statewide Planning Goal 14. The following list identifies the Goal 14 and Metro UGB amendment factors:

- *Metro UGB Amendment Factor & Statewide Planning Goal 14 Factor 1 – Efficient accommodation of identified land needs*.

- *Metro UGB Amendment Factor & Statewide Planning Goal 14 Factor 2 – Orderly and economic provision of public facilities and services.*

- *Metro UGB Amendment Factor & Statewide planning Goal 14 Factor 3 – Comparative environmental, energy, economic and social consequences.*

- *Metro UGB Amendment Factor & Statewide Planning Goal 14 Factor 4 – Compatibility of the proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB.*

In addition, Metro Code Section 3.01.020 provides five additional factors that must be considered when evaluating land for inclusion in the UGB:

- *Equitable and efficient distribution of housing and employment opportunities throughout the region;*
- *Contribution to the purposes of Centers;*
- *Protection of farmland that is most important for the continuation of commercial agriculture in the region;*
- *Avoidance of conflict with regionally significant fish and wildlife habitat; and*
- *Clear transition between urban and rural lands, using natural and built features to mark the transition.*

The essence of the six desired outcomes is embodied in these urban growth boundary (UGB) assessment factors and the state legislation and administrative rules which enabled the region to pursue urban and rural reserves.

The report begins with an explanation of the methodology used to evaluate each analysis area for the factors listed above. Please note that Statewide Planning Goal Factor 1 and the first additional Metro factor, are not evaluated for each analysis area, but findings for these two factors are made on the final UGB expansion decision. Following the methodology section is a brief summary of the results, including a table indicating the ratings applied to most of the factors noted above. The individual analysis area summaries that include basic quantitative information for each area, as well as descriptive information about site characteristics, development patterns, physical attributes, environmental features and the feasibility of providing urban services are found in Attachment 2.

METHODOLOGY

PRODUCTIVITY ASSESSMENT

The productivity assessments conducted for this study follow general procedures used for most buildable lands studies. Vacant areas are first identified. Areas that are unbuildable such as power line easements and environmentally sensitive areas are then removed from vacant lands. Specific categories of tax-exempt lands are also considered unbuildable. The inventory of vacant land is then reduced to account for future streets and public facilities needed to accommodate urbanization.

The majority of tabular data used in this analysis has been generated from Geographic Information Systems (GIS). In GIS, digital, coordinate-based spatial data layers are used to represent real world features such as tax lots, wetlands and floodplains, and zoning areas. All of the GIS data used in this analysis are from Metro's Research Center.

Of course, electronic data representing real world features are rarely perfect. Data representing features like floodplains and tax lots will have some positional inaccuracies, which, in turn, will be reflected in numbers representing them. In addition, much of the assessment information that is included in Metro's Regional Land Information System (RLIS) database comes directly from county assessment offices, where local updates may be conducted at different intervals. For a variety of reasons such as these, the study helps to point out general patterns, but is not intended to be accurate at extremely small levels of geography.

Step 1: Determine which lands within the study areas are vacant

For this study all of the land in the analysis areas was assumed to be "vacant", meaning all of the non-public land area that is not constrained by environmental resources or other constraints such as power line easements or parks is available for development. This determination is based on a comparison of land value to improvement value completed by Metro Economic & Land Use Forecasting staff that indicated the existing rural residences would most likely redevelop due to a substantial increase in land value as the rural lands are added to the UGB. In addition, Metro Planning staff's experience with concept planning of new urban areas generally validates this assumption. It is understood however, that some high valued residences will remain as rural lands are urbanized, but it is beyond the scope of this project to complete a more detailed economic analysis of all the parcels under evaluation to determine this small amount of land that would remain in the future. Metro's most recent vacant lands analysis, completed for the land inside the UGB, does not extend to the urban reserve areas.

Step 2: Remove environmentally constrained areas from vacant areas

Lands that are considered vacant may not necessarily be buildable. Therefore, the next step in a buildable lands study is to subtract those areas that are environmentally constrained. The following environmentally constrained areas are removed from vacant lands.

- Urban Growth Management Functional Plan Title 3 Water Quality and Flood Management Areas, consisting of:

  Flood Hazard Areas

  FEMA 100-year floodplains and 1996 flood inundation areas

  Wetlands - From an enhanced National Wetlands Inventory and local wetlands inventories

  Wetland Areas - 50 feet from the edge of wetland or up to 200 feet from the edge of wetland located adjacent to steep sloped areas (slopes > 25 percent).

Vegetated Corridor - A vegetated corridor between 15 feet and 200 feet depending upon the area drained by the water feature and the slope of the land adjacent to the water feature.

- Functional Plan Title 13 Nature in Neighborhoods Areas consisting of:

  Riparian habitat class I & II and upland habitat class A & B - Riparian habitat class I & II and upland habitat class A & B as identified on the Metro Regionally Significant Fish and Wildlife Habitat Inventory Map.

- Slopes greater than 25%

Metro maintains GIS data files representing the features described above. Data layers representing environmentally constrained areas are "clipped" out of the data layer representing vacant areas, leaving only those areas that are vacant and buildable.

Functional Plan Title 3 and Title 13 regulations apply only to areas within the Metro jurisdictional boundary. As some of the area under study extends beyond this boundary, Metro has constructed a supplemental data layer representing Title 3 protections for the areas outside the jurisdictional boundary. The Regionally Significant Fish and Wildlife Habitat Inventory, adopted September 29, 2005, extended beyond the jurisdictional boundary. If and when any of these analysis areas are added to the urban growth boundary, they would also be annexed to the Metro jurisdictional boundary, making Title 3 and Title 13 effective. Title 13 regulations apply to both riparian and upland habitats for UGB expansions. In almost all circumstances, the identified Title 13 significant riparian and fish habitats encompass the Title 3 Water Quality and Flood Management Areas. Metro's Title 13 regulations do provide for limited development impacts to the habitat areas, thus under step 7 below some additional capacity is added back into the process for determining overall residential capacity of the analysis areas. It is assumed that large site industrial development is more flexible in terms of its footprint on the ground, resulting in the ability to better avoid significant habitat. Thus additional capacity for large site industrial uses is not added back. In addition, the definition for large site industrial is 50 acres of buildable land, essentially assuming that environmental constraints have already been removed from the calculation. However, as development occurs in the future it is expected that some impact to environmental resources may occur.

Step 3: Remove some categories of tax-exempt parcels

Some categories of tax-exempt lands, consisting of Federal, State, County or City-owned properties, schools and cemeteries are identified from the assessment database and removed from consideration.

Step 4: Remove parks and open spaces, power line, natural gas and petroleum easements

There are a number of other land categories that are considered unbuildable and need to be removed from the vacant land supply. All park types are removed, including developed parks with amenities, open space or natural areas, common areas of subdivisions, cemeteries, golf courses, school grounds, pool, tennis courts, fairgrounds, community centers, trails and paths, and community gardens. In addition, utility easements are removed from the vacant land supply.

The following table shows the amount of constrained land identified in steps 2-4 that have been removed from the vacant lands supply of the analysis areas. This represents the amount of gross vacant buildable land.

Table -1 Gross Vacant Buildable Land

Land Type	Acres
Total Vacant Land	8,298
Constrained Land	2,266
Gross Vacant Buildable Land	6,032

Step 5: Remove future land needed for streets, parks, schools and churches/fraternal organizations

As urbanization proceeds, some additional land will be necessary to accommodate different types of public facilities. In particular, future streets, parks and schools should be expected to absorb some of the vacant land supply. In this analysis an estimate of future land needed to accommodate these uses is applied to analysis area as a whole. The reduction estimates are consistent with the percentage reductions used in Metro's 2002 UGB Alternatives Analysis. Refined acreage needs based will be developed through the planning requirements of Functional Plan Title 11: Planning for New Urban Areas.

- *Future Streets:* A global estimate of 18.5 percent is removed from all areas to account for future streets.
- *Future Parks*: A global estimate of 2.2 percent is removed from all areas to account for future park needs, except those areas being evaluated for large-site industrial use.
- *Future Schools:* A global estimate of 2.9 percent is removed from all areas to account for future school land needs, except those areas being evaluated for large-site industrial use.
- *Future Churches/Fraternal Organizations:* A global estimate of 1.8 percent is removed from all areas to account for future land needs for churches and fraternal organizations, except those areas being evaluated for large-site industrial use

The following table represents the net vacant buildable land.

Table -2 Net Vacant Buildable Land

	Acres Removed	Total Acres
Gross Vacant Buildable Land		6,032
Future Streets	1,116	4,916
Future Parks	86	4,830
Future Schools	111	4,719
Future Churches & Fraternal Organizations	71	4,648
Net Vacant Buildable Land		4,648

Step 6: Estimate residential build out on net vacant buildable acres

The Metro Chief Operating Officer's Urban Reserve Recommendation (September 15, 2009) indicated that over the life of the urban reserves, an average density of 15 dwelling units per net buildable acre should be achieved. Based on this expectation, staff has applied 15 dwelling units per net buildable acre for the analysis areas, except for two areas that are small and geographically limited (Beaver Creek Bluffs and Sherwood South) which had 10 dwelling units per net buildable acre allocated to them.

The following table represents the preliminary number of dwelling units expected from the residential analysis areas.

Table -3 Residential Dwelling Units

Expected Density	Net Buildable Acreage	Expected Dwelling Units
10 units/net buildable acre	259	2,590
15 units/net buildable acre	3,393	50,895
Total dwelling units		53,485

Step 7: Estimate dwelling units occurring in environmentally constrained areas or from possible density transfers out of environmentally constrained areas

Metro's Title 13: Nature in Neighborhoods program is intended to conserve, protect and restore a continuous ecologically viable streamside corridor system that is integrated with upland wildlife habitat and the surrounding urban landscape. The program balances and integrates goals of protecting and enhancing fish and wildlife, building livable Region 2040 communities and supporting a strong economy. Provisions within Title 13 do allow for limited impacts to identified fish and wildlife habitat from urban development through both clear and objective and discretionary development standards. Any impact to the habitat is expected to be mitigated for on-site, which could inhibit the amount of impact that occurs.

Title 13 also requires local jurisdictions to provide for the opportunity for the transfer of development rights on-site for identified habitat areas. However, it is assumed that not all of the potential development would be transferred due to the expected inability of the real estate market to absorb a higher density housing product on many of these lands at the edge of the UGB as a result of the transfer of development rights.

As noted previously Metro's Regionally Significant Fish and Wildlife Habitat Inventory Map extended to the urban reserve analysis areas. This mapping occurred at a regional scale based on 2002 aerial photos and is intended to be a guide for more detailed analysis as protection programs are developed. A review of the mapped habitat inventories on these rural lands reveals inconsistencies on how areas were mapped. Based on the potential for mapping inaccuracies and the fact that Title 13 does allow for some impacts to the habitat areas, it is assumed that some development will occur within the habitat areas that were identified through the regional mapping process. It is expected that this development will be at a much reduced density due to on-site mitigation requirements and real estate market realities. Therefore, for those Title 13 habitat areas that are outside of other constraints, such as Title 3 vegetative corridors, floodplains and utility easements, a reduced density of 3 dwelling units per net buildable acre is assumed. The total number of dwelling units on environmentally constrained land is 2,116.

Table -4 Total Estimated Dwelling Units

Land Type	Total Estimated Dwelling Units
Dwelling units from environmentally constrained land	2,116
Vacant Land	53,485
Total dwelling units	55,601

WATER, SEWER, STORMWATER, PARKS & SCHOOL SERVICES FEASIBILITY

This analysis is a preliminary study for developing cost estimates for providing specific public infrastructure components to the analysis areas. This work was completed by Group MacKenzie, under contract to Metro, and focuses on three topic areas: public utilities, parks, and schools. For this analysis, public utilities means sanitary sewer, water and storm sewer services and the review focuses on trunk lines, main lines, and other large components of the systems. This analysis assumes the vast majority of smaller laterals and individual service lines will be paid for by development. System component sizing and costs are derived from review of adjacent and similar sites with equivalent land use and development patterns.

Using the buildable acreage and estimated dwelling units calculated for the analysis areas, pipe lengths and sizes are translated from adjacent or similar sites of development to determine a large component system for each utility. Unit costs are based on recent industry-wide construction data

and recent project estimates. Each area is reviewed, assuming the service will be provided by adjacent cities and/or service districts, for likely points of connection and any supply, downstream capacity or treatment issues. This work is completed primarily through review of existing master plans, and existing system capacity is reviewed for general availability to the proposed expansion area – both in terms of access and any limitation due to prior commitment of service to other areas already within the UGB. The review of public utilities is similar for both residential and industrial uses.

For residential uses, an analysis of park and school services was also completed. Again, comparable development types are reviewed, and master plans and planned expansions by the park provider and school district are noted. For parks, the comparison is done on a developable acreage basis for each area, while schools are considered and compared on both an acreage and dwelling unit basis. See Attachment 3 for the Group Mackenzie report. Attachment 4 contains a summary of the costs for all of the analysis areas.

This analysis does not include an evaluation of electrical power. Power companies such as Portland General Electric (PGE) have an obligation to serve and power rates are monitored by the Oregon Public Utility Commission; therefore the rate differences between the different analysis areas, especially for residential use will not be considerable. One exception is the City of Forest Grove Light and Power Company, which is a preferred company of the Bonneville Power Administration. This preferred company status allows Forest Grove Light and Power to purchase power at a lower rate, thereby resulting in a lower base power rate for their customers.

The main cost of serving an area is the extension of the line and whether or not any specific equipment is necessary to provide power for specialized uses. That level of detail regarding specialized uses is not available at this time. The greatest challenge for PGE is community resistance to siting of new substations, power lines and other power system infrastructure.

TRANSPORTATION SERVICES FEASIBILITY

This analysis is a preliminary study for developing total cost estimates (public and privte) for a road network consisting of an arterial/collector level system for the analysis areas, using the connectivity standards in the Regional Transportation Plan (RTP). The cost estimates reflect a RTP consistent network necessary for the complete build-out of the analysis area, which would take a number of years to complete. It is not intended to depict the level of investment necessary at the onset of development. In addition, a RTP consistent network would serve a larger area beyond just the UGB amendment area, resulting in the potential for a range of funding options.

Using GIS-level data, a rough cost comparison can be made among analysis areas. The analysis is not meant to depict an actual complete urban roadway network or reflect detailed costs for construction of such a system, but rather provide preliminary information on how certain analysis areas compare relative to other analysis areas. More detailed cost estimating will be necessary to determine exact costs and phasing of construction. The analysis does not include the local road network as this is assumed to be paid for by development.

To facilitate the analysis, the following GIS data was used:

- Analysis area boundaries
- Existing rural and urban road network
- Existing railroad lines
- Topographical information
- Floodplains, streams, significant riparian and upland habitat, & wetlands
- Proposed High Capacity Transit corridors

An arterial and collector level system was developed for each analysis area using the connectivity standards in the RTP. The ideal spacing for arterials is one mile apart, and the ideal spacing for collectors is one-half mile from another collector or arterial. This spacing reflects the evidence outlined in the RTP that such a connected system best accommodates an urban-level development pattern including vehicular, transit, bicycle and pedestrian travel.

The road network was digitized and a database was created to query the number of lane miles, both existing and added, number of intersections and distance to existing network. This information was used to develop a rough capital cost estimate of the improved network for each analysis area. The proposed road network for each analysis area can be found in the Analysis Area Summary Sheets. A summary of the transportation costs for all of the analysis areas can be found in Attachment 5.

The cost estimating approach was derived from the ODOT Highway Economic Requirements System (HERS), which is used for planning-level capital costs for roadway projects. The approach includes assigning higher roadway costs to major bridge crossings, floodplains, wetlands and steep slope areas. It includes a standard right of way cost factor and is expressed as a unit cost per lane mile for a complete street section that includes bike lanes, sidewalk, curb and gutter. The cost estimates were completed using 2007 dollars, consistent with the RTP. Additional information on the HERS cost estimating approach can be found at http://www.fhwa.dot.gov/infrastructure/asstmgmt/hersindex.cfm

Tri-Met, the regional transit agency is currently completing a preliminary transit evaluation of the analysis areas. The results of this analysis will be available in August 2010.

ESEE ANALYSIS

Environmental, Social, Energy and Economic Consequences of adding land to the Urban Growth Boundary

Purpose of the ESEE Analysis

The purpose of this analysis is to assess the long-term environmental, social, energy and economic consequences that would result from urbanization of land considered for inclusion within the UGB and to guide the selection of lands from among those considered. The analysis must find that urbanization may occur in a manner consistent with any special protection of resources or hazards,

as identified in a local comprehensive plan and implemented by land use regulations. Any complimentary and adverse economic impacts must also be identified. Evaluation of these factors, on balance, must demonstrate that the lands being considered are no worse than other areas under consideration for urbanization. Each of the ESEE factors (Environmental, Social, Energy & Economic) must be evaluated for each study area or groups of study areas under consideration

Evaluation of ESEE Factors

Statewide Planning Goal 2: Land Use Planning, Part II Exceptions, suggests that when considering the conversion of land from rural to urban uses that the evaluation be based on the "Positive/Negative Effects" of the impacts of urbanization on the study areas and the "Advantages/Disadvantages" of a particular site versus another site.

ESEE Analysis Process

The environmental factor of the ESEE analysis was completed separately as the elements of this factor are easily quantified (stream length, acreage of wetlands, floodplain size) and there are specific regulatory programs in place to ensure that urbanization will occur in a manner consistent with the regulatory programs. Each of the environmental elements described below was evaluated to determine an overall environmental consequence rating that considered the individual element ratings equally. The overall environmental consequence rating for each analysis area can be found in Table 6. A summary of the environmental consequences for each analysis area can be found on the Analysis Area Summary Sheets.

The energy, social and economic factors were analyzed together. This was done to better understand and evaluate the components of these three factors, as they are not easily quantified and their consequences extend beyond the boundary. A summary of the energy, social and economic consequences can be found on the Analysis Area Summary Sheets.

Outlined below are general descriptions of the elements of each of the ESEE analysis factors and the expected consequences to each factor as a result of urbanization.

General Description of Factors

Environmental

Urbanization may impact natural resources through the degradation of water quality and wildlife habitat, the loss of floodplain functions and through increased instability of steep slopes. One way to maintain water quality is to protect the vegetated corridors adjacent to streams and wetlands. Urbanization can affect the function of these areas through either direct removal of vegetation or by increasing nearby impervious surface. This increase in impervious surface generates additional storm sewer run-off that in turn increases natural stream flows, which can impact the water quality of streams by washing sediments and impurities from impervious surfaces into the natural waterways. Additional stream flow may also prevent ground water infiltration and re-charge as well as scour streambeds due to the increased volume and velocity of the flow. Increased stream flows and associated transport of sediments and impurities reduce the ability of the vegetated

corridor to provide important functions, such as stream bank stability and regulation of water temperature.

A properly functioning floodplain allows for the storage and conveyance of natural floodwaters, thereby reducing the risk of flooding and preventing or reducing risk to human life and property. Floodplains impacted by urbanization through the placement of structures will have less storage and conveyance capacity for flood events, thereby increasing the likelihood of downstream flooding and health, welfare and safety issues. Attachment 6 contains a summary of the environmental factors for each analysis area.

Metro's Title 3 program as Functional Plan provides performance standards to protect and improve water quality and reduce the risk of flooding. Land added to the UGB is subject to the requirements of Title 3 through the concept planning requirements of Title 11 of the Functional Plan.

Metro's Title 13 program as defined in the Functional Plan provides performance standards to protect, maintain, enhance and restore significant fish and wildlife habitat through a comprehensive approach that includes voluntary, incentive based, educational and regulatory elements. Land brought into the UGB is subject to the requirements of Title 13 through the concept planning requirements of Title 11 of the Functional Plan.

The Metro UGB Amendment factor relating to the avoidance of regionally significant fish and wildlife was evaluated simultaneously with the environmental consequences factor. As noted previously the adopted Regionally Significant Fish and Wildlife Habitat Inventory extended beyond the jurisdictional boundary, allowing for the evaluation of whether urbanization could occur in an area in way that avoided the identified habitat.

Inclusion of land into the UGB does not necessarily mean a negative impact to inventoried natural resources. Often the existing rural uses impact the resource in a way that is not allowed in an urban setting. For instance, in many places agricultural activities occur right up to the edge of a stream corridor, effectively providing no riparian habitat. In an urban context, the same stream would have a required vegetative corridor along it, where development could not occur, thereby resulting in a positive impact on the resource. As part of the required planning of new urban areas, a concept plan shall identify water quality resource areas and habitat conservation areas that will be subject to performance standards under Titles 3 & 13 of the Functional Plan, effectively providing more protection of the resource.

Social

The social consequences of urbanization relate to changes to the built environment, the natural landscape, demographics and an influx of population, which can impact those living both inside and outside the UGB. As the character of an area changes from rural to urban the natural landscape is impacted by a denser built environment. Through the required planning of new urban areas an efficient and compact urban form can be created that will provide additional social, commercial, recreational and educational opportunities to serve both current and new residents of the area and nearby established residential communities inside the UGB. Mixed-use areas that are part of a

planned complete community have the greatest potential to provide social gathering places and community centers, or become the focus point for a neighborhood. The closer proximity to services, jobs and recreational opportunities due to an efficient and compact urban form will result in shorter trips by residents and provide opportunities for other modes of transportation such as transit, bicycling and walking.

Numerous national studies indicate there are several health impacts attributed to development of communities that are dependent on the automobile. These impacts range from air pollution and related illnesses to automobile accidents and a sedentary lifestyle, all based on increased vehicle miles traveled and commuting time. However, urbanization utilizing a compact urban form can help alleviate some of these health impacts and contribute in a positive nature to the overall health of the community by providing transportation options, nearby services, and opportunities for exercise that can reduce the time spent in an automobile.

As noted, urbanization will affect the rural character of the area, which is a negative social impact for those residents who desire such a lifestyle and rural environment. Residents within the UGB may also be negatively affected by the loss of nearby rural landscapes, the loss of the perception of easy access to open spaces and the perceived loss of protection of natural resources. Those individuals currently engaged in farming nearby land may feel pressure from encroaching urbanization to curtail farming activities.

Affordable Housing

The region functions as one housing market as people may live in one area, work in another and shop in yet another part of the region. In many areas there are few affordable housing options for the people who work there, resulting in long commute distances and times, while increasing congestion and pollution. This also leads people to purchase or rent more expensive homes than they can afford. The social factors of having an affordable home – shelter, safety and security – are fundamental to the livability of the region. The availability of a range of affordable homes throughout the region helps provide the stability needed to develop and maintain complete communities. A population that has access to housing choices near employment and services will spend less time traveling and may quite possibly be more aware of and involved in their immediate community. Title 11 of the Functional Plan requires that the planning for areas brought into the UGB demonstrate measures that will provide a diversity of housing stock that will fulfill needed housing requirements as defined by ORS 197.303. The intent of this requirement is to provide affordable housing options throughout the region.

Archeological Sites

State and federal laws prohibit the disturbance of Native American burial sites. Approximately six percent of the state has been formally surveyed for the presence of Native American artifacts, most often having to do with federally funded projects. As long as state and federal laws are observed during the planning and development processes there would not be any social consequences realized. Based on known settlement patterns and the level of disturbance that has already

occurred due to farming and rural development, it is unlikely that many significant archeological resources remain.

Historic Sites

The analysis study areas may contain historic resources that have been listed as a historic resource of statewide significance or on the National Register of Historic Places. Non-surveyed historic resources are best addressed through the local jurisdiction's Goal 5 survey, inventory and protection ordinances. As an area urbanizes the local government assuming governance will be responsible for the protection of all historic resources.

Clackamas County has identified a number of historic properties that are designated as historic landmarks in the rural portion of the county. Multnomah County's West of Sandy River Plan has identified a number of properties that could be designated as historic resources. Washington County has identified historic resources in the rural area as part of the county's Rural/Natural Resource Plan. The presence of historic resources identified or inventoried in any of the above referenced documents is noted on the appropriate Analysis Area Summary Sheet.

Aggregate Resources

The vast majority of mining sites in Oregon are aggregate mines. Aggregate is the main ingredient in concrete and asphalt pavement and is used as a base on which roads and buildings are placed. Other important uses include gravel roads, dams, landscaping, drainage control, landfills, sanding icy roads, and railroad ballast.

Due to the generally finite nature of these resources and the limited supply of aggregate mines located in the region, its value is expected to increase. Because of high transportation costs it is most economical for the construction industry to use resources that are closest to the region. The relationship between the value of the aggregate resource, the importance to the construction industry and the costs involved with extraction and transportation makes it important to preserve these uses. Furthermore, aggregate resource extraction uses are temporary in nature due to the limited supply of the resource within a mining site. Once a site is no longer economically viable it can be reclaimed for a number of uses including recreational, open space or general development.

Aggregate resource sites in the analysis areas were identified utilizing the State of Oregon Department of Geology and Mineral industries (DOGAMI) Special Paper 3 "Rock Material Resources of Clackamas, Columbia, Multnomah and Washington Counties, Oregon". In addition, Washington County identifies mineral and aggregate resources in the rural area through the use of two district overlays contained in the Rural/Natural Resource Plan. The District A overlay designation applies only to sites upon which extraction, processing, and stockpiling activities are currently undertaken and to sites which may be utilized for such activities in the future. The District B overlay designation applies to land within 1000 feet of District A with the intent to regulate the establishment of new noise sensitive uses to help reduce conflicting land uses. Clackamas County has inventoried significant mineral and aggregate resource sites, based on the DOGAMI report in their comprehensive plan. The presence of mineral and aggregate resource sites identified or

inventoried in any of the above referenced documents is noted on the appropriate Analysis Area Summary Sheet.

Energy

Statewide Planning Goal 13: Energy Conservation, states that "Priority consideration in land use planning should be given to methods of analysis and implementation measures that will assure achievement of maximum efficiency in energy utilization". Energy impacts are related to additional consumption of fossil fuels to heat and cool buildings and power motor vehicles. As an area urbanizes the number of buildings increases, resulting in an increase in natural gas, electricity and heating oil use.

The addition of residential dwelling units and non-residential uses in a new urban area also increases the number of vehicles in that area. Increased vehicle miles traveled (VMT) increases gasoline consumption and emissions output associated with internal combustion engines. The total increase in vehicular trips is based on the productivity of the individual study areas in terms of the number of dwelling units or the amount of employment that the area is expected to create through urbanization. Although an increase in energy consumption is inevitable, the urbanization of some study areas may improve transportation connectivity and efficiency for areas inside of the existing UGB. Furthermore, maintaining a compact urban form, providing both service and employment opportunities and increasing density along high capacity transportation corridors will result in smaller increases in energy consumption than disjointed unplanned large lot development.

ORS 660-23-190(1) states that energy sources may include naturally occurring locations, accumulations, or deposits of one or more of the following resources used for the generation of energy: natural gas, surface water (i.e., dam sites), geothermal, solar and wind areas. Energy sources applied for or approved through the Oregon Energy Facility Siting Council (EFSC) or the Federal Energy Regulatory Commission (FERC) are deemed to be significant energy sources that could be impacted by urbanization of the surrounding area. Protection of energy sources means to adopt plan and land use regulations that limit new conflicting uses within the impact area of the site and authorize future development or use of the energy source of the site. There are no known sources of energy in the study areas as defined in the ORS 660-23-109(1), although some of the areas contain easements for electric power, petroleum and natural gas transmission facilities.

Economic

The land in the analysis areas is currently in rural uses that include large lot residential, farm and forest activities, and limited commercial and industrial uses. Permitted commercial uses are generally confined to wholesale and retail sales of farm and forest products and other incidental uses including convenience stores or service based businesses under prescribed conditions. Industrial uses are mainly related to resource based industries such as sand and gravel, mineral extraction, and equipment storage.

Urbanization allows for a concentration of residential, industrial, commercial and office uses that benefit from economies of scale. As land is brought into the UGB, the range of uses and

development types increase. As land values increase activities that are land intensive such as agriculture, forestry and equipment storage may become less economical. The resulting diversified urban economy will serve both the current and new residents that will locate there as well as the nearby established residential communities inside the UGB.

The addition of public facilities and infrastructure increases the value of rural residential land by providing the opportunity to divide property into smaller lots for higher density residential use or by converting rural residential uses to either commercial or industrial uses. These development options would not be available without inclusion of the land in the UGB and the subsequent urban services that are provided.

Although there is economic value in converting land from rural to urban uses as noted above, there also is a cost associated with protecting natural resources in terms of lost development productivity and/or replacement or mitigation of development impacts on natural resources. The cost of lost development productivity from the protection of natural resources must be balanced with the immeasurable value of lost open spaces and the degradation of wildlife habitat. Metro's Goal 5 Phase 1 ESEE Analysis explains in detail how the ecological functions of fish and wildlife habitat provide ecosystem services that have economic value and benefit society. Based on this information it seems to be cost effective to concentrate development in areas where impacts to natural resources can be minimized and to avoid impacts that would require restoration and mitigation.

The Oregon Department of Agriculture reported that in 2008, two of the top five agriculture producing counties were in urban Oregon. Clackamas and Washington counties ranked fourth ($364 million) and fifth ($302 million), respectively, in gross farm and ranch sales. The top commodity in 2008 was greenhouse and nursery products, with an $808 million value. Three of the top five counties producing greenhouse and nursery products are Clackamas (first), Washington (third) and Multnomah (fifth). In addition all three counties are also in the top five for cane berry production. Urbanization of land that is currently in agricultural production, particularly in the nursery stock and cane berry production could have a significant effect on the regional economy, especially if they are part of a larger block of agricultural activity.

AGRICULTURAL/FOREST COMPATIBILITY ANALYSIS

The basic methodology for this compatibility analysis is similar to the analysis that accompanied the legislative amendments to the UGB in 2002. However, the adoption of rural reserves by Clackamas, Multnomah and Washington counties shifts the focus of the analysis away from the protection of farmland that is most important for the continuation of commercial agriculture in the region, to the compatibility of the proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB and whether or not there is a clear transition area, utilizing natural and built features, between urban and rural lands. It is assumed that the rural reserves process designated the most important land for commercial agriculture as rural reserves and the most suitable land for urbanization as urban reserves. Certainly some high value farm land was designated as urban reserves; however the balancing of the urban and rural

reserve factors resulted in the determination that the farm land was more suitable for an urban reserve designation.

The Oregon Department of Agriculture's 2007 Study, Identification and Assessment of the Long-term Commercial Viability of Metro Region Agricultural Lands expands on the needs for edges and buffers to protect and moderate adverse impacts between agriculture and other non-compatible land uses and is useful in helping to identify those transition areas between urban and rural uses.

Data Sources - Zoning

Zoning data was obtained from regularly updated county records from Metro's RLIS. Counties designate land as resource land or exception land through the comprehensive planning process, which must be acknowledged by Oregon Department of Land Conservation and Development (DLCD). Counties must go through an exception process to remove resource land from protected status. Metro is required to utilize this local zoning that has been acknowledged by the State when completing an agricultural compatibility analysis.

The zoning within each county that qualifies as resource land and exception land is somewhat different. The exception land and resource land zone designations shown below were used for the agricultural compatibility analysis.

Table -5 County Resource & Exception Land Designations

County	Resource Land Designation	Exception Land Designation
Clackamas	EFU Exclusive Farm Use AGF Agriculture/Forest District TBR Timber District	RA1 Rural Residential RA2 Rural Residential RRFF5 Rural Residential/Farm Forest 5 Acre FF 10 Farm Forest 10 Acre RC Rural Commercial RTC Rural Tourist Commercial
Multnomah	EFU Exclusive Farm Use MUF Multiple Use Forest CFU-1, CFU-2, CFU-3, CFU-4 and CFU-5 Commercial Forest Use districts	RR Rural Residential RC Rural Center MUA 20 Multiple Use Agriculture
Washington	EFU Exclusive Farm Use AF20 Agriculture/Forest 20 Acre EFC Exclusive Forest and Conservation	RR 5 Rural Residential 5 Acre AF 5 Agriculture & Forest District 5 Acre AF 10 Agriculture & Forest District 10 Acre RC Rural Commercial RI Rural Industrial

Agricultural and Forest Activities

Agricultural and forest activities occurring on nearby farm and forest land outside the UGB were interpreted from computerized aerial photographs taken in the year 2009. Aerial photos are generally taken in June or July; thus many crops may be young and difficult to identify at the time the photo was taken. Crops were grouped into general categories of nursery stock, orchards, row crops (corn, vineyards, cane berries, etc) and field crops (grasses and grains). Forest activities are basically impossible to detect based on aerial photos that represent a snap shot in time due to the very long harvest cycle. Metro staff recognizes that this evaluation may not precisely identify all crops being cultivated or whether forest harvesting is expected to occur.

Compatibility Factors

Compatibility considerations include:

- Increased traffic resulting from urbanization may impede the movement of farm or forest equipment and hinder the transport of agricultural goods to market.
- Urbanization may result in the isolation of certain agricultural areas from the greater farming community. This may hinder normal practices of sharing equipment and knowledge among farmers.
- Conflicts due to dust, noise, odor and chemical spray resulting from urban development being located in close proximity to active farming.
- An increase in impervious surface generates additional storm water run-off that can impact the water quality of streams, prevent ground water infiltration and re-charge, and scour streambeds that nearby agricultural activities are dependent upon.

The agricultural practices used in the production of the identified crop categories vary somewhat in the levels of pesticide use, noise produced, etc., which may conflict with urban development in close proximity. In addition, one of the strengths of agriculture is its ability to change crops over time to reflect current market conditions. For these reasons, the intensity of the agricultural uses occurring within the surrounding areas and the degree to which active farming of these crops may be hindered by nearby urban development was not ranked. Metro staff simply noted when the potential for such conflicts existed. The base assumption was that areas that support intensive and uninterrupted agricultural uses would be most impacted by the proximity of new urban development.

Clear Transition between Urban and Rural Lands

Finally, the presence of buffers or transitions areas in the form of natural and man-made features such as rivers, steep slopes, highways and golf courses may serve to limit impacts of urbanization on agricultural practices were identified.

Each of the compatibility factors and the presence or not of natural and man-made buffers or transition areas was evaluated for each analysis area. The starting point for the analysis was whether or not any agricultural activities were occurring on adjacent land. The size or extent of the

adjacent agricultural activity, the number of streams that flowed from the study area through active farming areas and local traffic patterns were additional factors in consideration of the overall compatibility determination. A summary of the compatibility factor and the urban to rural transition factor can be found on the Analysis Area Summary Sheets.

CONTRIBUTION TO THE PURPOSES OF CENTERS

The Metro 2040 Growth Concept was adopted as a vision to guide growth and development over the coming decades. A key component of the Growth Concept is concentrating growth in the 37 designated Centers across the region with a focus on redevelopment, multi-modal transportation and concentrations of households and employment. Centers vary greatly in geographic size, urban form and transportation access, making each center truly unique. Metro completed a State of the Centers Report, January 2009, which was intended to help communities understand their current conditions and develop their aspirations for the future.

Using the information from the State of the Centers Report, along with the numerous locally adopted plans and visions for the designated Centers and downtown areas, staff evaluated whether or not the addition of residential or large site industrial land to the UGB would support, negatively impact or have no effect on the identified local and regional visions for the Centers. Additional information for those Centers that are near the MAX Light Rail Line was obtained from Metro's Transit Oriented Development (TOD) Group's forthcoming strategic plan that is expected to be finalized in September 2010.

RESULTS

Individual ratings were determined for the following Goal 14 Factors: ESEE analysis, Significant Fish and Wildlife Habitat, Agricultural Analysis and Contribution to Centers and can be found in Table 6 below. The preliminary cost estimations developed for providing sanitary sewer, water, storm sewer, parks, schools and transportation services are intended to provide additional information and are found in Attachment 4. These cost estimates were made using very general assumptions on future growth expectations. Detailed concept plans, consistent with the requirements of Metro's Functional Plan Title 11 will be necessary to develop more refined cost estimates that better reflect the expected development pattern and uses, and take into consideration more current costs for infrastructure materials at the expected time of construction as some of these areas may not urbanize for a number of years.

An additional consideration that should be included in determining the best places for potential expansion of the UGB is the current level of local jurisdiction support for including the area in the UGB. Staff feels that this is a key ingredient in determining the appropriate locations for expansion, given the results of the 2007 Great Communities study that highlighted the need for governance, the focus of the reserves analysis on the efficient use of existing and future public and private infrastructure investments, and the results of the recent Washington County Urbanization Forum that concluded new urban areas would be governed by cities. In addition, Functional Plan Title 11: Planning for New Urban Areas requires provision for annexation to a city and to any necessary service district prior to, or simultaneously with, application of city land use regulations. If a new

urban area has local support, there is accountability and buy in from the local government that the area will develop into a great community that supports the vision of the 2040 Growth Concept. A new urban area that lacks local willingness for governance and providing urban services will result in the land remaining in its rural condition, thereby reducing the overall expected capacity of the UGB in future growth management decisions.

Table 6

Summary of results for each Analysis Area

Analysis Area	*Environmental Consequences*	*Energy, Economic, Social Consequences*	*Impact to Significant Habitat*	*Agricultural Compatibility*	*Natural Transition/Buffer*	*Contribution to Centers*
1C - East Gresham	Low	Moderate	Low	Compatible*	Partial	No
3D - Maplelane	Moderate	Low	Low*	Compatible	Yes	No
3G - Beaver Creek Bluffs	Moderate	Low	Low	Compatible	Yes	No
4D - Norwood	Low	Moderate	Low*	Mitigation Required	Partial	No
4E - I-5 East	Moderate	Moderate	Substantial	Mitigation Required	No	No
4F/G - Elligsen	Moderate	Moderate	Low*	Mitigation Required	Limited	No
4H - Advance	Low	Low	Low	Partially Compatible	Partial	No
5B - Sherwood West	Low	Low	Low	Compatible	Yes	No
5D - Sherwood South	Moderate	Moderate	Moderate	Compatible	Yes	No
5F - Tonquin	Low*	Low	Low	Compatible	Yes	No
5G - Grahams Ferry	Low	Moderate	Moderate	Compatible	Partial	No
6A - South Hillsboro	Low*	High	Low*	Not Compatible	Partial	New Center**
6C - Roy Rogers West	Low`	Low	Low	Not Compatible	No	No
7B - Forest Grove North	Low	Low	Low	Not Compatible	No	No
7D - Cornelius South	Low	Low	Low	Partially Compatible	Partial	New Center**
7I - Cornelius North	Low	Low	Low*	Not Compatible	No	New Center**
8A - Hillsboro North	Low	Moderate	Moderate	Partially Compatible	Partial	No
8B - Shute Road Interchange	Low	Low	Low	Not Compatible	No	No

*Area is generally compatible or impact is minimal, with potential exceptions. See summary for specific details.

**A new center had been proposed as part of the South Hillsboro Community Plan and the City of Cornelius is proposing a center designation for their downtown.

FIGURES AND ATTACHMENTS

FIGURES

Figure 1: Process for Evaluating Urban Reserve Analysis Areas for Inclusion in the Urban Growth Boundary

ATTACHMENTS

Attachment 1: Urban Growth Boundary Alternatives Analysis Areas Map

Attachment 2: Analysis Area Summary Sheets

- East Gresham – 1C
- Maplelane – 3D
- Beaver Creek Bluffs – 3G
- Norwood – 4D
- I-5 East – 4E
- Elligsen – 4F/G
- Advance – 4H
- Sherwood West – 5B
- Sherwood South – 5D
- Tonquin – 5F
- Grahams Ferry – 5G
- South Hillsboro – 6A
- Roy Rogers West – 6C
- Forest Grove North – 7B
- Cornelius South – 7D
- Cornelius North – 7I
- Hillsboro North – 8A
- Shute Road Interchange – 8B

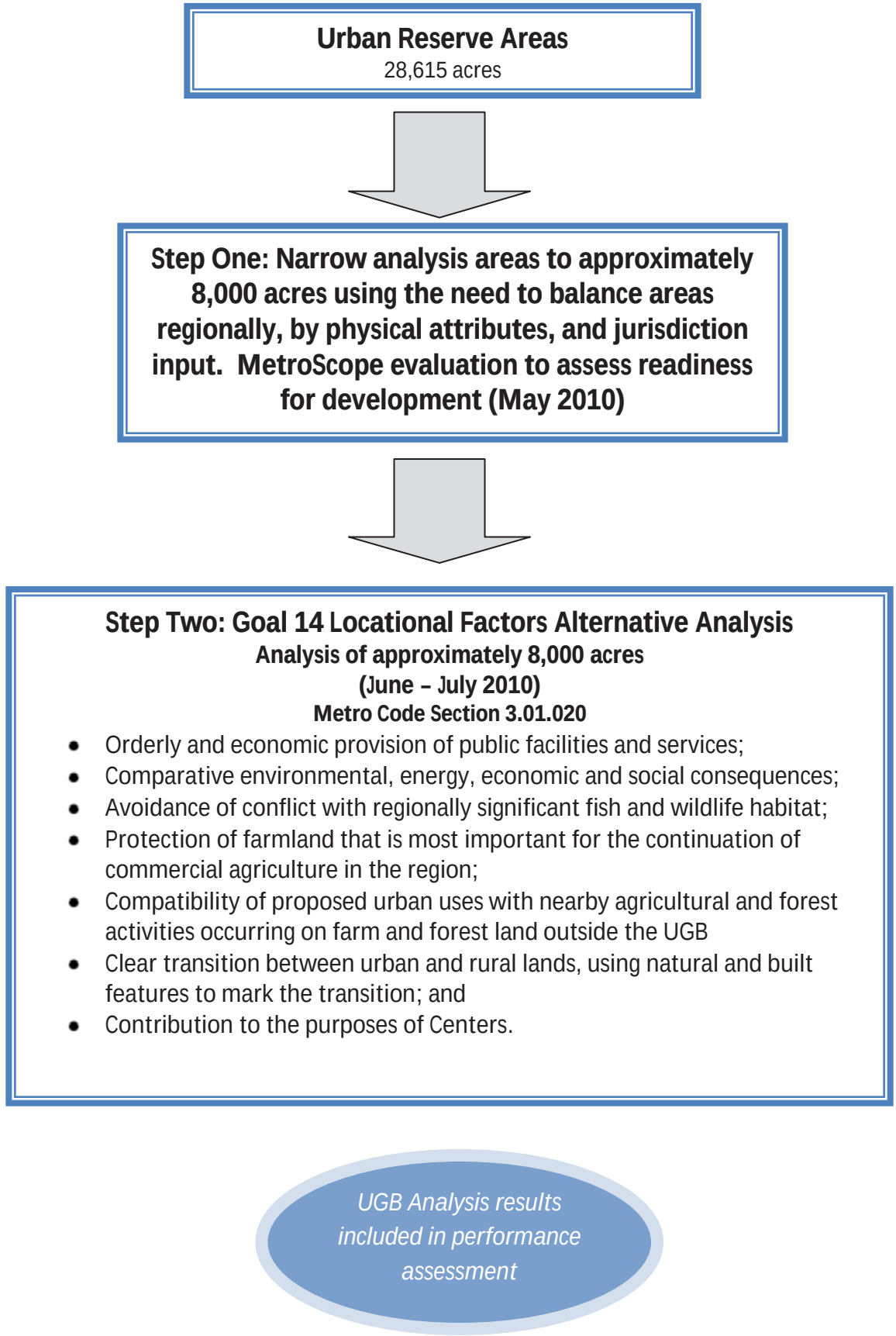
Attachment 3: Group MacKenzie Report – Assessment of Potential Urban Growth Boundary Expansion Areas

Attachment 4: Public Facilities and Services Cost Summary

Attachment 5: Transportation Analysis Cost Summary

Attachment 6: Environmental Analysis Summary

Figure 1
Process for evaluating urban reserve analysis areas for inclusion in the urban growth boundary



Performance Assessment

MetroScope analysis of efficiency measures combined with potential UGB additions (July 2010), including impacts on:

- Region's six desired outcomes
- Cost burdened households
- Impact to existing Centers, Corridors and Employment Areas

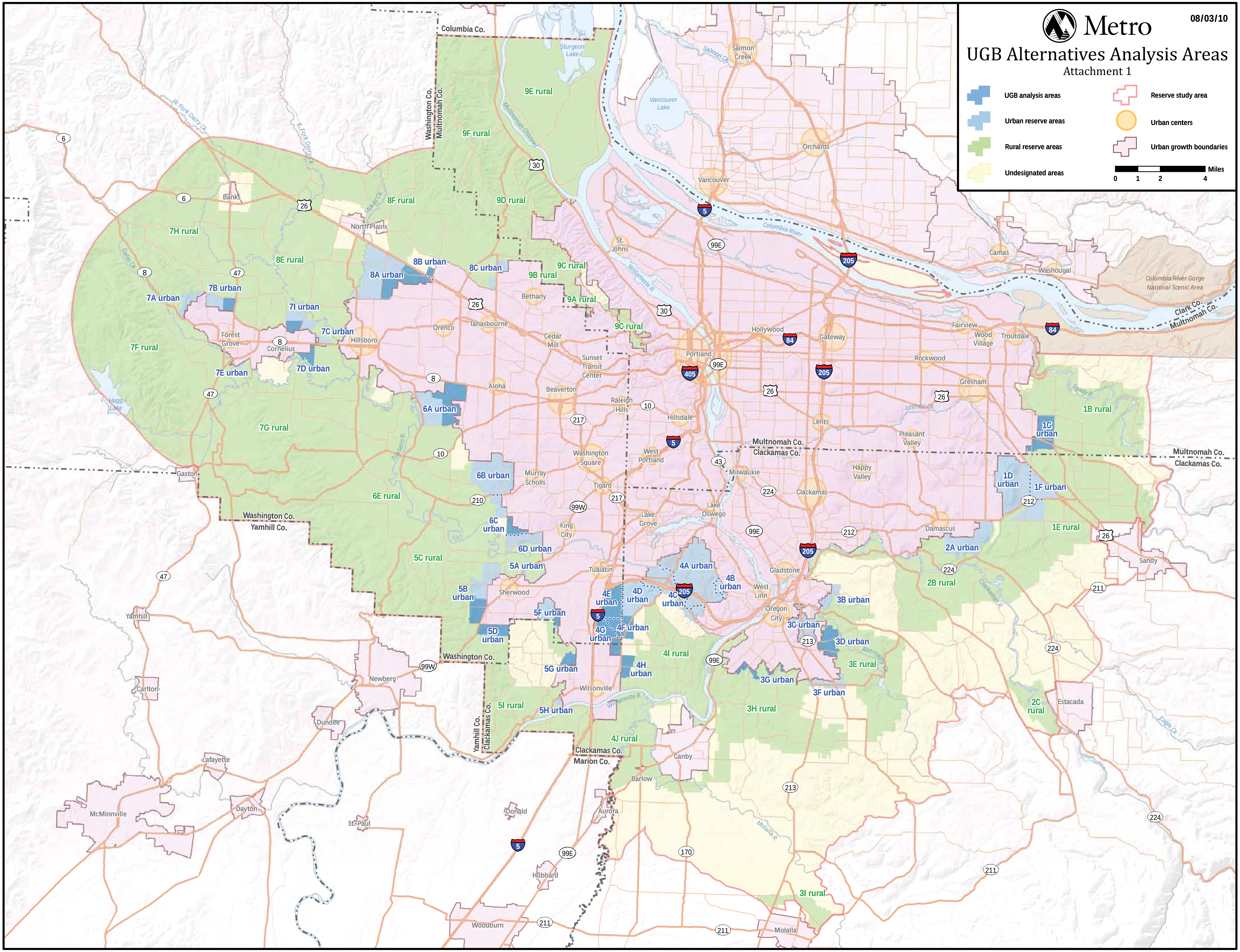
Inform COO Recommendation on Capacity Ordinance (August 2010)

Required residential neighborhood impact report

26-29 Report on the effect of the proposed UGB amendments sent to all households within one mile of the proposed amendment areas (October 2010)

Metro Code Section 3.01.015

- Traffic patterns and any resulting increase in traffic congestion, commute times and air quality;
- Whether parks and open space protection in the area to be added will benefit existing residents of the district as well as future residents of the added territory; and
- The cost of impacts on existing residents of providing needed public facilities and services, police and fire services, public schools, emergency services and parks and open spaces.



Metro
08/03/10
UGB Alternatives Analysis Areas
Attachment 1
UGB analysis areas
Urban reserve areas
Rural reserve areas
Undesignated areas
Reserve study area
Urban centers
Urban growth boundaries
Miles
0 1 2 4
Columbia Co.
Washington Co.
Multnomah Co.
Clackamas Co.
Yamhill Co.
Marion Co.
Clark Co.
Columbia River Gorge National Scenic Area
Columbia River
Willamette R.
9E rural
9F rural
9D rural
9C rural
9B rural
9A rural
9C rural
8F rural
8E rural
8A urban
8B urban
8C urban
7H rural
7A urban
7B urban
7I urban
7C urban
7E urban
7D urban
7F rural
7G rural
6A urban
6B urban
6C urban
6D urban
6E rural
5A urban
5B urban
5C rural
5D urban
5F urban
5G urban
5H urban
5I rural
4A urban
4B urban
4C urban
4D urban
4E urban
4F urban
4G urban
4H urban
4I rural
4J rural
3B urban
3C urban
3D urban
3E rural
3F urban
3G urban
3H rural
3I rural
2A urban
2B rural
2C rural
1B rural
1C urban
1D urban
1E rural
1F urban
Portland
Vancouver
Orchards
Salmon Creek
Camas
Washougal
St. Johns
Hollywood
Gateway
Rockwood
Gresham
Fairview
Wood Village
Troutdale
Hillsboro
Orenco
Tanasbourne
Bethany
Cedar Mill
Sunset Transit Center
Beaverton
Aloha
Raleigh Hills
Hillsdale
Lents
Pleasant Valley
Washington Square
Murray Scholls
Tigard
West Portland
Milwaukie
Happy Valley
Clackamas
Lake Oswego
Lake Grove
King City
Tualatin
Sherwood
Damascus
Gladstone
West Linn
Oregon City
Wilsonville
Sandy
Estacada
Canby
Barlow
Aurora
Donald
St. Paul
Hubbard
Woodburn
Molalla
Newberg
Dundee
Carlton
Yamhill
Lafayette
Dayton
McMinnville
Gaston
Forest Grove
Cornelius
Banks
North Plains

GRESHAM EAST ANALYSIS AREA (1C)

Gresham East Analysis Area		**Total Acres**	**857**
Gross Vacant Buildable Acres	688	Total Constrained Acres	169
Estimated Dwelling Unit Capacity	7,980	• Title 13 Significant Habitat	117
Estimated Employment Acres		• Public Land	62

General Description (see attached map)

The Gresham East Analysis Area is a boot-shaped rectangular area in east Multnomah County, with 857 total acres. The area is generally bounded by SE Lusted Road to the north and extends out to SE 302nd Avenue to the east. Metro's current UGB forms the western edge, and the entire area lies north of Johnson Creek. The area is served by SE Lusted Road in the north, SE 282nd and SE 302nd Avenues running north-south and by SE Orient Drive in the southern portion of the area. It is primarily flat, with all slopes over 25% occurring in riparian areas surrounding the three drainages running through the area.

Parcelization, Building Values, Development Pattern (see attached aerial photograph)

The analysis area contains 222 tax lots, 187 with improvements. There are two school sites within the area that contain three schools: Sam Barlow High School in the northeastern corner of the area and East Orient Elementary School and West Orient Middle School in the southeast, totaling about 62 acres. Excluding the school parcels, the median value of improvements is over $100,000. Thirty-seven properties have improvements valued above $250,000. The area is predominantly in agriculture use, but has some rural residential and commercial land uses primarily along SE Dodge Park and SE Orient Drive. Available data does not suggest the existence of power lines or other public easements within this area.

GOAL 14 LOCATIONAL FACTORS (METRO CODE SECTION 3.01.020)

Public Facilities and Services

Orderly and economic provision of public facilities and services

The preliminary sanitary sewer, water and transportation suitability analyses completed by the Core Four Technical Team for the urban and rural reserve study area indicated this general location had high suitability for sanitary sewer services, medium suitability for water services and medium suitability for transportation connectivity. As part of Multnomah County's urban and rural reserve designation process, the City of Gresham indicated its ability and desire to provide services to this area in the long term.

The following cost estimates represent preliminary estimates for the major components of the individual systems. The estimates were generated using very general assumptions about the level of residential or large site industrial development that could occur in the analysis area. More detailed concept plans, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11 will be necessary to develop more refined cost estimates. Attachment 5 contains the breakdown for the transportation cost estimates. A map of the proposed collector and arterial transportation network is attached to this summary.

Sanitary Sewer Services - $15,272,000

Water Distribution Services - $3,240,000

Storm Sewer Services - $2,858,500

Transportation - $260,050,000

Parks - $43,560,000

Schools - $60,000,000 (New Elementary and Middle Schools)

ESEE Analysis

Comparative environmental, energy, economic and social consequences

Environmental

Kelly Creek bisects the area, and two other unnamed streams, north and south of Kelley Creek, flow west through the area. Kelly Creek eventually meets with Beaver Creek, as does the small tributary in the northern portion of the analysis area, ultimately flowing into the Sandy River. The second small tributary in the southern part of the area flows into Johnson Creek which travels through Portland to the Willamette River. No 100-yr floodplains are identified within the study area. There is one small wetland of approximately ¼ acre, just south of SE Orient Drive and along the Johnson

Creek tributary. The proximity of flat, developable land surrounding all three streams within the analysis area indicates potential impact from urbanization of this area. However, current agricultural development covers most of the analysis area including some headwater stages of the three creeks, thereby minimizing the additional impact future development will have on the streams and wetlands. Preservation of existing riparian and upland habitat and restoration of degraded stream edges will further protect the streams from urbanization.

Johnson Creek flows along the southern boundary of the study area, separated by a strip of rural land. The 100-yr flood plain lies just outside of the analysis area boundary, so the existing farmland and undeveloped land could provide a buffer between the creek and urban development. Attachment 6 contains a breakdown of the environmental factors.

Energy, Economic & Social

The vast majority of the parcels in this large analysis area are less than five acres in size and 84% have improvements, reflecting the numerous rural residences dispersed throughout the area, mainly along the major roadways. Of the three schools located in the analysis area, the elementary and middle schools serve the rural area while the third, Sam Barlow High School serves the urban and rural area. Urbanization may enhance the opportunity for Sam Barlow High School to become more of a community focal point, while the elementary and middle schools may be negatively impacted as they are not sized to serve an urban population. At the same time, urbanization may provide the opportunity for these two older school facilities to be enhanced. As this area is relatively developed and close to downtown Gresham, urbanization would be less of an impact on the rural way of life for the current residents compared to areas that are farther away from a center. The increased VMT from urbanization of the area would be significantly larger than current levels, although the direct access to the Gresham Regional Center, the Springwater Industrial area and the Max line may reduce the impact compared to other areas that have limited transportation connections to centers or employment areas. There are two main pockets of nursery activity, each approximately 150 acres in size. The loss of the economic impact from these agricultural uses may be considerable; however the potential economic impact of urbanization on these relatively flat lands will outweigh this loss. Approximately 10% of the land is identified as containing environmental resources, mainly in three locations along the stream corridors that traverse the area. The costs for protecting these linear resources will be small in contrast to the potential economic impact of urbanizing the larger areas in between. Overall this analysis area has medium economic, social and energy consequences from urbanization.

Avoidance of conflict with regionally significant fish and wildlife habitat

A total of 91 acres adjacent to the three streams in the area are identified as regionally significant riparian habitat, although much of that acreage is currently impacted by active agriculture or development. Regionally significant upland habitat covers an additional 26 acres, almost all of which occurs around the northern-most stream corridor and partially within the Barlow High School property. The proximity of this identified habitat to flat, easily developable land throughout the analysis area could create a conflict between future urbanization and regionally significant fish and wildlife habitat. The City of Gresham, the nearest and expected governing body, has adopted a

habitat conservation area overlay district plan that is compliant with Metro's Title 13 program, which should protect habitat and stream areas from the impacts of urbanization. Given the city's habitat protection program, the level of habitat currently impacted by agricultural activities and the overall limited amount of riparian areas surrounding Kelly Creek and the other streams within the analysis area, urbanization could occur with minimal additional impacts to regionally significant fish and wildlife habitat.

Agricultural/Forest Compatibility

Protection of farmland that is most important for the continuation of commercial agriculture in the region

The urban and rural reserves process designated the most important land for commercial agriculture as rural reserves and the most suitable land for urbanization as urban reserves. Designation of this area as an urban reserve means farmland within this analysis area is not the most important for the continuation of commercial agriculture in the region.

Compatibility of proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

There are three separate locations where farm and/or forest land is contiguous to the analysis area (see attached resource land map). The first location fronts SE 302nd Avenue for approximately ½ mile and extends east and north of SE Lusted Road all the way to the Sandy River. The area is generally zoned exclusive farm use (EFU) near the analysis area and commercial forest use (CFU) the closer you get to the Sandy River. This area is a large, intact block of land that is actively being farmed, mainly with nursery and field crops but also some dispersed orchard uses. The South Fork of Beaver Creek flows in a northwesterly direction through the area and is about half mile east of 302nd Avenue. This stream corridor, which is a few hundred feet in width, provides a buffer to the agricultural activities further east and thereby makes the proposed urban uses compatible with the outlying areas. The proposed urban uses would not be compatible with the agricultural activities that occur between 302nd Avenue and the South Fork of Beaver Creek as there is no edge or buffer between the two uses. However, mitigation measures could reduce conflicts between urban uses inside the UGB and resource uses outside the UGB.

The farm and/or forest land north of the analysis area, north of SE Lusted Road, is buffered by the South Fork of Beaver Creek ravine and the rural residences along the north side of SE Lusted Road. Thus, the proposed urban uses will be separated from the agricultural activities in this area further to the north.

The second area is a small, isolated pocket (45 acres) of EFU land north of SE Stone Road in the vicinity of SE Short Road that is adjacent to the analysis area. One 14-acre parcel is currently being farmed with nursery and field crops while the remainder of the area is in rural residential use. Johnson Creek flows in an east-west direction through this resource land area, although most of the area that is actively being farmed is between Johnson Creek and the analysis area. As there is

minimal agricultural activity occurring in this pocket of EFU land and Johnson Creek provides a buffer to the remaining agricultural activities, the proposed urban uses will generally be separated from the nearby agricultural activities.

The third area is a 97acre block of EFU land that is north and south of SE Stone Road in the vicinity of Highway 26 and is adjacent to the analysis area and the UGB. This entire area is actively being farmed with nursery crops and all but approximately 18 acres is owned by one family. Johnson Creek flows in an east-west direction through the north portion of the resource land area, on the north side of SE Stone Road. The vast majority of the agricultural activity occurs south of Johnson Creek and north of Highway 26. Since most of the agricultural activity in the EFU area is south of Johnson Creek, it will not be directly impacted by urban uses in the analysis area. Increased traffic along SE Stone Road will probably have some adverse affect, as SE Stone Road provides access to Highway 26. SE 282nd Avenue, which runs along the eastern edge of the EFU area does not provide access to Highway 26 and therefore will most likely not see as much increase in traffic from new urban uses in the analysis area. Highway 26 provides an effective edge on the southwest side of this EFU area, reducing any impacts by urbanization of the analysis area.

Overall the proposed urban uses are compatible with the nearby agricultural and forest activities occurring on farm and forest land outside the UGB with the exception of the portion of area 1 directly adjacent to 302nd Avenue as noted above.

Clear transition between urban and rural lands, using natural and built features to mark the transition

The South Fork of Beaver Creek is located just north of the analysis area and provides a clear transition area between the urban reserve and adjacent rural lands. The rural residences along the north side of SE Lusted Road combined with the 100-foot drop in elevation to Beaver Creek reinforce this transition area. Johnson Creek is located just south of the analysis area. While Johnson Creek itself is not within a ravine, the stream corridor combined with a hill south of SE Stone Road do provide a clear transition area between the analysis area and adjacent rural lands to the south. There are no natural or built features to mark a transition between urban and rural lands east of SE 302nd Avenue beyond the road itself. Even assuming that 302nd Avenue becomes a collector level road in the future, the road itself will still not provide a clear transition area between future urban and rural uses. Additional buffers will need to be incorporated into the planning of the urban reserve area to provide a clear transition from urban to rural uses along this east edge.

Overall, just over half of the analysis area edge has a natural or built feature that provides a clear transition between urban and rural lands.

2040 Growth Concept

Contribution to the purposes of Centers

The Gresham Regional Center is the closest regional center to the Gresham East analysis area. It is 387 acres in size, serves all of eastern Multnomah County and is the eastern terminus of the MAX Blue Line. The regional center is linked to the analysis area by Highway 26/SE Orient Drive (3 miles) and SE Powell Valley Road/SE Lusted Road (2.6 miles). Tri-Met line 84 connects the analysis area to the regional center.

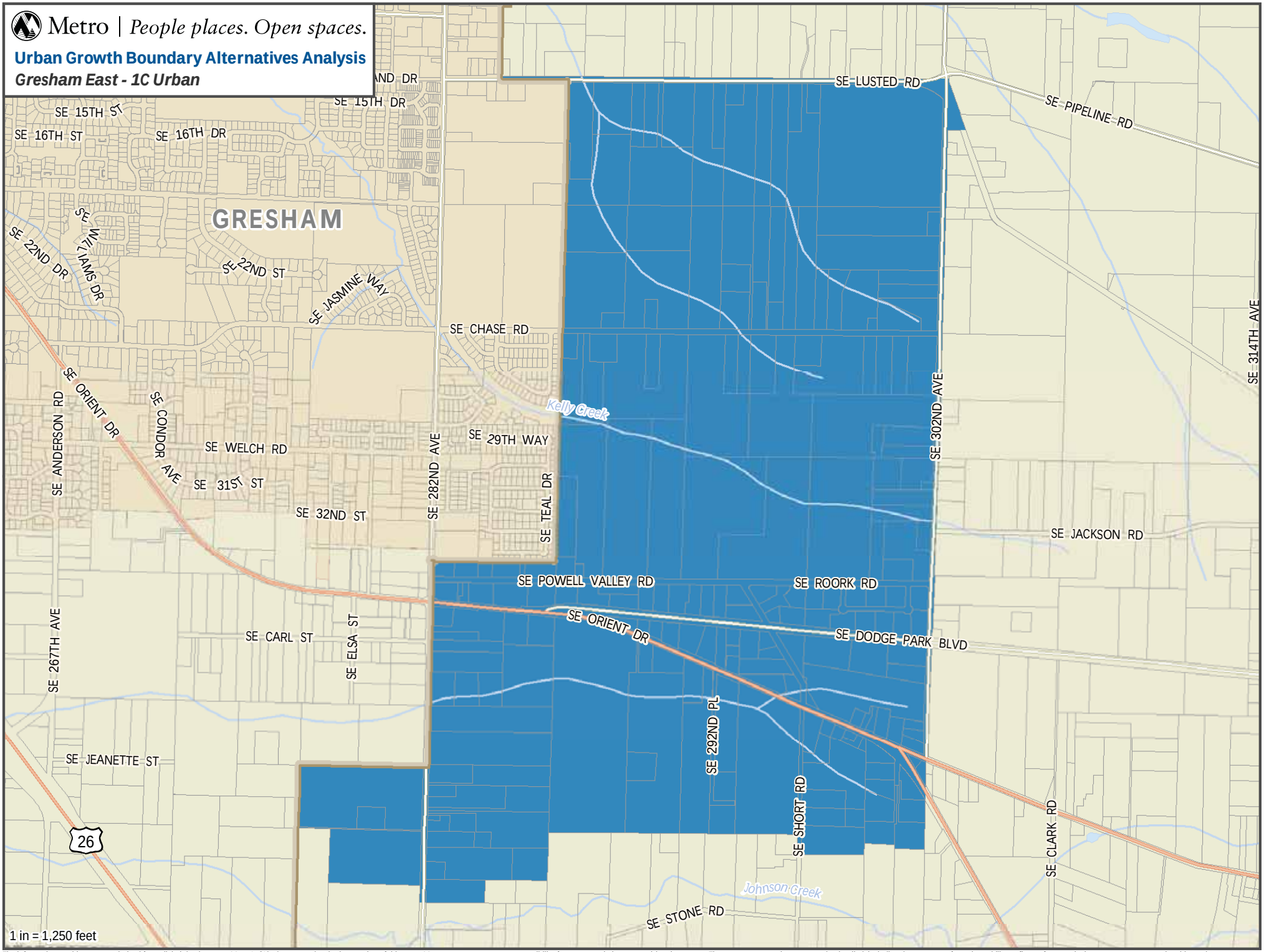
Gresham's Downtown Plan, which includes a significant portion of the regional center, is envisioned to include most significant civic and governmental functions, including public parks and the Center for the Arts. It will also include large numbers of professional sector jobs, medium- and high-density residential development and a thriving and unique entertainment, nightlife and shopping district. According to Metro's State of the Centers Report, January 2009, the Gresham Regional Center's jobs to housing ratio is higher than ideal and the total number of people per acre is low, indicating that the regional center needs to attract more housing to meet the vision in the Downtown Plan. The Gresham Regional Center is considered a strong emerging market that is ripe for infill and enhancement, based on research completed by Metro's Development Center for the TOD Strategic Plan.

Currently the City of Gresham foresees the analysis area urbanizing with a mixture of industrial uses in the south close to Highway 26, to complement the Springwater Industrial Area and mixed use/residential complimenting the three schools in the analysis area. Urbanization of the Gresham East analysis area will not contribute to the vision or purpose of the Gresham Regional Center. While the area may provide some job opportunities for future residents of the center, the undeveloped Springwater Industrial Area is a better fit due to its proximity and more direct transportation connections. In addition, the availability of housing opportunities in the analysis area could impact the emerging market for infill and enhancement and hinder the city's desire for medium and high density residential development in the center.

Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

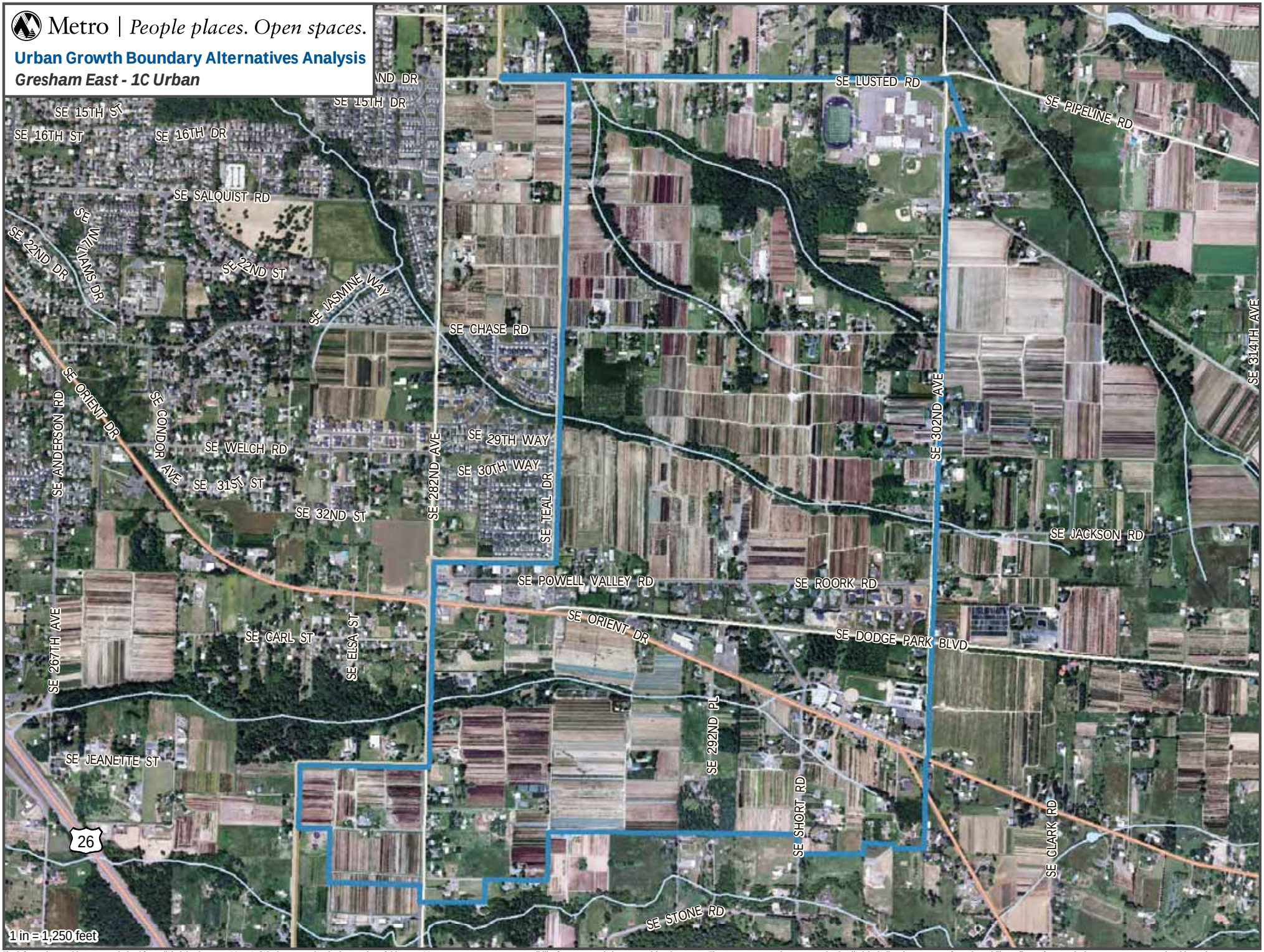
Gresham East - 1C Urban



Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

Gresham East - 1C Urban

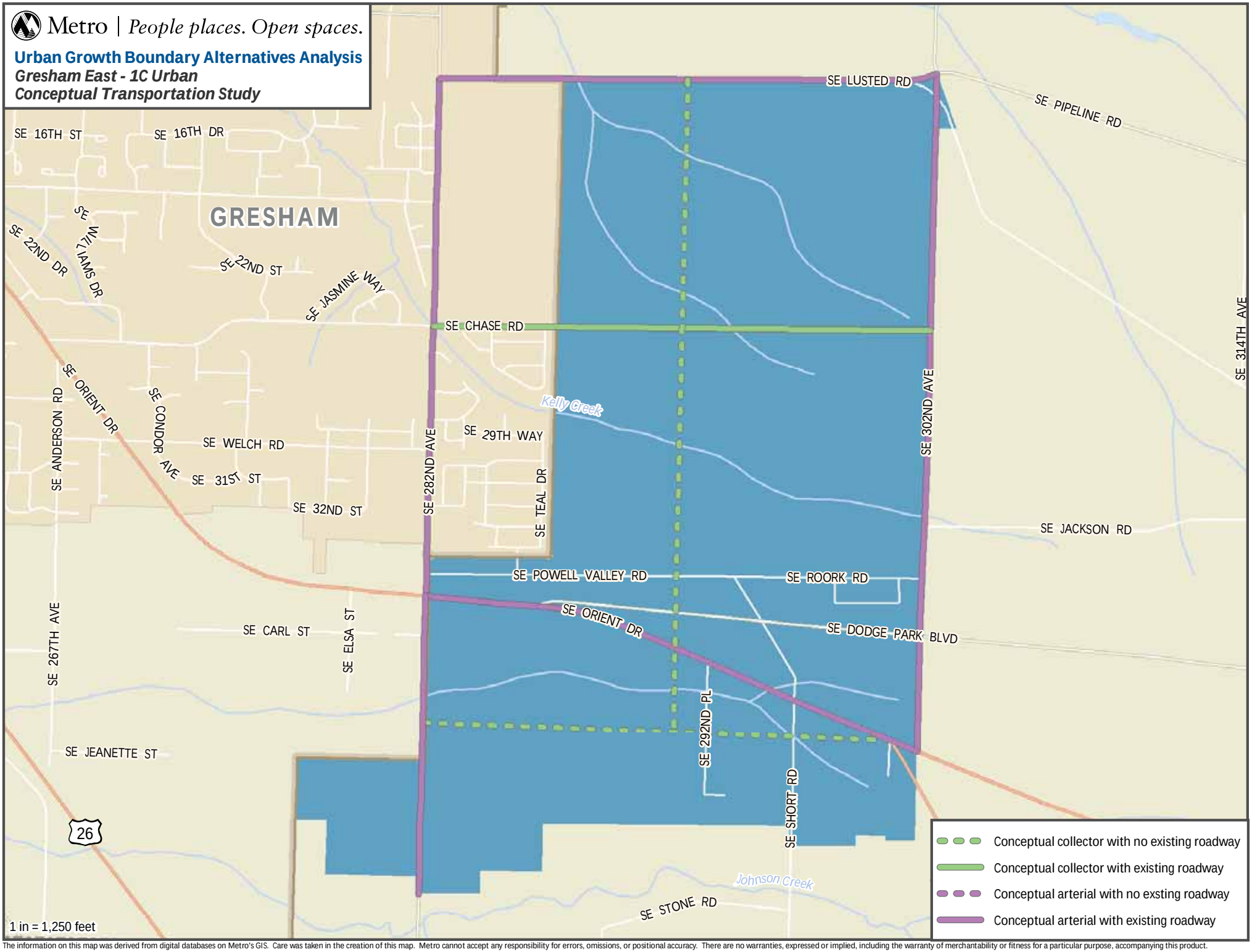


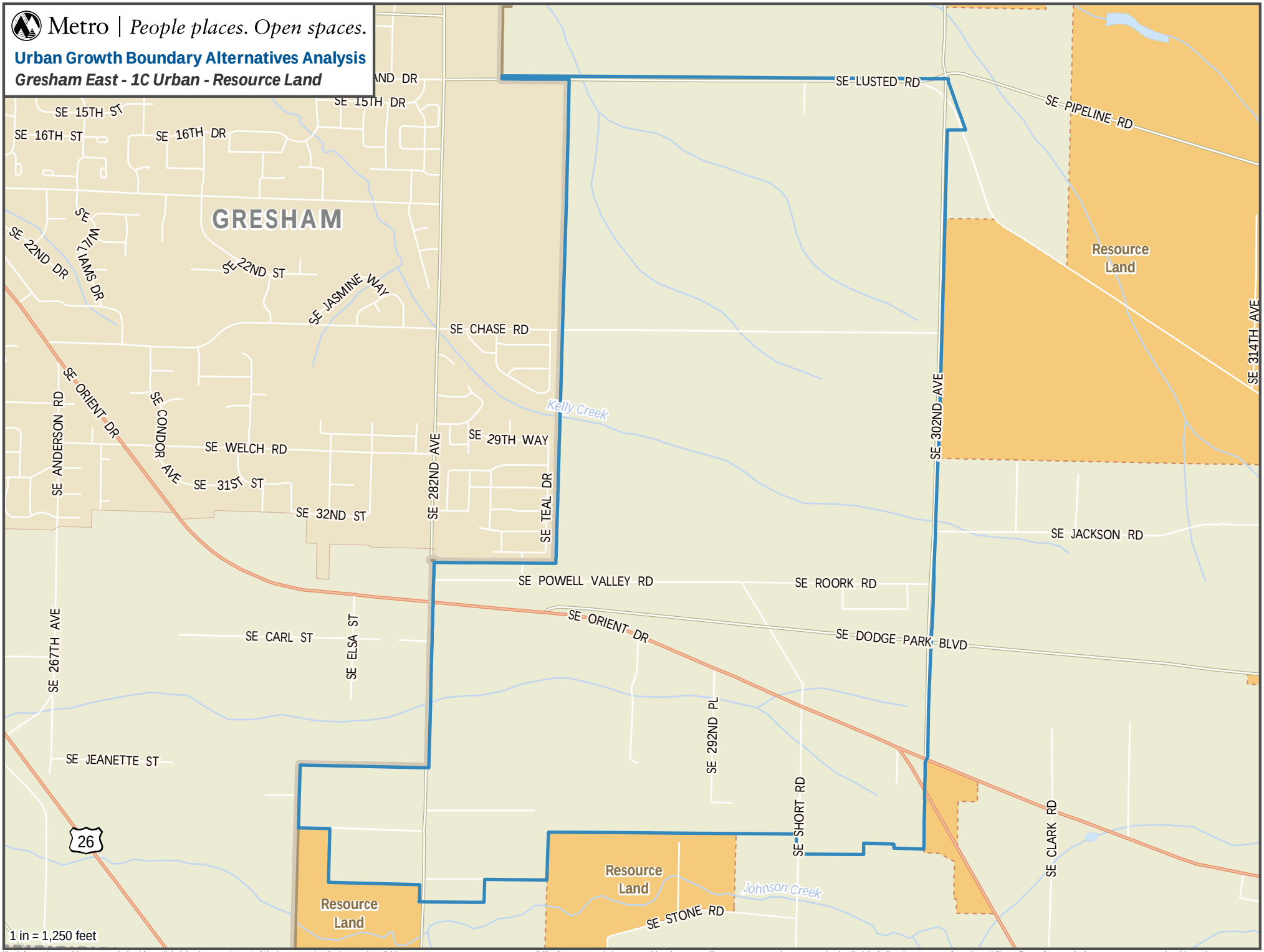
Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

Gresham East - 1C Urban

Conceptual Transportation Study





MAPLELANE ANALYSIS AREA (3D)

Maplelane Analysis Area		**Total Acres**	**573**
Gross Vacant Buildable Acres	331	Total Constrained Acres	242
Estimated Dwelling Unit Capacity	3,970	• Title 13 Significant Habitat	181
Estimated Employment Acres		• Public Land	69

General Description (see attached map)

The Maplelane Analysis Area is located to the east of Oregon City and covers 573 acres. The current UGB forms the western and southern edges of the area; the eastern and northern boundaries follow tax lot lines and are within 1000-1500 feet of Abernathy Creek. S Maplelane Road forms part of the eastern edge of the area. The area is primarily flat, with the exception of two tributary riparian areas flowing into Abernathy Creek to the east and a small forested area of steep slopes in the northeastern corner of the analysis area.

Parcelization, Building Values, Development Pattern (see attached aerial photograph)

The analysis area contains a total of 168 parcels, four of which are in public ownership. Of the private parcels, 33 are larger than five acres comprising 376 of the 573 total acres. The remaining 196 acres fall within 135 parcels. A total of 147 parcels have improvements, with an average value of $160,000 and 12 improvements valued over $250,000. One tax lot, in the northwest along S Waldo Road, is cut in half by the analysis area boundary. Rural and single-family residential land uses make up a majority of the area, with a mix of agricultural and forested parcels scattered throughout. Smaller lot single family residential lies primarily along S Maplelane Road and within a development around S Forest Grove Loop (off of S Thayer Road). There is an 18 acre manufactured home development in the center of the study area, off of S Maplelane Road.

There is a power line running north-south through the area, from south of S Thayer Road to a substation just north of S Maplelane Road owned by Portland General Electric (PGE). In addition to the power line easement, a PGE substation sits on a 35 acre parcel adjacent to the current UGB. A natural gas line easement runs in a northeast-southwest direction through the southern portion of the analysis area. There is a 55 acre publicly-owned parcel belonging to the Oregon City School District in the northern portion of the study area

GOAL 14 LOCATIONAL FACTORS (METRO CODE SECTION 3.01.020)

Public Facilities and Services

Orderly and economic provision of public facilities and services

The preliminary sanitary sewer, water and transportation suitability analyses completed by the Core Four Technical Team for the urban and rural reserve study area indicated this general location had high suitability for sanitary sewer services, medium suitability for water services and low suitability for transportation connectivity. As part of Clackamas County's urban and rural reserve designation process, the City of Oregon City indicated both a willingness and capability to provide service to this area.

The following cost estimates represent preliminary estimates for the major components of the individual systems. The estimates were generated using very general assumptions about the level of residential or large site industrial development that could occur in the analysis area. More detailed concept plans, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11 will be necessary to develop more refined cost estimates. Appendix 5 contains the breakdown for the transportation cost estimates. A map of the proposed collector and arterial transportation network is attached to this summary.

Sanitary Sewer Services - $8,028,000

Water Distribution Services - $6,600,000

Storm Sewer Services - $6,914,500

Transportation Services - $142,760,000

Parks – $33,200,000

Schools - $20,000,000 (New Elementary School)

ESEE Analysis

Comparative environmental, energy, economic and social consequences

Environmental

There are three small wetland areas, totaling 2 acres mostly along an unnamed tributary of Abernathy Creek, just north of S Maplelane Road. A second stream flows eastward, along S Thayer Road into Abernathy Creek just east of the analysis area. Steep slopes along the streams and particularly in the northeast corner of the analysis area may inhibit development and minimize the impact of future urbanization. Urbanization may impact wetland areas and those portions of the streams that lie near the flatter developable land, outside of the steep sloped areas.

Abernathy Creek flows along the eastern and northern edges of the study area, although the 100-year floodplain does not overlap into the area due to topography. There is approximately a 1,500 foot difference in elevation between the analysis area boundary and Abernathy Creek, providing a buffer of agricultural and forested land between potential future development and the stream corridor. Based on this buffer area, future urbanization would not significantly impact Abernathy Creek or its surrounding environmentally sensitive land. Attachment 6 contains the breakdown of the environmental factors.

Energy, Economic & Social

The majority of the parcels in this medium sized analysis area are less than five acres in size and 88% have improvements, reflecting the numerous rural residences that include two main clusters of half-acre parcels. The area also contains an 18 acre manufactured home park, adding to the developed nature of the analysis area. There is very little agricultural activities occurring in the area and much of the natural resources are located on slopes near the edges of the area, away from the flatter more developable portions. The minimal agricultural activities combined with the locations of the natural resources will reduce the potential negative economic impacts of a lost farming economy and costs for protecting natural resources. The area contains a 55-acre school site, which when developed could provide a community focus point, reducing impacts of the loss of the rural lifestyle for current residents. Much of the land to the west inside the UGB is currently undeveloped. This area is envisioned as a mixture of employment and residential uses that may help reduce the VMT for future residents by providing nearby job opportunities. Overall this analysis area has low economic, social and energy consequences from urbanization.

Avoidance of conflict with regionally significant fish and wildlife habitat

The Newell and Abernathy Creek significant natural landscape feature borders the analysis area to the east. Regionally significant riparian habitat exists along both small stream corridors in the analysis area, totaling 35 acres. There is an additional 146 acres of upland habitat, extending out of the riparian areas, the majority of which is in the northeast corner of the analysis area on the Oregon City School District property. Portions of both riparian and upland habitat acreage currently lie within areas of active agricultural activities, particularly along the small stream in the north portion of the analysis area. Oregon City, the expected governing body for the area, has adopted a habitat protection program that is compliant with Metro's Title 13 Nature in Neighborhoods. Based on the location of the majority of the significant habitat along ravines and within publicly owned land, and Oregon City's habitat conservation program, future urbanization could occur with minimal impacts to regionally significant habitat throughout most of the central and western portions of the analysis area. Development in the northeast and southern-most portions of the area may have a higher impact on significant habitat unless it is protected through a conservation program or other preservation option.

Agricultural/Forest Compatibility

Protection of farmland that is most important for the continuation of commercial agriculture in the region

The urban and rural reserves process designated the most important land for commercial agriculture as rural reserves and the most suitable land for urbanization as urban reserves. This analysis area is an urban reserve thus the farmland that is most important for the continuation of commercial agriculture in the region is protected.

Compatibility of proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

There are two separate locations where farm and/or forest land is contiguous to the urban reserve area (see attached resource land map). The first location is on the north edge of the analysis area and is composed of three timber zoned (TBR) parcels (one single parcel and two contiguous parcels) totaling 36 acres. The single parcel is directly adjacent to the anlaysis area, is partially forested and contains a single family home. Since this timber zoned parcel contains a rural residence and does not appear to be in a commercial forest use, the proposed urban uses of the reserve area would be compatible with this adjacent forest land parcel.

The two contiguous parcels, which are vacant, share a 160-foot edge with the analysis area and have a number of rural residences between them and the main portion of the analysis area. Abernethy Creek cuts through the very southern portion of the area, continuing along the western edge of the two contiguous timber zoned parcels. A steeply forested slope, that is part of the analysis area, lies between the two contiguous timber zoned parcels and the flatter main portion of the analysis area. Since the two contiguous timber zoned parcels are separated from the flat developable portion of the analysis area by a 1,600-foot forested slope, Abernethy Creek and a rural subdivision, the proposed urban uses would be compatible with the forest activities occurring on these forest land parcels.

The second larger resource land area is adjacent to the analysis area in the vicinity of S Forest Grove Loop/S Thayer Road and contains 168 acres of TBR zoned land and 437 acres of land zoned agriculture/forest (AGF). Abernethy Creek flows north through the middle of the TBR zoned land area. The TBR zoned block of resource land has a minimal connection point to the analysis area along the edges of three parcels; otherwise it is separated from the analysis area by rural residential land and a change in elevation of approximately 100 feet. The TBR zoned land contains six rural residences on large acreage with mixed forest and open lands in between. The AGF zoned block of land is separated from the analysis area by rural residences and Thimble Creek. Two parallel power line easements run in an east-west direction through the center of the AGF zoned block of land that contains numerous rural residences on a mixture of forested and open land. It appears that there are minimal active agriculture or forestry activities occurring on the land. Since this large block of resource zoned land is mostly separated from the analysis area by rural residences or a stream corridor and as minimal agricultural or forestry activities are currently

occurring on the land, the proposed urban uses would be compatible with the forest and agricultural activities occurring on these resource land parcels.

Clear transition between urban and rural lands, using natural and built features to mark the transition

Thimble Creek, portions of Abernethy Creek, and extensive forested slopes, some of which occur on the analysis area land provide natural features that mark a clear transition between urban and rural lands.

2040 Growth Concept

Contribution to the purposes of Centers

The Oregon City Regional Center is the closest regional center to the Maplelane analysis area. It is 414 acres in size, serves Clackamas County and some neighboring cities to the south. The regional center is linked to the analysis area by Highway 213/S Maplelane Road (3.2 miles). Tri-Met lines 32 & 33 run from the regional center to Clackamas Community College, approximately one mile from the analysis area.

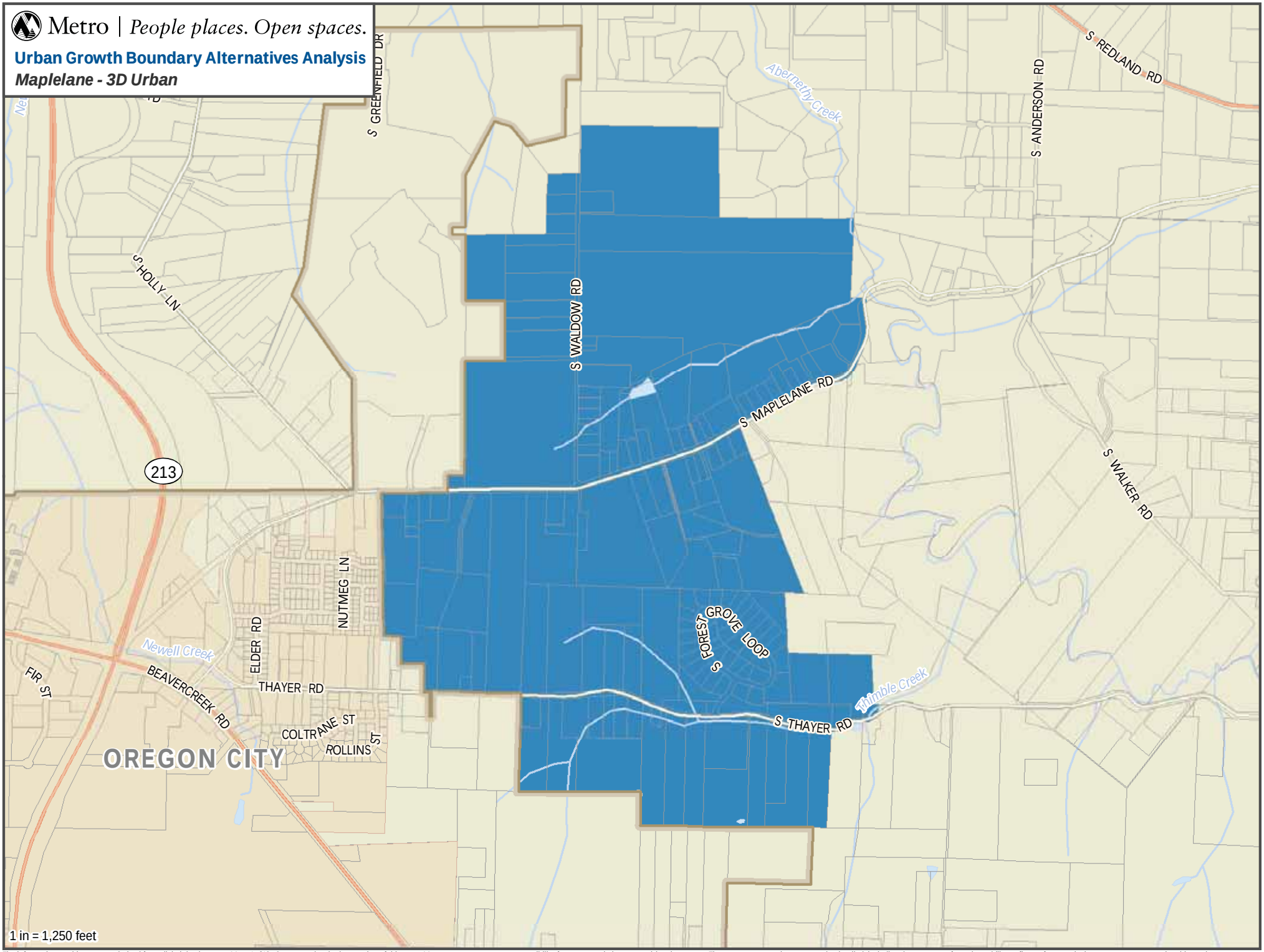
The Oregon City Downtown Community Plan envisions a community that celebrates Oregon City's historic past while promoting a positive change for the future. The plan emphasizes the creation of pedestrian-friendly places, varied mixed use developments, new open space and civic amenities. It also strives to reestablish Oregon City's historical prominence by protecting and strengthening historic themes and features unique to Oregon City. According to Metro's State of the Centers Report, January 2009, the Oregon City Regional Center's jobs to housing ratio is very high and the total number of people per acre is low, indicating that the regional center needs to attract more housing to meet the city's vision for a pedestrian friendly environment.

Urbanization of the Maplelane analysis area will not contribute to the vision or the purpose of the Oregon City Regional Center. The analysis area is too isolated from to the center to help support the need for more people to meet a higher level of activity. In addition, the availability of housing opportunities in the analysis area could detract from the city's desire for mixed use development in the center.

Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

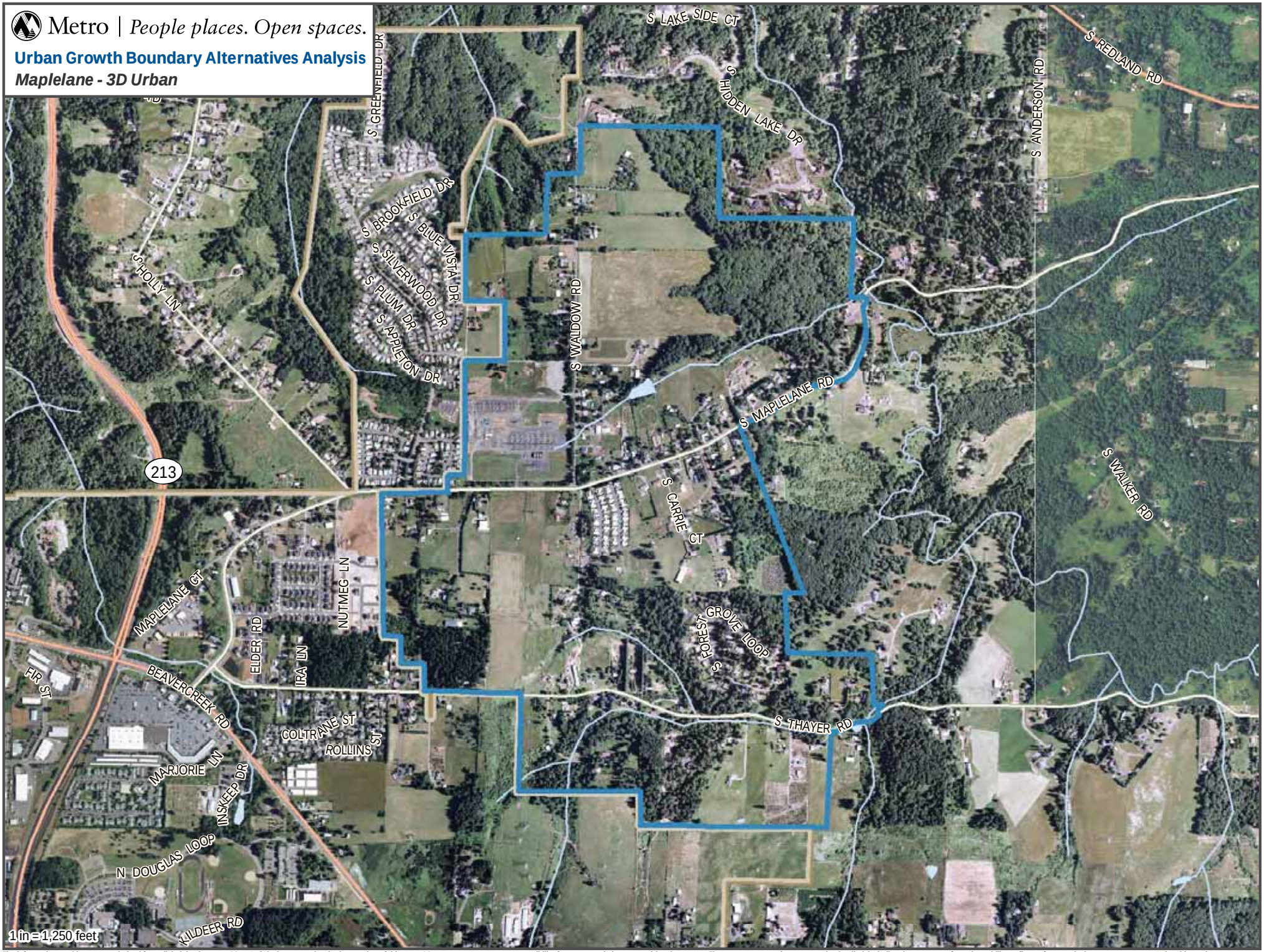
Maplelane - 3D Urban



Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

Maplelane - 3D Urban

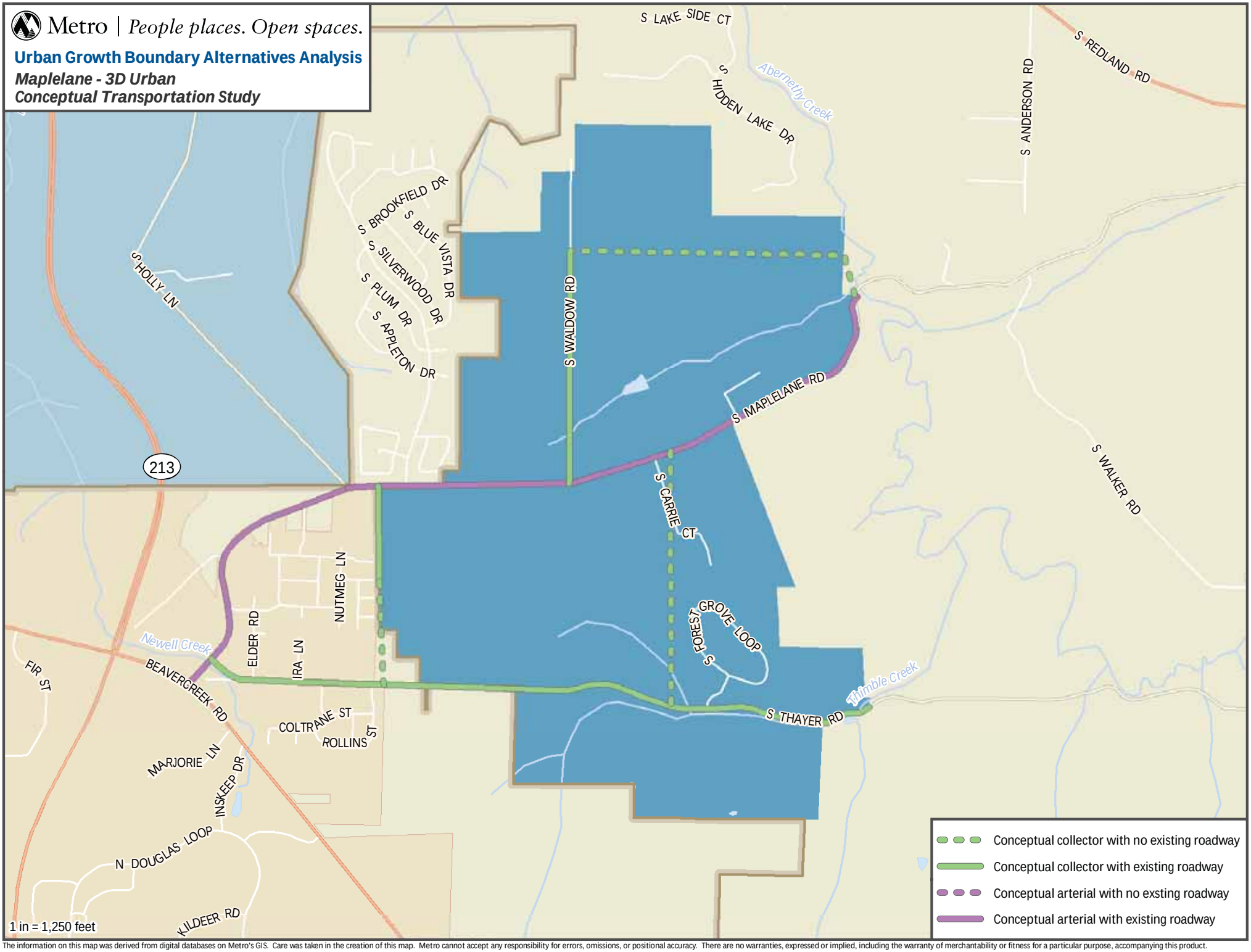


Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

Maplelane - 3D Urban

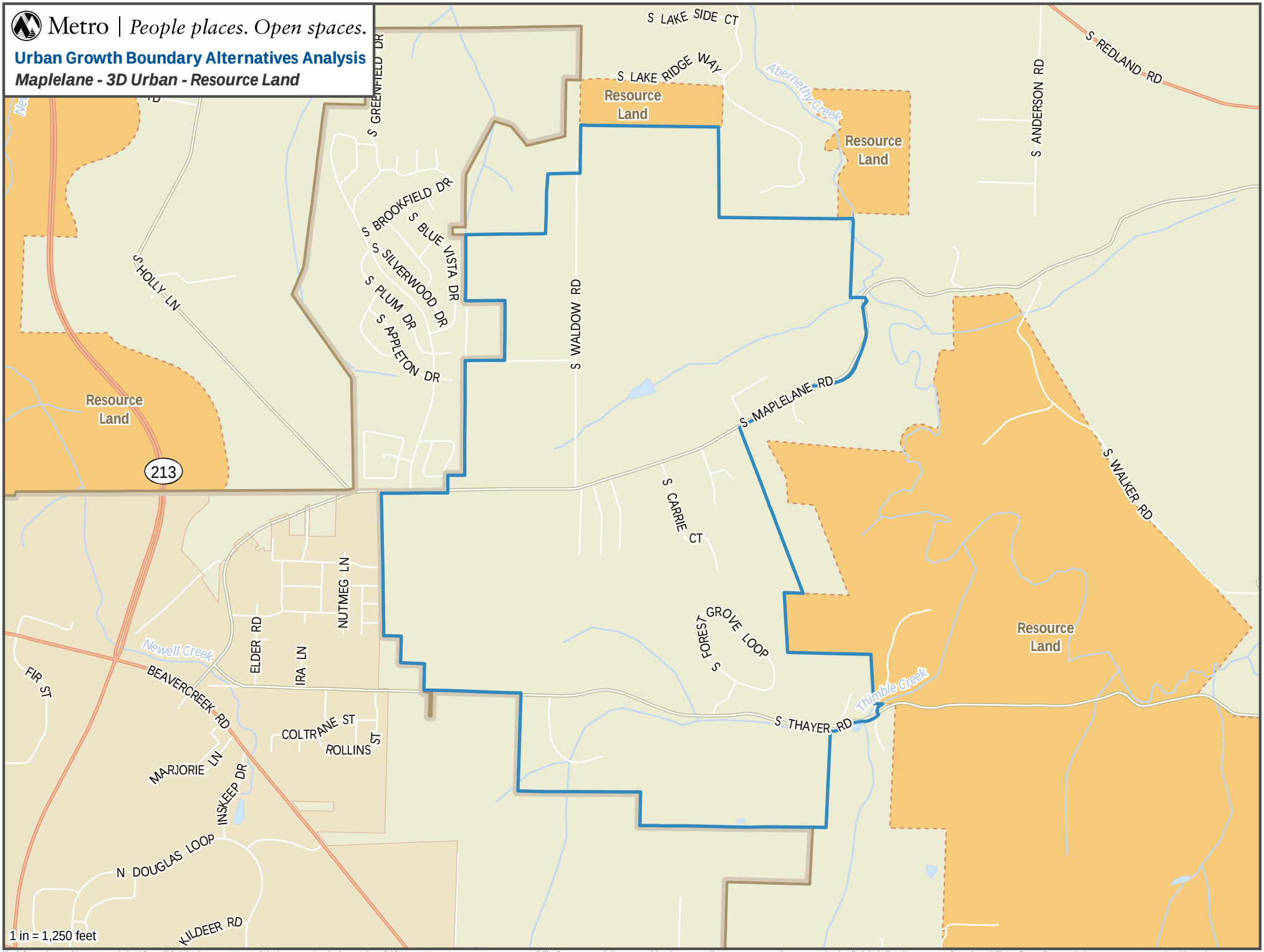
Conceptual Transportation Study



Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

Maplelane - 3D Urban - Resource Land



BEAVER CREEK BLUFFS ANALYSIS AREA (3G)

Beaver Creek Bluffs Analysis Area		**Total Acres**	**227**
Gross Vacant Buildable Acres	124	Total Constrained Acres	103
Estimated Dwelling Unit Capacity	1,052	• Title 13 Significant Habitat	83
Estimated Employment Acres		• Public Land	

General Description (see attached map)

The Beaver Creek Bluffs Analysis Area is composed of 3 sub-areas along the bluffs to the south of Oregon City. The eastern sub-area, bounded by the current UGB to the northeast and Mud and Caufield Creek drainages to the southeast and west, has two parts separated by the UGB boundary. The second, central sub-area sits between Mud Creek and another tributary of Beaver Creek, bounded by S Leland Road to the east, bluffs to the south and west, and the UGB to the north. The third western sub-area extends across S Center Point Road, sitting between the bluffs overlooking Beaver Creek and the current UGB to the north. There are a total of 227 acres within these three areas, although 22 of those acres are constrained by steep slopes over 25% along the bluffs. The rest of the areas are generally flat, and form a logical extension of the current UGB up to the edge of the bluffs.

Parcelization, Building Values, Development Pattern (see attached aerial photograph)

The area contains 34 parcels, although three of those within the central sub-area extend out over the bluffs and beyond the boundary of the analysis area. The eastern sub-area contains three parcels ranging from four to ten acres. The central sub-area contains 17 parcels that are mostly less than five acres. The western sub-area contains 14 parcels, ranging from less than one to 40 acres. Overall, 26 of the 34 tax lots have improvements, with a median value of $161,930. Only five of those improvements are valued over $250,000. Thirteen of the tax lots are greater than five acres in size, and 21 are smaller than five acres. Given the location between urban development within the UGB and steep bluffs, there is minimal agricultural activity in the area. Most land uses are rural residential, although a few of the larger parcels do appear to have minor agricultural uses.

There is a power line running through the western sub-area, crossing through five parcels, and covering approximately 16 acres of land within the study area. The Nature Conservancy owns a large parcel that is being preserved as open space immediately adjacent to the eastern edge of the western sub-area. There is no other evidence of public easements.

GOAL 14 LOCATIONAL FACTORS (METRO CODE SECTION 3.01.020)

Public Facilities and Services

Orderly and economic provision of public facilities and services

The preliminary sanitary sewer, water and transportation suitability analyses completed by the Core Four Technical Team for the urban and rural reserve study area indicated this general location had low suitability for sanitary sewer services, high suitability for water services and low suitability for transportation connectivity. It should be noted that the transportation and sewer suitability analyses included this small analysis area in with the much larger area south of Oregon City that is located below the bluff. As part of Clackamas County's urban and rural reserve designation process, the City of Oregon City indicated both a willingness and capability to provide service to this area.

The following cost estimates represent preliminary estimates for the major components of the individual systems. The estimates were generated using very general assumptions about the level of residential or large site industrial development that could occur in the analysis area. More detailed concept plans, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11 will be necessary to develop more refined cost estimates. Attachment 5 contains the breakdown for the transportation cost estimates. A map of the proposed collector and arterial transportation system is attached to this summary.

Sanitary Sewer Services - $4,116,000

Water Distribution Services - $3,290,000

Storm Sewer Services - $2,587,500

Transportation Services - $64,140,000

Parks - $5,960,000

Schools - $250,000 (No new schools needed)

ESEE Analysis

Comparative environmental, energy, economic and social consequences

Environmental

Approximately 327 feet of Mud Creek flows through a ravine on the edge of the eastern sub-area and about 3,200 feet of an unnamed stream flows south through the western sub-area. A 1,200 foot segment of this stream, including an associated 1.5 acre wetland is located on the flat portion of the area above the bluff. Beaver Creek lies below the analysis area, approximately 2,000 ft south of the bluffs that form the southern edge. Urbanization of this area may impact the steam and wetland on

the flatter portion of the western sub-area, but the remainder of the stream is located down the bluff and would be minimally impacted. The eastern sub-area stream would not be impacted by urbanization as it is located over 200 feet from the flat portion of the area. Overall urbanization of the area could occur with some impacts to the stream corridor in the western sub-area along the flat portions where development would be easier. Attachment 6 contains the breakdown of the environmental factors.

Energy, Economic & Social

This area is made up of three very small land areas, half of which are adjacent to urban subdivisions and the other half adjacent to undeveloped urban land zoned single family residential. The main use in the area is rural residential and 76% of the parcels have improvements. Existing urban streets provide the majority of the access points to these parcels. Urbanization of this area will not negatively impact the general activity of the residents as these small isolated areas are in effect more urban than rural due to their location. There are minimal agricultural activities occurring in this area and the majority of the natural resources are located on slopes near the edges of the area. The lack of agricultural activities combined with the locations of the natural resources will greatly reduce the potential negative economic impacts of a lost farming economy and costs for protecting natural resources. The additional VMT generated through urbanization of this very small area will be minimal. Overall this analysis area has low economic, social and energy consequences from urbanization.

Avoidance of conflict with regionally significant fish and wildlife habitat

A very limited amount of regionally significant riparian habitat has been identified on 20 acres within the analysis area, along both Mud Creek and the small tributary flowing into Beaver Creek from the western sub-area. Regionally significant upland habitat, covering an additional 63 acres, occurs primarily along the steeper slopes of the bluffs that form the southern boundary of the analysis area, away from the flatter developable portion of the area. Oregon City, the expected governing body for the area, has adopted a habitat protection program that is compliant with Metro's Title 13 Nature in Neighborhoods. Based on the limited amount of riparian habitat, the upland habitat being generally located away from the developable portion of the analysis area, and Oregon City's habitat protection program, urbanization can take place with minimal disturbance of the regionally significant fish and wildlife habitat.

Agricultural/Forest Compatibility

Protection of farmland that is most important for the continuation of commercial agriculture in the region

The urban and rural reserves process designated the most important land for commercial agriculture as rural reserves and the most suitable land for urbanization as urban reserves. Designation of this area as an urban reserve means farmland within this analysis area is not the most important for the continuation of commercial agriculture in the region.

Compatibility of proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

The entire edge of the Beaver Creek Bluffs analysis area borders resource zoned land (see attached resource land map). The vast majority of the resource land is zoned timber (TBR) except for a small portion of exclusive farm use (EFU) zoned land in the vicinity of S Central Point Road and S Geiger Road. There are significant slopes along almost the entire edge of the analysis area, most of which are forested except in those areas where the reserve abuts an approximate 250-foot power line easement.

The small portion of EFU zoned land that is located between the analysis area and Beaver Creek is being farmed, although there are significant pockets of forest land and some rural residences intermixed. This small area of agricultural activity is mainly in the form of field crops and pasture land. Beaver Creek provides an edge to the larger block of EFU land to the south that also includes nursery stock. The majority of the adjacent TBR zoned land drops steeply to the south from the analysis area. Most of these parcels include rural residences and streams, including Mud and Canfield Creeks.

Due to the very limited nature of the nearby agricultural and forest activities, the relatively small area between the analysis area and Beaver Creek that potentially could be impacted, the significant change in elevation between the analysis area and the resource lands, and the number of rural residences spread throughout, the proposed urban uses would be compatible with the nearby agricultural and forest activities occurring on farm and forest land.

Clear transition between urban and rural lands, using natural and built features to mark the transition

The forested slope south of the analysis area along with Beaver Creek and its tributaries, including Mud and Canfield Creeks, provide a clear transition between urban and rural lands.

2040 Growth Concept

Contribution to the purposes of Centers

The Oregon City Regional Center is the closest regional center to the Beaver Creek Bluffs analysis area. It is 414 acres in size, serves Clackamas County and some neighboring cities to the south. The regional center is linked to the analysis area by S Central Point Road/S Linn Road (3.1 miles) and S Leland Rd/S Linn Rd (3.1 miles). Tri-Met lines 32 & 33 run from the regional center to Clackamas Community College, approximately two miles from the analysis area.

The Oregon City Downtown Community Plan envisions a community that celebrates Oregon City's historic past while promoting a positive change for the future. The plan emphasizes the creation of pedestrian-friendly places, varied mixed use developments, new open space and civic amenities. It also strives to reestablish Oregon City's historical prominence by protecting and strengthening historic themes and features unique to Oregon City. According to Metro's State of the Centers

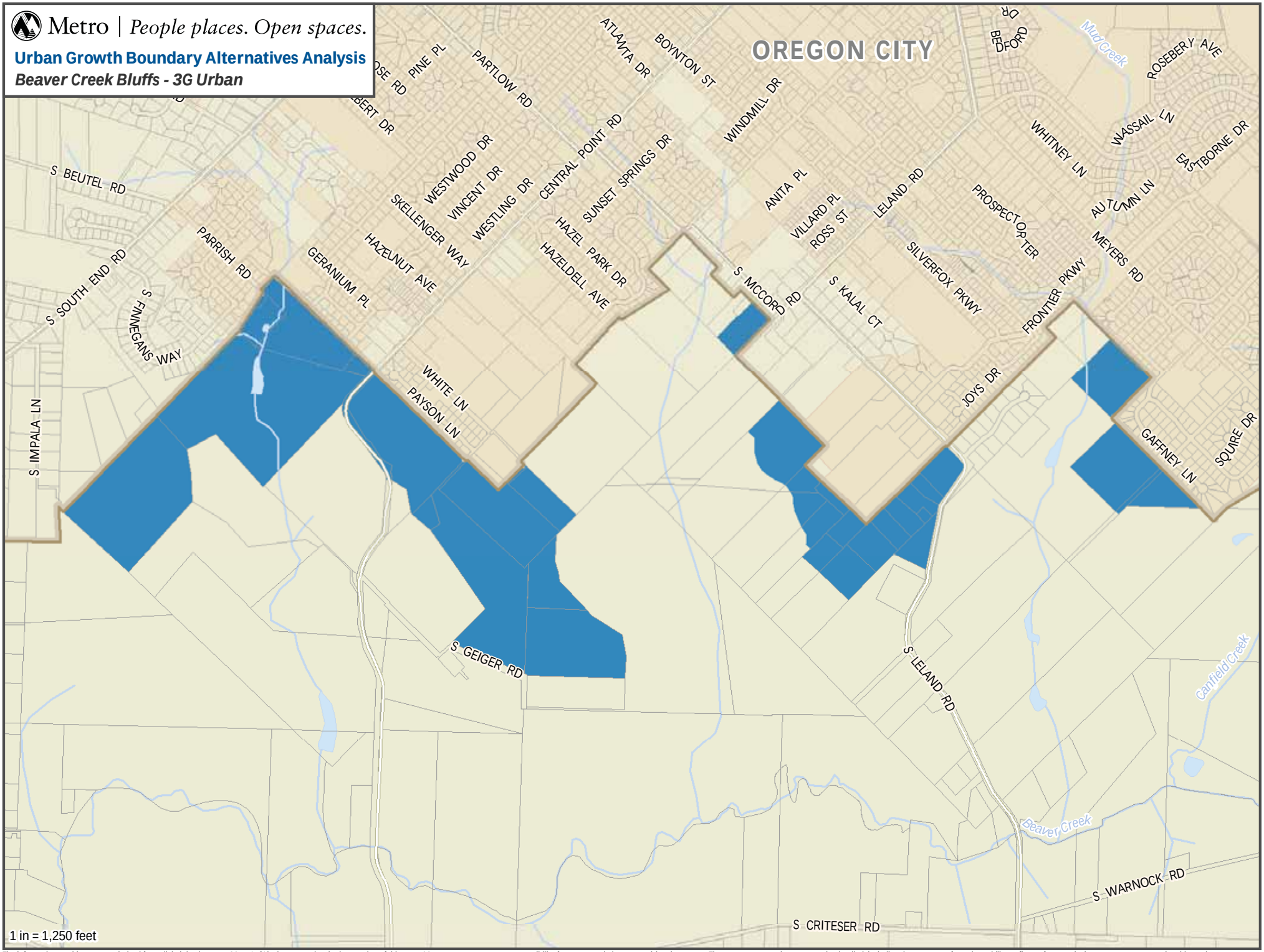
Report, January 2009, the Oregon City Regional Center's jobs to housing ratio is very high and the total number of people per acre is low, indicating that the regional center needs to attract more housing to meet the city's vision for a pedestrian friendly environment.

Urbanization of the Beaver Creek Bluffs analysis area will not contribute to the vision or the purpose of the Oregon City Regional Center. The analysis area is too isolated from the center to support the need for more people to meet a higher level of activity.

Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

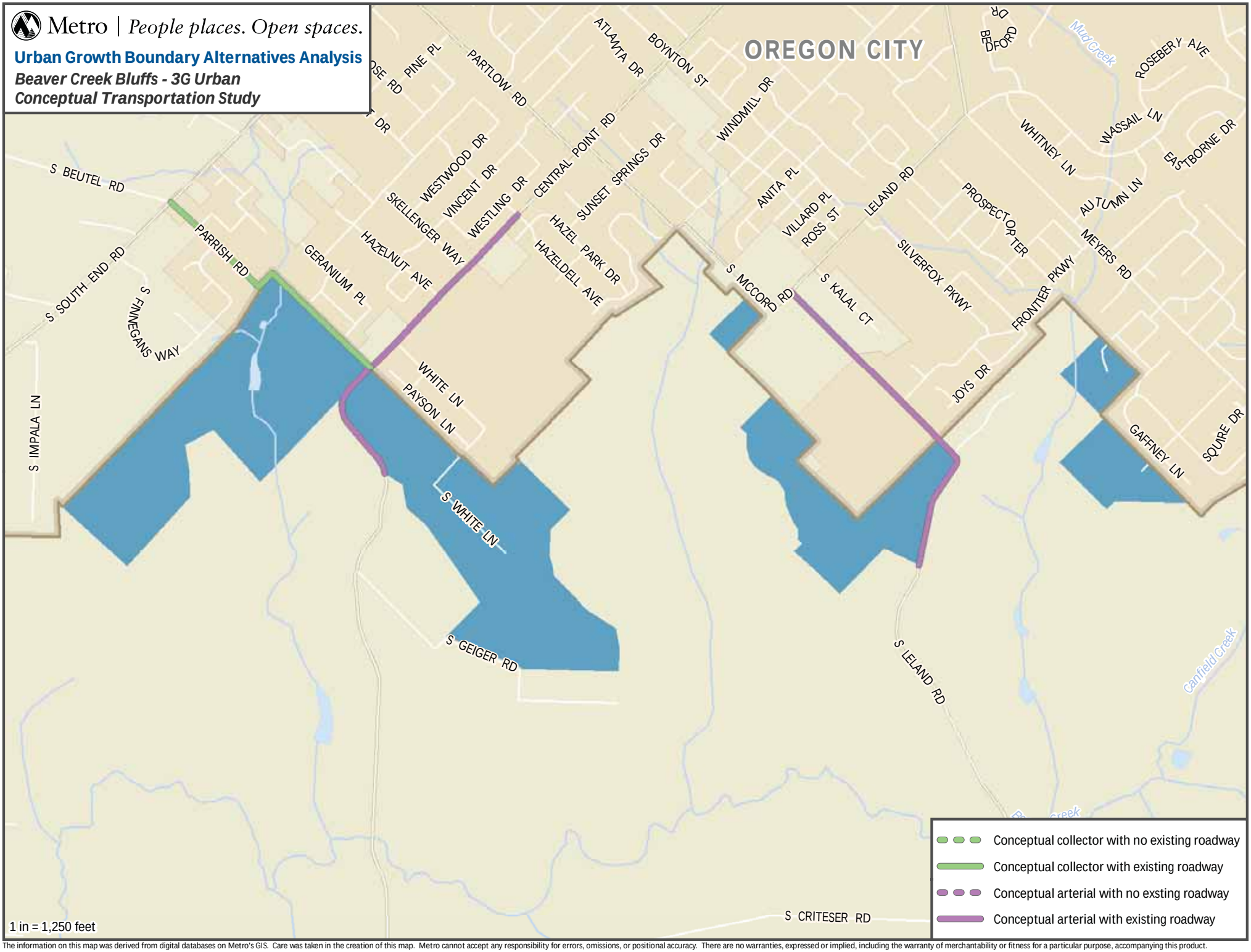
Beaver Creek Bluffs - 3G Urban

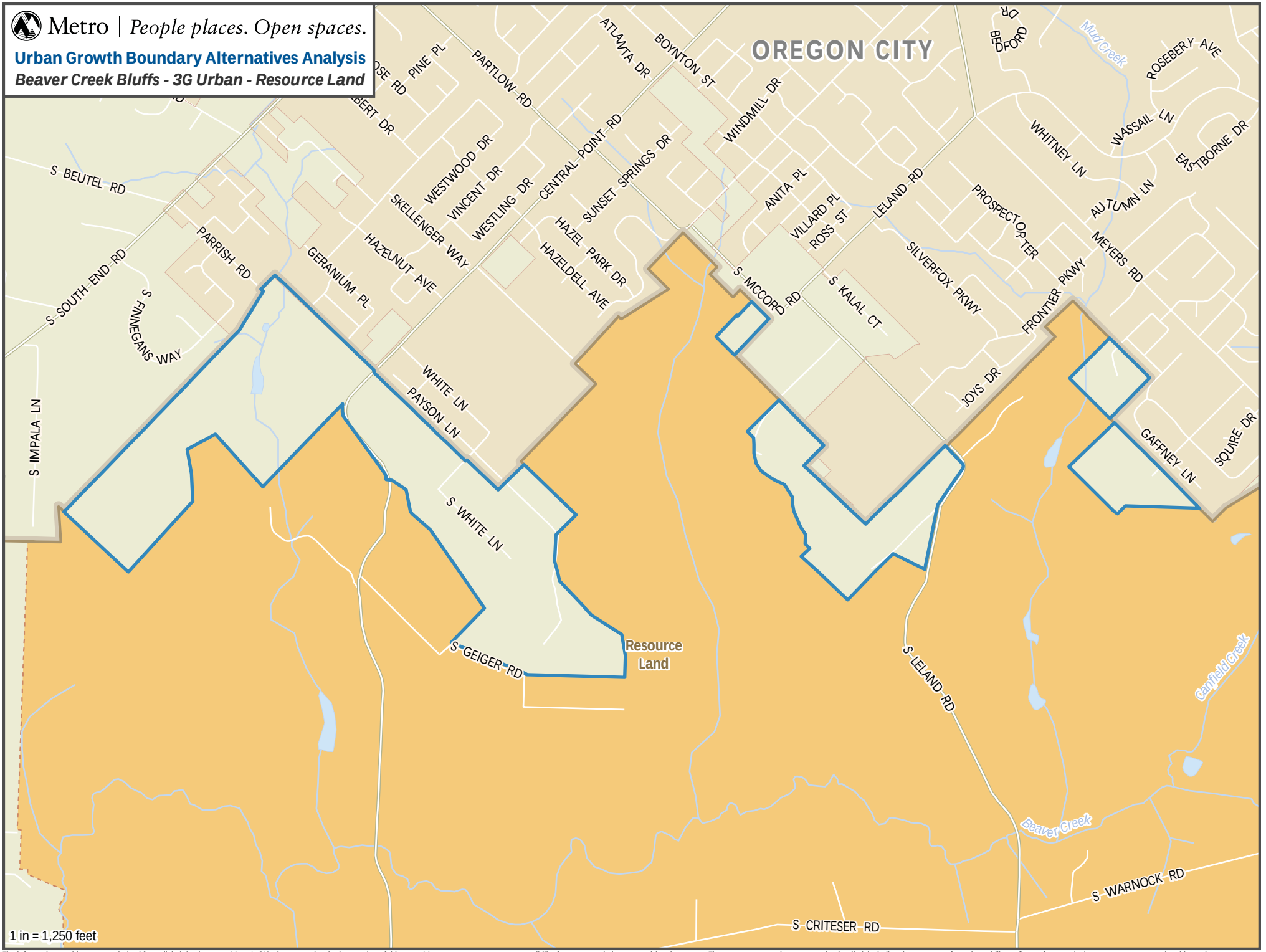


Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

Beaver Creek Bluffs - 3G Urban





NORWOOD ANALYSIS AREA (4D PARTIAL)

Norwood Analysis Area		**Total Acres**	**337**
Gross Vacant Buildable Acres	286	Total Constrained Acres	51
Estimated Dwelling Unit Capacity	3,331	• Title 13 Significant Habitat	46
Estimated Employment Acres		• Public Land	0

General Description (see attached map)

The Norwood Analysis Area, a portion of the larger Norwood Urban Reserve Area, is a rectangular area that lies to the east of I-5, in the vicinity of SW Stafford Road. The area is 337 acres in size and is not adjacent to the current UGB. The Clackamas-Washington County line and SW 65th Avenue form the western boundary, with the remaining three edges defined by tax lot lines. The southern edge extends ½ mile east from the intersection of SW 65th Avenue and SW Stafford Road, then extends north for approximately one mile to form the eastern edge. SW Stafford Road bisects the area diagonally from the northeast corner to the southwest. I-5 is easily accessible via SW Elligsen Road, just over one mile to the west.

Parcelization, Building Values, Development Pattern (see attached aerial photograph)

The analysis area contains a total of 64 tax lots, 54 of which have improvements. The median value of improvements on these lots is $273,085, and 31 have building values over $250,000. Parcel sizes range from 0.4 acres to 30 acres, with a median size of 4.5 acres and 31 parcels at least five acres in size. Most of the smaller parcels lie along and between SW Stafford Road and SW Gage Road. Land use within the analysis area is a mix of agriculture, forest and rural residential. Agricultural and forest uses include field crops, christmas tree farms, and nurseries. This analysis area is primarily characterized by larger lot rural residential, consistent with the surrounding development pattern to the north, east and west.

There is no evidence of power lines or other public easements, and there is no identified public land within the study area.

GOAL 14 LOCATIONAL FACTORS (METRO CODE SECTION 3.01.020)

Public Facilities and Services

Orderly and economic provision of public facilities and services

The preliminary sanitary sewer, water and transportation suitability analyses completed by the Core Four Technical Team for the urban and rural reserve study area indicated this general location had high suitability for sanitary sewer services, medium suitability for water services and low suitability for transportation connectivity.

The following cost estimates represent preliminary estimates for the major components of the individual systems. The estimates were generated using very general assumptions about the level of residential or large site industrial development that could occur in the analysis area. More detailed concept plans, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11 will be necessary to develop more refined cost estimates. Attachment 5 contains the breakdown for the transportation cost estimates. A map of the proposed collector and arterial transportation system is attached to this summary.

Sanitary Sewer Services - $13,170,000

Water Distribution Services - $5,990,000

Storm Sewer Services - $6,303,000

Transportation Services - $80,580,000

Parks - $35,920,000

Schools - $15,000,000 (New Elementary School)

ESEE Analysis

Comparative environmental, energy, economic and social consequences

Environmental

There are two identified streams, Boeckman and Newland Creeks that total 1.3 miles in length, although it appears from aerial photography that the upper headwaters remain dry for much of the year. The topography of the area is predominantly flat, with less than three percent of the area having slopes greater than 25%. Given that much of the identified streams and wetlands are already impacted by rural development and the absence of significant riparian areas, future development would have minimal impact on these environmental resources within the analysis area. Attachment 6 contains a breakdown of the environmental factors.

Energy, Economic & Social

About half of the parcels in this small analysis area that is not adjacent to the current UGB are less than five acres in size and 84% have improvements, reflecting the rural residential nature of the area. There are very few agricultural activities occurring in the area. The minimal level of agricultural activity will reduce the potential negative economic impacts of a lost farming economy. Ten percent of the area has been identified as riparian habitat, mainly along Boeckman Creek that flows through the center of the area near SW Stafford Road. Due to the location of these resources in the center of the area, the costs for protecting them will be considerable in contrast to the potential economic impact of urbanizing some of the small areas in between the resources. Urbanization will negatively impact the rural lifestyle for current residents as the area contains the highest median building value and the median size of the parcels is 4.5 acres, which is representative of the many large homes on fairly sizeable sites. In addition, as this area is not directly adjacent to the UGB, additional land to the west will also need to be added to the UGB, resulting in a much larger negative impact on the rural nature of the area. Additional VMT will be generated through urbanization of this small sized area as its average commute distance is larger than the existing average commute distance for the region. Overall this analysis area has medium economic, social and energy consequences from urbanization.

Avoidance of conflict with regionally significant fish and wildlife habitat

There are 34 acres of identified riparian habitat surrounding the streams in the area, and a small 0.12 acre wetland in the northwest portion of the study area. Another 12 acres of upland habitat surrounds riparian areas and extends outward in the northwest quadrant of the analysis area. However, much of the identified habitat occurs on parcels currently in active agriculture or developed as single-family residential. The consistently flat topography within the area creates some threat to existing riparian and upland habitat. It is not immediately clear who will act as the governing entity for this analysis area, although Wilsonville and Tualatin, the two nearest cities capable of serving the area, currently have adopted natural resource protection and habitat conservation policies or overlay districts that are in compliance with Metro's Title 13 Nature in Neighborhoods program. Based on these factors there may be some risk to regionally significant riparian and upland habitat, but impacts of urbanization can be mitigated through habitat conservation programs established by the governing body.

Agricultural/Forest Compatibility

Protection of farmland that is most important for the continuation of commercial agriculture in the region

The urban and rural reserves process designated the most important land for commercial agriculture as rural reserves and the most suitable land for urbanization as urban reserves. Designation of this area as an urban reserve means farmland within this analysis area is not the most important for the continuation of commercial agriculture in the region.

Compatibility of proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

There are two locations where farm land is adjacent to the analysis area (see attached resource land map). The first area is located at the northwest corner of the analysis area and is a 446 acre block of exclusive farm use (EFU) zoned land that connects to the area at SW Frobase Road. This farm land area is a mixture of forested and open parcels that contain a few rural residences, two domestic water storage tanks and field crops. The agricultural activities are concentrated near SW Elligsen Road in the south and SW Frobase Road in the north. The majority of this resource land area is separated from the analysis area by topography and the rural residences along SW 65th Avenue, with the exception of the farm land near the intersection of SW Frobase Road and SW 65th Avenue. SW 65th Avenue provides a western edge to the analysis area and, in combination with the rural residences along the roadway and the change in topography, would make the proposed urban uses compatible with the adjacent agricultural activities occurring on farm land to the west. Increased traffic along SW Frobase Road due to new urban uses within the analysis area may impact agricultural activities on the resource lands fronting the roadway; however it is unlikely that there would be a great increase in traffic as SW Frobase Road does not connect to the regional system. The proposed urban uses would not be compatible with the agricultural activities that occur on the one small section of farm land north of SW Frobase Road. However mitigation measures could reduce conflicts between the proposed urban uses and agricultural activities occurring outside the UGB in this location. As noted previously, this area is not directly adjacent to the UGB, so some of the farm land that is located west of the analysis area will also be added to the UGB to connect this area to the current UGB.

The second location of farm land is south of the analysis area, extending to the Willamette River. This very large block of farm land contains numerous agricultural activities, bisected by forested stream corridors and pockets of rural residences. Newland Creek and its associated riparian corridor provides a buffer to the extensive agricultural activities occurring east of SW 45th Drive, but there is no edge or buffer for the agricultural activities occurring near SW Homesteader Road, SW Briar Patch Lane and SW Kahle Road. Increased traffic along SW Stafford Road due to new urban uses within the analysis area may impact agricultural activities on the resource lands in this area, but the majority of increased traffic would most likely head towards I-205 or I-5, bypassing this farm land. The proposed urban uses would not be compatible with the agricultural activities that occur on this pocket of farm land to the south. However mitigation measures could reduce conflicts between the proposed urban uses and agricultural activities occurring outside the UGB in this location.

There is a third area of farm land located east of SW Newland Road. This farm land area is separated from the analysis area by a significant hill that essentially isolates the agricultural activities from the analysis area, thus the proposed urban uses would be compatible with the agricultural activities occurring on farm land in this location.

Clear transition between urban and rural lands, using natural and built features to mark the transition

Newland Creek provides a clear transition area for the rural lands southeast of the analysis area, however there are no natural or built features to mark the transition for the rural lands directly south of the analysis area. To the east, the change in topography that occurs between the analysis area and SW Newland Road provides a transition area between urban and rural lands. There are no natural or built features that mark a clear transition between urban and rural lands to the south or north. SW 65th Avenue provides an edge between urban and rural land to the west. Even assuming SW 65th Avenue develops as a connector in the future, the road itself will not provide a clear transition area between future urban and rural uses in this location. Additional buffers will need to be incorporated into the planning of the urban reserve analysis area for the rural lands to the north, west and south. The rural lands west of SW 65th Avenue and to the north of the analysis area are included in the 4G/4F and 4D urban reserve areas and may be included in the UGB in the future. Thus, any buffers that are incorporated into the planning study for the analysis area should consider the potential for making urban form connections in these locations in the future.

2040 Growth Concept

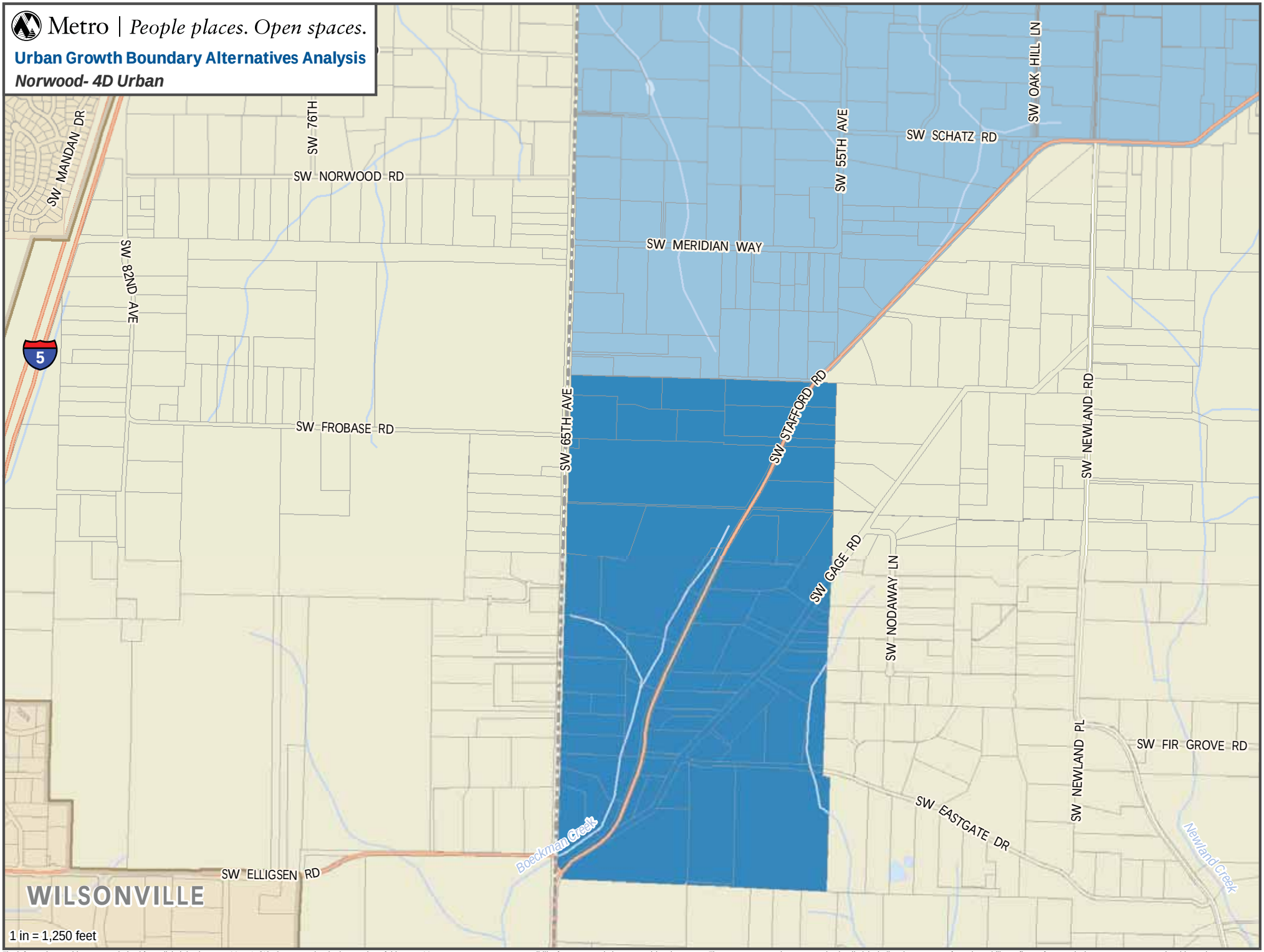
Contribution to the purposes of Centers

The Norwood analysis area is located equidistant between the Wilsonville Town Center to the southwest and the Tualatin Town Center to the northwest. Wilsonville's center is 166 acres in size, and serves primarily the City of Wilsonville, and is linked to the analysis area by SW Stafford Road/SW Wilsonville Road (2.6 miles). No Tri-Met services connect the analysis area to this center. The City of Wilsonville's bus system, SMART, also does not connect the analysis area to the center. Tualatin's center is approximately 325 acres in size, and primarily serves the surrounding residential areas in the City of Tualatin. The analysis area is connected to Tualatin via SW 65th Avenue to SW Nyberg Road (3.2 miles). There is no Tri-Met service connecting Tualatin and the Norwood Analysis Area, although the line 96 bus stops at SW Commerce Circle, just west of I-5. Both Wilsonville and Tualatin centers can also be accessed via I-5 (3.4 and 5 miles respectively).

Tualatin's Town Center Plan envisions a mixed use live, work and play center that integrates natural resources like the Tualatin River and incorporates civic, social, economic and cultural functions in a walkable destination community. According to Metro's State of the Centers Report, January 2009, the Tualatin Town Center has a lower than ideal number of people per acre and slightly below average number of dwellings per acre. Wilsonville's Town Center, which includes an area just east of I-5, is envisioned to be a dense, mixed used community that creates a walkable, pedestrian-oriented environment. Metro's State of the Centers Report shows a higher than average jobs to housing ratio, and fewer people and dwellings per acre than desired and needing more infill and redevelopment to boost urban densities.

Urbanization of the Norwood analysis area will not contribute to the vision or purpose of either the Wilsonville or Tualatin Town Center. In order to support either center, additional urban reserve

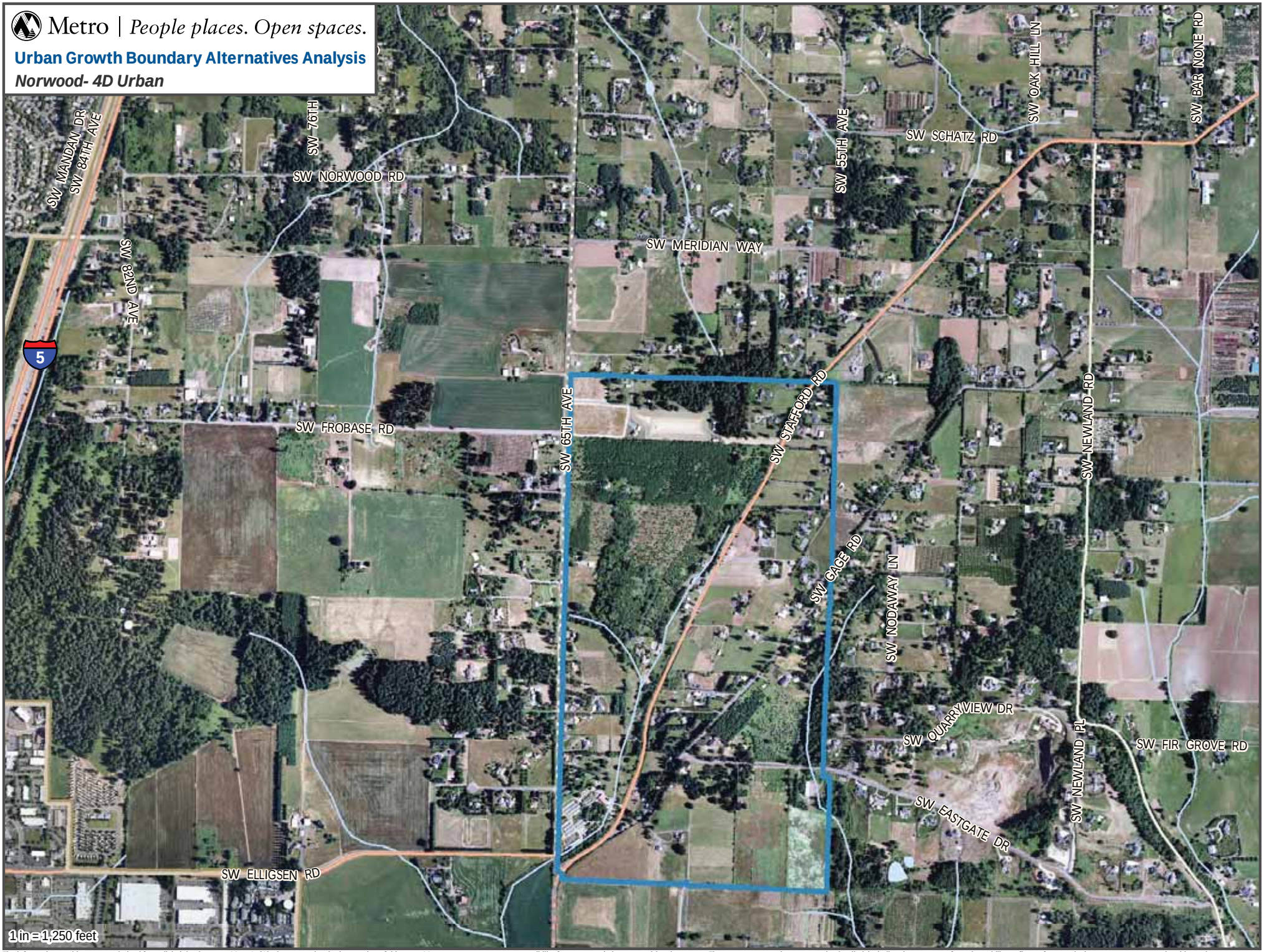
land would have to be added to create continuous urban development. In addition, the potential for housing development in the analysis area could negatively impact the desire for both town centers to create more infill development and housing to create a more balanced jobs housing ratio.

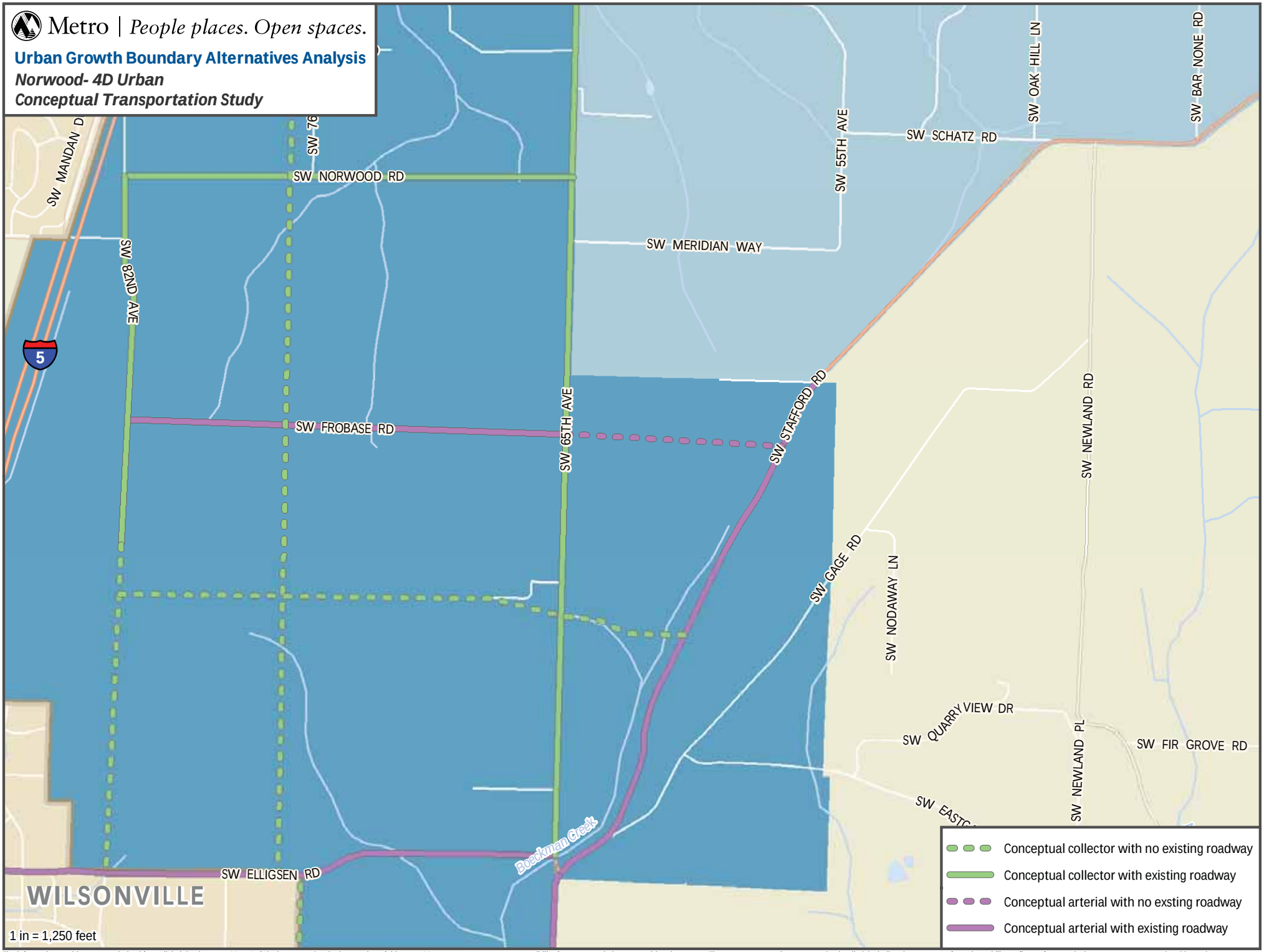


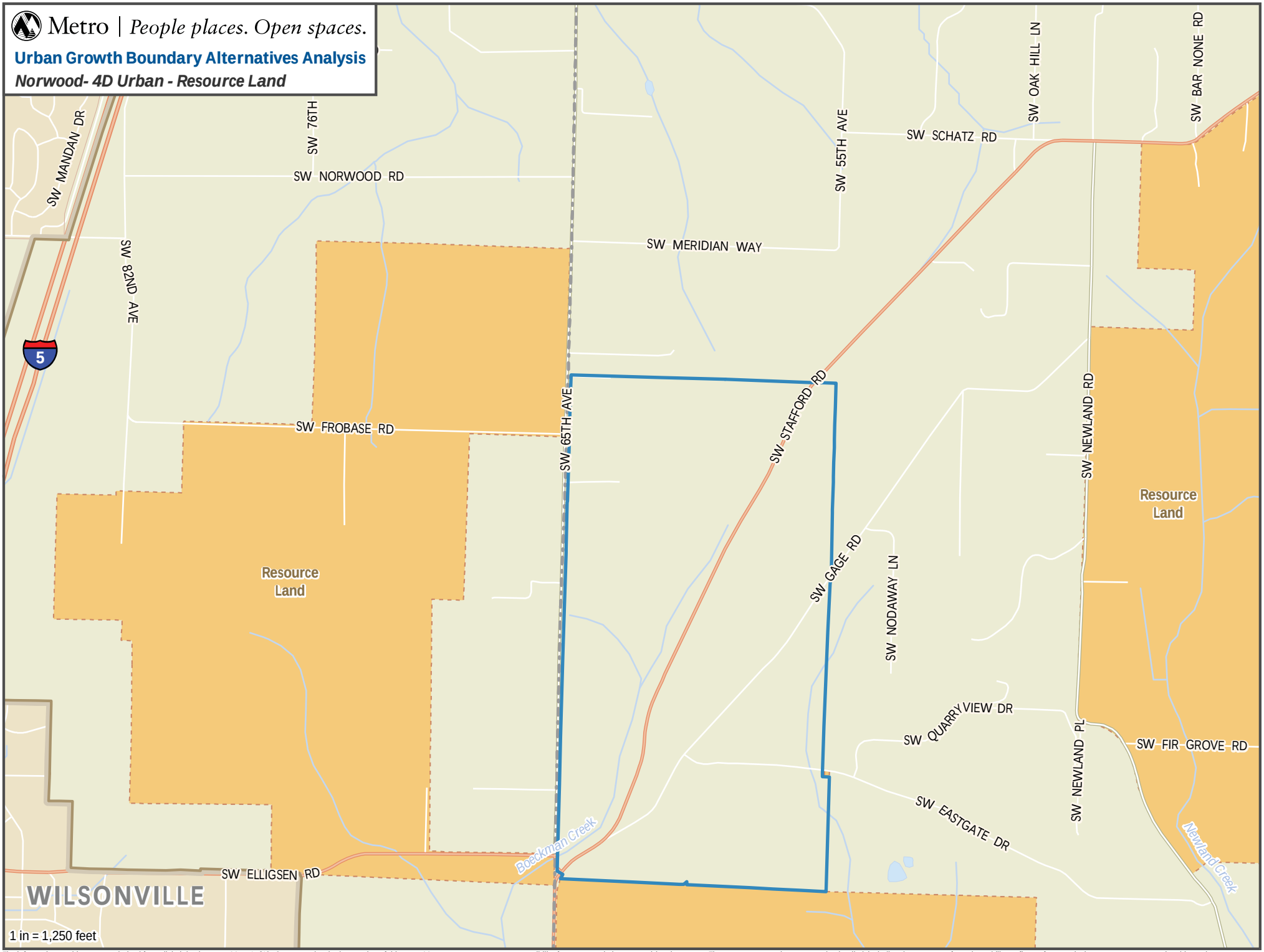
Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

Norwood- 4D Urban







I-5 EAST ANALYSIS AREA (4E)

I-5 East (1) Analysis Area		**Total Acres**	**848**
Gross Vacant Buildable Acres	558	Total Constrained Acres	290
Estimated Dwelling Unit Capacity	6,795	• Title 13 Significant Habitat	281
Estimated Employment Acres		• Public Land	0

General Description (see attached map)

The I-5 East Analysis Area is located immediately to the north of the Elligsen Analysis Area and completely within unincorporated Washington County. The total area is 848 acres, and is bounded by I-5 to the west, I-205 to the north, the Clackamas/Washington County line and SW 65th Avenue to the east, and SW Frobase Road to the south. The area is served by primarily by SW 65th Avenue, with access to I-5 to the south via SW Elligsen Road and access to I-205 via SW Stafford Road. Travel across I-5 and I-205 from the study area is limited to SW Norwood Road and SW 65th Avenue respectively. The area contains numerous flat sections located between riparian corridors along Saum Creek and its tributaries. A map of the analysis area is attached.

Parcelization, Building Values, Development Pattern (see attached aerial photograph)

This analysis area contains 158 total parcels. About one-third of the parcels are over five acres, and the median lot size is three acres. More than 85% of tax lots have improvements, though only 30 lots have improvement values over $250,000. The median improvement value is $145,580. Land use in the study area is primarily rural residential, with some agricultural uses along the southern edge and in the northeast that appear to include several lots in active crop production. The development pattern to the east of the study area is almost exclusively large-lot rural residential.

There is no evidence of power lines or other public easements, and there is no identified public land within the study area. An aerial photo of the analysis area is attached.

GOAL 14 LOCATIONAL FACTORS (METRO CODE SECTION 3.01.020)

Public Facilities and Services

Orderly and economic provision of public facilities and services

The preliminary sanitary sewer, water and transportation suitability analyses completed by the Core Four Technical Team for the urban and rural reserve study area indicated this general location had high suitability for sanitary sewer services, medium suitability for water services and low suitability for transportation connectivity. The City of Tualatin's Pre-Qualifying Concept Plan, completed as part of the Washington County urban and rural reserve designation process, indicates that the city is interested in providing urban services to this area in the long-term.

The following cost estimates represent preliminary estimates for the major components of the individual systems. The estimates were generated using very general assumptions about the level of residential or large site industrial development that could occur in the analysis area. More detailed concept plans, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11 will be necessary to develop more refined cost estimates. Attachment 5 contains the breakdown for the transportation cost estimates. A map of the proposed collector and arterial transportation system is attached to this summary.

Sanitary Sewer Services - $15,852,000

Water Distribution Services - $3,605,000

Storm Sewer Services - $2,652,500

Transportation - $124,290,000

Parks - $70,920,000

Schools - $20,000,000 (New Elementary School)

ESEE Analysis

Comparative environmental, energy, economic and social consequences

Environmental

More than five miles of streams run through the area, including Saum Creek and several of its unnamed tributaries. These stream corridors and their associated steeper slopes create a divided landscape in the northern portion of the analysis area, with flatter developable land extending in between the steeper fingers of ravines. Topography across the area, other than ravines, is generally flat, with only 50 acres of land with slopes greater than 25%. Of those 50 acres, 18 lie along stream corridors. These conditions create a fractured development area in the northern half of the analysis

area, limiting the connectivity potential of future urbanization and increasing the pressure on existing environmental resources. Steeper slopes surrounding much of the riparian area could reduce the impact of urbanization; however the associated riparian and upland habitat on the flatter areas may be at risk. There are no identified parks or open space within the study area. Attachment 6 contains the breakdown of the environmental factors.

Energy, Economic & Social

This large analysis area, with 70% of the parcels less than five acres in size, is almost entirely composed of rural residences. Eighty-seven percent of the 158 parcels have improvements. The area is somewhat isolated from the urban area by I-5 and I-205, adding to the rural feel of the area. Urbanization will negatively impact the rural lifestyle for the many current residents. The minimal level of agricultural activities will reduce the potential negative economic impacts of a lost farming economy. The area contains 5.6 miles of streams, the most of any analysis area. There are 280 acres of riparian and upland habitat associated with Saum Creek, flowing north through the center of the area, and its tributaries that divide this large area into much smaller portions of developable land. The costs for protecting these large environmental resource areas will be considerable in contrast to the potential economic impact of urbanizing the developable lands in between in a well connected manner. Additional VMT will be generated through urbanization of this large sized area as the average commute distance for this area is somewhat larger than the existing average commute distance for the region. Overall this analysis area has medium economic, social and energy consequences from urbanization.

Avoidance of conflict with regionally significant fish and wildlife habitat

There are 140 acres of regionally significant riparian habitat along Saum Creek and tributary stream corridors, with five acres of wetlands scattered throughout. Overall there are 281 acres of regionally significant fish and wildlife habitat throughout the study area. A portion of this habitat is currently impacted by active agricultural production in the southern portion of the analysis area. Future urbanization poses a higher risk to the upland habitat, which occurs generally on gentler slopes. The riparian habitat is mostly confined to steeper slopes, however development along stream areas or crossings to provide connectivity could threaten the riparian habitat, mainly in the northern portion of the analysis area. The City of Tualatin, the expected governing body for this area, has adopted habitat protection measures in compliance with Metro's Title 13 program through the Tualatin Basin Natural Resource Coordinating Committee's protection, which could help protect these regionally significant habitat areas and mitigate some of the impact from future urbanization. Overall, urbanization of the analysis area in a well connected manner could substantially impact the regionally significant fish and wildlife habitat that is found throughout the area.

Agricultural/Forest Compatibility

Protection of farmland that is most important for the continuation of commercial agriculture in the region

The urban and rural reserves process designated the most important land for commercial agriculture as rural reserves and the most suitable land for urbanization as urban reserves. Designation of this area as an urban reserve means farmland within this analysis area is not the most important for the continuation of commercial agriculture in the region.

Compatibility of proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

The UGB borders the I-5 East analysis area on the north and west. To the east is a significant segment of rural residential zoned land. A 331 acre block of resource land zoned exclusive farm use (EFU) directly borders the analysis area on the south, extending to SW Elligsen Road (see attached resource land map). The area is a mixture of forested and open parcels that contain a few rural residences, two domestic water storage tanks and field crops. The agricultural activities are concentrated near SW Elligsen Road in the south and SW Frobase Road in the north, adjacent to the analysis area. SW Frobase Road provides a southern edge to the analysis area; however the road itself would not make the proposed urban uses compatible with the adjacent agricultural activities occurring on farm land to the south. In addition, increased traffic along SW Frobase Road due to new urban uses within the analysis area may impact agricultural activities on these resource lands to the south. The proposed urban uses would not be compatible with the agricultural activities that occur on this one section of farm land outside the UGB. However mitigation measures could reduce conflicts between urban uses inside the UGB and resource uses outside the UGB.

Clear transition between urban and rural lands, using natural and built features to mark the transition

There are no natural or built features that mark a clear transition between urban and rural lands. SW Frobase Road and SW 65th Avenue provide the two edges between urban and rural land. Even assuming these two roads develop as arterial roadways in the future, the roads themselves will not provide a clear transition area between future urban and rural uses. Additional buffers will need to be incorporated into the planning of the urban reserve analysis area. The rural lands east of SW 65th Avenue and to the south of SW Frobase Road are included in the Norwood (4E) and Elligsen (4G/4F) urban reserve areas and may be included in the UGB in the future. Thus, any buffers that are incorporated into the planning study for the analysis area should consider the potential for making urban form connections in these locations in the future.

2040 Growth Concept

Contribution to the purposes of Centers

The Tualatin Town Center is the nearest 2040 Growth Concept center to the I-5 East analysis area. It is approximately 325 acres in size, and primarily serves the surrounding residential and commercial areas in the City of Tualatin. The analysis area is connected to the Tualatin Town Center via SW 65th Avenue to SW Sagert Road and SW Nyberg Road (1.5 miles), although I-5 and I-205 present significant visual barriers between the two locations. There is no Tri-Met service connecting the town center and the analysis area directly, although line 76 stops at SW 65th Avenue and SW Sagert Road, just north of I-205 from the analysis area.

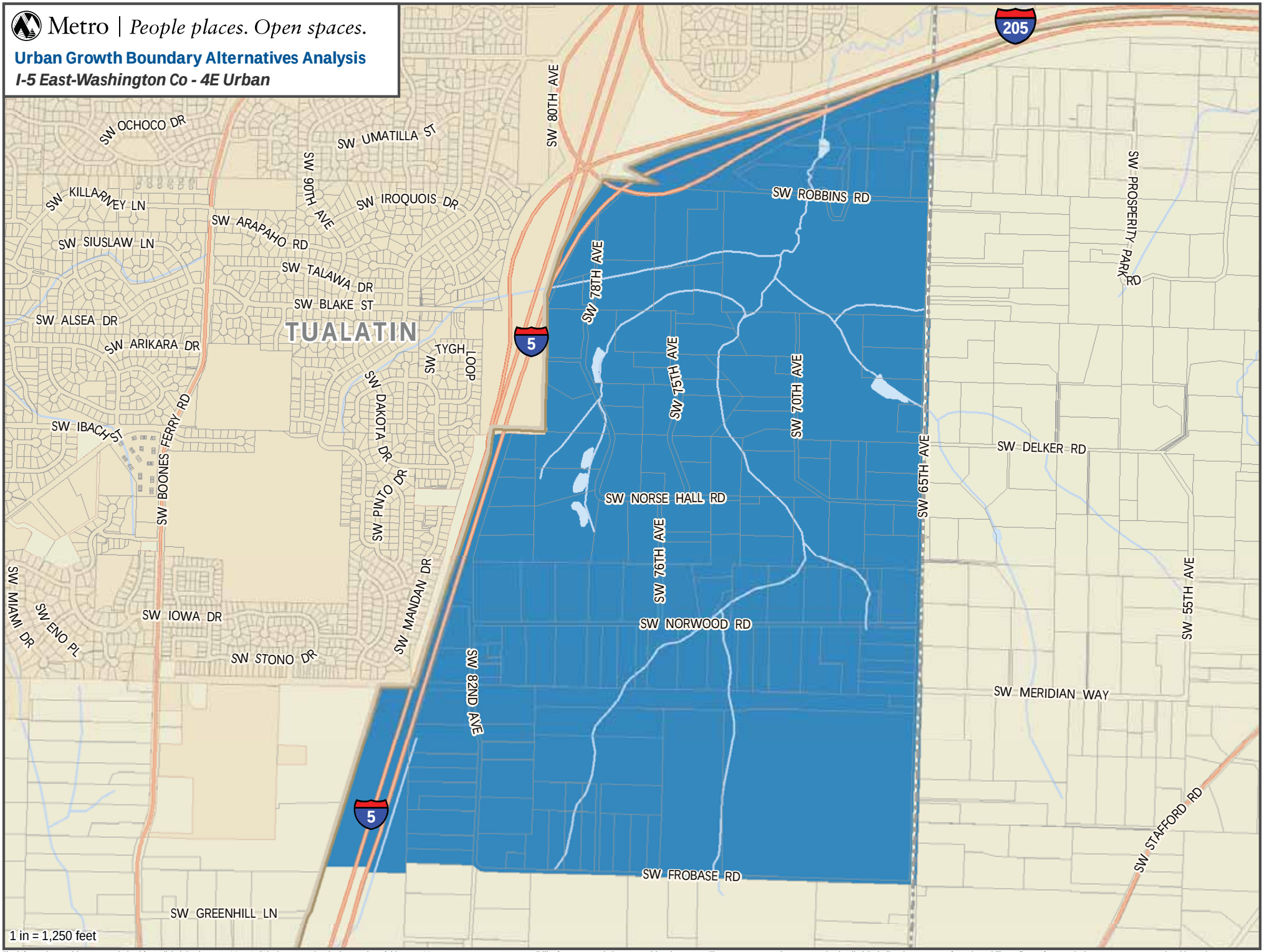
Tualatin's Town Center Plan, envisions a mixed use live, work and play center that integrates natural resources like the Tualatin River with civic, social, economic and cultural functions in a walkable community. According to Metro's State of the Centers Report, January 2009, the Tualatin Town Center has a lower than ideal number of people per acre and slightly below average number of dwellings per acre. The Tualatin center has an average jobs to housing ratio, but density is somewhat lower than average for both housing and businesses.

Pre-qualified concept planning by Tualatin indicates that the city foresees primarily residential development in the analysis area with a small amount of employment land and significant protection of parks and open spaces. They also envision new school sites to support the increased residential population. Urbanization of the analysis area will not support the vision or purpose of the Tualatin Town Center, as it may draw residential development away from the center by creating a large market for single family residential units. The analysis area's isolated location across both I-5 and I-205 would not contribute to the compact, pedestrian-oriented environment envisioned for the center.

Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

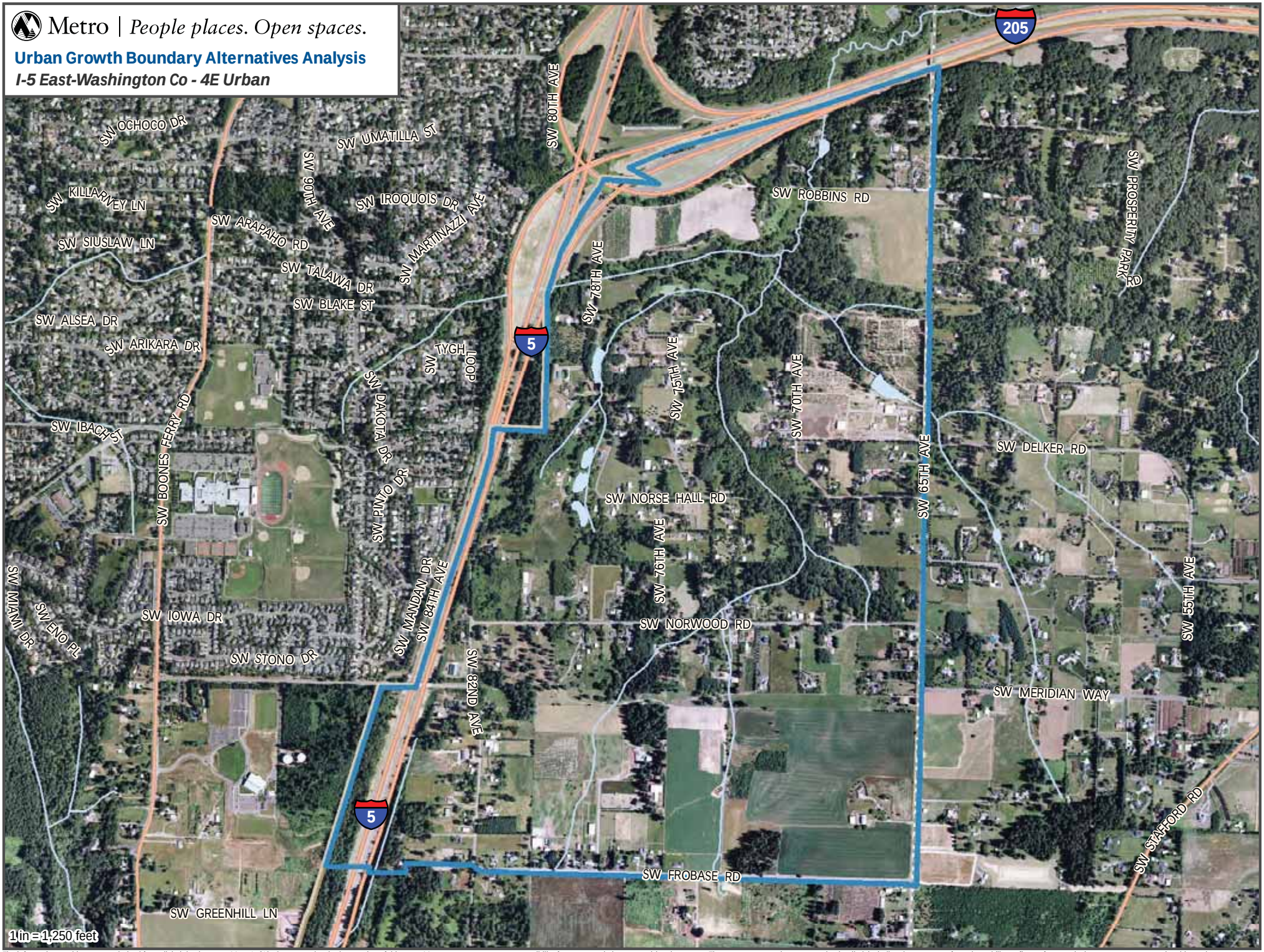
I-5 East-Washington Co - 4E Urban



Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

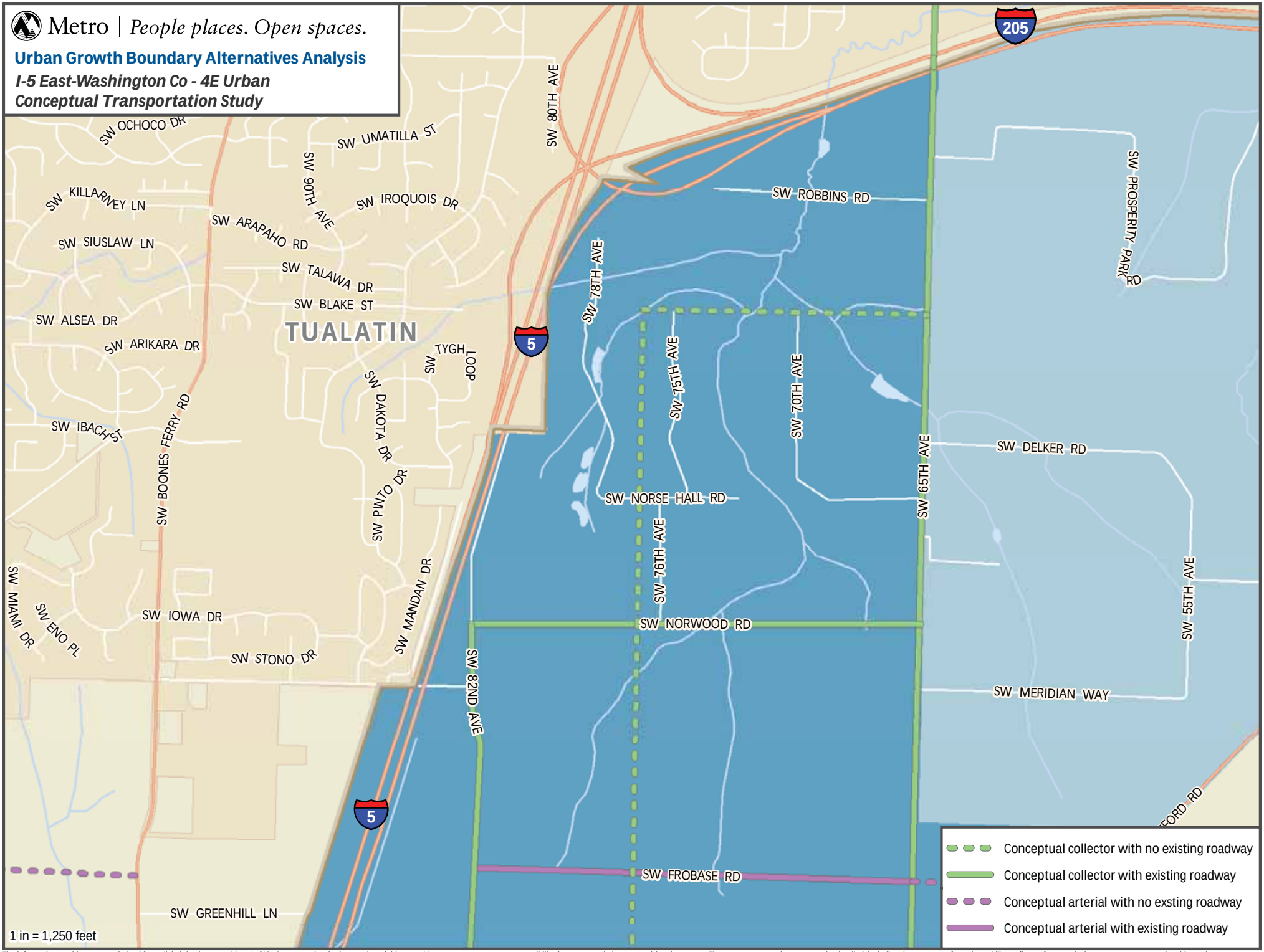
I-5 East-Washington Co - 4E Urban



Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

I-5 East-Washington Co - 4E Urban Conceptual Transportation Study



ELLIGSEN ANALYSIS AREA (4F/4G)

I-5 East (2 & 3) Analysis Area		**Total Acres**	**891**
Gross Vacant Buildable Acres	637	Total Constrained Acres	254
Estimated Dwelling Unit Capacity	7,578	• Title 13 Significant Habitat	203
Estimated Employment Acres		• Public Land	4

General Description (see attached map)

The Elligsen Analysis Area is located east of I-5, straddling SW Elligsen Road. It is irregular in shape and is located directly south of the I-5 East Analysis Area. It is bordered by the UGB on the west and south and SW 65th Avenue and SW Stafford Road on the east. The majority of the area is in Washington County with a small portion in Clackamas County. SW Stafford Road, SW 65th Avenue and SW Elligsen Road are the primary routes serving this area, with access to I-5 from SW Elligsen Road. The area is a mixture of farm land, rural residences and forested parcels on rolling hills with Boeckman Creek running through the southern portion.

Parcelization, Building Values, Development Pattern (see attached aerial photograph)

This analysis area contains 67 tax lots, and a total of 891 acres. The median parcel size is five acres, and approximately half of the parcels are at least five acres in size. Improvements are present on 52 of the 67 parcels, with a median value of $313,090. Agriculture and forest are the predominant uses in this study area, with most of the active farming occurring in the southeast and forest covering most of the west and northwest. The northeast portion of the area, along SW 65th Avenue, has a cluster of rural residential development.

This area has a power line easement that runs through the southern end and one small open space owned by the Meridian United Church of Christ Cemetery. The City of Wilsonville owns two parcels in the northwest portion of the area with a water reservoir located on one of the parcels. The analysis area is adjacent to Canyon Creek Park, maintained by the City of Wilsonville. The Pheasant Ridge Recreational Vehicle Resort has developed a large RV lot just off of SW Elligsen Road, in the west side of the analysis area, which includes a large piece of forest land to the north.

GOAL 14 LOCATIONAL FACTORS (METRO CODE SECTION 3.01.020)

Public Facilities and Services

Orderly and economic provision of public facilities and services

The preliminary sanitary sewer, water and transportation suitability analyses completed by the Core Four Technical Team for the urban and rural reserve study area indicated this general location had high suitability for sanitary sewer services, medium suitability for water services and low suitability for transportation connectivity. As part of Clackamas County's urban and rural reserve designation process, the City of Wilsonville indicated that the area represented by Urban Reserve Area 4G can be efficiently and cost-effectively provided with public facilities necessary to support urban development in the long term. The City of Wilsonville did not comment on the portion of the analysis area that is composed of Urban Reserve Area 4F.

The following cost estimates represent preliminary estimates for the major components of the individual systems. The estimates were generated using very general assumptions about the level of residential or large site industrial development that could occur in the analysis area. More detailed concept plans, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11 will be necessary to develop more refined cost estimates. Attachment 5 contains the breakdown for the transportation cost estimates. A map of the proposed collector and arterial transportation system is attached to this summary.

Sanitary Sewer Services - $27,886,000

Water Distribution Services - $12,150,000

Storm Sewer Services - $14,064,000

Transportation - $238,260,000

Parks - $81,160,000

Schools - $20,000,000

ESEE Analysis

Comparative environmental, energy, economic and social consequences

Environmental

Two tributaries marking the origin of Boeckman Creek flow together in the southeastern portion of the analysis area, and then continue on to the Willamette River south of Wilsonville. There are a couple of small wetlands associated with this stream corridor, although most of the northernmost reaches appear to be either under active agriculture activities or little more than seasonal

drainages. There are 42 acres of slopes greater than 25%, with most of these steep slopes in the forested portion of the area. Fourteen of the steep slope acres occur along the riparian corridor of Boeckman Creek. Based on this analysis, urbanization may pose some risk to environmental resources, particularly the forested land east of I-5 and the area along Boeckman Creek as it evenly divides the southern portion of the analysis area, potentially making connectivity difficult. Attachment 6 contains the breakdown of the environmental factors.

Energy, Economic & Social

This large analysis area, with 50% of the parcels less than five acres in size, is a mixture of forested parcels, some significant agricultural sections and rural residences, mainly along SW 65th Avenue, including a RV Park on SW Elligsen Road. Boeckman Creek flows south through the center of the southern portion of the area, south of SW Elligsen Road. Sixty-nine percent of the 67 parcels have improvements. Urbanization will negatively impact the rural lifestyle, mainly for the current residents along SW 65th Avenue as they are located further away from the urban area than the RV Park that is across the street from the current UGB. The loss of the economic impact from the agricultural uses may be considerable; however the potential economic impact of urbanization on these lands will outweigh this loss. Approximately 23% of the land is identified as containing riparian or upland habitat, much of which is in the northwestern portion of the analysis area. The riparian habitat associated with Boeckman Creek divides the southern portion of the area in half. The costs for protecting these large resource areas will be considerable in contrast to the potential economic impact of urbanizing the remaining developable lands in a well connected manner. Additional VMT will be generated through urbanization of this large sized area as the average commute distance for this area is somewhat larger than the existing average commute distance for the region. Overall this analysis area has medium economic, social and energy consequences from urbanization.

Avoidance of conflict with regionally significant fish and wildlife habitat

Regionally significant riparian habitat covers 70 acres along the stream corridors, although much of this has already been developed or is currently impacted by active agricultural use. A large concentration of upland habitat, primarily forest, covers 133 acres of land in the northwest portion of the analysis area and remains mostly undeveloped. Much of this habitat is on the relatively flat top portions of the hills land and could easily be impacted by future development. In the south half of the analysis area, Boeckman Creek contains a small amount of significant riparian habitat, although steep slopes forming a ravine around the creek would prevent development up to the stream's banks. The City of Wilsonville, the most likely governing body for this area, has adopted a habitat protection program that is in substantial compliance with Metro's Title 13 Nature in Neighborhoods regulations. As the majority of the riparian habitat is away from the flatter developable portions, combined with the expected natural resource protection programs that will be in place prior to development, future urbanization could occur with only minimal to moderate disturbance to regionally significant fish and wildlife habitat, mostly depending on the level of impact to the upland habitat.

Agricultural/Forest Compatibility

Protection of farmland that is most important for the continuation of commercial agriculture in the region

The urban and rural reserves process designated the most important land for commercial agriculture as rural reserves and the most suitable land for urbanization as urban reserves. Designation of this area as an urban reserve means farmland within this analysis area is not the most important for the continuation of commercial agriculture in the region.

Compatibility of proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

The UGB borders the Elligsen analysis area on the west and south. A 115 acre block of resource land zoned exclusive farm use (EFU) is adjacent to the analysis area on the north side of SW Frobase Road and contains three rural residences (see attached resource land map). Agricultural activities are mainly field crops with a very small amount of orchards. Increased traffic along SW Frobase Road due to new urban uses within the analysis area may impact agricultural activities on this small segment of resource land. The proposed urban uses would not be compatible with the agricultural activities that occur on this pocket of farm land to the north. However mitigation measures could reduce conflicts between the proposed urban uses and the small amount of agricultural activities occurring outside the UGB in this location.

A much larger area of farm land is adjacent to the southeast portion of the analysis area, south and east of SW Stafford Road. This area extends south and east to the Willamette River and includes extensive agricultural activities. A number of stream corridors bisect the farm land in a north/south direction. Newland Creek, the closest stream to the analysis area, provides a buffer for the farm land to the east and to a lesser extent for the farm land to the south of SW Kahle Road. There is no edge or buffer for the agricultural activities occurring near SW Homesteader Road, SW Briar Patch Lane and SW Kahle Road. SW Stafford Road provides an edge for this portion of the analysis area, but the road itself would not make the proposed urban uses compatible with the agricultural activities occurring on the farm land to the east. Increased traffic along SW Stafford Road due to new urban uses within the analysis area may also impact agricultural activities on these resource lands to the east. The proposed urban uses would not be compatible with the agricultural activities that occur between SW Stafford Road and Newland Creek riparian area. However mitigation measures could reduce conflicts between the proposed urban uses and agricultural activities occurring outside the UGB in this location.

Clear transition between urban and rural lands, using natural and built features to mark the transition

The up and down change in elevation between SW 65th Avenue and SW Gage Road, east of the analysis area, provides a transition area between urban and rural lands for the portion of the analysis area that is north of SW Elligsen Road. There are no natural or built features that mark a clear transition between the analysis area and the rural lands to the north of SW Frobase Road.

Similarly, there are no natural or built features that mark a clear transition between the analysis area and the rural lands to the east of SW Stafford Road, south of SW Elligsen Road. Even assuming both SW Frobase Road and SW Stafford Road develop as arterials in the future, the roads themselves will not provide a clear transition area between future urban and rural uses. Additional buffers will need to be incorporated into the planning of the urban reserve analysis area. The rural lands north of SW Frobase Road are included in the I-5 East Urban Reserve and may be included in the UGB in the future. Thus, any buffers that are incorporated into the planning study for the analysis area should consider the potential for making urban form connections in this location in the future.

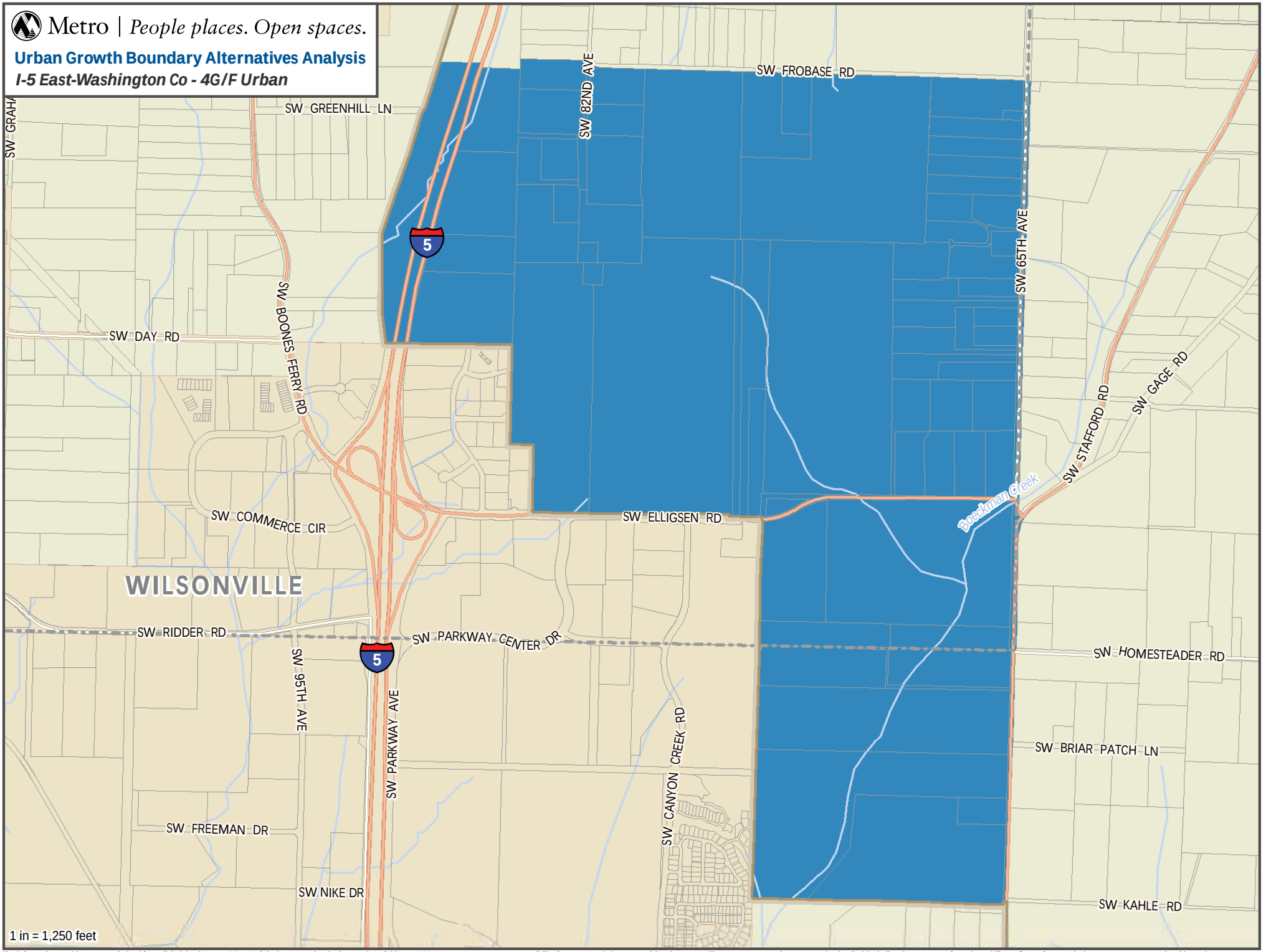
2040 Growth Concept

Contribution to the purposes of Centers

The Wilsonville Town Center is the nearest center, located to the south of the Elligsen Analysis Area. Wilsonville's center is 166 acres in size, and serves primarily the City of Wilsonville in this southern-most extent of the region. The town center is linked to the analysis area by SW Stafford Rd/SW Wilsonville Rd (2 miles) or by I-5 from the SW Elligsen Rd interchange (2.3 miles). No Tri-Met services currently connect the analysis area to the center. Route 6, Canyon Creek of SMART, the City of Wilsonville's bus service does provide service adjacent to a small portion of the analysis area on SW Elligsen Road.

Wilsonville's Town Center, which is east of I-5, is envisioned to be a dense, mixed used community that creates a walkable, pedestrian-oriented environment. The center is located a short distance from the terminus of the WES Commuter Rail line. Metro's State of the Centers Report shows a higher than average jobs to housing ratio, fewer people and dwellings per acre than desired, and needing more infill and redevelopment to boost urban densities.

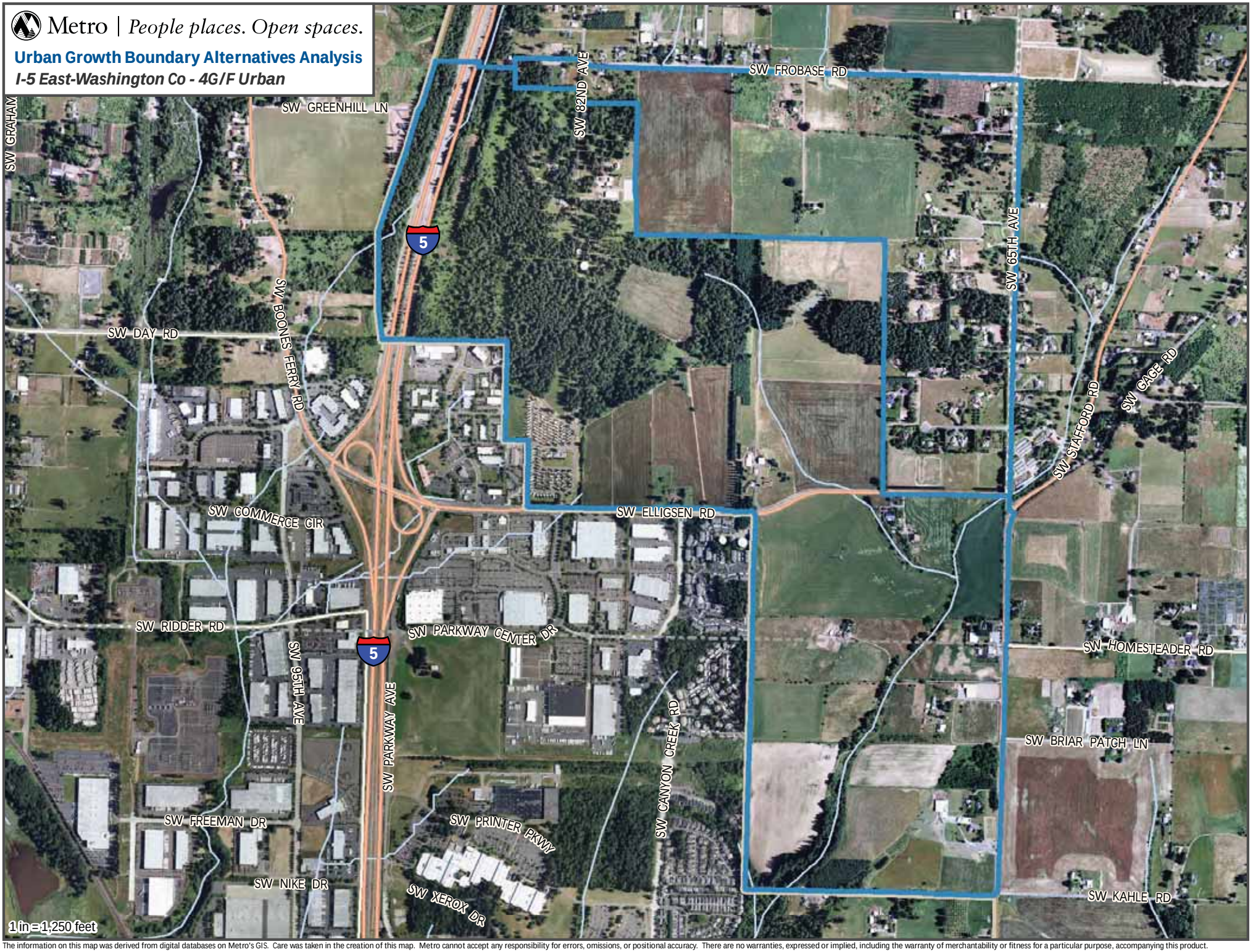
The Elligsen Analysis Area was identified by Wilsonville as a site for long-term future urbanization. The city's 20 Year Look process identified this area as a potential mixture for employment and residential use north of SW Elligsen Road and residential use south of SW Elligsen Road. The portion of the analysis area that is made up of Urban Reserve Area 4F has not been identified by a city as a location for future development. Urbanization of the analysis area will not contribute to the purpose and vision of the Wilsonville Town Center as a dense mixed-used environment due to the distance between the two areas and the potential to negatively impact residential markets for developing density within the center by providing an alternative housing market.

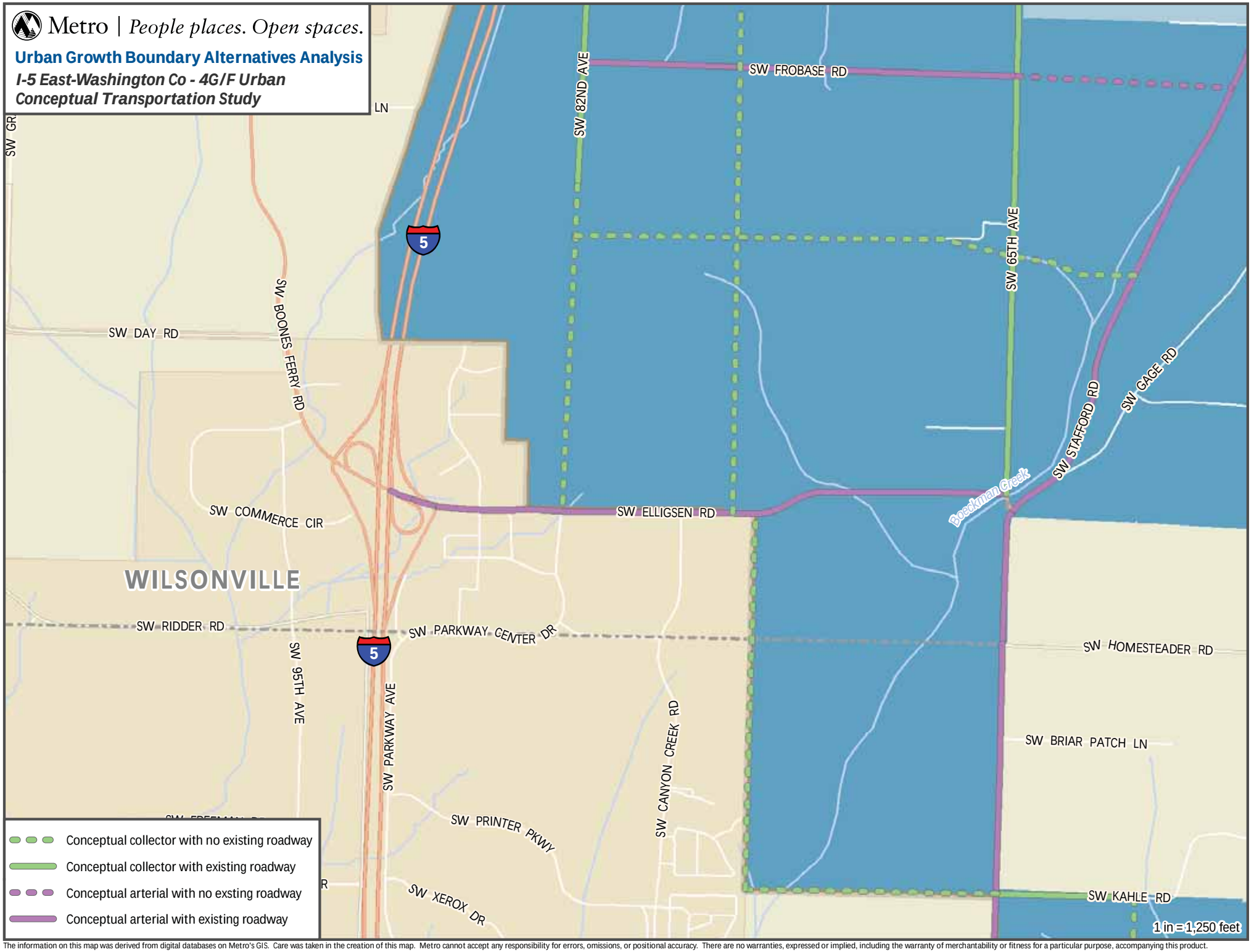


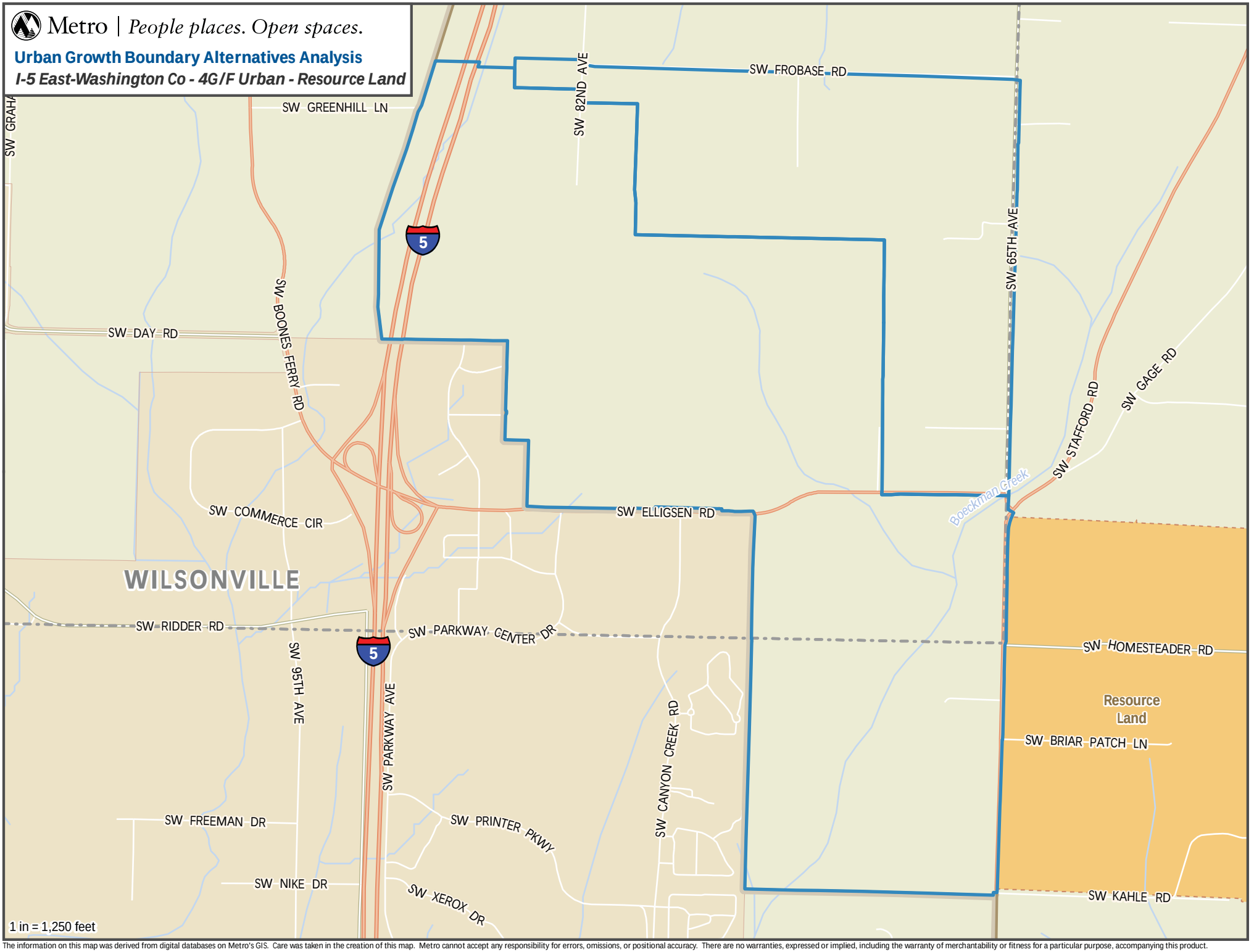
Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

I-5 East-Washington Co - 4G/F Urban







ADVANCE ANALYSIS AREA (4H)

Advance Analysis Area		**Total Acres**	**316**
Gross Vacant Buildable Acres	181	Total Constrained Acres	135
Estimated Dwelling Unit Capacity	2,133	• Title 13 Significant Habitat	73
Estimated Employment Acres		• Public Land	40

General Description (see attached map)

The Advance Analysis Area is a rectangular shaped mostly flat area located between the current UGB to the west and Newland Creek to the east and contains a total of 316 acres. It lies just to the east of SW Stafford Road, and straddles SW Advance Road. The area extends as far north as SW Kahle Road, and as far south as SW Kruse Road. The area is directly to the southeast of the Elligsen analysis area (4F/4G). The Advance analysis area is served primarily by SW Advance Road (east/west) and SW Stafford/Wilsonville Road (north/south).

Parcelization, Building Values, Development Pattern (see attached aerial photograph)

The Advance area contains 36 tax lots. Of those 36 lots, ten are at least five acres and account for approximately 259 of the 317 total acres. Median parcel size is 1.75 acres. There is one lot at the north edge of the area that is bisected by the analysis area boundary, at Newland Creek. A majority of the parcels smaller than five acres are clustered in the southeastern quarter of the study area, south of SW Advance Road and east of SW 60th Avenue. At least 21 properties have recorded improvements with a median value of $169,520, although only three have values greater than $250,000. Although there are some improvements present on a few tax lots, the area remains largely undeveloped and in agricultural use, primarily field crops and tree farms.

There is a substantial BPA power line easement running through the northern half of the analysis area that is around 560 ft wide and covers 44 acres. The West Linn-Wilsonville School District also owns four parcels, totaling approximately 40 acres just south of SW Advance Road.

GOAL 14 LOCATIONAL FACTORS (METRO CODE SECTION 3.01.020)

Public Facilities and Services

Orderly and economic provision of public facilities and services

The preliminary sanitary sewer, water and transportation suitability analyses completed by the Core Four Technical Team for the urban and rural reserve study area indicated this general location had high suitability for sanitary sewer services, medium suitability for water services and low suitability for transportation connectivity. As part of Clackamas County's urban and rural reserve designation process, the City of Wilsonville indicated that the area can be efficiently and cost-effectively provided with public facilities necessary to support urban development.

The following cost estimates represent preliminary estimates for the major components of the individual systems. The estimates were generated using very general assumptions about the level of residential or large site industrial development that could occur in the analysis area. More detailed concept plans, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11 will be necessary to develop more refined cost estimates. Attachment 5 contains the breakdown for the transportation cost estimates. A map of the proposed collector and arterial transportation system is attached to this summary.

Sanitary Sewer Services - $9,788,000

Water Distribution Services - $4,570,000

Storm Sewer Services - $4,513,000

Transportation Services - $107,520,000

Parks - $25,600,000

Schools - $20,000,000 (New Elementary School)

ESEE Analysis

Comparative environmental, energy, economic and social consequences

Environmental

No significant wetlands or floodplains are present in the area, although there is about 1 mile of stream corridor and 35 acres of surrounding riparian areas. There are no parks or open spaces within the area, but there is some private commonly-owned open space adjacent to the analysis area inside the UGB to the west. Only 18 acres of land are constrained by steep slopes (>25%), all but three acres of which are within riparian corridors. Future development may impact a small portion of riparian habitat in the far northeast corner of the analysis area, but the majority of this

area can be developed without impacting important environmental resources due to their isolated nature. Attachment 6 contains a breakdown of the environmental factors.

Energy, Economic & Social

This small area is a mixture of limited agricultural activities and rural residences. Fifty-eight percent of the parcels have improvements and 72% of the parcels are less than five acres in size. There are two large parcels each greater than 80 acres in size; however a power line easement cuts through these parcels, limiting developable acreage. The limited agricultural activities combined with most of the natural resources being located on or near the edges of the area, away from the flatter more developable portions, will reduce the potential negative economic impacts of a lost farming economy and costs for protective natural resources. The West Linn-Wilsonville School District owns a 40 acre site that abuts the current UGB and is very close to the existing Wilsonville High School and Boeckman Creek Elementary School, providing the opportunity to connect the analysis area to the existing urban neighborhoods through a significant school campus. In addition, the analysis area is adjacent to the Frog Pond expansion area that was included in the UGB in 2002, providing for additional opportunities to knit the two areas into the urban fabric of Wilsonville, thereby reducing some of the impact of the loss of the rural lifestyle for current residents. The additional VMT generated through urbanization of this small area will be minimal as the average commute distance is similar to the existing commute distance for the region. Overall this analysis area has low economic, social and energy consequences from urbanization.

Avoidance of conflict with regionally significant fish and wildlife habitat

Total regionally significant fish and wildlife habitat covers 73 acres mainly concentrated in the northeast corner of the analysis area, all within or along riparian zones, including 38 acres of upland habitat that is contiguous with the riparian areas. In addition, the BPA power line easement runs diagonally adjacent to the main segment of habitat area, providing an additional buffer for the habitat. The City of Wilsonville has adopted a habitat protection program that is in substantial compliance with Metro's Title 13 Nature in Neighborhoods regulations. Based on the limited amount of significant habitat that is adjacent to the flatter developable areas, the overlap of the habitat area with the power line easement and Wilsonville's habitat conservation policies, urbanization of this area can occur with minimal impacts to regionally significant fish and wildlife habitat.

Agricultural/Forest Compatibility

Protection of farmland that is most important for the continuation of commercial agriculture in the region

The urban and rural reserves process designated the most important land for commercial agriculture as rural reserves and the most suitable land for urbanization as urban reserves. Designation of this area as an urban reserve means farmland within this analysis area is not the most important for the continuation of commercial agriculture in the region.

Compatibility of proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

All but the western edge of the Advance analysis area borders exclusive farm use (EFU) zoned resource land (see attached resource land map). Directly north, between the analysis area and the Elligsen analysis area is an approximately 310-acre block of farm land in field crop and nursery production. There is no edge or buffer between the analysis area and this block of farm land beyond SW Kahle Road which extends almost the entire length of the northern edge. Increased traffic along SW Kahle Road as well as along SW Stafford Road as a result of urbanization will impact the agricultural activities occurring in this location.

Directly east, north of Advance Road, Newland Creek flows south in a wooded ravine about 70-feet below the elevation of the analysis area. The riparian area associated with Newland Creek fluctuates between 1,000 – 1,500 feet wide in this vicinity, effectively providing a buffer to the widespread agricultural activities occurring further east.

South of Advance Road there is a pocket of farm land approximately 200 acres in size located between the analysis area and Newland Creek. This pocket of agricultural land extends south across SW Kruse Road to the Willamette River and is mostly composed of field crops. Directly south of the analysis area is another pocket of farm land approximately 38 acres in size that is located between two small unnamed streams. Increased traffic along SW Kruse Road as well as along SW 53rd Avenue as a result of urbanization will impact the agricultural activities occurring in this location.

Overall, the proposed urban uses for the Advance analysis area would not be compatible with the agricultural activities occurring on the farm land to the north and southeast. The proposed urban uses for the analysis area would be compatible with the agricultural activities that are occurring on farm land to the east due to the wide riparian corridor of Newland Creek.

Clear transition between urban and rural lands, using natural and built features to mark the transition

Newland Creek provides a clear transition between urban and rural lands on the east side of the analysis area. There are no natural or built features to provide a transition on the north and south sides of the analysis area. Additional buffers will need to be incorporated into the planning of the analysis area to provide a clear transition from urban to rural uses along these two edges.

2040 Growth Concept

Contribution to the purposes of Centers

The Wilsonville Town Center is the nearest center, located to the southwest of the Advance analysis area. Wilsonville's Town Center is 166 acres in size, and serves primarily the City of Wilsonville in this southern-most extent of the current UGB. The town center is linked to the analysis area by SW Wilsonville Rd (1.5 miles). No Tri-Met services currently connect the analysis area to the center.

SMART, the City of Wilsonville's bus service does provide limited service adjacent to the analysis area.

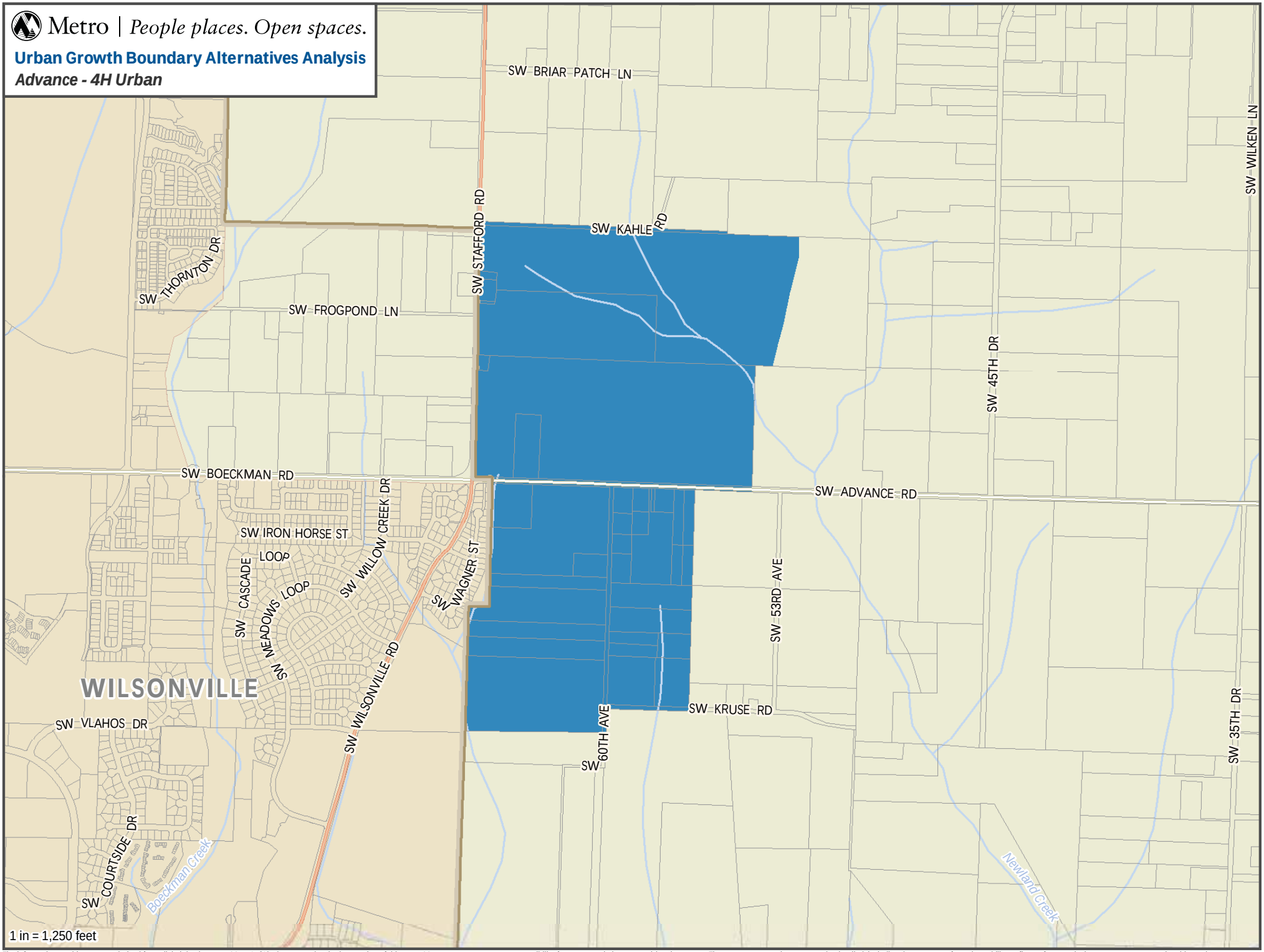
Wilsonville's Town Center, which is east of I-5, is envisioned to be a dense, mixed used community that creates a walkable, pedestrian-oriented environment. The center is located a short distance from the terminus of the WES Commuter Rail line. Metro's State of the Centers Report shows a higher than average jobs to housing ratio, fewer people and dwellings per acre than desired, and needing more infill and redevelopment to boost urban densities.

The Advance analysis area is identified in Wilsonville's 20 Year Look process as a site for long-term future urbanization that is expected to provide primarily residential land to help balance the jobs to housing ratio for the city and a new school site. Urbanization of the analysis area is unlikely to contribute to the purpose and vision of the Wilsonville Town Center due to its distance and potential to negatively impact the market for increasing residential density within the center. Although the added residential development the Advance area would help even out the jobs to housing ratio for the entire city of Wilsonville, the distance of this area from the Town Center would more likely increase the imbalance at the center and impede development of a compact, pedestrian-oriented community.

Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

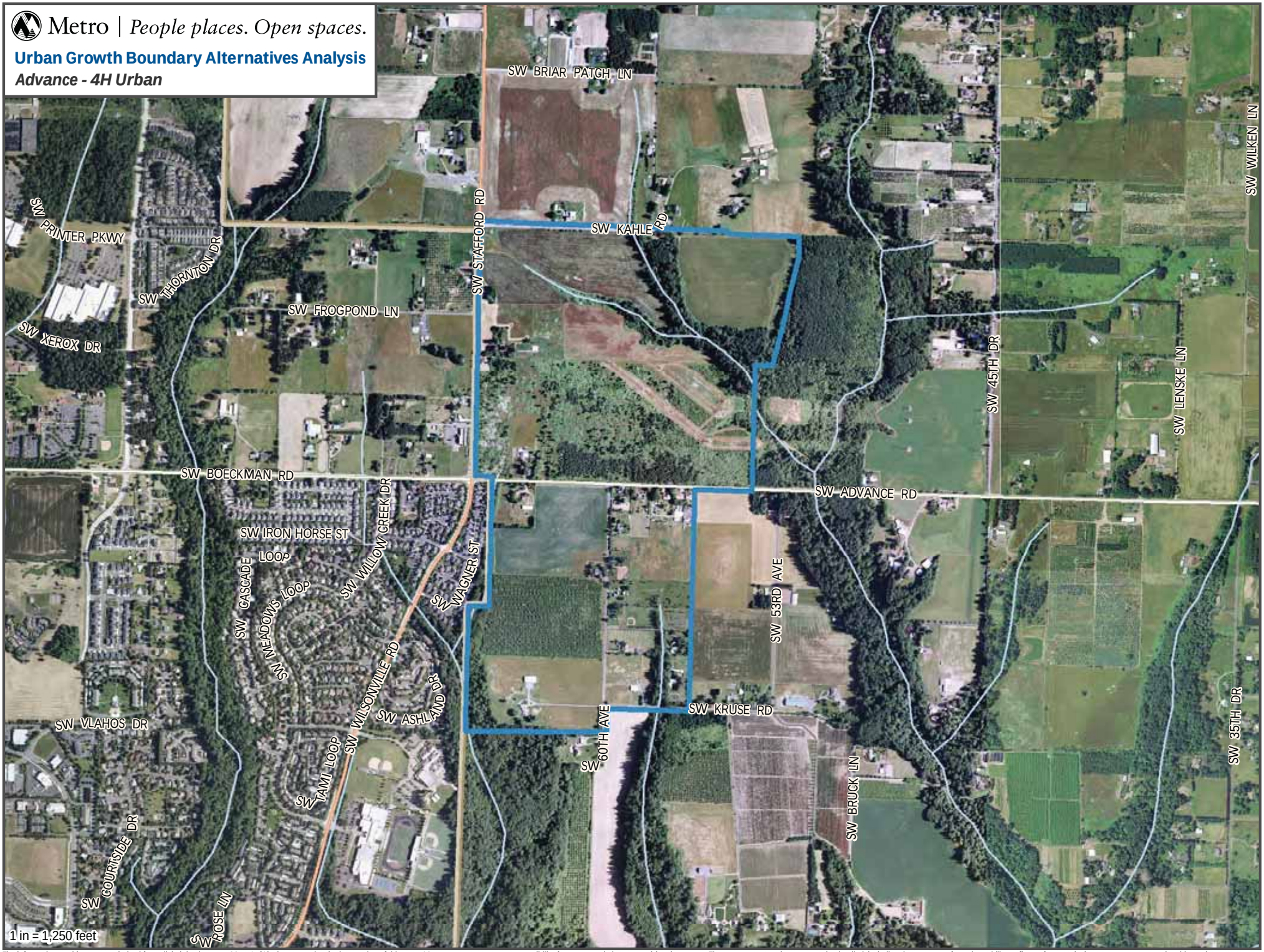
Advance - 4H Urban

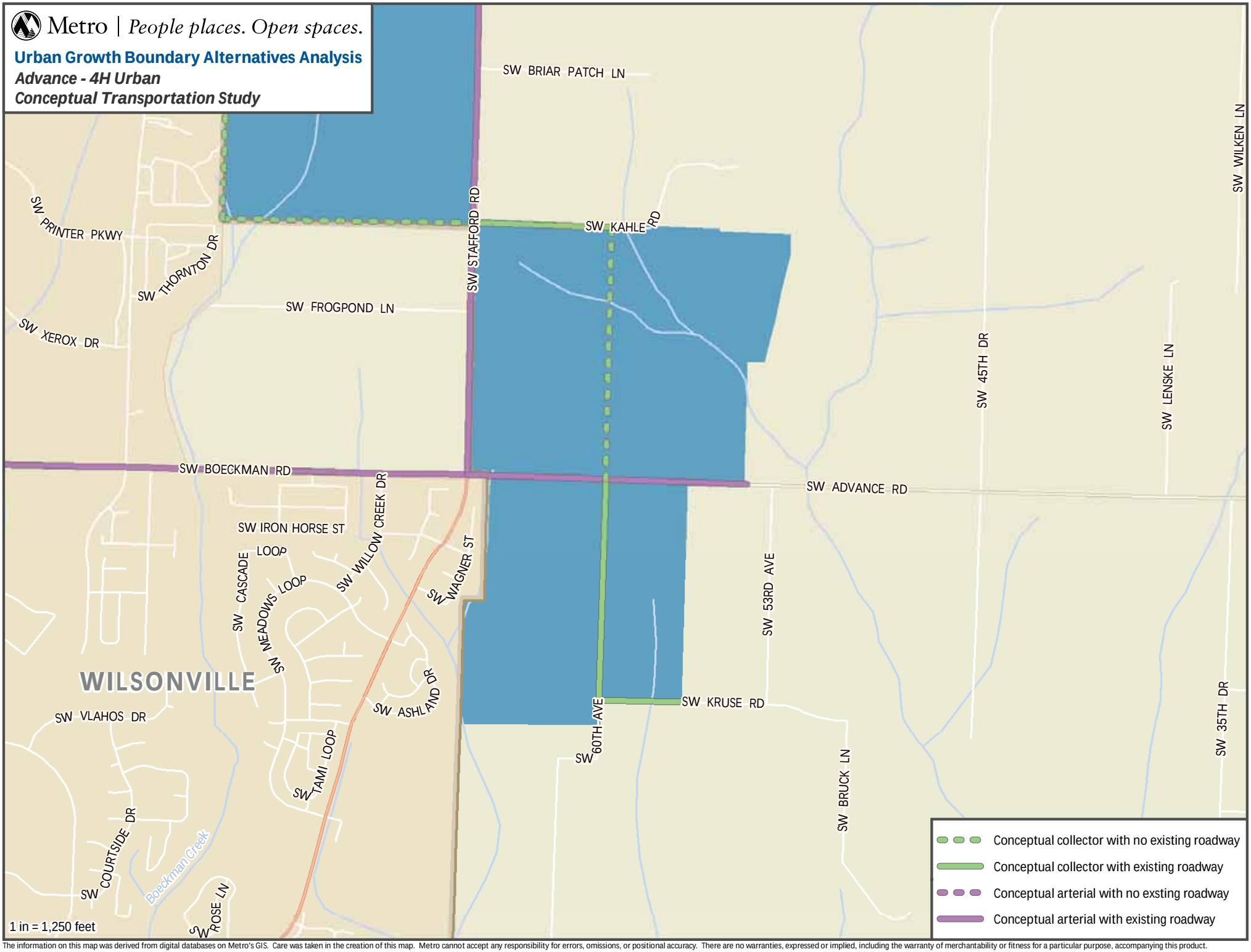


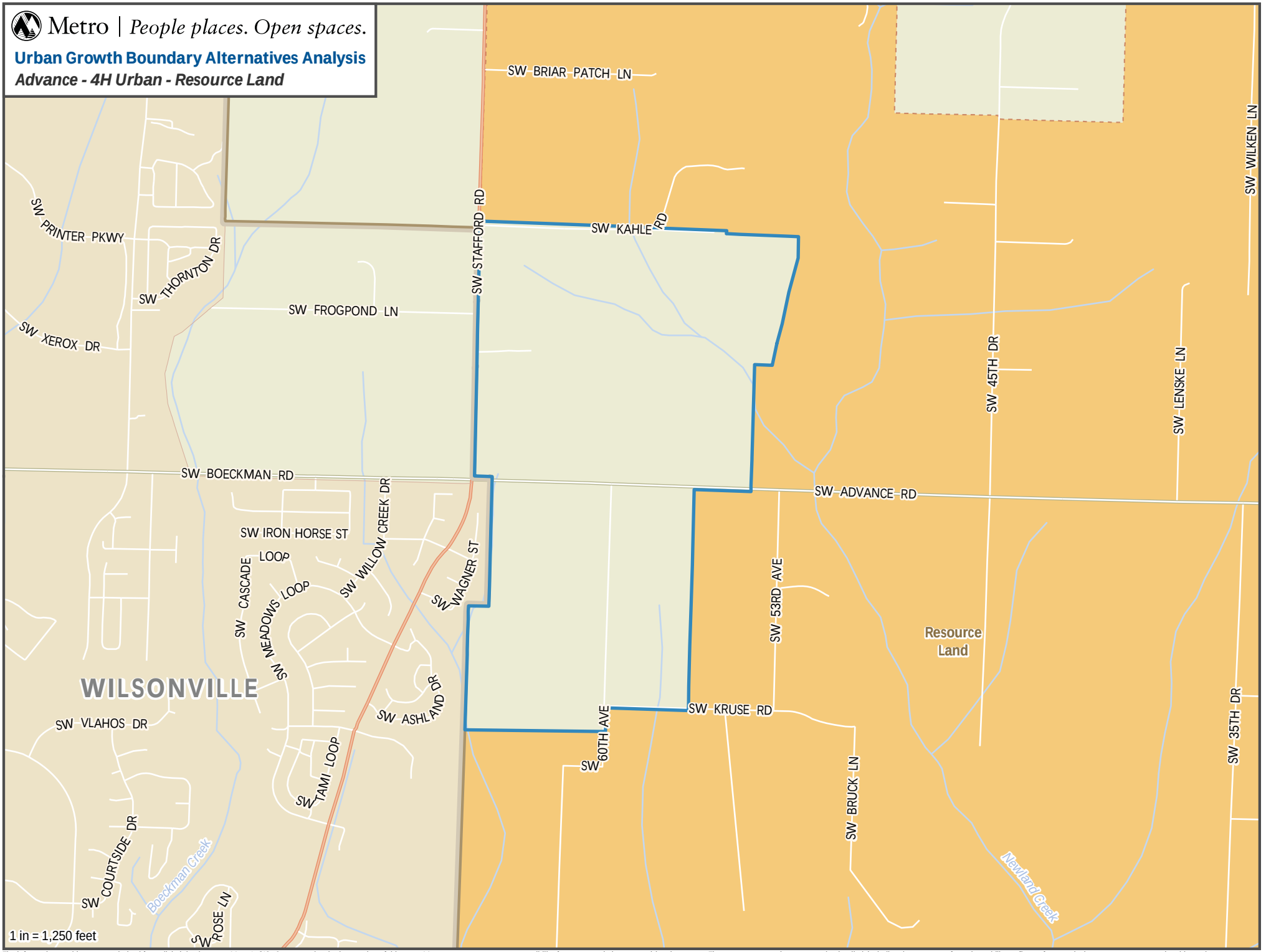
Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

Advance - 4H Urban







SHERWOOD WEST ANALYSIS AREA (5B)

Sherwood West Analysis Area		**Total Acres**	**496**
Gross Vacant Buildable Acres	432	Total Constrained Acres	64
Estimated Dwelling Unit Capacity	4,981	• Title 13 Significant Habitat	45
Estimated Employment Acres		• Public Land	5

General Description (see attached map)

The Sherwood West Analysis Area, a portion of the larger Sherwood West Urban Reserve, is located west of the city of Sherwood, along Highway 99W. The area sits between the Pacific Highway (99W) and SW Elwert Road on the east, SW Haide Road to the north, Chicken Creek to the west and SW Chapman Road to the south. SW Kruger Road runs east/west through the center of the study area. The area covers approximately 496 acres, entirely within unincorporated Washington County. Slopes are generally flat, and the landscape is a mix of farm and forested parcels.

Parcelization, Building Values, Development Pattern (see attached aerial photograph)

There are a total of 52 parcels within this area, with 32 parcels of at least five acres accounting for 85% of the total analysis area. The median parcel size is 6.17 acres and no lots are split by the study area boundary. A majority, 33 out of the 52 parcels, have improvements, 13 of which are valued over $250,000. The median improvement value is $214,440. The primary land uses in this area are a mix of agriculture and forested parcels, with rural residences scattered throughout. Agricultural activities include field crops, tree farms and orchards.

There is no evidence of power line easements within the analysis area. The City of Sherwood owns five acres that contains a water reservoir, and Metro owns 40 acres of natural area land just outside of the analysis area to the west (just south of SW Kruger Road).

GOAL 14 LOCATIONAL FACTORS (METRO CODE SECTION 3.01.020)

Public Facilities and Services

Orderly and economic provision of public facilities and services

The preliminary sanitary sewer, water and transportation suitability analyses completed by the Core Four Technical Team for the urban and rural reserve study area indicated this general location had medium/high suitability for sanitary sewer services, medium suitability for water services and high suitability for transportation connectivity for the northern portion of the analysis area. The southern portion was not evaluated for transportation connectivity. The City of Sherwood's Pre-Qualifying Concept Plan, completed as part of the Washington County urban and rural reserve designation process, indicates that the city has the ability and willingness to provide urban services to this area.

The following cost estimates represent preliminary estimates for the major components of the individual systems. The estimates were generated using very general assumptions about the level of residential development that could occur in the analysis area. More detailed concept plans, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11 will be necessary to develop more refined cost estimates. Attachment 5 contains the breakdown for the transportation cost estimates. A map of the proposed collector and arterial transportation network is attached to this summary.

Sanitary Sewer Services - $18,760,000

Water Distribution Services - $8,935,000

Storm Sewer Services - $8,949,500

Transportation Services - $145,460,000

Parks - $69,240,000

Schools - $80,000,000 (New Elementary School)

ESEE Analysis

Comparative environmental, energy, economic and social consequences

Environmental

Chicken Creek flows along the northwest corner of the area, and a small wetland of less than one acre forms the start of Goose Creek in the southeast portion of the study area. These two creeks have a total of eight acres of associated riparian habitat and several acres of steeper slopes (>25%) within the analysis area boundary. There are an additional 36 acres of upland habitat concentrated

in the northwest and just south of SW Kruger Rd, and a total of 23 acres of steep slopes occurring within much of the habitat. With the exception of the ravine along Goose Creek and the small wetland that marks its origin, the analysis area is either in active agricultural use or does not contain important environmental features. Current conditions therefore indicate that future urbanization can occur throughout much of the analysis area without significantly impacting environmental resources. The small riparian area along Goose Creek is isolated near the edge of the area and can be protected, reducing the potential risk from development. Attachment 6 contains the breakdown of the environmental factors.

Energy, Social & Economic

This medium sized area, with 62% of the parcels larger than five acres in size, is a mixture of agricultural activities and rural residences on larger parcels. Sixty-three percent of the parcels have improvements. Urbanization will impact the rural lifestyle for current residents as the median size of the parcels is 6.17 acres, which represents fairly large home sites. There are a few significant pockets of agricultural activities, ranging in size from 40-80 acres. The loss of the economic impact from these agricultural uses may be considerable; however the potential economic impact of urbanization on these relatively flat lands will outweigh this loss. Approximately eight percent of the land is identified as containing riparian habitat located near the edges of the analysis area. The costs for protecting these smaller isolated resources will be small in contrast to the potential economic impact of urbanizing the larger areas in between. Additional VMT will be generated through urbanization of this medium sized area as the average commute distance for this area on the southwestern edge of the region is larger than the existing commute distance for the region. Overall this analysis area has low economic, social and energy consequences from urbanization.

Avoidance of conflict with regionally significant fish and wildlife habitat

A finger of significant riparian and upland habitat extends into the area along Goose Creek. With the exception of this habitat area and a small area of significant riparian habitat in the far northwest corner near Chicken Creek, there is a minimal amount of regionally significant habitat within the analysis area. The small block of upland habitat occurring in the northern-most portion of the area is characterized by steeper slopes that will prevent pressure from development, but the riparian and upland habitat surrounding Goose Creek could be impacted by urbanization as the adjacent area is flat and near Highway 99W. The City of Sherwood, the expected governing body, has adopted habitat protection measures that are in compliance with Metro's Title 13 requirements as part of the Tualatin Basin Natural Resource Coordinating Committee's protection program. Given that the pockets of habitat area are isolated and the expected protection measures that will be in place prior to urbanization, development could occur in a manner with minimal impact to the regionally significant habitat areas.

Agricultural/Forest Compatibility

Protection of farmland that is most important for the continuation of commercial agriculture in the region

The urban and rural reserves process designated the most important land for commercial agriculture as rural reserves and the most suitable land for urbanization as urban reserves. Designation of this area as an urban reserve means farmland within this analysis area is not the most important for the continuation of commercial agriculture in the region.

Compatibility of proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

A block of resource land zoned AF-20 is located west of the urban reserve between SW Chapman Road and SW Kruger Road, and extends just over 1 mile to the Washington County line (see attached resource land map). Chicken Creek flows north through the resource land area that is a mixture of forested and open parcels that includes some rural residences and a small amount of agricultural activities, including a vineyard. Two unnamed tributaries to Chicken Creek flow in an easterly direction through the area. The rural residences along SW Delanos Place in combination with the Chicken Creek riparian area provide a buffer for the limited agricultural activities that occur to the west; therefore the proposed urban uses are generally compatible with the nearby agricultural activities occurring on this block of farm and forest land.

A second block of resource land zoned AF-20 shares a 1/3 mile edge with the analysis area to the south. This is the same AF-20 zoned land that is west of the Sherwood South analysis area, on the west side of Highway 99W. There is a small amount of field crops and an equestrian center within the resource land area just to the south of the analysis area. A pocket of rural residential zoned land adjacent to Chicken Creek provides a buffer to the remaining AF-20 zoned land to the west. The location of the large equestrian center, the pocket of rural residential zoned land and to a lesser extent Chicken Creek combine to provide separation between the analysis area and the majority of the agricultural activities that are occurring on the nearby farm land.

Overall, proposed urban uses in the Sherwood West analysis area would generally be compatible with nearby agricultural and forest activities occurring on farm and forest land outside the UGB.

Clear transition between urban and rural lands, using natural and built features to mark the transition

The UGB borders this analysis area on the east side. The Chicken Creek riparian corridor provides a transition on the west and northern edges and to a lesser extent on the southern edge of the analysis area. The equestrian center functions as a transition area between urban and rural uses as this large facility is more developed than a typical rural use, while at the same time focusing on a rural use. Therefore, there is a clear transition between urban and rural lands using both natural and built features/specialized uses.

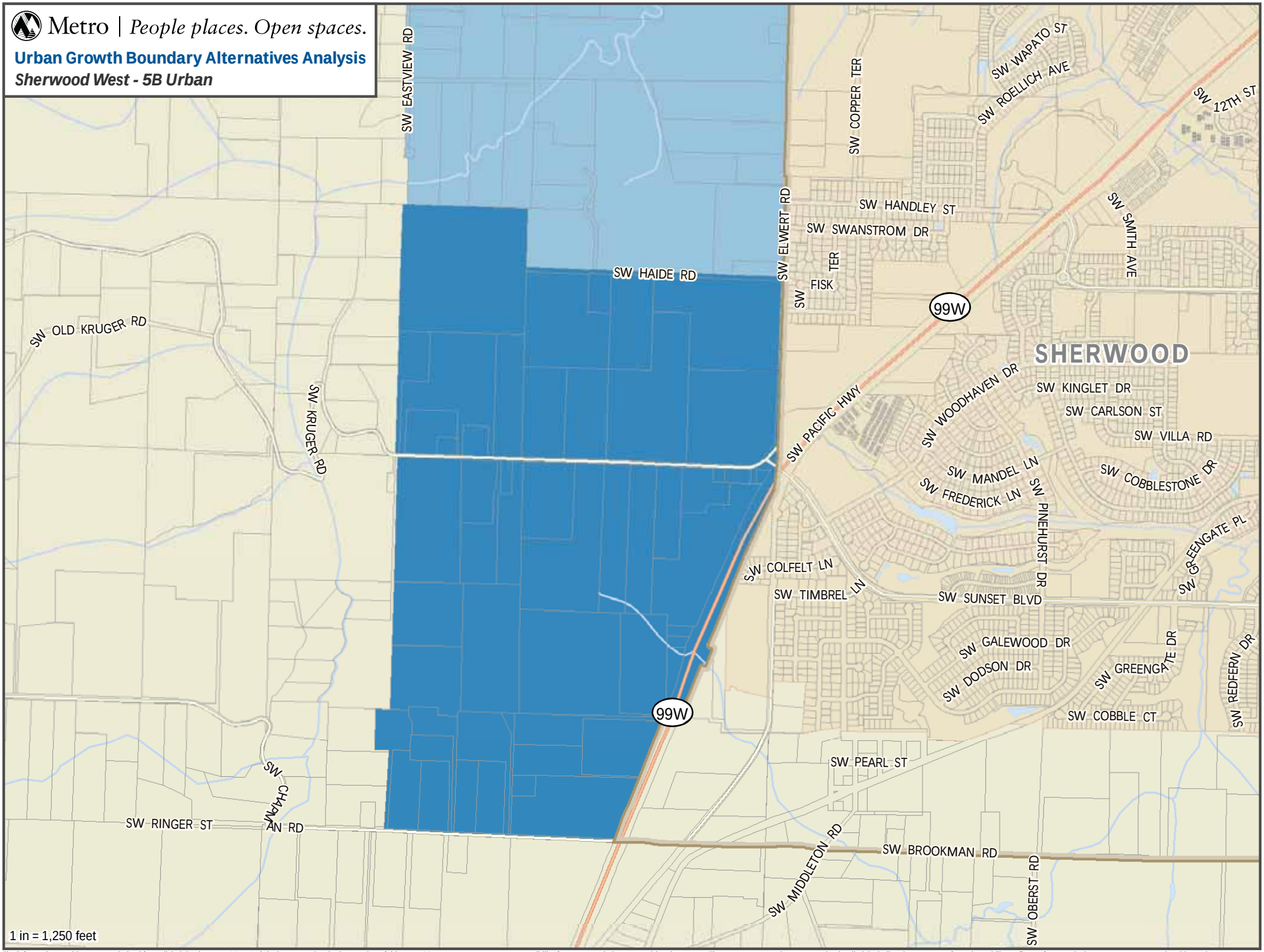
2040 Growth Concept

Contribution to the purposes of Centers

The Sherwood Town Center is the only center near the Sherwood West analysis area. It is a small town center of 88 acres, located to the northeast of the analysis area at the intersection of the SW Pacific Hwy (99W) and SW Tualatin-Sherwood Road. The center serves the community of Sherwood and the surrounding rural areas at the southwest edge of the region. Sherwood West is connected to the center via Highway 99W (approximately 1 mile) and there are currently no transit connections between the two locations. Tri-Met does have two bus routes serving the Sherwood Town Center, lines 12 and 94.

According to Metro's State of the Centers Report, January 2009, the Sherwood Town Center's jobs to housing ratio is higher than ideal and the total number of people per acre is low, indicating that there may be a need to attract and develop more housing within the center. The center also has a much lower than average number of dwellings per acre than other town centers. Based on the pre-qualified concept plans that were developed as part of the urban and rural reserve designation process, the City of Sherwood envisions the analysis area developing with a mix of limited commercial and residential uses. Urbanization of the Sherwood West area will not support developing increased residential units or employment opportunities within the center and ultimately may impede the creation of a compact, walkable community the city desires for the town center.

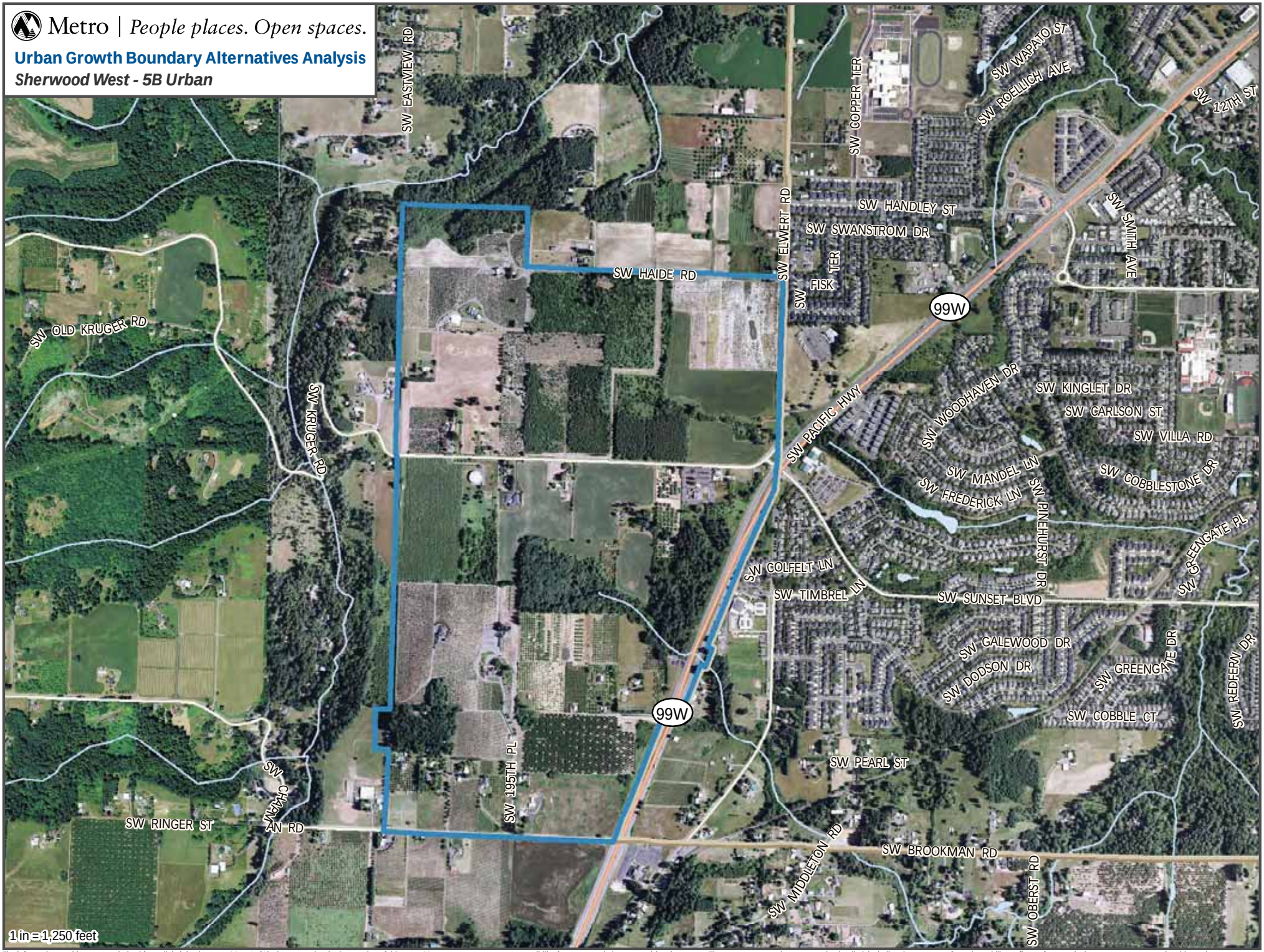
Sherwood foresees the potential need for a new station community in the southwest edge of the city to accommodate planned transportation system improvements such as a light rail or other public transit options for the area. As part of the city's pre-qualified concept planning, a portion of the analysis area was identified as a potential site for a new station center in Sherwood. The development of a new high capacity transit line along with the urbanization of the greater urban reserve areas adjacent to the city may support a new center in this location in the long term.

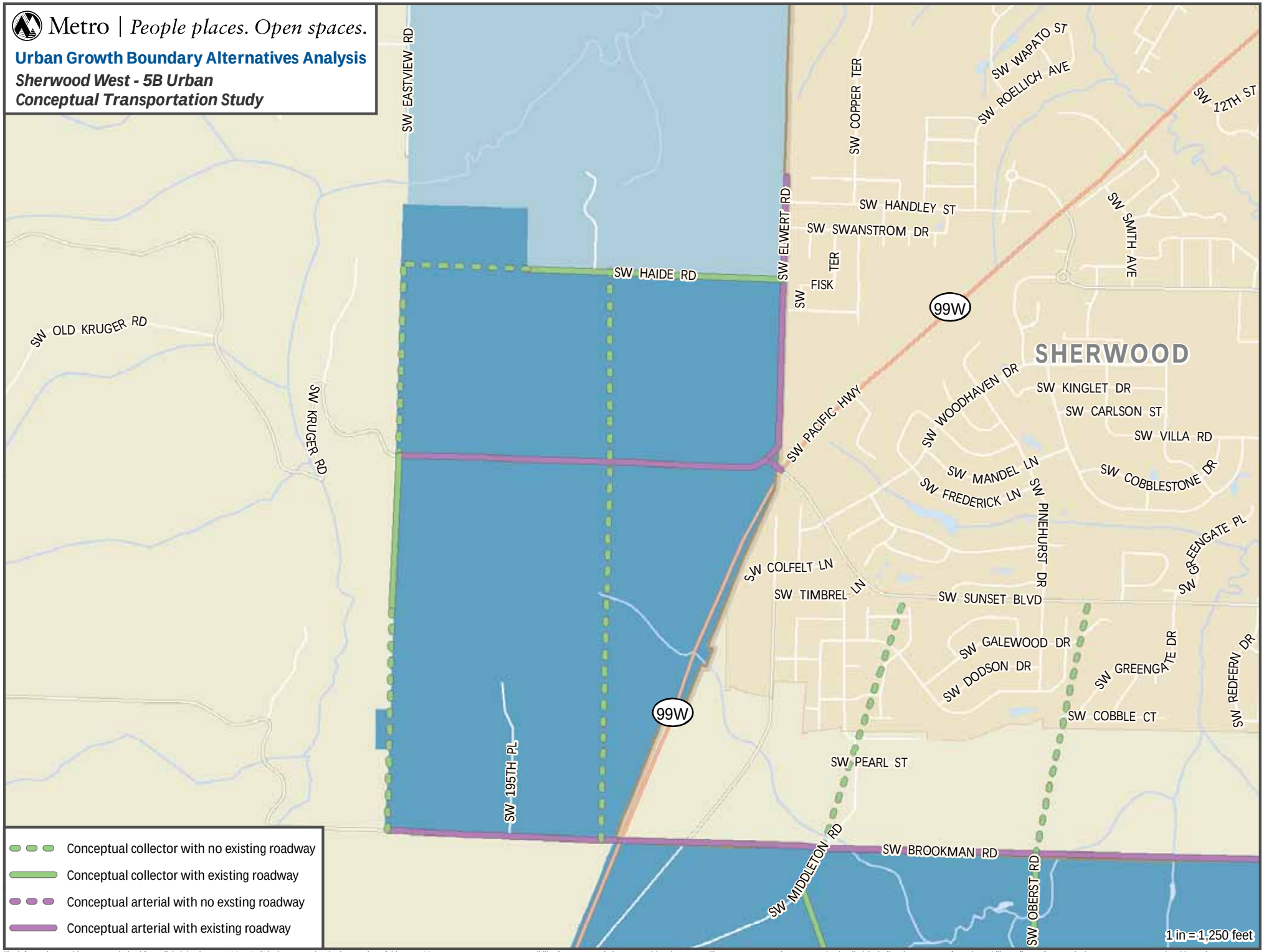


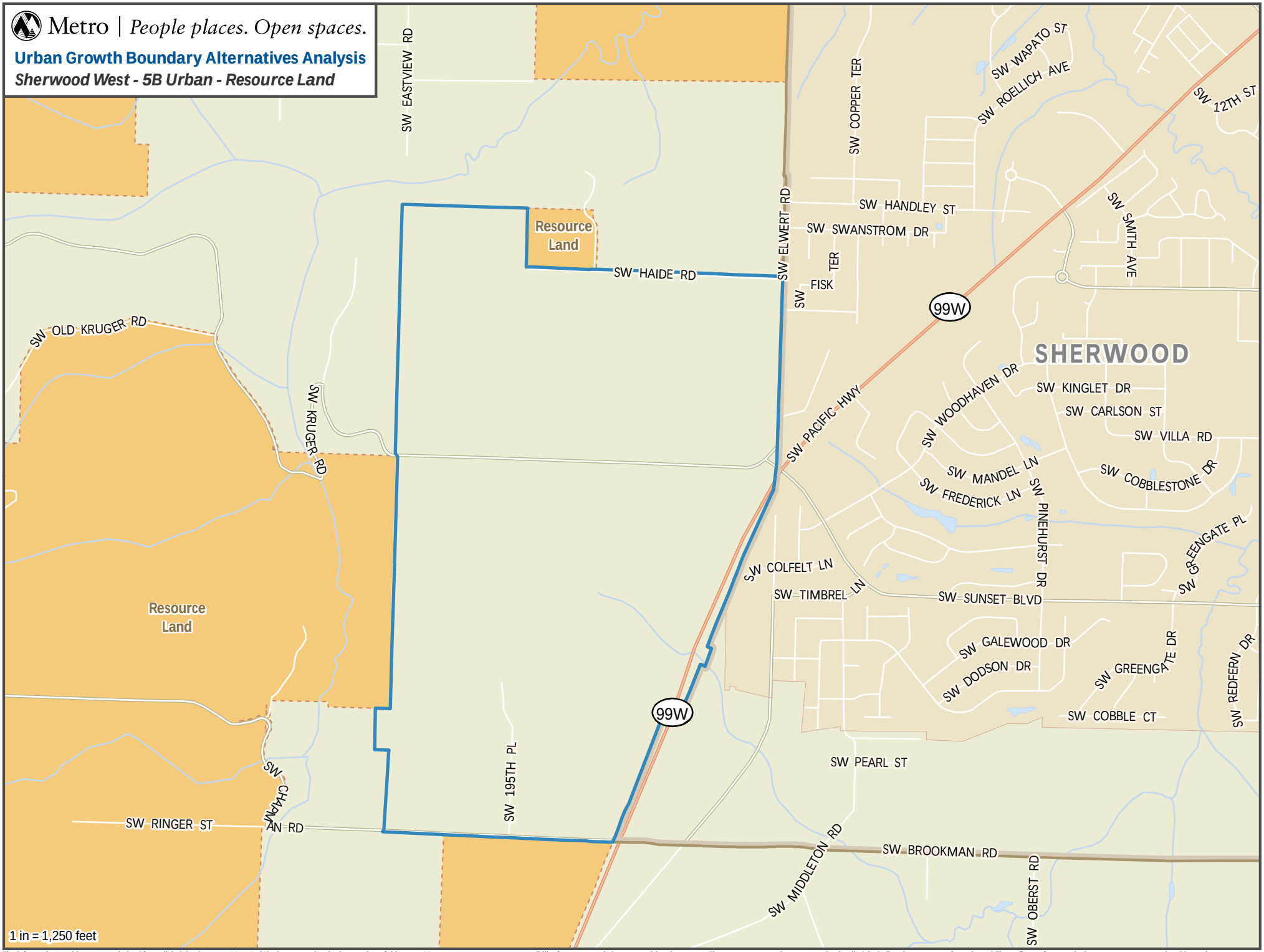
Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

Sherwood West - 5B Urban







SHERWOOD SOUTH ANALYSIS AREA (5D)

Sherwood South Analysis Area		**Total Acres**	**447**
Gross Vacant Buildable Acres	216	Total Constrained Acres	231
Estimated Dwelling Unit Capacity	1,902	• Title 13 Significant Habitat	204
Estimated Employment Acres		• Public Land	4

General Description (see attached map)

The Sherwood South Analysis Area, is a medium sized rectangular area just south of the City of Sherwood with a total area of 447 acres. The area is a mixture of flat plateaus intermixed with stream corridors in ravines and forested areas. The area contains the confluence of Goose and Cedar Creeks. Southwest Brookman Road and the current UGB form the north boundary, Pacific Highway (99W) forms the western edge, and tax lot lines define the south edge and the Clackamas-Washington County line forms the east edge. There is one lot that is split by the study area boundary along its southern edge. The area is served by SW Brookman Road, Highway 99W, and SW Middleton Road. The entire area is within unincorporated Washington County.

Parcelization, Building Values, Development Pattern (see attached aerial photograph)

The South Sherwood Analysis Area contains 82 parcels, one of which is only partially within the study area (28 out of 67 acres of that parcel lie within the study area). There are 36 parcels of at least five acres, and a median parcel size of 4.32 acres. Of the 447 total acres, 367 are accounted for by parcels of five acres or more. Improvements are recorded for 68 of the 82 tax lots, with a median value of $130,795. Only 11 of those lots have improvements valued over $250,000. Land use is composed of primarily rural residential in the western half, and a mix of agriculture and forested parcels in the eastern half. It appears that a large portion of the agricultural use is for tree farms and orchards, and minimal use for crop cultivation.

Available data does not suggest the existence of power lines within the analysis area. The State of Oregon owns one small 4 acre parcel in the north central part of the area, along SW Labrousse Road.

GOAL 14 LOCATIONAL FACTORS (METRO CODE SECTION 3.01.020)

Public Facilities and Services

Orderly and economic provision of public facilities and services

The preliminary sanitary sewer, water and transportation suitability analyses completed by the Core Four Technical Team for the urban and rural reserve study area indicated this general location had medium suitability for sanitary sewer services and water services. This location was not evaluated for transportation connectivity. The City of Sherwood's Pre-Qualifying Concept Plan, completed as part of the Washington County urban and rural reserve designation process, indicates that the city has the ability and willingness to provide urban services to this area.

The following cost estimates represent preliminary estimates for the major components of the individual systems. The estimates were generated using very general assumptions about the level of residential development that could occur in the analysis area. More detailed concept plans, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11 will be necessary to develop more refined cost estimates. Attachment 5 contains the breakdown for the transportation cost estimates. A map of the proposed collector and arterial transportation network is attached to this summary.

Sanitary Sewer Services - $9,988,000

Water Distribution Services - $4,925,000

Storm Sewer Services - $4,483,500

Transportation Services - $178,120,000

Parks - $35,000,000

Schools - $300,000 (Increased maintenance costs, no new schools)

ESEE Analysis

Comparative environmental, energy, economic and social consequences

Environmental

Two creeks flow through the area: Cedar Creek from the southwest and Goose Creek from the northwest. The two creeks join together near the center of the analysis area, and continue north through the city of Sherwood to ultimately flow into the Tualatin River. Two additional unnamed creeks flow through the east side of the area, joining Cedar Creek to the north of the analysis area boundary. There are 45 acres of constrained steep slopes over 25%, 20 of those acres occurring within riparian corridors. A floodplain area along both Cedar and Goose Creeks covers 44 acres.

No parks or open space areas are identified within or adjacent to this study area. The locations of the streams result in the analysis area being broken up into small segments of non-constrained land. As a result of this fragmented landscape, urbanization of the area in a well connected manner could highly impact the natural resources. If urbanization occurs in a more segmented manner impacts to significant environmental resources can be reduced. Overall, urbanization of this area will impact the natural resources to some degree, depending on the urban form. Additionally, it should be noted that the City of Sherwood has preserved the Cedar Creek riparian area that currently is within the city limits by integrating the stream corridor into the urban form and as a result creating an amenity for its citizens. Attachment 6 contains the breakdown of the environmental factors.

Energy, Social & Economic

This medium sized area is divided into 82 parcels with 56% of the parcels less than five acres in size. The area contains limited agricultural activities and numerous rural residences, evident by improvements on 83% of the parcels. The minimal level of agricultural activities will reduce the potential negative economic impacts of a lost farming economy. There are 2.87 miles of streams and approximately 45% of the land is identified as containing habitat areas, which are dispersed throughout the analysis area. The costs for protecting these large resource areas will be considerable in contrast to the potential economic impact of urbanizing the developable lands in between in a well connected manner. Directly to the north is an area that was brought into the UGB in 2002, but is currently undeveloped. Once this area is developed to urban levels, the loss of the rural lifestyle for the current residents of the analysis area may be less, as they will be closer to urban amenities. Development of the two areas together may provide efficiencies in infrastructure financing and delivery of services. Additional VMT will be generated through urbanization of this medium sized area as the average commute distance for this area on the southwestern edge of the region is larger than the existing commute distance for the region. Overall this analysis area has medium economic, social and energy consequences from urbanization.

Avoidance of conflict with regionally significant fish and wildlife habitat

A total of 4.5 acres of wetlands are scattered throughout the area, along with 98.6 acres of regionally significant riparian habitat along Cedar and Goose Creeks as well as the smaller drainages. An additional 105 acres of regionally significant upland habitat extend beyond the riparian corridors in the area, with a large cluster located along the south edge of the analysis area between Cedar and Goose Creeks. Future development opportunities will be limited due to the dispersed locations of significant habitat throughout the area. The City of Sherwood, the expected governing body, has adopted habitat protection measures that are in compliance with Metro's Title 13 requirements as part of the Tualatin Basin Natural Resource Coordinating Committee's protection program. The expected protection measures that will be in place prior to urbanization will help protect much of the habitat, however the need for connecting the dispersed developable areas together will result in impacts to some significant habitat areas.

Agricultural/Forest Compatibility

Protection of farmland that is most important for the continuation of commercial agriculture in the region

The urban and rural reserves process designated the most important land for commercial agriculture as rural reserves and the most suitable land for urbanization as urban reserves. Designation of this area as an urban reserve means farmland within this analysis area is not the most important for the continuation of commercial agriculture in the region.

Compatibility of proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

There is a 127 acre block of resource land zoned agriculture forest 20 (AF-20) directly south of the analysis area between SW Ladd Hill Road and SW Labrousee Road (see attached resource land map). The majority of the resource land is forested with one rural residence and a very limited amount of agricultural activities occurring. Two unnamed tributaries to Cedar Creek flow north through the forested portion of the resource land area in ravines up to 200-feet deep. As there is a very limited amount of agricultural activities and no indication of forest activities occurring in this resource land area, the proposed urban uses are generally compatible with the nearby agricultural and forest activities occurring on this farm and forest land.

A second block of resource land zoned AF-20 is located west of the analysis area, on the west side of Highway 99W between SW Chapman Road and SW Gimm Lane, and extends approximately 1 ½ miles to the Washington County line. Agricultural activities near Highway 99W include a small amount of orchard and field crops and a 44-acre equestrian center. The Highway 99W right-of-way, which is approximately 150-feet in width, provides a good edge to the analysis area in this location. In addition, the equestrian center is essentially a developed use that supplements the buffer of the highway for the majority of the agricultural activities that occur to the west. Due to the fairly wide highway right-of-way and the location of the equestrian center, the proposed urban uses are generally compatible with the nearby agricultural activities occurring on this farm and forest land.

There is a third 438 acre block of resource land zoned AF-20 located approximately ¼ mile south of the analysis area along SW Rein Road. This resource land area is approximately 100-feet higher in elevation and is separated by a number of rural residences. As this block of resource land is not directly adjacent to the analysis area, and there are a number of rural residences located on the slope between the two areas, the proposed urban uses would be compatible with nearby agricultural or forest activities occurring on this farm or forest land.

Overall, proposed urban uses in the Sherwood South analysis area would generally be compatible with nearby agricultural and forest activities occurring on farm and forest land outside the UGB.

Clear transition between urban and rural lands, using natural and built features to mark the transition

The UGB borders this analysis area on the north side. Along the short eastern edge of the area there is a change in elevation of around 100-feet up to SW Ladd Hill Road, resulting in a small natural feature that provides some transition area between the urban and rural lands. This strip of land includes rural residences on mostly forested lots and the headwaters of a small tributary to Cedar Creek that flows within the analysis area. Along the southern edge of the analysis area is a significant change in elevation of approximately 800-feet up to SW Parrett Mt. Road that provides a transition area between the urban and rural lands. There are a number of rural residences located in this area as well as a significant amount of private open space associated with Parrett Mountain View Estates. The combination of change in elevation and private open space provides a transition between urban and rural lands using a natural feature. Highway 99W provides a built feature transition area between urban and rural uses along the western edge of the urban reserve area. Therefore, there is a clear transition between urban and rural lands using both natural and built features.

2040 Growth Concept

Contribution to the purposes of Centers

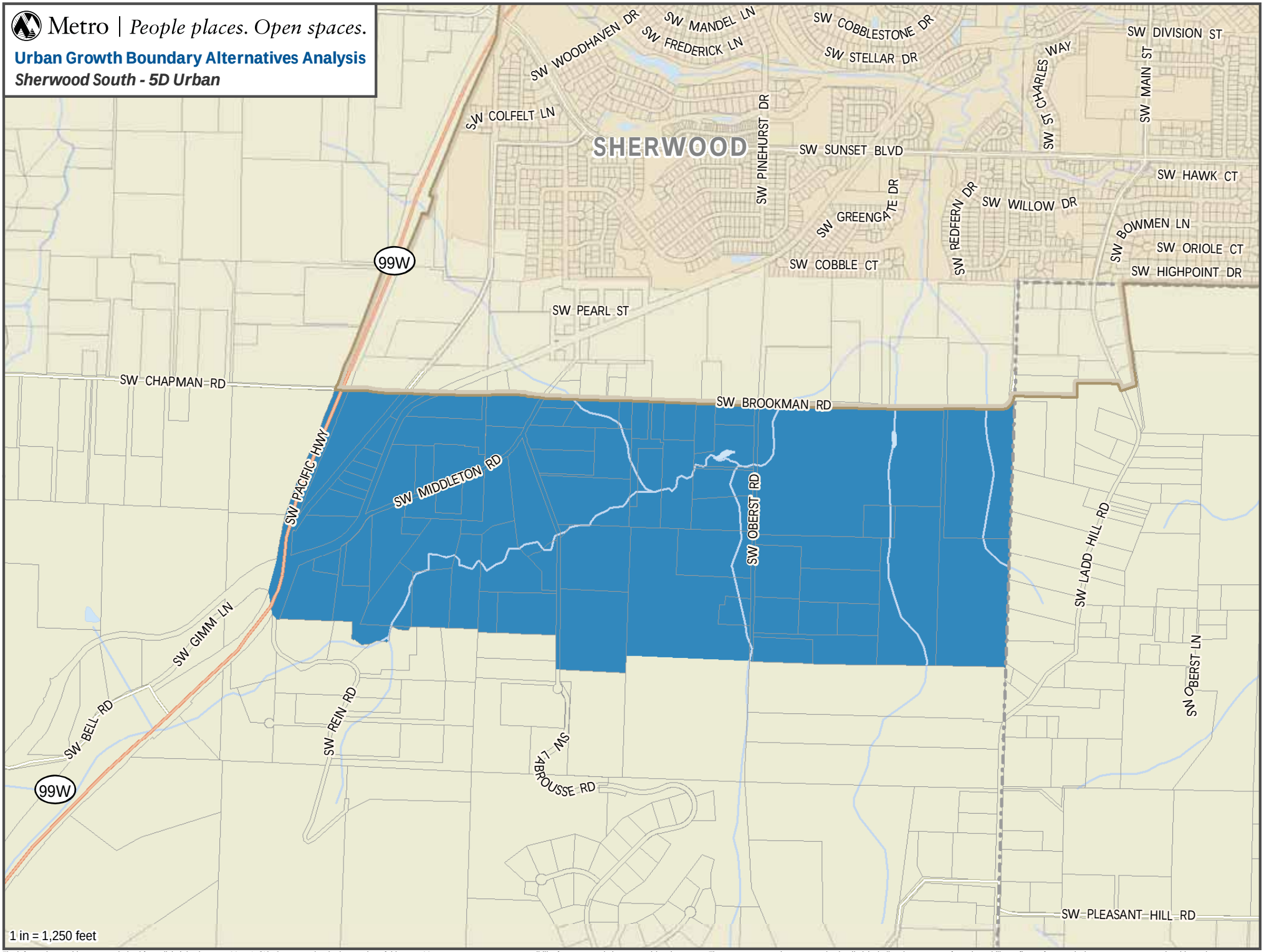
The Sherwood Town Center is the nearest center to the Sherwood South analysis area. It is a small town center of 88 acres, located to the north of the analysis area at the intersection of the SW Pacific Hwy (99W) and SW Tualatin-Sherwood Road. The center primarily serves the community of Sherwood and the surrounding rural area located in the southwest edge of the region. The analysis area is connected to the center via Highway 99W (approximately 1 mile) and there are currently no transit connections. Tri-Met does have two bus routes serving the Sherwood Town Center, lines 12 and 94.

According to Metro's State of the Centers Report, January 2009, the Sherwood Town Center's jobs to housing ratio is higher than ideal and the total number of people per acre is low, indicating that there may be a need to attract and develop more housing within the center. The center also has a much lower than average number of dwellings per acre. Currently the City of Sherwood envisions the analysis area developing primarily as residential, with a limited amount of commercial use while preserving a large area of riparian habitat. Urbanization of the Sherwood South area is unlikely to support developing increased residential units or employment opportunities within the center and ultimately may impede the creation of a compact, walkable community the city desires for the town center by providing alternative housing options.

Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

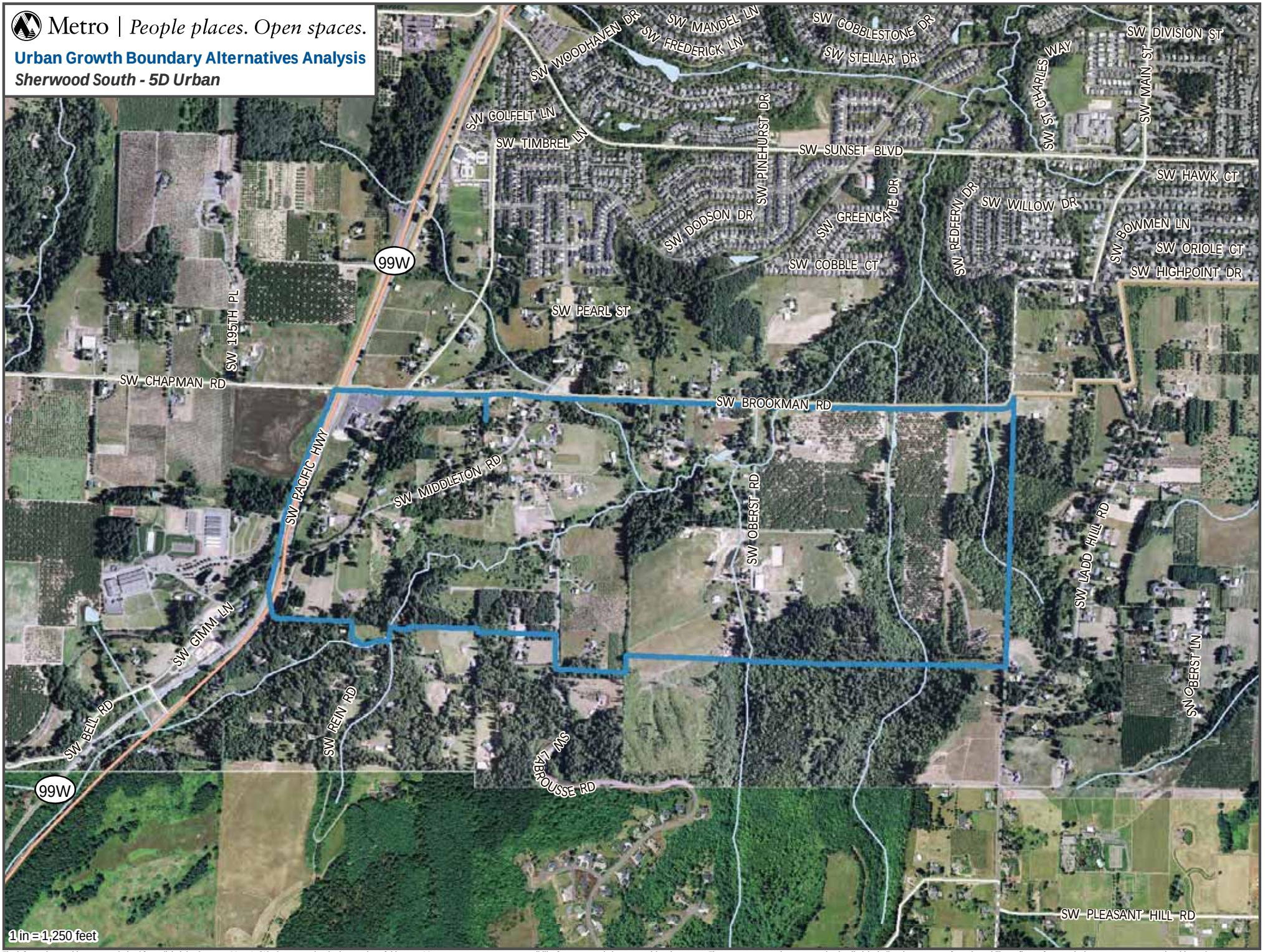
Sherwood South - 5D Urban

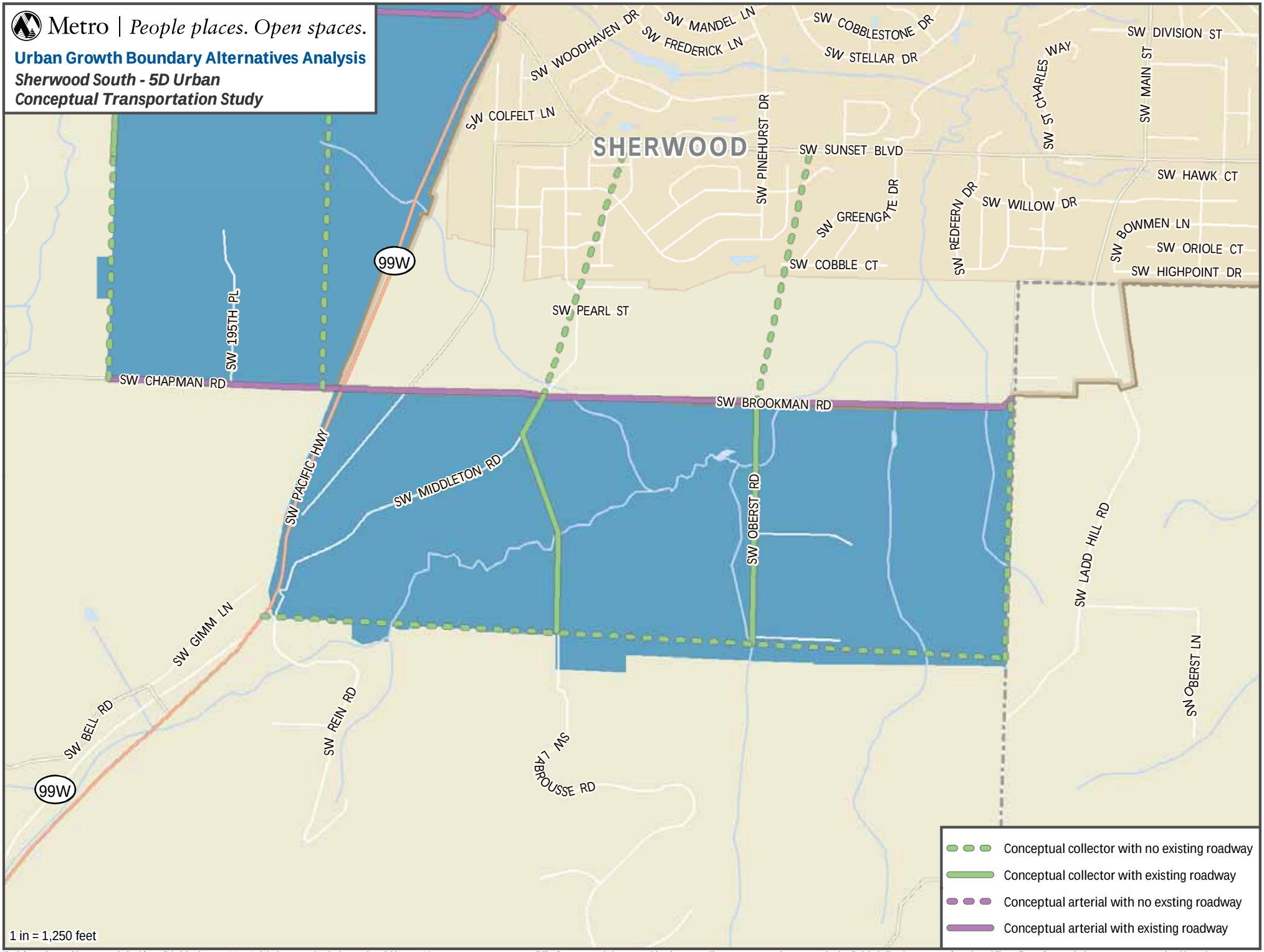


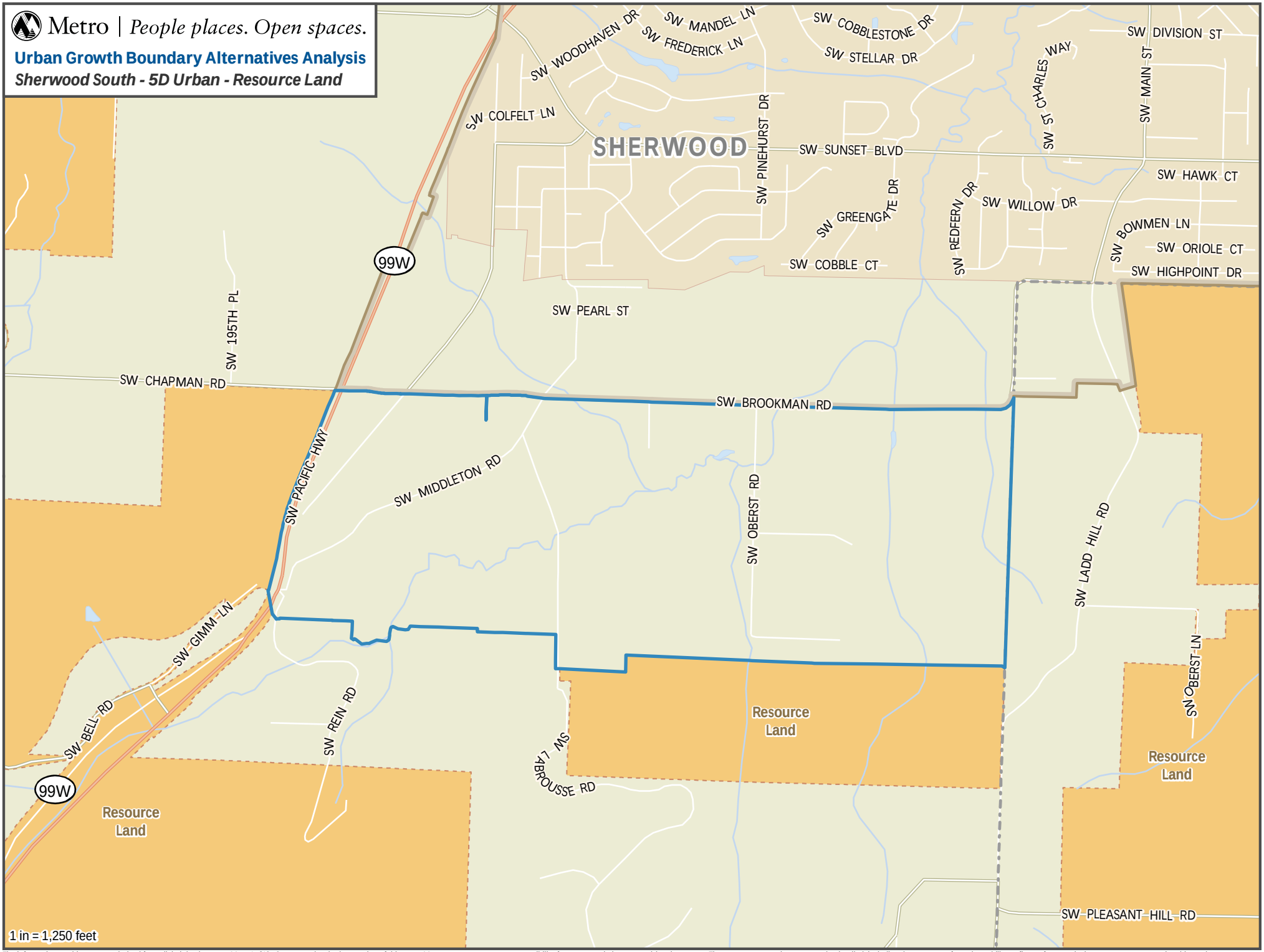
Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

Sherwood South - 5D Urban







TONQUIN ANALYSIS AREA (5F)

Tonquin Analysis Area		**Total Acres**	**120**
Gross Vacant Buildable Acres	57	Total Constrained Acres	63
Estimated Dwelling Unit Capacity	0	• Title 13 Significant Habitat	36
Estimated Employment Acres	46	• Public Land	0

General Description (see attached map)

The Tonquin Analysis Area is a rectangular shaped area located to the southwest of Tualatin, in unincorporated Washington County, and consists of 120 total acres of land. The current UGB forms the north and east edges, and the west edge is formed by extending a line north from the intersection of SW Morgan Rd and SW Tonquin Road. The area is served primarily by SW Tonquin Road, but otherwise lacks major transportation connectors. This analysis area and much of the surrounding landscape is characterized by large quarries and other mineral extraction enterprises.

Parcelization, Building Values, Development Pattern (see attached aerial photograph)

This analysis area contains only 12 parcels within the study area boundary, half of which are more than five acres. The median parcel size is 7.5 acres. There are structural improvements built on five of the 12 parcels, with a median value of $119,320. One of the larger parcels, on the south side of SW Tonquin Road, is owned by Tualatin Valley Fire & Rescue and houses their Regional Training Center. The remainder of the study area, to the north of SW Tonquin Road, is dominated by the Coffee Lake Quarry. Land uses in the area are designated as primarily industrial, commercial or vacant.

A small corner of a power line easement exists in the northeast corner, but only covers 1.4 acres. Available data do not suggest the existence of other public easements within this area.

GOAL 14 LOCATIONAL FACTORS (METRO CODE SECTION 3.01.020)

Public Facilities and Services

Orderly and economic provision of public facilities and services

The preliminary sanitary sewer, water and transportation suitability analyses completed by the Core Four Technical Team for the urban and rural reserve study area indicated this general location had high suitability for sanitary sewer services and medium suitability for water services and transportation connectivity. The City of Tualatin's Pre-Qualifying Concept Plan, completed as part of the Washington County urban and rural reserve designation process, indicates that the city is interested in providing urban services to this area.

The following cost estimates represent preliminary estimates for the major components of the individual systems. The estimates were generated using very general assumptions about the level of residential or large site industrial development that could occur in the analysis area. More detailed concept plans, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11 will be necessary to develop more refined cost estimates. Attachment 5 contains the breakdown for the transportation cost estimates. A map of the proposed collector and arterial transportation system is attached to this summary.

Sanitary Sewer Services - $592,000

Water Distribution Services - $630,000

Storm Sewer Services - $476,500

Transportation Services - $75,840,000

ESEE Analysis

Comparative environmental, energy, economic and social consequences

Environmental

The Coffee Lake Creek stream corridor flows through the center of the area from north to south, although its actual path is obscured by the presence of the large rock quarry and widespread landscape modification. Wetlands cover 13.4 acres of the study area, however 5 of those acres lie within rock quarries and are subject to the same landscape modification that obscures the Coffee Lake Creek corridor. Steep slopes occur on 27 of the total 120 acres, again mainly as a result of the quarries. The large wetlands in that southeast corner are also within the 100-year flood plain, limiting the development potential there. Once a quarry is no-longer being actively mined, a reclamation plan must be implemented. As the majority of the environmental features identified are within the existing mining operation, it is difficult to assess the impacts urbanization may have on the resources prior to the reclamation plan being implemented, thus urbanization will have

minimal impact on the environmental resources in the area. Attachment 6 contains the breakdown of the environmental factors.

Energy, Economic & Social

The vast majority of this small area is currently being used as a quarry. The Tualatin Valley Fire & Rescue Training Facility encompasses the next largest site within the analysis area. There is one rural residence and the remaining parcel is constrained with natural resources. It is expected that the ultimate reuse of the quarry site will provide future industrial uses that will replace the quarry operation, thereby negating any economic loss from the quarry. The fire training facility is expected to continue operating. Urbanization will have minimal impact on the lone residence in the area, assuming that the expected reuse of the quarry will provide a less degraded environment. As the natural landscape is severely manipulated by the quarry operations, the required mitigation plan once the extraction operations cease will provide the opportunity to restore a critical habitat link. . Overall this analysis area has low economic, social and energy consequences from urbanization.

Avoidance of conflict with regionally significant fish and wildlife habitat

There is approximately 36 acres of identified regionally significant habitat, 33 acres of which are within riparian zones. The significant habitat is mostly concentrated in the undeveloped and undisturbed parcel in the southeast corner of the study area, 12.6 acres of which is also within the 100-year flood plain. The remainder of the identified habitat occurring along the Coffee Lake Creek is within the rock quarry and mineral extraction areas, and has already undergone significant disruption. The City of Tualatin, the expected governing body for this area, has adopted habitat protection measures in compliance with Metro's Title 13 program through the Tualatin Basin Natural Resource Coordinating Committee's protection program. Based on the edge location of the significant habitat areas that are outside the quarry operations and the fact that the quarry area will undergo a significant reclamation program prior to urbanization, it appears that urbanization in this area is unlikely to impact regionally significant fish and wildlife habitat, and may ultimately improve the habitat within the area.

Agricultural/Forest Compatibility

Protection of farmland that is most important for the continuation of commercial agriculture in the region

The urban and rural reserves process designated the most important land for commercial agriculture as rural reserves and the most suitable land for urbanization as urban reserves. Designation of this area as an urban reserve means farmland within this analysis area is not the most important for the continuation of commercial agriculture in the region.

Compatibility of proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

There is one block of resource land zoned Agriculture Forest 20 (AF-20) and Exclusive Forest and Conservation (EFC) zoned land directly west of the northern portion of the Tonquin analysis area that extends west to the City of Sherwood (see attached resource land map). The AF-20 zoned land totals 186-acres and is entirely owned by the Tualatin Valley Sportsmen Club. Of the remaining 221-acres zoned EFC, 58 acres are owned by the US Fish & Wildlife Service. There are two rural residences within the entire area and there appears to be no agricultural or forest activities occurring. Due to the fact there is no agricultural or forest activities occurring on the adjacent AF-20 and EFC zoned land, the proposed urban uses would be compatible with nearby agricultural or forest activities occurring on farm or forest land.

Clear transition between urban and rural lands, using natural and built features to mark the transition

The UGB borders this analysis area on the north and east sides and rural lands abut the western and southern edges. There are no natural or built features that mark a clear transition area between the proposed urban and rural lands. However, more than half of the west edge of the analysis area is bordered by the Tualatin Valley Sportsmen Club, which includes a firearms training facility that is used extensively by numerous law enforcement agencies. This facility encompasses 186 acres and a firearms training facility use is an allowed use in forest zones. The expectation is that the facility will continue to operate for the foreseeable future, thereby providing a buffer to the rural lands further west. Coffee Lake Creek and its associated floodplain also provide a transition area between urban and rural lands to the south. Therefore, there is a clear transition between urban and rural lands using both natural features and the existence of a specialized use.

2040 Growth Concept

Contribution to the purposes of Centers

The Tualatin Town Center is the nearest center to the Tonquin analysis area. The Tualatin Town Center is approximately 325 acres in size, and primarily serves the surrounding residential and commercial areas in the City of Tualatin. The analysis area is connected to the town center via SW Tonquin Road, SW Grahams Ferry Road and SW Boones Ferry Road (3 miles). There is no Tri-Met service connecting the Tualatin Town Center and the Tonquin area directly. The WES Commuter Rail passes near the eastern border of the analysis area prior to stopping in the town center, although no station stops are near the analysis area.

Tualatin's Town Center Plan, envisions a mixed use live, work and play center that integrates natural resources like the Tualatin River with civic, social, economic and cultural functions in a walkable community. According to Metro's State of the Centers Report, January 2009, the Tualatin Town Center has a lower than ideal number of people per acre and slightly below average number

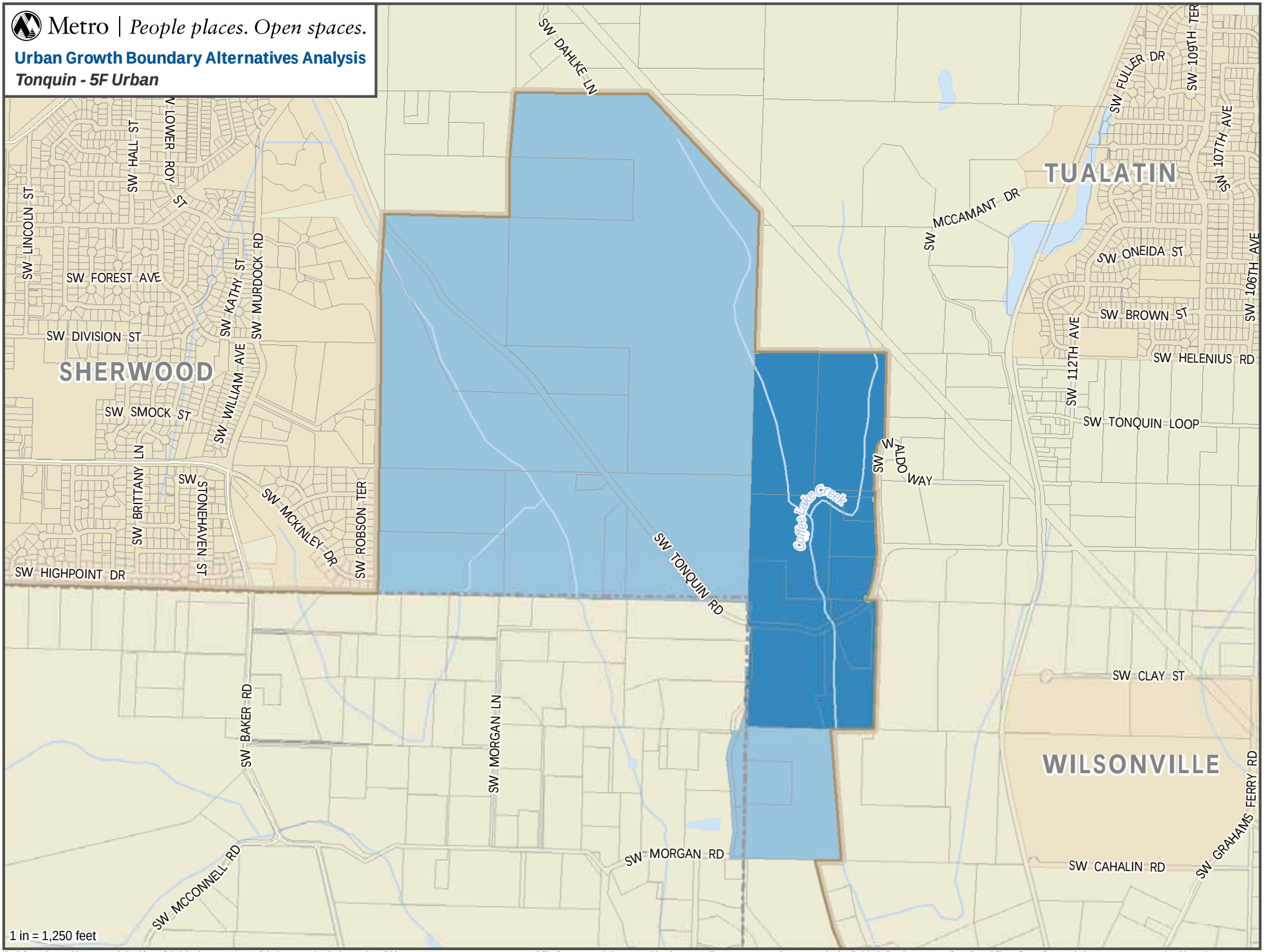
of dwellings per acre. The Tualatin center has an average jobs to housing ratio, but density is somewhat lower than average for both housing and businesses.

Pre-qualified concept planning by Tualatin indicates that the city foresees primarily industrial redevelopment for the analysis area (referred to as "Knife River"). Urbanization of the Tonquin analysis area will not support the vision or purpose of the Tualatin Town Center. The area's future as industrial uses combined with the distance from the town center will not contribute to creating a compact, pedestrian-oriented community within the Tualatin Town Center. The analysis area is of primary interest to the city for transportation connectivity, as it would serve to extend SW 124th Avenue to future east west arterial roads.

Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

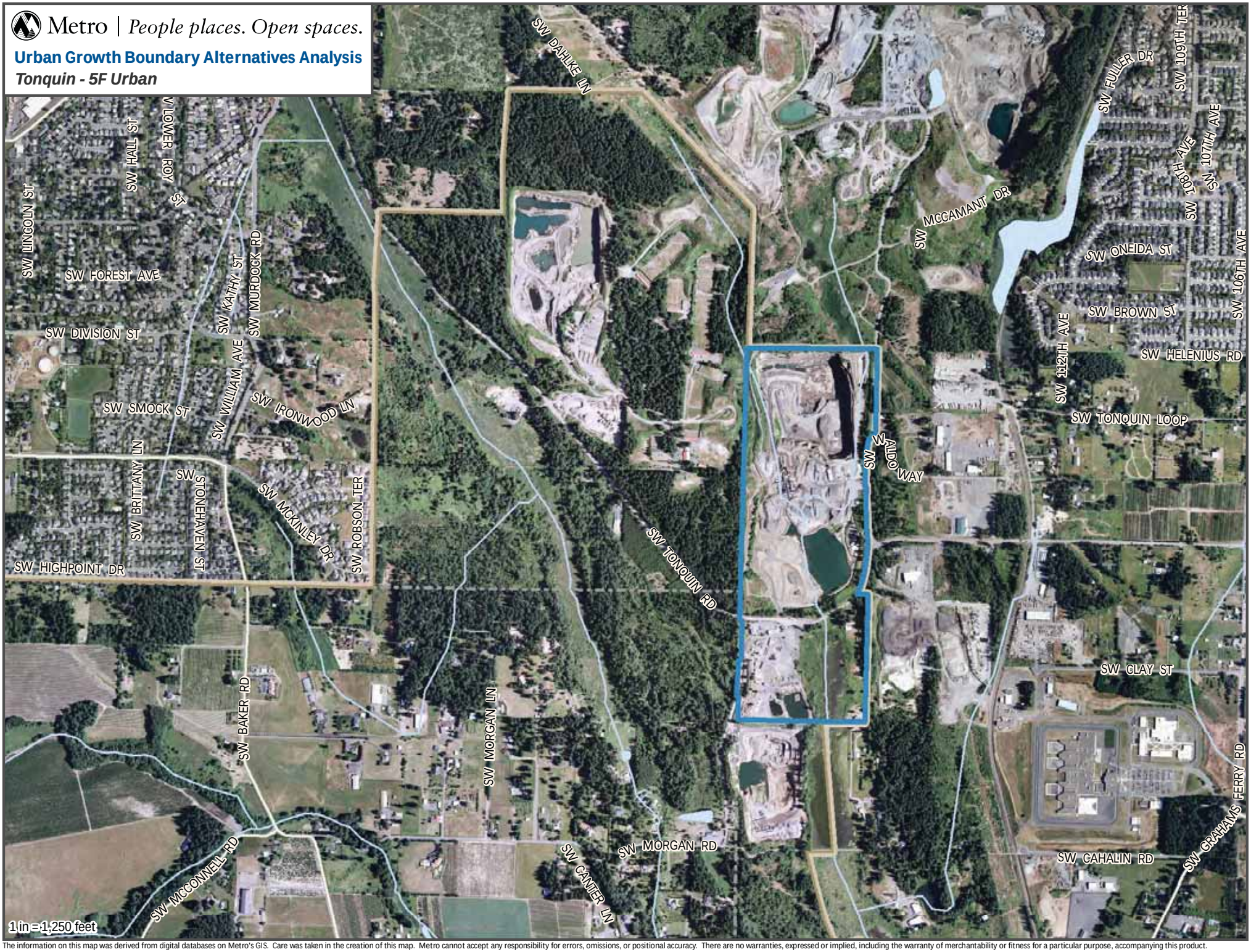
Tonquin - 5F Urban

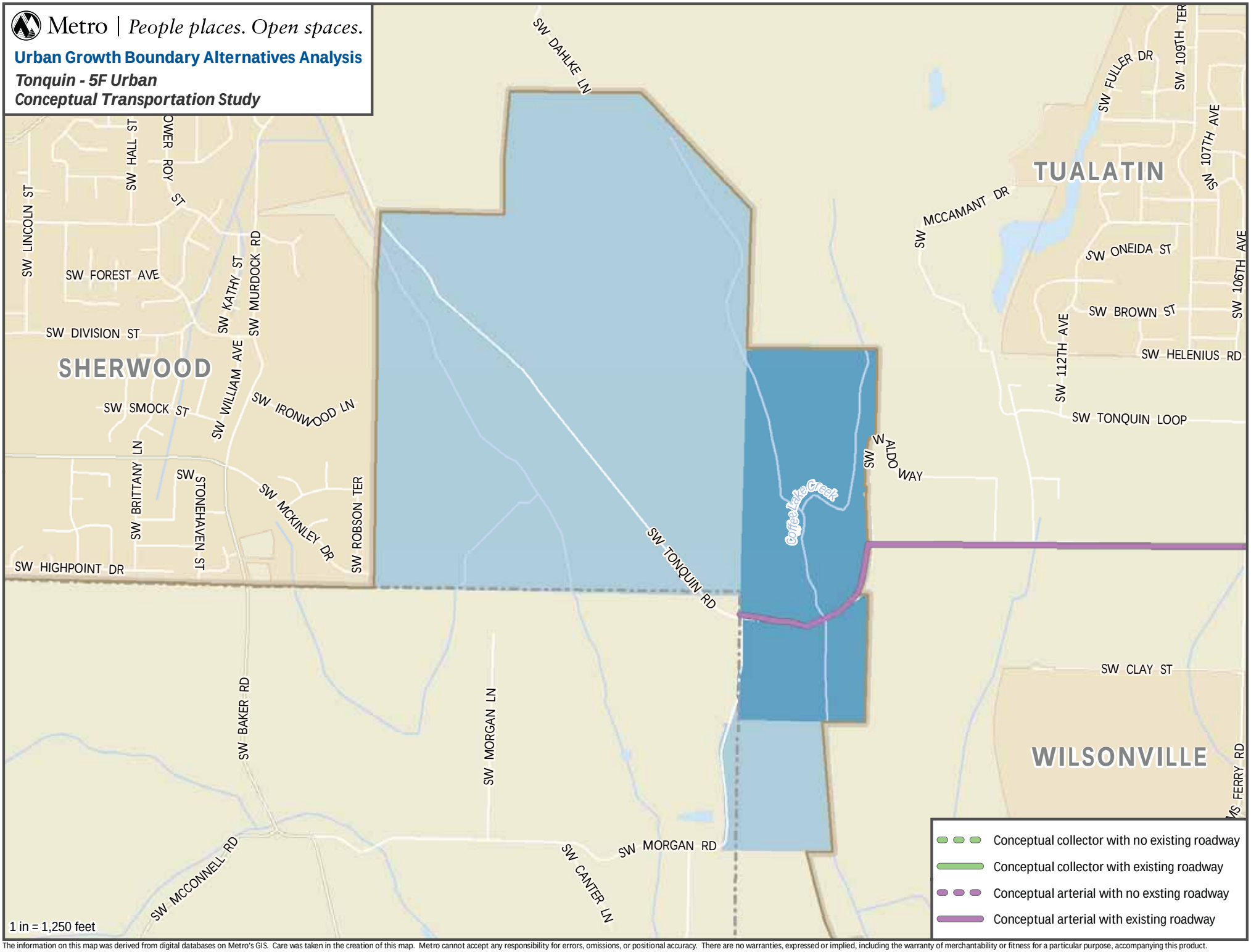


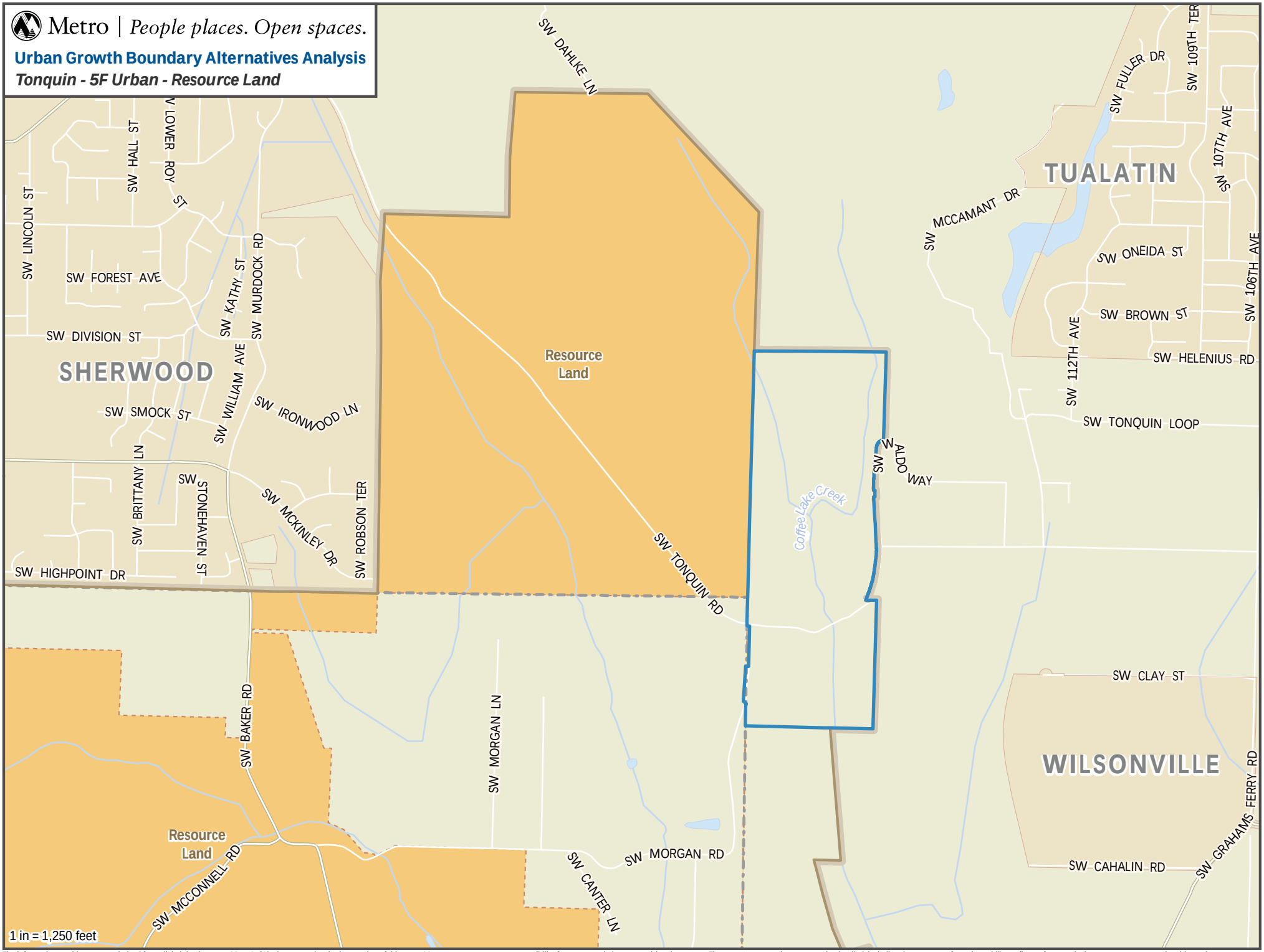
Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

Tonquin - 5F Urban







GRAHAMS FERRY ANALYSIS AREA (5G)

Grahams Ferry Analysis Area		**Total Acres**	**203**
Gross Vacant Buildable Acres	83	Total Constrained Acres	120
Estimated Dwelling Unit Capacity	1,094	• Title 13 Significant Habitat	115
Estimated Employment Acres		• Public Land	0

General Description (see attached map)

The Grahams Ferry Analysis Area is located to the west of Wilsonville, west of the Coffee Lake Wetlands natural area owned by Metro. The current UGB forms the eastern and southern edges. Access to the area includes SW Tooze Road, running along the south edge, and SW Grahams Ferry Road which forms the west edge. The area is flat, and is adjacent to significant natural features including the south end of the Tonquin Geologic Area.

Parcelization, Building Values, Development Pattern (see attached aerial photograph)

There are 24 parcels with this area, three-quarters of which are less than five acres in size. The median parcel size is 2.77 acres and approximately 170 of the 203 total acres are contained in the eight largest lots. Building improvements have been made on 19 of the 24 lots, with a median value of $183,420 and four improvements are valued over $250,000. There appears to be limited active farming or crop production. A small pocket of rural residences are clustered in the southwest corner of the analysis area, at the intersection of SW Tooze Road and SW Grahams Ferry Road.

Available data does not suggest the existence of power lines or public easements through this area. However, there is a large block of Metro-owned open space between the study area and the industrial uses to the east within the UGB.

GOAL 14 LOCATIONAL FACTORS (METRO CODE SECTION 3.01.020)

Public Facilities and Services

Orderly and economic provision of public facilities and services

The preliminary sanitary sewer, water and transportation suitability analyses completed by the Core Four Technical Team for the urban and rural reserve study area indicated this general location had high suitability for sanitary sewer services, medium suitability for water services and medium suitability for transportation connectivity. As part of Clackamas County's urban and rural reserve designation process, the City of Wilsonville indicated that the area can be efficiently and cost-effectively provided with public facilities necessary to support urban development.

The following cost estimates represent preliminary estimates for the major components of the individual systems. The estimates were generated using very general assumptions about the level of residential development that could occur in the analysis area. More detailed concept plans, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11 will be necessary to develop more refined cost estimates. Attachment 5 contains the breakdown for the transportation cost estimates. A map of the proposed collector and arterial transportation system is attached to this summary.

Sanitary Sewer Services - $3,188,000

Water Distribution Services - $2,510,000

Storm Sewer Services - $1,906,000

Transportation Services - $127,780,000

Parks - $15,360,000

Schools - $300,000 (Increased maintenance costs, no new schools)

ESEE Analysis

Comparative environmental, energy, economic and social consequences

Environmental

Coffee Lake Creek runs through the east side of the study area, and including other small unnamed tributaries totals 1.5 miles of stream corridor. A small irrigation channel runs north-south through the southeast corner of the analysis area. There are two ponds along this channel, one along the forested area along Coffee Lake Creek, and the other just south of the analysis area, along SW Boeckman Road. The Coffee Lake Wetlands natural area is along the eastern edge of the study area, and forms a large continuous area with the habitat surrounding Coffee Lake Creek.

Slopes are generally mild, with only a half acre over 25%, even within the riparian areas. A large 100-year flood plain cuts across the northeast portion of the analysis area, and extends throughout the Coffee Lake Wetlands area to the east. A portion of this flood plain area appears to be active farmland, and the rest is forested. Based on this analysis, urbanization throughout most of the area would have minimal environmental impacts. In the eastern portion that includes forest and wetland features, the 100-year flood plain will limit development opportunities, precluding the impact of urbanizing the area. Attachment 6 contains the breakdown of the environmental factors.

Energy, Economic & Social

This small area, composed of 24 parcels is a mixture of limited agricultural activities and rural residences. Seventy-nine percent of the parcels have improvements and 66% of the parcels are less than five acres in size. Directly to the south is the Villebois area that is currently being developed to urban standards. Once the development of this area is completed, the loss of the rural lifestyle for the current residents of the analysis area may be less, as they will be closer to urban amenities. There is one 60-acre parcel and two other parcels in the same ownership that total more than 50 acres; however significant portions of these large areas are constrained by riparian habitat limiting developable acreage. The limited agricultural activity reduces the potential negative economic impacts of a lost farming economy and would be offset by the potential economic impact of urban development. The costs for protecting the significant habitat areas will be considerable in contrast to the potential economic impact of urbanizing the remaining land, although most of the habitat is at the edge, adjacent to other habitat patches that would reduce the overall cost impact of protection. Overall, this analysis area has medium economic, social and energy consequences from urbanization.

Avoidance of conflict with regionally significant fish and wildlife habitat

Regionally significant riparian habitat areas exist along the Coffee Lake Creek corridor, with 44.5 acres of wetland, 37 acres of floodplain, and a majority of the area's 83 acres identified as riparian habitat found in this location. Total regionally significant habitat in the study area includes an additional 32 acres of upland habitat, primarily connected with riparian habitat along the small stream corridor in the southwest corner of the analysis area, including a small pocket of forested land along SW Grahams Ferry Road. The Grahams Ferry Analysis Area is also adjacent to a large 200 acre block of natural area to the east, part of the Coffee Lake Wetlands land owned by Metro, and lies partially within the Tonquin Geologic Feature in the north and east portions of the analysis area.

The City of Wilsonville, the expected governing body, has adopted a habitat protection program that is in substantial compliance with Metro's Title 13 Nature in Neighborhoods regulations. This protection program, along with the limited development potential within the 100-year flood plain, creates a buffer that can minimize the impacts future urbanization will have on regionally significant fish and wildlife habitat in the area. The habitat in the southwest portion of the area is at a higher risk from urbanization due to its isolation, but is currently covered by active agriculture and rural residential developments that have removed much of the critical habitat. Redevelopment

of this area will provide the opportunity to restore the habitat that is impacted. Overall, future urbanization will impact some of the regionally significant habitat within the analysis area.

Agricultural/Forest Compatibility

Protection of farmland that is most important for the continuation of commercial agriculture in the region

The urban and rural reserves process designated the most important land for commercial agriculture as rural reserves and the most suitable land for urbanization as urban reserves. Designation of this area as an urban reserve means farmland within this analysis area is not the most important for the continuation of commercial agriculture in the region.

Compatibility of proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

There is a 178-acre block of exclusive farm use (EFU) zoned land directly adjacent to the north edge of the Grahams Ferry analysis area that extends both east and west of SW Grahams Ferry Road (see attached resource land map). The resource land to the west of SW Grahams Ferry Road is forested with no agricultural activities and two of the four parcels contain rural residences. The resource land to the east of SW Grahams Ferry Road includes one parcel with minimal agricultural activities, two rural residences and an open space parcel owned by Metro. Coffee Lake Creek flows south through this area on its way to the Willamette River. Due to the very limited agricultural activities that are occurring on the adjacent EFU zoned land, the proposed urban uses would be compatible with nearby agricultural activities occurring on farm land.

One would expect that most of the additional traffic generated by urbanization of this analysis area would be directed into the City of Wilsonville to the east, thereby causing a minimal impact on the more intense level of agricultural activities occurring on EFU zoned land in the vicinity of SW Baker and SW Tooze Roads.

Clear transition between urban and rural lands, using natural and built features to mark the transition

Coffee Lake Creek, its associated floodplain and nearby forested areas provide a transition between the analysis area and the rural lands to the north and northwest. There are no natural or built features that provide a transition area for the rural residences to the west. Even assuming SW Grahams Ferry Road is built to a collector level roadway, the road itself will not provide the needed transition area between urban and rural lands. Additional buffers will need to be incorporated into the planning of the analysis area to provide a clear transition from urban to rural uses along this western edge. The remaining edges of the analysis area connect to the UGB. Overall, there is a transition area for approximately half of the Grahams Ferry analysis area edge.

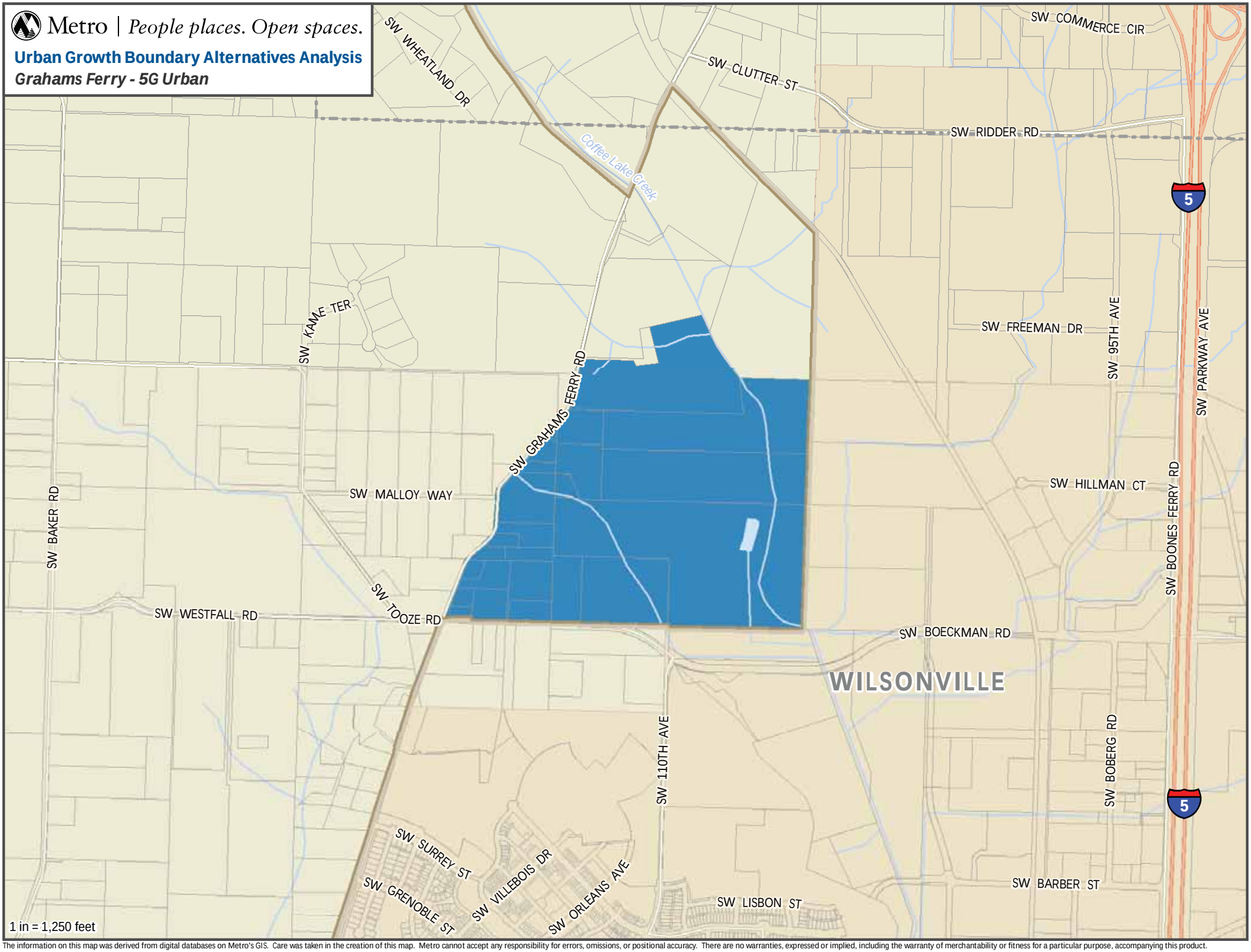
2040 Growth Concept

Contribution to the purposes of Centers

The Wilsonville Town Center is the nearest center, located to the southeast of the Grahams Ferry analysis area. Wilsonville's center is 166 acres in size, and serves primarily the City of Wilsonville in this southern-most extent of the region. The town center is only indirectly linked to the analysis area by a series of arterial roads (1.5 miles). No Tri-Met services currently connect the analysis area to Wilsonville's Town Center, nor does SMART, the City of Wilsonville's bus service. The WES Commuter Rail's southern terminus stop is approximately half way between the center and analysis area.

Wilsonville's Town Center is envisioned to be a dense, mixed used community that creates a walkable, pedestrian-oriented environment. The town center is located a short distance from the terminus of the WES Commuter Rail line. Metro's State of the Centers Report shows a higher than average jobs to housing ratio, fewer people and dwellings per acre than desired, and needing more infill and redevelopment to boost urban densities.

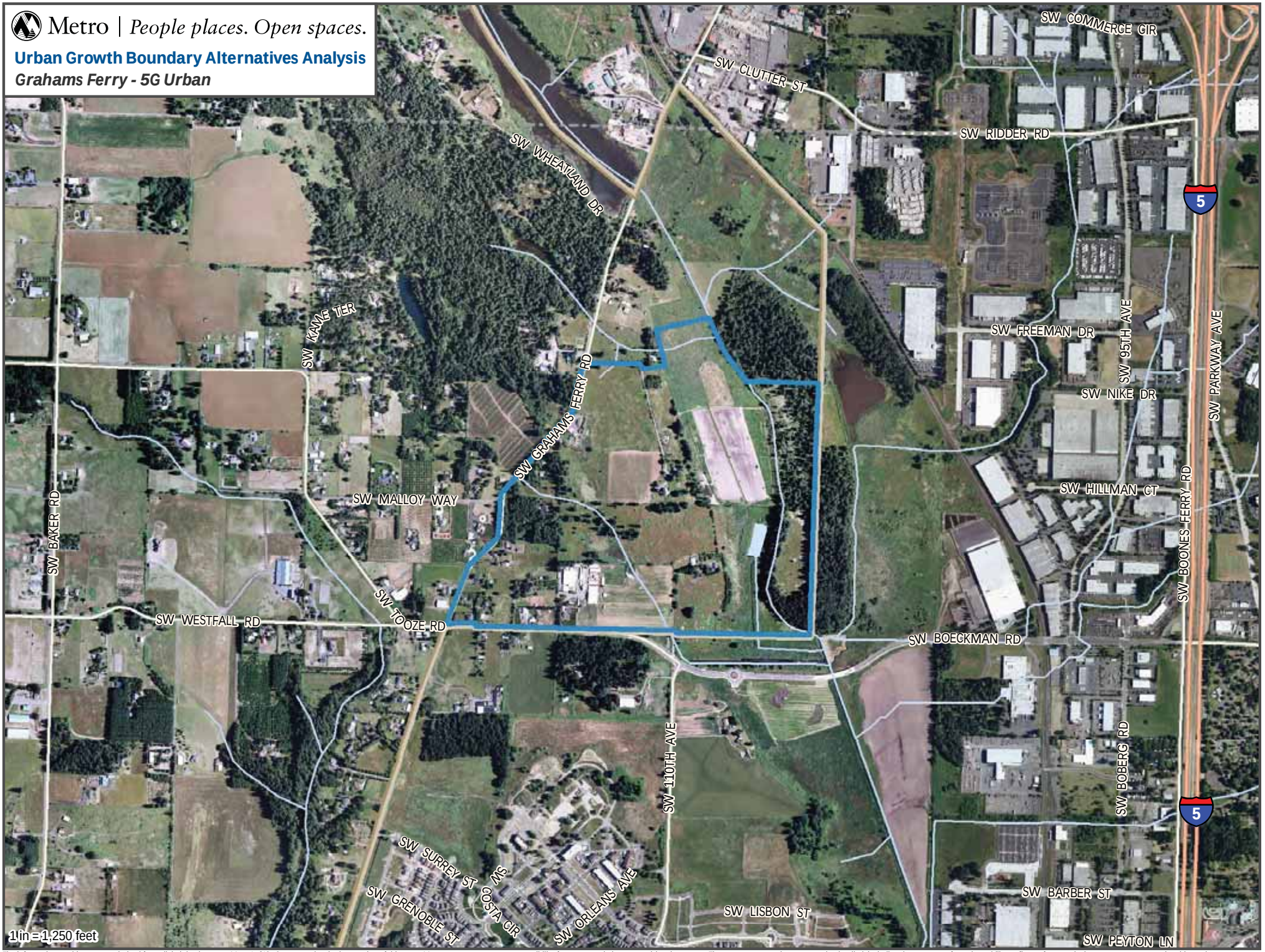
The Grahams Ferry analysis area was identified by Wilsonville's 20 Year Look process as a site for long-term future urbanization, and expected to provide primarily industrial land to build on development within the Coffee Creek industrial area. Urbanization of the analysis area is unlikely to contribute to the purpose and vision of the Wilsonville Town Center due to its distance from the center and its potential industrial use. Although the added industrial development here could provide jobs for the area, the Grahams Ferry analysis area is too distant and disconnected to support the town center. There is currently a block of additional undeveloped land zoned for industrial use adjacent to the east of the analysis area, within the current UGB.



Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

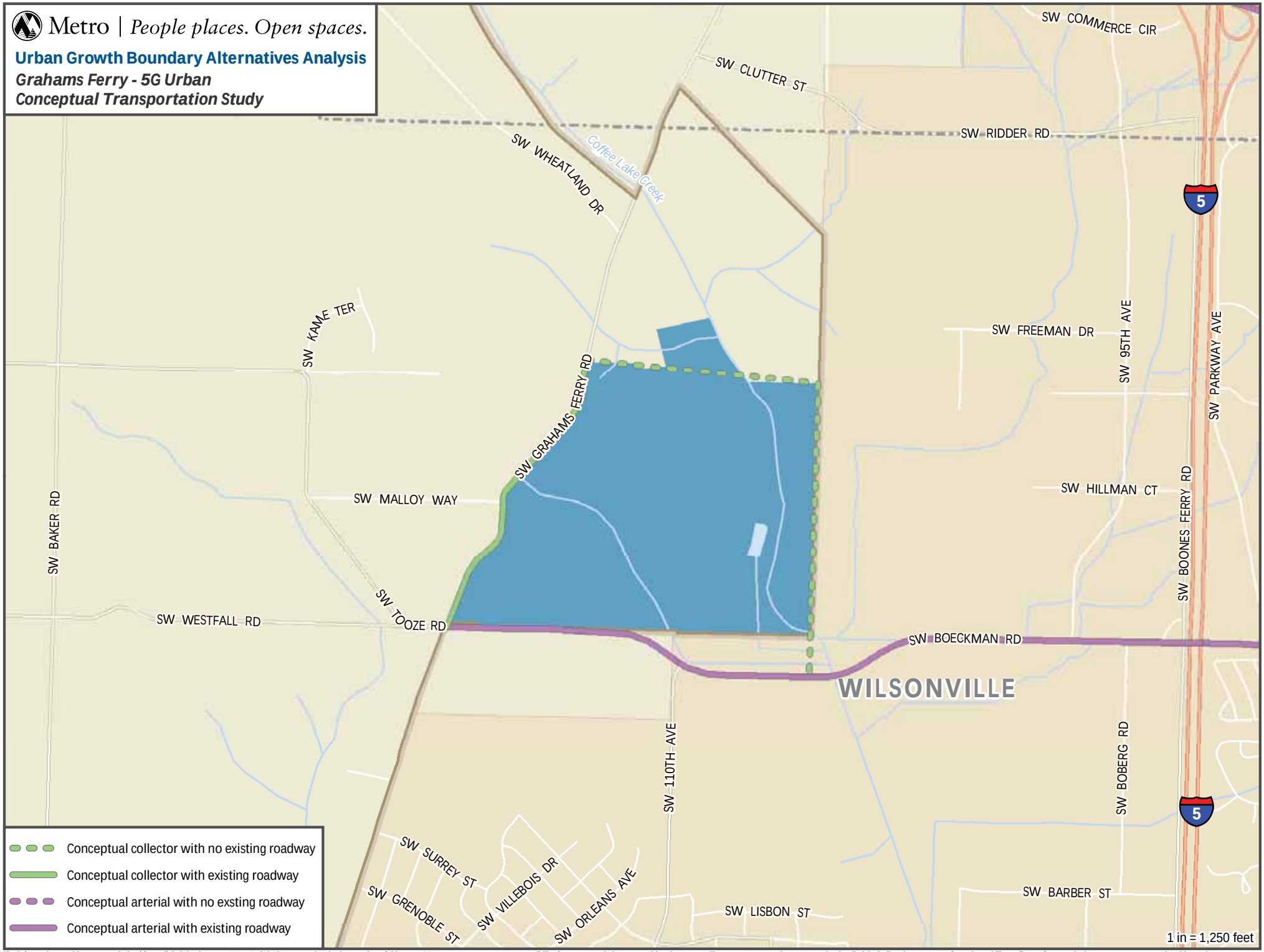
Grahams Ferry - 5G Urban

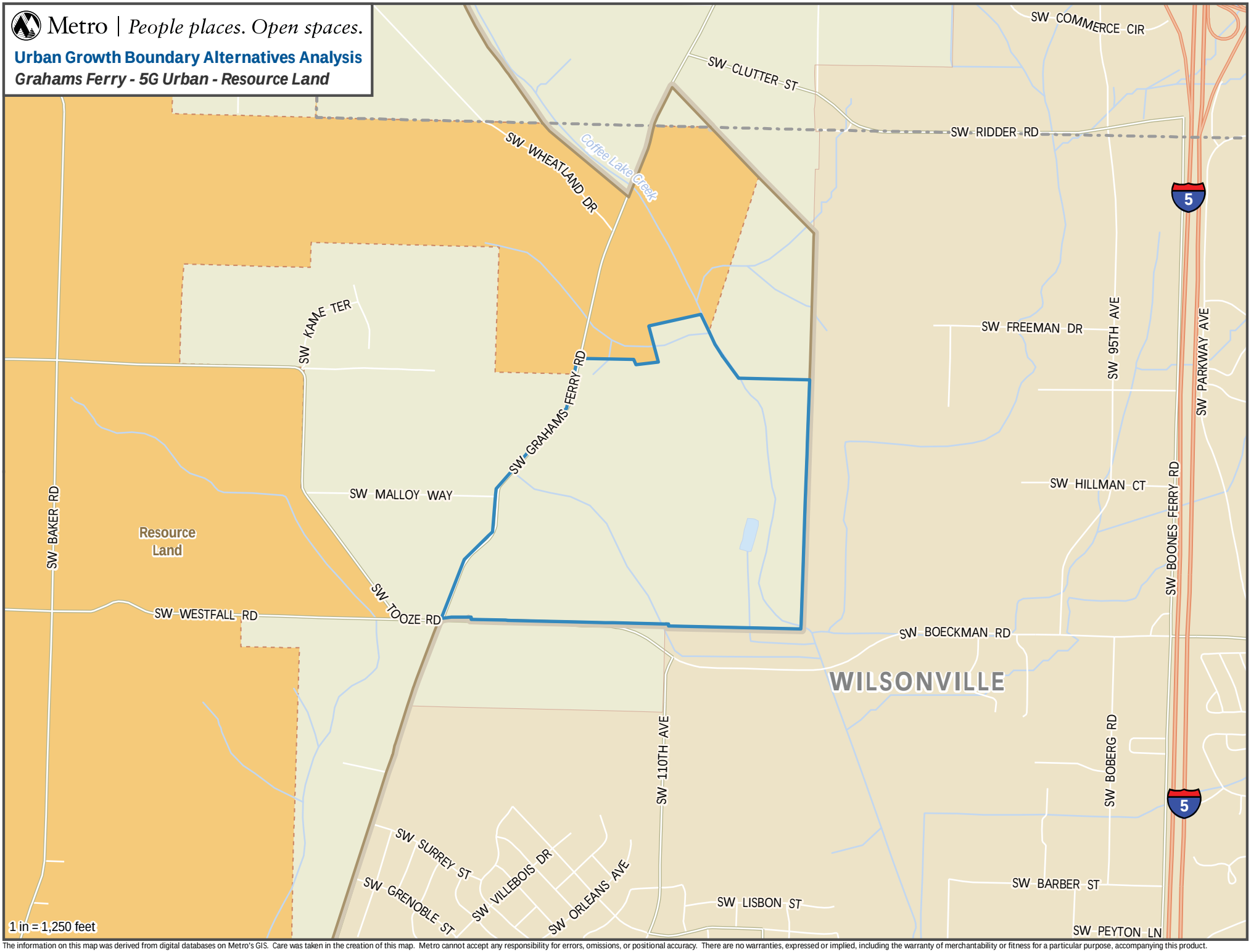


Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

Grahams Ferry - 5G Urban
Conceptual Transportation Study





SOUTH HILLSBORO ANALYSIS AREA (6A)

Hillsboro South Analysis Area		**Total Acres**	**1,063**
Gross Vacant Buildable Acres	878	Total Constrained Acres	184
Estimated Dwelling Unit Capacity	10,172	• Title 13 Significant Habitat	132
Estimated Employment Acres		• Public Land	0

General Description (see attached map)

The South Hillsboro Analysis Area, a portion of the larger South Hillsboro Urban Reserve, is a large irregular shaped area totaling 1,063 acres south of the Tualatin Valley Highway. The area is bounded by the UGB to the east and north, SW 229th Avenue to the west and SW Rosedale Road to the south. South Hillsboro is primarily served by the Tualatin Valley Highway, SW 209th Avenue, SW 229th Avenue and SW Rosedale Road. The Reserve Vineyard and Golf Course is directly west of the analysis area, west of SW 229th Avenue.

Parcelization, Building Values, Development Pattern (see attached aerial photograph)

The South Hillsboro area contains a total of 49 tax lots with a median size of five acres. The largest lot is 203 acres, and the three largest parcels cover just over half of the total study area. Improvements are recorded on 35 of the 49 parcels, with a median value of $104,260, and four parcels have an improvement value over $250,000. The northeast portion of the area, which is almost completely surrounded by the current UGB, has two parcels that total almost 480 acres with no improvements. Within the rest of the area 23 parcels are less than five acres primarily in two clusters, one in the center of the area along SW 229th Avenue and the other in the south along SW Rosedale Road. Land use is almost exclusively agriculture, although some of the land is not utilized due to wetland/stream corridor locations. Agricultural activities include field crops, orchards and nursery stock.

A power line easement runs north-south through the area, covering 45 acres. There is no evidence of other public easements within the analysis area.

GOAL 14 LOCATIONAL FACTORS (METRO CODE SECTION 3.01.020)

Public Facilities and Services

Orderly and economic provision of public facilities and services

The preliminary sanitary sewer, water and transportation suitability analyses completed by the Core Four Technical Team for the urban and rural reserve study area indicated this general location had high suitability for sanitary sewer services, water services and transportation connectivity. The City of Hillsboro's Pre-Qualifying Concept Plan, completed as part of the Washington County urban and rural reserve designation process, indicates that the city has the ability and willingness to provide urban services to this area.

The following cost estimates represent preliminary estimates for the major components of the individual systems. The estimates were generated using very general assumptions about the level of residential development that could occur in the analysis area. More detailed concept plans, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11 will be necessary to develop more refined cost estimates. Attachment 5 contains the breakdown for the transportation cost estimates. A map of the proposed collector and arterial transportation network is attached to this summary.

Sanitary Sewer Services - $24,552,000

Water Distribution Services - $5,230,000

Storm Sewer Services - $4,357,500

Transportation Services (public & private) - $329,340,000

The South Hillsboro area has undergone numerous planning studies over the years, culminating in the development of the South Hillsboro Community Plan. The overview of the community plan, Spring 2010, identifies the "public" portion of the funding for the transportation plan as $95,088,200. This includes only those improvements deemed to be "public", meaning those that serve a larger area for which developers will be entitled to a proportionate credit if they build the improvement or any portion of it. For more information on the South Hillsboro Community Plan efforts see http://www.ci.hillsboro.or.us/Planning/South_Hillsboro.aspx?g1dd=8&g2dd=5

Parks - $59,840,000

Schools - $70,000,000 (New Elementary and Middle Schools)

ESEE Analysis

Comparative environmental, energy, economic and social consequences

Environmental

Butternut Creek flows through the center of the area, from the east, and enters the Tualatin River just over a mile to the west of the study area. Three other small streams cross through the area, Gordon Creek in the north, a small tributary drainage of Butternut Creek, and a third stream at the southern edge of the area. Gordon Creek has almost no riparian corridor and it exists primarily as a drainage way through the cultivated farm land. The tributary to Butternut Creek includes some significant riparian corridor areas as does the third unnamed stream that flows across the southern edge of the area.

Wetlands cover 36 acres, concentrated around the various stream corridors, with the largest block along Butternut Creek in the middle of the study area. The same stretch of Butternut Creek also has a small area of 100-year flood plain, extending between 50-150 feet along either side of the stream. The creek along the southern edge of the analysis area and the early stages of Gordon Creek in the northwest corner of the area also have small flood plains, although Gordon Creek is completely under cropland at this stage of its length. There are 37 total acres in the area that fall within the 100-year flood plain.

Slopes are mild, as the area is generally flat. Only 2.6 acres have slopes over 25%. Although developable land coincides with many of the environmental features in the analysis area, those features are largely within actively farmed agricultural land. With the exception of the riparian areas surrounding Butternut Creek and the two smaller creeks to the south, urbanization would have little impact on current environmental resources in the area. For those streams not under agricultural development, protection of the riparian and upland habitat would minimize the environmental impacts of future urbanization of the area. Attachment 6 contains the breakdown of the environmental factors.

Energy, Economic & Social

This large analysis area is divided into 49 parcels with 53% of the parcels greater than five acres in size. Seventy-one percent of the parcels contain improvements and there are four very large parcels that total 635 acres that contain no improvements. Agricultural activities dominate significant portions of the area with pockets of rural residences along SW 229th Avenue and SW Murphy Lane. Urbanization will negatively impact the current residents who are located further away from the UGB through the loss of the rural lifestyle, especially for those residences that are not associated with the large parcels and will realize less of a positive economic impact. However the Reserve Vineyard and Golf Course, which is directly west of the analysis area, represents more of an urban use and thus already impacts some of the residents. The loss of the economic impact from these significant agricultural uses may be considerable; however the potential economic impact of urbanization on these large flat parcels will reduce or outweigh this loss. Only the agricultural activities in the southern portion of the analysis area are connected to the agricultural

activities to the south, thus reducing any impact on the greater farming community. Approximately 11% of the land is identified as containing environmental resources, mainly in three locations along the 3.3 miles of stream corridors that flow east to west through the area. The costs for protecting these linear resources will be small in contrast to the potential economic impact of urbanizing the larger areas in between. Additional VMT will be generated through urbanization of this large area as the average commute distance for this area is greater than the existing average commute distance for the region. Overall this analysis area has high economic, social and energy consequences from urbanization.

Avoidance of conflict with regionally significant fish and wildlife habitat

There are 115 acres of identified regionally significant riparian habitat, and an additional 17 acres of significant upland habitat along the 3.25 miles of streams. However, almost the entire riparian habitat area along Gordon Creek in the north and some surrounding the small tributary along the southern edge of the analysis area are currently impacted by active cultivation. The most significant habitat appears to occur around Butternut Creek, cutting through the center of the analysis area, and along the small tributary just to its south.

There are limited natural buffers present to protect the identified regionally significant fish and wildlife habitat in this area. The existing habitat that has not been cleared for agriculture is on relatively flat, easily developable land, and could be threatened by future urbanization. The City of Hillsboro, the expected governing body, has adopted habitat protection measures that are in compliance with Metro's Title 13 requirements as part of the Tualatin Basin Natural Resource Coordinating Committee's protection program. Based on habitat location and Hillsboro's protection programs that will provide protection for the stream segments that currently have no buffers, future urbanization could be accommodated throughout the majority of this area with minimal additional impact to regionally significant fish and wildlife habitat.

Agricultural/Forest Compatibility

Protection of farmland that is most important for the continuation of commercial agriculture in the region

The urban and rural reserves process designated the most important land for commercial agriculture as rural reserves and the most suitable land for urbanization as urban reserves. Designation of this area as an urban reserve means farmland within this analysis area is not the most important for the continuation of commercial agriculture in the region.

Compatibility of proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

The UGB borders the Hillsboro South analysis area on the north, east and a portion of the south boundary. Resource land zoned exclusive farm use (EFU) borders the west and south edges of this urban reserve analysis area, with the exception of a very small amount of agriculture forest 20 (AF-

20) zoned lands south of SW Rosedale Road (see attached resource land map). This extensive block of farm land extends for a number of miles to the west and south of the analysis areas. There is a 77-acre island of non-farm land on the west side of SW River Road in the vicinity of SW Rosa Road. The Reserve Vineyards & Golf Club borders the northern portion of the western edge of the analysis area. Adjacent to the golf course are forested parcels with rural residences and some agricultural activities, mainly to the north in the vicinity of Gordon Creek. The west side of SW River Road contains rural residences that front on to the Tualatin River. Southwest of the golf course is a mixture of rural residences along SW Rosa Road and SW River Road, forested parcels along Butternut Creek and a tributary to Butternut Creek and limited agricultural activities. The proposed urban uses for the Hillsboro South analysis area would be compatible with these areas as there is a very limited agricultural activity occurring on the nearby farm land, and those activities that do occur are buffered by the golf course or the two riparian corridors.

The main location of agricultural activities near the analysis area occurs south of the tributary to Butternut Creek to an unnamed stream south of SW Rosedale Road and includes nursery, orchard, and field crops. There is no buffer between these agricultural activities and the analysis area. In addition, any increased traffic along SW Rosedale Road due to new urban uses may also impact the agricultural activities in this area. Therefore the proposed urban uses would not be compatible with the agricultural activities that occur in this area near SW Rosedale Road. However mitigation measures could reduce conflicts between urban uses inside the UGB and resource uses outside the UGB.

Clear transition between urban and rural lands, using natural and built features to mark the transition

The Reserve Vineyards & Golf Course, Butternut Creek and a tributary to Butternut Creek provide a clear transition area between urban and rural lands for more than half of the analysis area. South of the tributary to Butternut Creek, south of SW Rosedale Road there is no natural or built feature to mark a transition between urban and rural lands. Additional buffers will need to be incorporated into the planning of the urban reserve analysis area to provide a clear transition from urban to rural uses. The rural lands between SW Rosedale Road and the tributary to Butternut Creek are part of the larger Hillsboro South urban reserve area and may be included in the UGB in the future. Thus, any buffers that are incorporated into the planning study for this analysis area should consider the potential for connecting these two areas in the future.

2040 Growth Concept

Contribution to the purposes of Centers

The Aloha Town Center is the closest 2040 designated center to the South Hillsboro analysis area. It is one of the largest town centers, at 405 acres in size, and primarily serves the local unincorporated community. The Aloha Town Center connects to the South Hillsboro area by the Tualatin Valley Highway (1.2 miles) and Tri-Met line 57 establishes a transit connection between

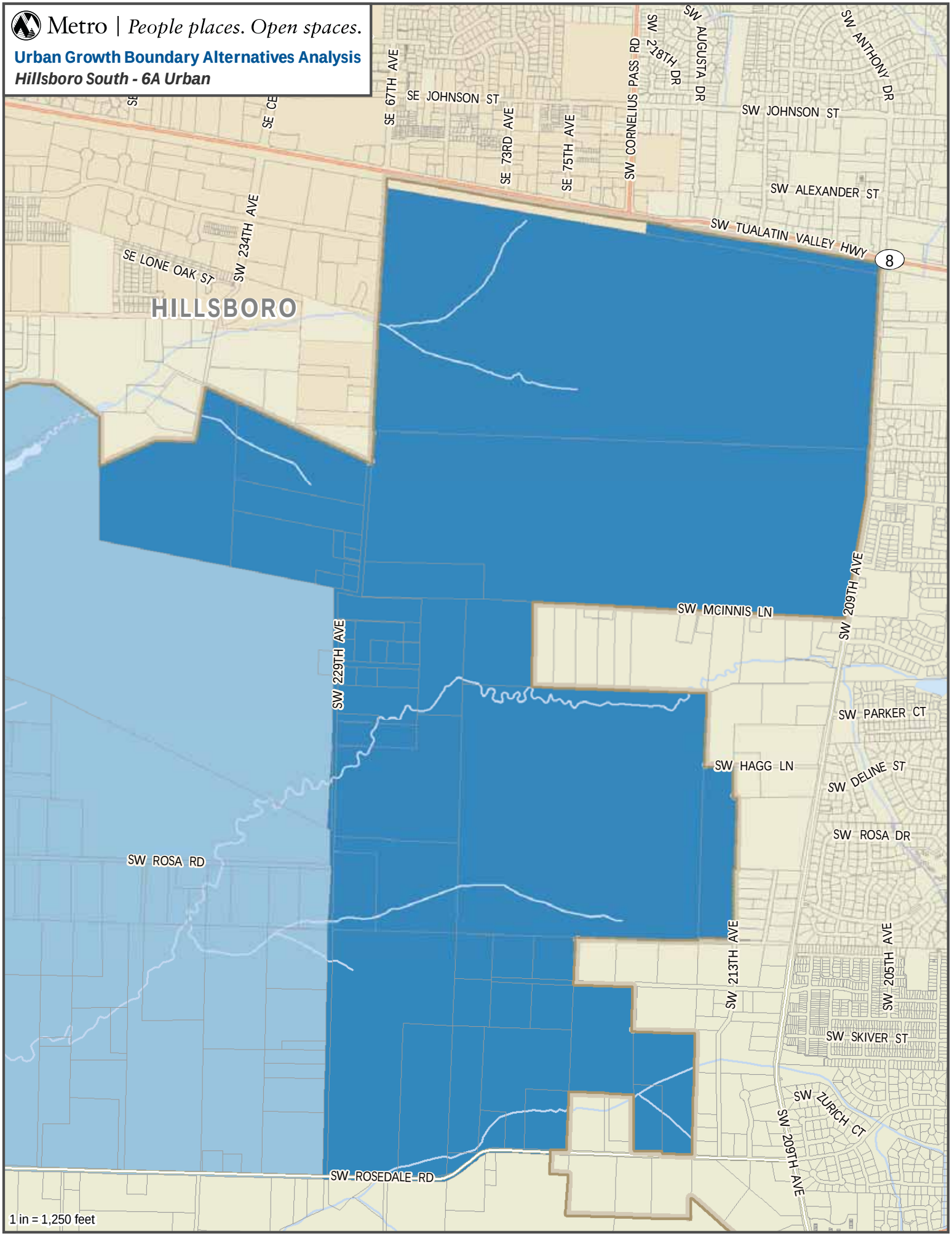
the two areas. The Hillsboro Regional Center is approximately 4 miles west of the analysis area and is also connected by the Tualatin Valley Highway and Tri-Met line 57.

According to Metro's State of the Centers Report, January 2009, the Aloha Town Center currently has some mixed retail providing services to the surrounding community, but overall has one of the lowest jobs to housing ratios in the region. This center located in unincorporated Washington County lacks an overall vision or plan for future development. Urbanization of South Hillsboro will not contribute to balancing the jobs to housing ratio, or promoting walkability and a compact urban form desired of centers, as any commercial or residential development in the analysis area will detract from development within the Aloha Town Center due to the relatively close proximity of the two areas. The Hillsboro Regional Center, the historic downtown for the city, is located quite some distance from the analysis area and would not be affected by new development in the analysis area. Finally, the City of Hillsboro, has envisioned a new town center in the northern portion of the analysis area, supported by an urban pattern of a compact neighborhood and single-family residential development. A new town center in the analysis area would not support the purpose or vision of the nearby Aloha Town Center, but could conceivably develop into a new center to serve the surrounding community.

Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

Hillsboro South - 6A Urban



Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

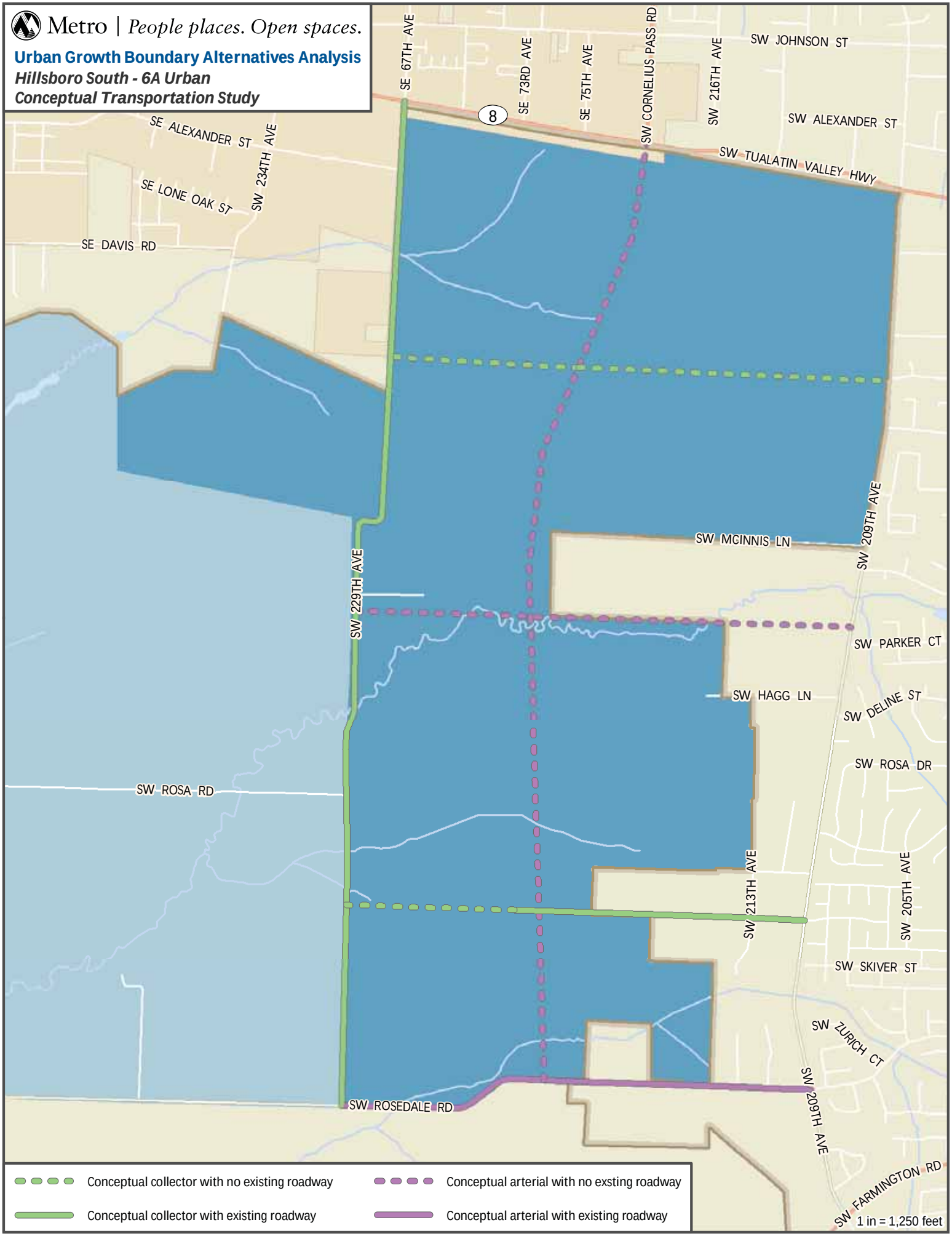
Hillsboro South - 6A Urban

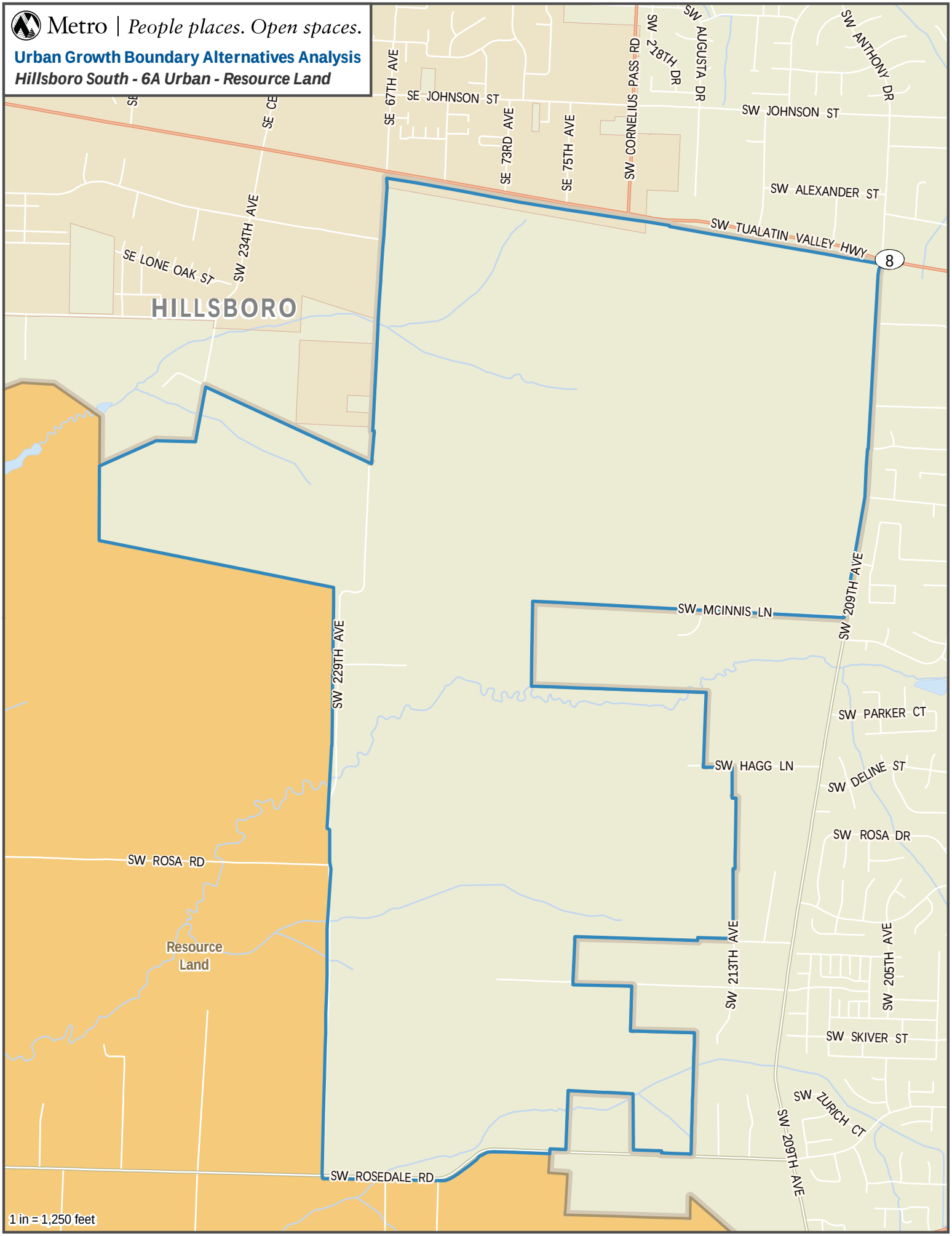
Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

Hillsboro South - 6A Urban

Conceptual Transportation Study





ROY ROGERS WEST ANALYSIS AREA (6C)

Roy Rogers West Analysis Area		**Total Acres**	**256**
Gross Vacant Buildable Acres	206	Total Constrained Acres	50
Estimated Dwelling Unit Capacity	2,424	• Title 13 Significant Habitat	43
Estimated Employment Acres		• Public Land	0

General Description (see attached map)

The Roy Rogers West Analysis Area is L-shaped, and located at the intersection of SW Roy Rogers Road and SW Beef Bend Road, which form the west and south boundaries, respectively. Metro's current UGB forms the north and east edges. It has a total of 256 acres, sits at the base of Bull Mountain and is generally flat. The area is primarily served by SW Roy Rogers Road and SW Beef Bend Road, and is west of King City. The Tualatin River lies a short distance to the west and south.

Parcelization, Building Values, Development Pattern (see attached aerial photograph)

A total of 18 parcels are contained within the analysis area. The largest parcel is approximately 40 acres, the median size of tax lots is 13.5 acres and five of the 18 parcels within the area are less than five acres. All but two parcels have improvements, with a median value of $182,600, and five parcels have a value over $250,000. The area is primarily rural residential, with some agricultural activities occurring on a few parcels and several are forested. Adjacent to the north is the West Bull Mountain planning area that was added to the UGB in 2002. The Tualatin River National Wildlife Refuge provides an edge for development to the south and southwest of the analysis area.

Available data does not suggest the existence of power lines or other public easements through this area.

GOAL 14 LOCATIONAL FACTORS (METRO CODE SECTION 3.01.020)

Public Facilities and Services

Orderly and economic provision of public facilities and services

The preliminary sanitary sewer, water and transportation suitability analyses completed by the Core Four Technical Team for the urban and rural reserve study area indicated this general location

had medium suitability for sanitary sewer services and high suitability for water services and transportation connectivity. As part of the Washington County urban and rural reserve designation process, the City of Tigard submitted information that indicates the city has the ability and willingness to provide urban services to this area in the long term, noting that there are annexation issues that will need to be resolved.

The following cost estimates represent preliminary estimates for the major components of the individual systems. The estimates were generated using very general assumptions about the level of residential development that could occur in the analysis area. More detailed concept plans, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11 will be necessary to develop more refined cost estimates. Attachment 5 contains the breakdown for the transportation cost estimates. A map of the proposed collector and arterial transportation network is attached to this summary.

Sanitary Sewer Services - $9,570,000

Water Distribution Services - $4,670,000

Storm Sewer Services - $4,224,500

Transportation Services - $93,820,000

Parks - $13,680,000

Schools - $20,000,000 (New Elementary School)

ESEE Analysis

Comparative environmental, energy, economic and social consequences

Environmental

There is no indication of the presence of wetlands or flood plains within the analysis area, although there is approximately ¾ of a mile of small unnamed tributaries flowing across the area that ultimately reach the Tualatin River. The area does have some forested land, primarily along the riparian corridors and in two other clusters in the western half of the area. The Tualatin River National Wildlife Refuge lies to the south and southwest along the Tualatin River, but is outside of the analysis area and should not be significantly impacted by urban development within the analysis area. The very limited stream corridors and forested areas would not be significantly impacted by urbanization due to their limited size and being located in four small pockets of land, the amount of buildable land between the natural areas to allow for development to occur, and the natural resource protection measures that are required along with urban development. Attachment 6 contains the breakdown of the environmental factors.

Energy, Economic & social

This small sized area, with 72% of the parcels larger than five acres in size, is a mixture of agricultural activities and rural residences on larger parcels. All but two of the 18 parcels have improvements. Urbanization will impact the rural lifestyle for current residents as the median size of the parcels is 13.5 acres, which represents large rural home sites. Directly to the north is the West Bull Mt. area that was brought into the UGB in 2002, but is currently undeveloped. Once this area is developed to urban levels, the loss of the rural lifestyle for the current residents of the analysis area may be less, as they will be closer to urban amenities. In addition, the combination of this area with the West Bull Mt. area provides opportunities to knit the two areas into one urban community and develop efficiencies in infrastructure financing and delivery of services. There are a few significant locations of agricultural activities dispersed within the rural residences. The potential economic impact of urbanizing this area adjacent to two well-traveled roadways will outweigh the loss of the economic impact from these agricultural uses. Approximately 21% of the land is identified as containing riparian habitat dispersed in four pockets throughout the analysis area. The costs for protecting these isolated resources will be small in contrast to the potential economic impact of urbanizing the larger areas in between. The additional VMT generated through urbanization of this small area will be minimal as the average commute distance is similar to the existing commute distance for the region. Overall this analysis area has low economic, social and energy consequences from urbanization.

Avoidance of conflict with regionally significant fish and wildlife habitat

Regionally significant riparian habitat is identified on 24 acres along the three small stream segments, and another 19 acres of regionally significant upland habitat is located within two forested areas, one centrally located and the other in the northern segment of the analysis area. A portion of the identified habitat in the analysis area appears to be currently in agricultural use. The Tualatin River National Wildlife Refuge has a scattering of land to the south and southwest of this area, including a large tract of land directly diagonal across the intersection of SW Roy Rogers Road and SW Beef Bend Road. The City of Tigard, the expected governing body for this area, has adopted habitat protection measures in compliance with Metro's Title 13 program through the Tualatin Basin Natural Resource Coordinating Committee's protection program. Based on the location of the limited amounts of regionally significant habitat and the expected protection measures that will be in place prior to urbanization, this area could be urbanized with minimal impacts on regionally significant fish and wildlife habitat.

Agricultural/Forest Compatibility

Protection of farmland that is most important for the continuation of commercial agriculture in the region

The urban and rural reserves process designated the most important land for commercial agriculture as rural reserves and the most suitable land for urbanization as urban reserves.

Designation of this area as an urban reserve means farmland within this analysis area is not the most important for the continuation of commercial agriculture in the region.

Compatibility of proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

Resource land zoned exclusive farm use (EFU) borders the entire Roy Rogers West analysis area (see attached resource land map). This extensive block of farm land extends beyond the Tualatin River to the west and south. The farm land to the west and south of SW Roy Rogers Road and SW Beef Bend Road is actively farmed with nursery, field and row crops. A retail nursery operation is located on SW Roy Rogers Road, just south of the analysis area and both roads are currently heavily traveled. Any additional traffic on these two roads as a result of urbanization of the analysis area may further impact the ability to move farm equipment and goods. SW Roy Rogers Road and SW Beef Bend Road do provide an edge to the analysis area; however the roads alone would not make the proposed urban uses compatible with the adjacent agricultural activities occurring on farm land. Mitigation measures could reduce conflicts between urban uses inside the UGB and resource uses outside the UGB.

Clear transition between urban and rural lands, using natural and built features to mark the transition

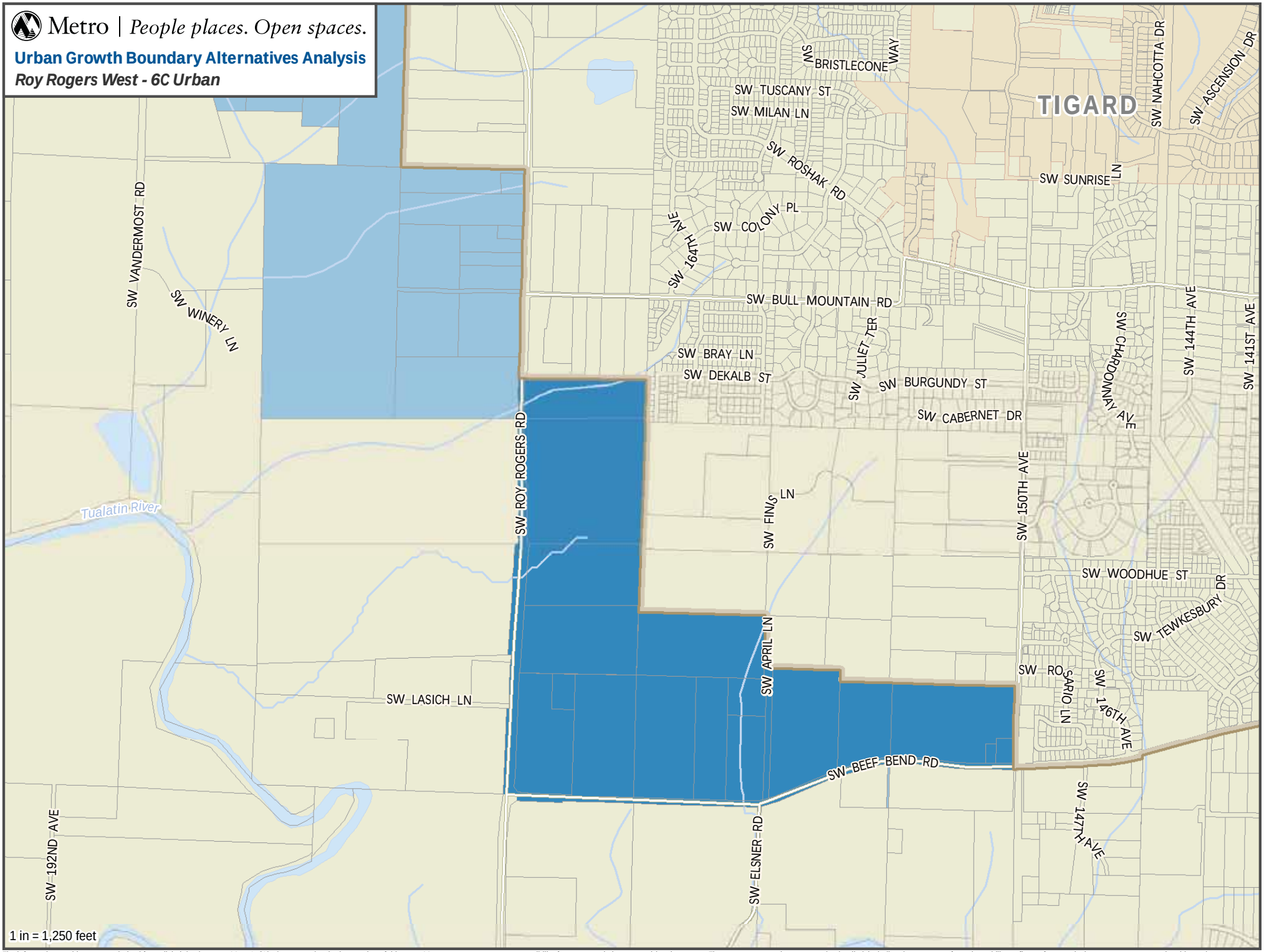
There are no natural or built features to mark the transition between urban and rural lands. Even assuming SW Roy Rogers Road and SW Beef Bend Road develop as arterial roadways in the future, the roads themselves will not provide a clear transition area between future urban and rural uses, especially given the level of traffic that may occur. Additional buffers will need to be incorporated into the planning of the urban reserve analysis area to provide a clear transition from urban to rural uses. The rural lands south of SW Beef Bend Road are within the Beef Bend South Urban Reserve Area (Area 6D) and may be included in the UGB in the future. Thus, any buffers that are incorporated into the planning study for this analysis area should consider the potential for connecting these two areas in the future.

2040 Growth Concept

Contribution to the purposes of Centers

There are two 2040 designated centers that are in proximity to the Roy Rogers West analysis area, the Murray/Scholls Town Center and King City Town Center. Of the two, the King City Town Center is slightly closer and more directly connected to the analysis area via SW Beef Bend Road (1.5 miles). It is a 77 acre center that has the highest median age, 60, reflecting its origins as a retirement community. The Murray/Scholls Town Center is a little larger, at 123 acres, and is primarily a higher density residential center. The Murray/Scholls Town Center is linked to the Roy Rogers West analysis area by SW Roy Rogers Road/SW Scholls Ferry Road (2.5 miles). No transit lines connect the analysis area to either town center. The Sherwood Town Center is only slightly farther than the Murray/Scholls Town Center, and is accessible via SW Roy Rogers Road.

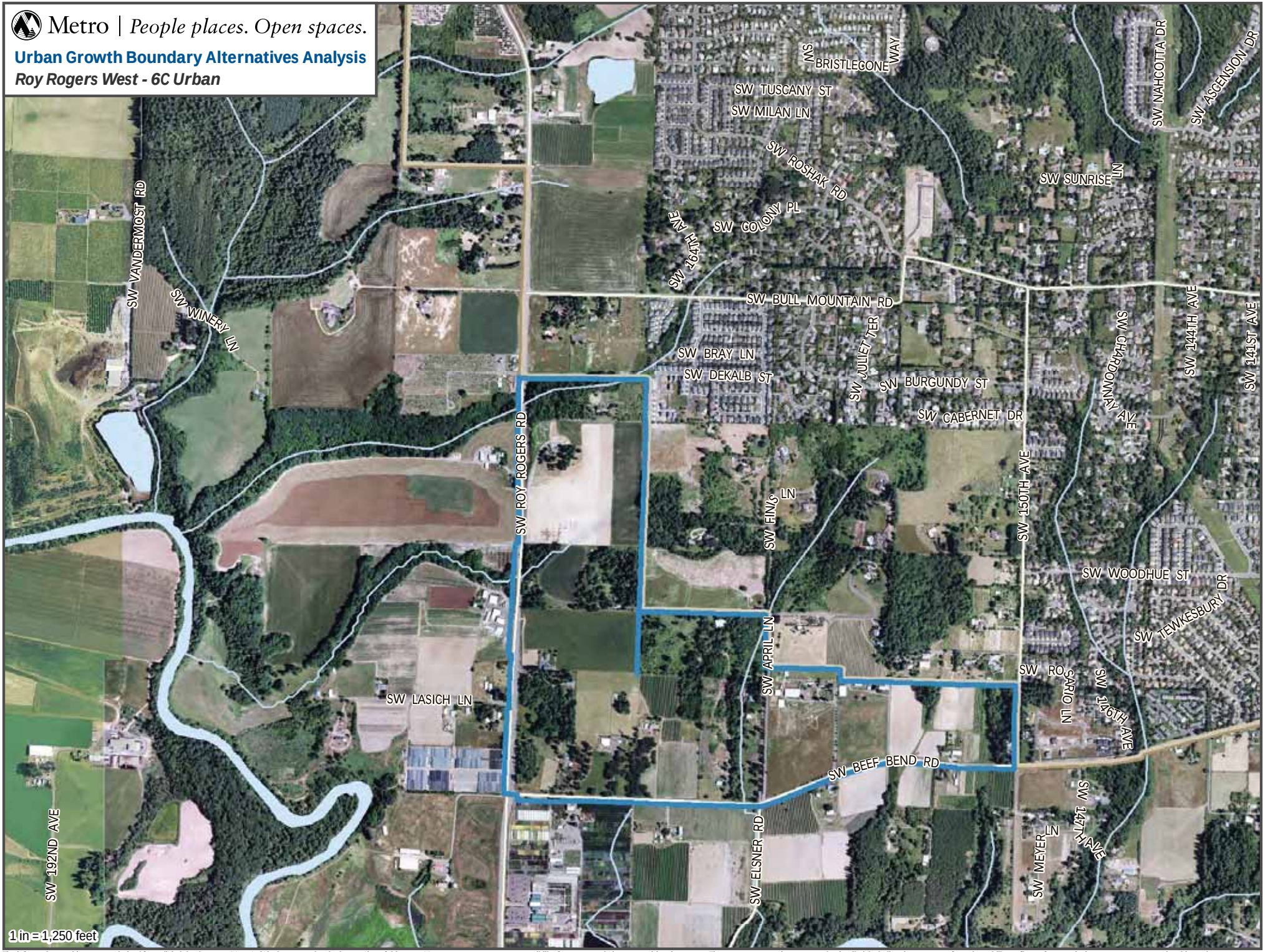
In pre-qualified concept planning, the City of Tigard identified the Roy Rogers West analysis area as a potential future development site, providing a location for additional residential development with a mix of local services and other small-scale employment opportunities. Urbanization of this area will not support the creation of compact, pedestrian-oriented communities in either of the two town centers, due mainly to the distance between the analysis area and the centers. Both King City and Murray/Scholls Town Centers already have low or average jobs to housing ratios, and additional residential units in the analysis area could have a negative impact on creating a more balanced ratio in the town centers. Employment development is not envisioned to be significant enough to support either center as well. It is also unlikely, given the small size of the analysis area that a new center will emerge in this location.

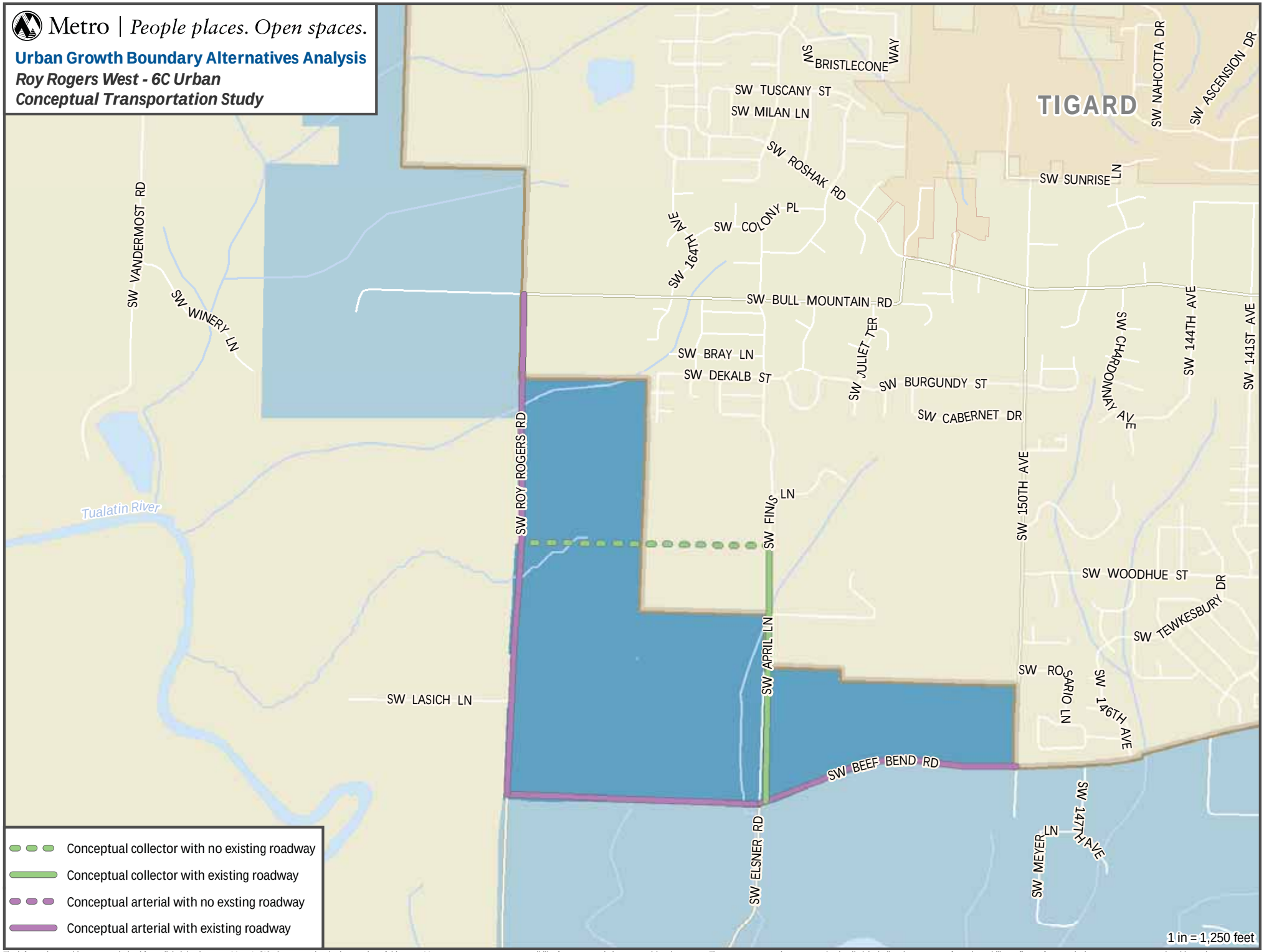


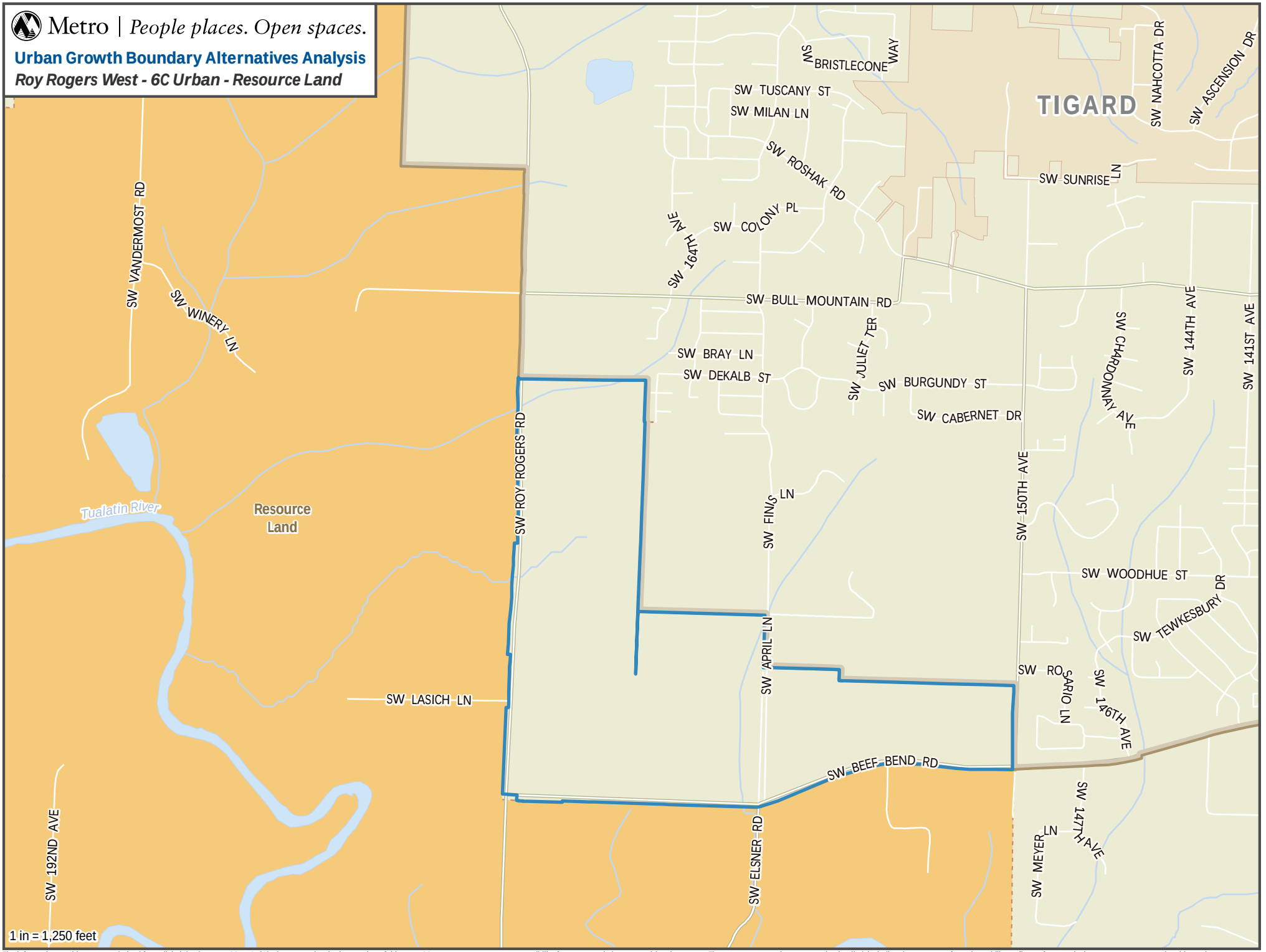
Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

Roy Rogers West - 6C Urban







FOREST GROVE NORTH ANALYSIS AREA (7B)

Forest Grove North Analysis Area		Total Acres	216
Gross Vacant Buildable Acres	175	Total Constrained Acres	41
Estimated Dwelling Unit Capacity	0	• Title 13 Significant Habitat	39
Estimated Employment Acres	143	• Public Land	0

General Description (see attached map)

The Forest Grove North Analysis Area, a portion of the larger Forest Grove North Urban Reserve, is a small area located to the north of the current Forest Grove UGB, along Highway 47. The area extends from the UGB north to NW Purdin Road, and Highway 47 forms the eastern boundary. The Forest Grove North area contains a total of 216 acres and is generally flat. Council Creek flow south along the eastern edge near Highway 47.

Parcelization, Building Values, Development Pattern (see attached aerial photo)

The analysis area has only 11 parcels, the median size of which is 24 acres. Seven of the 11 parcels are greater than 20 acres, the largest being 40 acres. The remaining four lots are one acre or less. All but one parcel have improvements, with a median value of $145,130. However, only two parcels have improvements valued over $250,000. The entire study area appears to be in active agricultural land use, the majority of which is for cropland. There is a small cluster of rural residential, associated with surrounding farmland, on the east side along Hwy 47 which is also where all the building improvements are located.

Available data does not suggest the existence of power lines or other public easements through this area.

GOAL 14 LOCATIONAL FACTORS (METRO CODE SECTION 3.01.020)

Public Facilities and Services

Orderly and economic provision of public facilities and services

The preliminary sanitary sewer, water and transportation suitability analyses completed by the Core Four Technical Team for the urban and rural reserve study area indicated this general location

had high suitability for sanitary sewer services, water services and transportation connectivity. The City of Forest Grove's Pre-Qualifying Concept Plan, completed as part of the Washington County urban and rural reserve designation process, indicates that the city has the ability and willingness to provide urban services to this area.

The following cost estimates represent preliminary estimates for the major components of the individual systems. The estimates were generated using very general assumptions about the level of large site industrial development that could occur in the analysis area. More detailed concept plans, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11 will be necessary to develop more refined cost estimates. Attachment 5 contains the breakdown for the transportation cost estimates. A map of the proposed collector and arterial transportation network is attached to this summary.

Sanitary Sewer Services - $2,848,000

Water Distribution Services - $1,590,000

Storm Sewer Services - $1,429,500

Transportation Services - $80,150,000

The City of Forest Grove is unique in that the city is the electrical power provider through its power and light department. Forest Grove Light and Power is a Bonneville Power Administration preferred company, as they have been purchasing power from BPA since 1939. Because of this status the city is able to purchase power from BPA at a lesser rate than other power providers. Based on information provided by the city, monthly charges for a typical large industrial load provided by Forest Grove Light and Power would be approximately 37% less than what Portland General Electric would charge for the same power.

ESEE Analysis

Comparative environmental, energy, economic and social consequences

Environmental

Council Creek runs along the eastern edge of the analysis area, near Highway 47. A small tributary of Council Creek flows through the center of the area. Along Council Creek there is a small 4 acre wetland and 36 acres of 100-year flood plain, some of which are currently under cropland cultivation. There are no steep slopes, and overall topography is very flat. Based on the current level of disturbance surrounding the two streams, the location of Council Creek near the edge of the analysis area and development limitations due to the 100-year flood plain, future urban development will not additionally impact these stream corridors beyond the current impact from the agricultural uses. Attachment 6 contains the breakdown of the environmental factors.

Energy, Economic & Social

This small area, composed of 11 parcels is completely in agricultural production. Seven of the 11 parcels are greater than 20 acres, the largest being 38 acres. The loss of the economic impact from the significant agricultural uses in this small area may be considerable; however the potential economic impact of urbanization for industrial use on these large flat parcels will outweigh this loss. There are 39 acres of identified habitat in the area along Council Creek and a tributary. The costs for protecting these linear resources will be small in contrast to the potential economic impact of urbanizing the larger areas outside the stream corridors. Urbanization will impact the current residents of the area through the loss of the rural lifestyle, however since there are no residences that aren't associated with the adjacent agricultural activities, this impact will be less than if the area contained just rural residences on smaller lots. Overall this analysis area has low economic, social and energy consequences from urbanization.

Avoidance of conflict with regionally significant fish and wildlife habitat

Regionally significant riparian habitat along the stream corridors totals 39 acres, and represents the only fish and wildlife habitat within the analysis area. Much of the habitat area is currently impacted by agricultural activities and limited habitat currently exists surrounding the streams. The City of Forest Grove, the expected governing body, has adopted habitat protection measures that are in compliance with Metro's Title 13 requirements as part of the Tualatin Basin Natural Resource Coordinating Committee's protection program. Given the level of agricultural activity, the protection measures that will be in place prior to urbanization and limitations of the flood plain on development, future urbanization in this area will not impact regionally significant fish and wildlife habitat.

Agricultural/Forest Compatibility

Protection of farmland that is most important for the continuation of commercial agriculture in the region

The urban and rural reserves process designated the most important land for commercial agriculture as rural reserves and the most suitable land for urbanization as urban reserves. Designation of this area as an urban reserve means farmland within this analysis area is not the most important for the continuation of commercial agriculture in the region.

Compatibility of proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

The UGB borders the Forest Grove North analysis area on the south. Resource land zoned exclusive farm use (EFU) directly borders the analysis area on the west, north and east (see attached resource land map). This extensive block of farm land extends for miles to the north and east and is intensely farmed for numerous agricultural products. To the west, the farm land extends approximately ¾ of a mile to the UGB along NW Thatcher Road. There are two islands of non-farm

land east of the analysis area centered on NW Verboort Road that are 15 acres and 49 acres in size and represent the community of Verboort. West of the analysis area there are two unnamed tributaries to Council Creek that flows east then through open farm fields and appear to be piped for some portions, but they do not act as an edge or buffer for the analysis area. Council Creek flows south through open farm fields paralleling Highway 47. It is possible that in some locations Council Creek in combination with the Highway 47 right-of-way could provide a buffer for the agricultural activities occurring east of the highway. NW Purdin Road provides a northern edge to the analysis area; however the road itself would not make the proposed urban uses compatible with the adjacent agricultural activities occurring on farm land. Increased traffic along NW Purdin Road due to new urban uses within the analysis area may impact agricultural activities on the resource land to the north. As there are no identifiable edges or buffers between the analysis area and the extensive farm lands to the north, the limited farm lands to the west and to a lesser degree to the east, the proposed urban uses would not be compatible with the agricultural activities that occur on farm land outside the UGB. However mitigation measures could reduce conflicts between urban uses inside the UGB and resource uses outside the UGB.

Clear transition between urban and rural lands, using natural and built features to mark the transition

There are no natural or built features to mark a clear transition between urban and rural lands, with the exception of some potential areas along Highway 47 where Council Creek flows close to the roadway. Even assuming NW Purdin Road develops as an arterial roadway in the future, the road itself will not provide a clear transition area between future urban and rural uses. Additional buffers will need to be incorporated into the planning of the urban reserve analysis area to provide a clear transition from urban to rural uses. The rural lands west to NW Thatcher Road are part of the larger Forest Grove North urban reserve area and may be included in the UGB in the future. Thus, any buffers that are incorporated into the planning study for this analysis area should consider the potential for making urban form connections in this location in the future.

2040 Growth Concept

Contribution to the purposes of Centers

The Forest Grove Town Center is the closest center to the Forest Grove North analysis area. It is a smaller center, at only 56 acres in size, and serves as a cultural and commercial center for the city of Forest Grove. The town center is linked to the analysis area by Highway 47 and NW Sunset Drive (1.2 miles). There is currently no Tri-Met service connecting the analysis area to the town center, although the center is served by Tri-Met line 57 along Highway 8.

Over time Forest Grove has been undergoing a change away from being a complete community and toward becoming a bedroom community, due in part to increasing residential development trends. A component of the city's visioning process is to retain the vitality of the historic town center and surrounding neighborhoods through appropriate densities and development patterns and providing job opportunities close to homes. Metro's State of the Centers Report, January 2009,

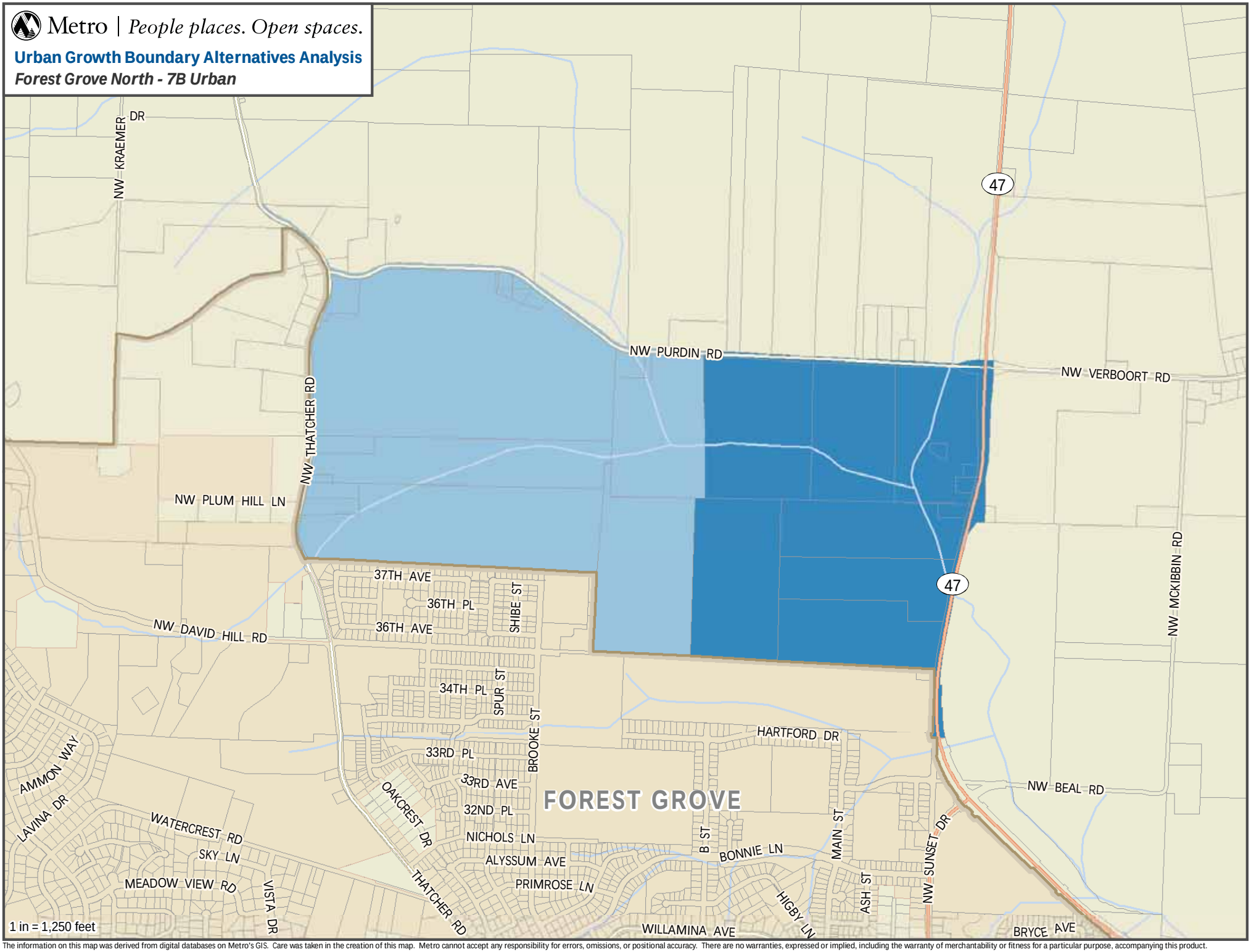
indicates that the town center has the highest median household size reflecting the Pacific University student population and high businesses per acre and jobs to housing ratios.

The City of Forest Grove currently envisions industrial development occurring within the analysis area. Urbanization of the Forest Grove North analysis area is unlikely to support the vision and purpose of the Forest Grove Town Center. Focusing on infill and redevelopment of underutilized land in other parts of the city may better support the continued success of the town center. However, additional employment opportunities in the analysis area would promote the city's other goals of job opportunities close to local residents and meeting industry needs.

Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

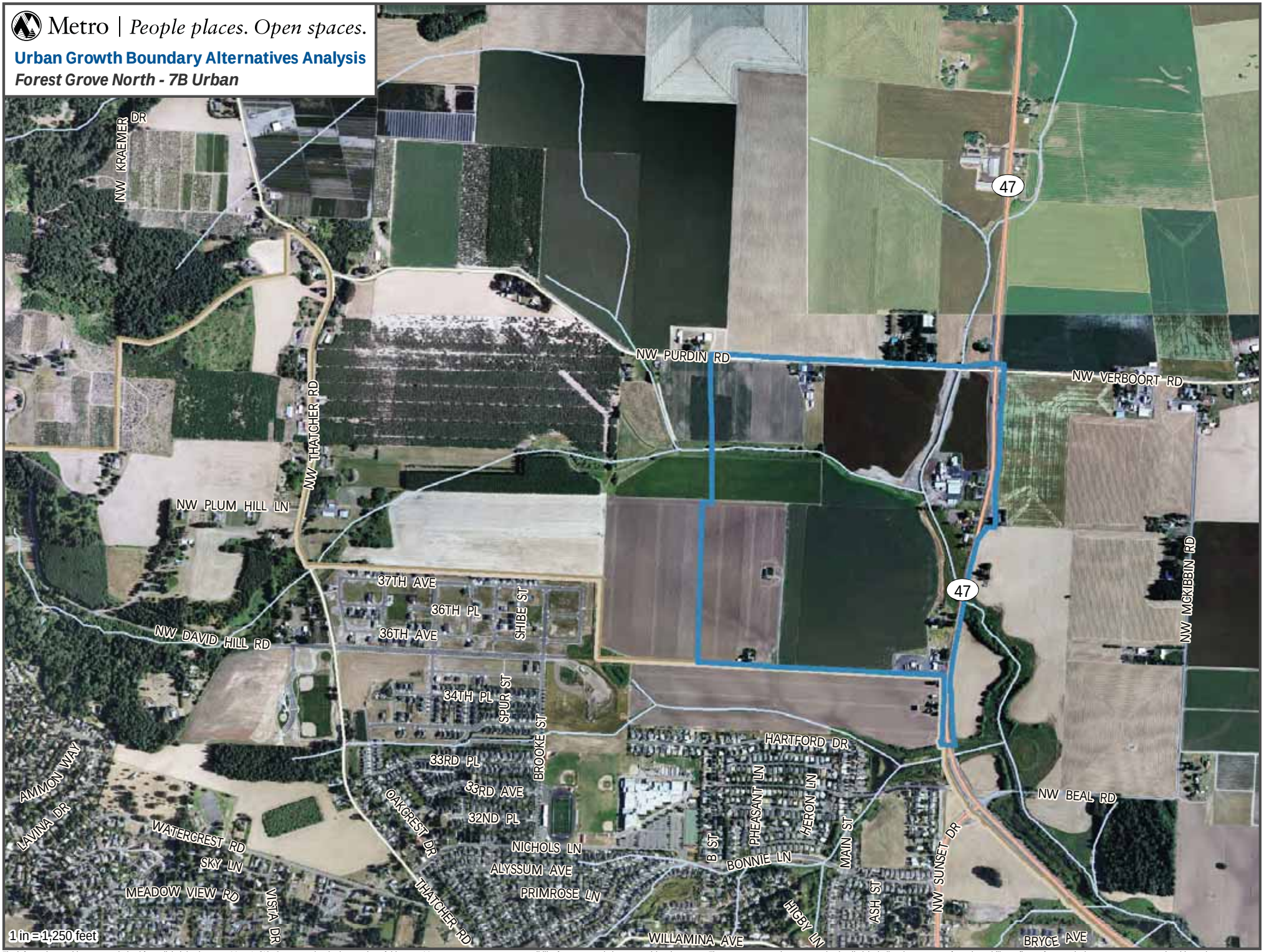
Forest Grove North - 7B Urban



Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

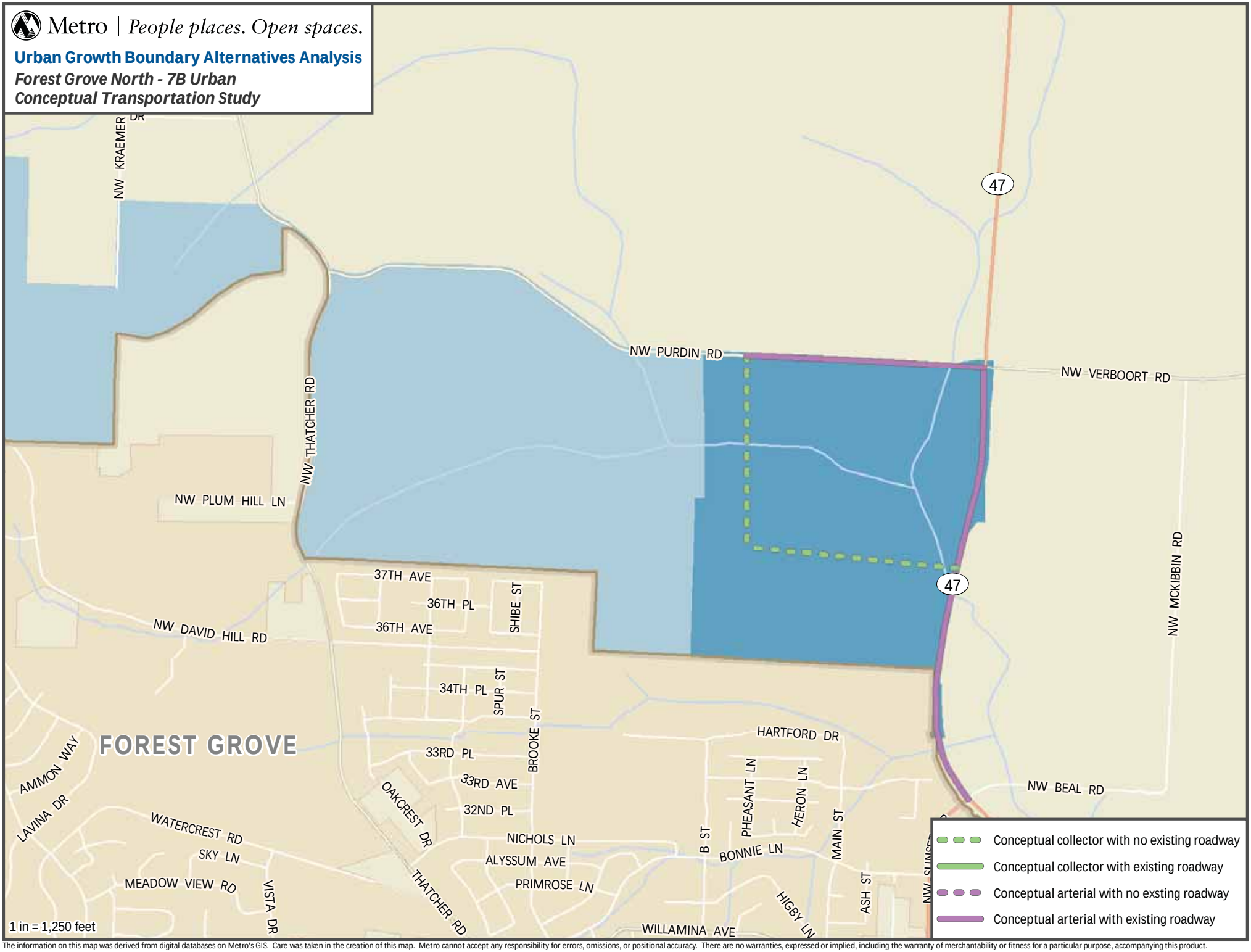
Forest Grove North - 7B Urban



Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

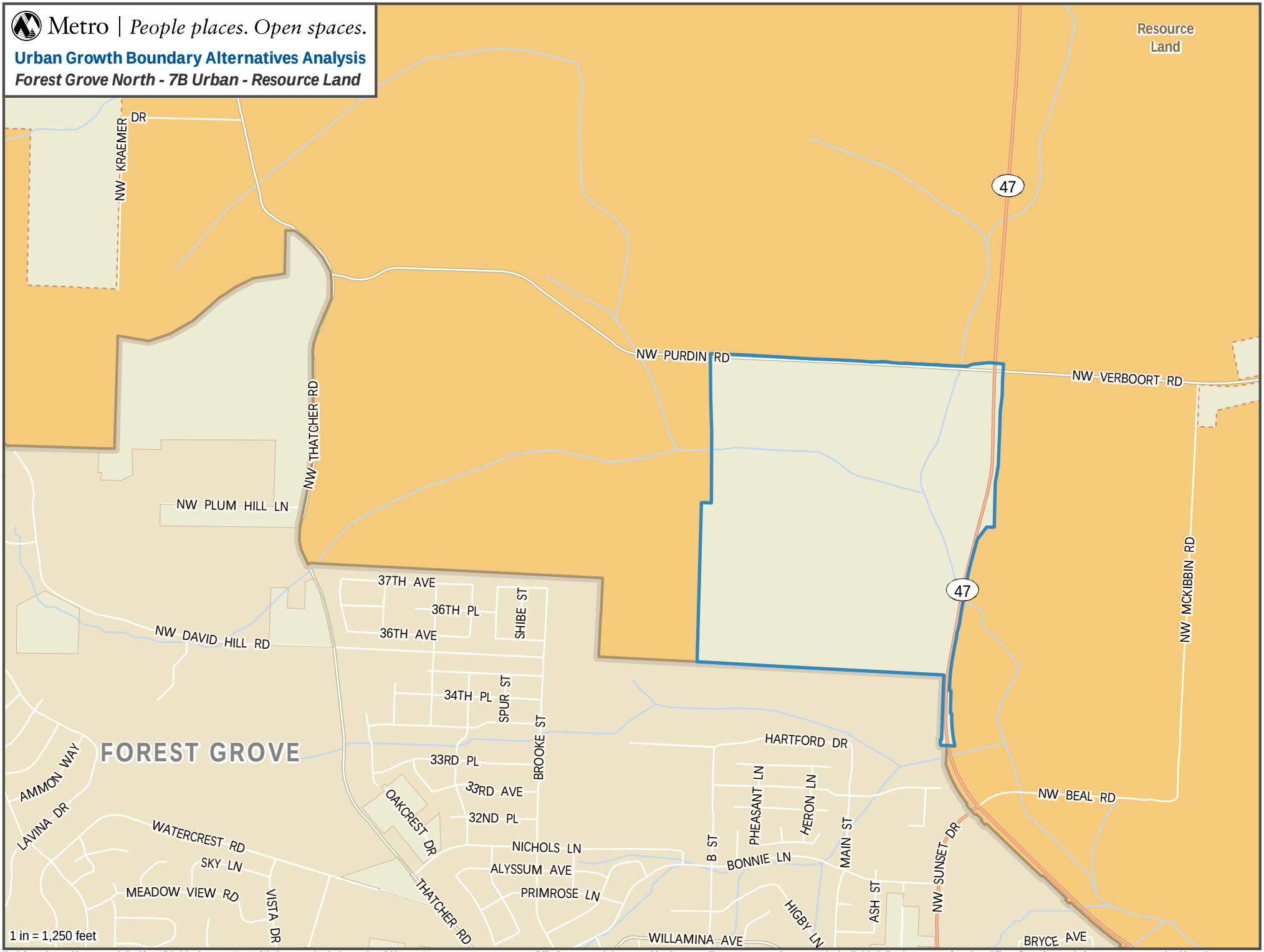
Forest Grove North - 7B Urban Conceptual Transportation Study



Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

Forest Grove North - 7B Urban - Resource Land



CORNELIUS SOUTH ANALYSIS AREA (7D)

Cornelius South Analysis Area		Total Acres	210
Gross Vacant Buildable Acres	189	Total Constrained Acres	21
Estimated Dwelling Unit Capacity	2,188	• Title 13 Significant Habitat	21
Estimated Employment Acres		• Public Land	0

General Description (see attached map)

The Cornelius South Analysis Area is a 210 acre area that lies to the southeast of Cornelius, between the city and the Tualatin River. SW 345th Avenue forms the eastern boundary, the Tualatin River floodplain the south edge, and the current UGB the west and north boundaries. The area is served primarily by Highway 8 to the north, accessed from the analysis area via SW 345th Avenue.

Parcelization, Building Values, Development Pattern (see attached aerial photo)

Cornelius South contains 15 parcels, eight of which are less than five acres in size. The seven parcels that are over five acres cover 185 acres and include four parcels that are only partially inside the study area boundary. Median size of all tax lots is 4.9 acres. One parcel is split by the analysis area boundary with 50 of the total 90 acres within the analysis area. Improvements have been made to eight parcels, only one of which is valued over $250,000. The median improvement value is $152,670. The entire study area appears to be in active agricultural use, including row crops, nursery and field crops. The development pattern is almost entirely composed of large, actively farmed parcels, with only a few small improvements or other development.

Available data does not suggest the existence of power lines or public easements through this area.

GOAL 14 LOCATIONAL FACTORS (METRO CODE SECTION 3.01.020)

Public Facilities and Services

Orderly and economic provision of public facilities and services

The preliminary sanitary sewer, water and transportation suitability analyses completed by the Core Four Technical Team for the urban and rural reserve study area indicated this general location had high suitability for sanitary sewer services and water services. This location was not analyzed

for transportation connectivity. The City of Cornelius' Pre-Qualifying Concept Plan, completed as part of the Washington County urban and rural reserve designation process, indicates that the city has the ability and willingness to provide urban services and all major infrastructure systems are either available or can be extended to serve this area.

The following cost estimates represent preliminary estimates for the major components of the individual systems. The estimates were generated using very general assumptions about the level of residential development that could occur in the analysis area. More detailed concept plans, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11 will be necessary to develop more refined cost estimates. Attachment 5 contains the breakdown for the transportation cost estimates. A map of the proposed collector and arterial transportation network is attached to this summary.

Sanitary Sewer Services - $9,320,000

Water Distribution Services - $4,165,000

Storm Sewer Services - $4,431,000

Transportation Services - $68,350,000

Parks - $6,800,000

Schools - $500,000 (Increased maintenance costs, no new school needed)

ESEE Analysis

Comparative environmental, energy, economic and social consequences

Environmental

A small tributary of the Tualatin River flows south across the triangular western section of the analysis area. The Tualatin River runs just outside the southwest boundary of the area. There are 11 acres of riparian and 10 acres of upland habitat along the tributary and the southwest edge of the analysis boundary that are not currently in agricultural use. The entire southwest half of the area is considered part of the Tualatin River Natural Landscape Feature, although most of that area is currently under active cultivation. The study area is very flat, with less than one acre of slopes over 25% concentrated primarily around stream areas. Although flat topography may increase the threat development poses to the Tualatin River and its small unnamed tributary, the amount of surface hydrology within the analysis area appears to be minimal. Therefore, future urban development will have minimal impact on environmental resources. Attachment 6 contains the breakdown of the environmental factors.

Energy, Economic & Social

This small area, composed of 15 parcels is completely in agricultural production. Seven of the parcels are greater than five acres and eight of the parcels contain improvements. The loss of the economic impact from the significant agricultural uses in this small area may be considerable; however the potential economic impact of urbanization on these generally large flat parcels will outweigh this loss. There are only 21 acres of identified habitat in the area, mainly along the southern edge near the floodplain of the Tualatin River. The costs for protecting these linear resources will be small in contrast to the potential economic impact of urbanizing the larger internal locations, as their locations easily allow for preservation away from development. Urbanization will impact the current residents of the area through the loss of the rural lifestyle, however since there are no residences that aren't associated with the adjacent agricultural activities, this impact will be less than if the area contained just rural residences on smaller lots. The Hillsboro School District owns a 41-acre parcel in the northern portion of the area. Development of this site will provide the opportunity to connect the analysis area to the existing adjacent urban neighborhood through the school site, thereby integrating the new area into the city of Cornelius and potentially its new Town Center area. Additional VMT will be generated through urbanization of this small area as the average commute distance for this area is greater than the existing average commute distance for the region. Overall this analysis area has low economic, social and energy consequences from urbanization.

Avoidance of conflict with regionally significant fish and wildlife habitat

A small amount of regionally significant riparian upland habitat lies inside the southwest edge of the analysis area, near the Tualatin River floodplain. Most of this habitat is currently being farmed. There is a larger block of regionally significant riparian habitat to the south and west of the analysis area that could be threatened by future urban development as there is no clear buffer between proposed urban uses and the habitat areas. The City of Cornelius, the expected governing body, has adopted habitat protection measures that are in compliance with Metro's Title 13 requirements as part of the Tualatin Basin Natural Resource Coordinating Committee's protection program. Based on the level of agricultural activity already impacting the limited habitat, the linear shape of the habitat area and the expected environmental protection measures that will be in place prior to urbanization, the proposed urban uses will have a minimal additional impact on regionally significant fish and wildlife habitat that is mostly outside the analysis area.

Agricultural/Forest Compatibility

Protection of farmland that is most important for the continuation of commercial agriculture in the region

The urban and rural reserves process designated the most important land for commercial agriculture as rural reserves and the most suitable land for urbanization as urban reserves. Designation of this area as an urban reserve means farmland within this analysis area is not the most important for the continuation of commercial agriculture in the region.

Compatibility of proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

The UGB borders the Cornelius South urban reserve analysis area on the north. Resource land zoned exclusive farm use (EFU) borders the remainder of the analysis area (see attached resource land map). This extensive block of farm land extends south and east well beyond the Tualatin River and is intensely farmed for numerous agricultural products. There is a 128-acre island of non-farm land on the west side of SW River Road in the vicinity of SW Cook Road and SW 331st & 326th Avenues. The Tualatin River and its associated floodplain directly border the analysis area on the south. This extensive floodplain provides a buffer for the agricultural activities south of the river. Therefore, the proposed urban uses would be compatible with the agricultural activities occurring on the farm land to the south of the Tualatin River.

SW 345th Avenue forms the entire eastern edge of the analysis area. East of SW 345th Avenue is an unnamed stream that flows south through open farm fields and appears to be piped for significant portions as well as controlled to create storage ponds for irrigation. Neither SW 345th Avenue nor the unnamed stream provides an edge or buffer for the farm land to the east. Increased traffic along SW 345th Avenue, SW Cook Road and SW 331st Avenue due to new urban uses within the analysis area may impact agricultural activities in this area. Therefore the proposed urban uses would not be compatible with the agricultural activities that occur in this area east of SW 345th Avenue. However mitigation measures could reduce conflicts between urban uses inside the UGB and resource uses outside the UGB.

Clear transition between urban and rural lands, using natural and built features to mark the transition

The Tualatin River and its extensive floodplain provide a clear transition area between urban and rural lands for more than half of the analysis area. East of SW 345th Avenue there is no natural or built feature to mark a transition between urban and rural lands. Even assuming SW 345th Avenue develops as an arterial roadway in the future, the road itself will not provide a clear transition area between future urban and rural uses. Additional buffers will need to be incorporated into the planning of the urban reserve analysis area to provide a clear transition from urban to rural uses.

2040 Growth Concept

Contribution to the purposes of Centers

The nearest center to the Cornelius South analysis area is the Hillsboro Regional Center, located approximately two miles to the east along Highway 8. The analysis area is also linked to the regional center by TriMet's number 57 bus route. The Forest Grove Town Center is also nearby, approximately 3.5 miles to the west along Highway 8 and is also linked by TriMet's number 57 bus line.

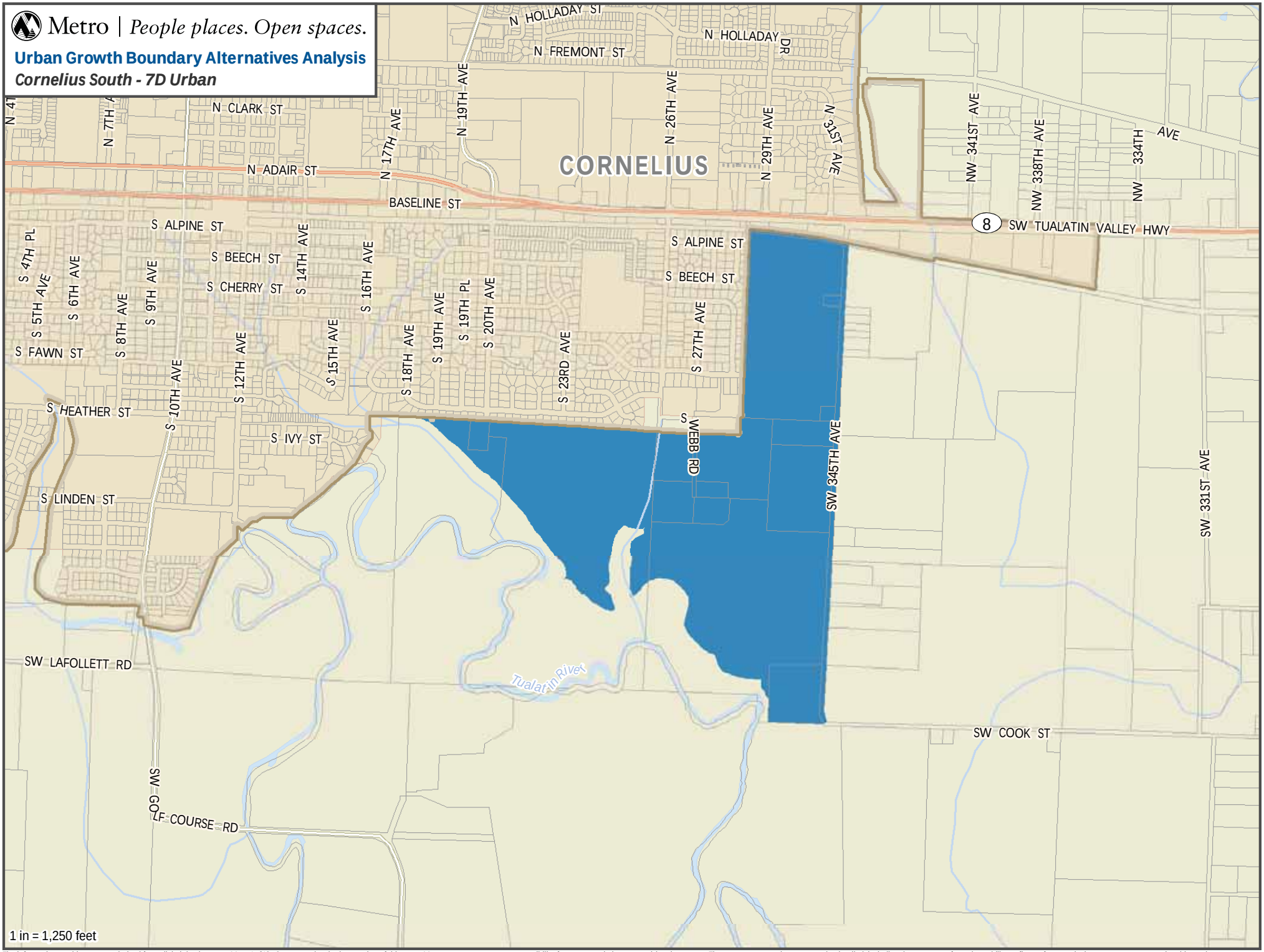
The Cornelius South analysis area is separated from the Hillsboro Regional Center by a band of agricultural land that includes the Dairy Creek floodplain and the only transportation connection is via Highway 8. Similarly, Forest Grove's Town Center is separated not only by distance from the analysis area, but also by other urban development within the City of Cornelius. Urbanization of Cornelius South will therefore not support the continued development of either center.

The City of Cornelius, as part of their pre-qualified concept planning for the Urban and Rural Reserves selection process, envision the creation of a new Town Center over the next 10-20 years. Due to the relatively close proximity of the analysis area (0.5 miles or less) to the center of Cornelius, there may be some opportunity to support the creation of a new center in the near future. The analysis area has potential to create good local connectors to a future town center in Cornelius, and currently has access via TriMet's route 57 bus line. Urbanization of this area may be able to support the vision and purpose of a town center in Cornelius that is compact, walkable, bikable, and has an appropriate jobs to housing balance.

Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

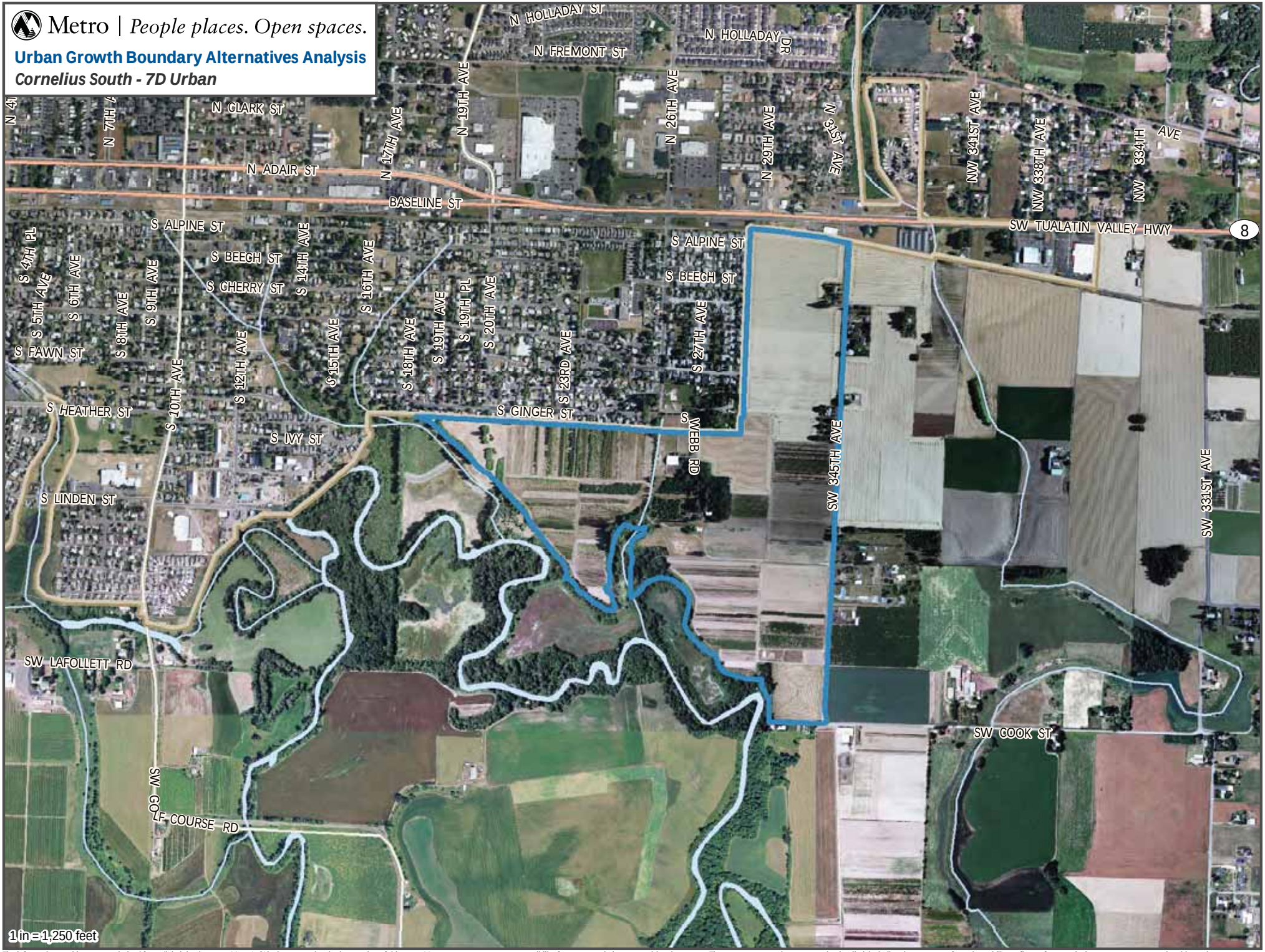
Cornelius South - 7D Urban

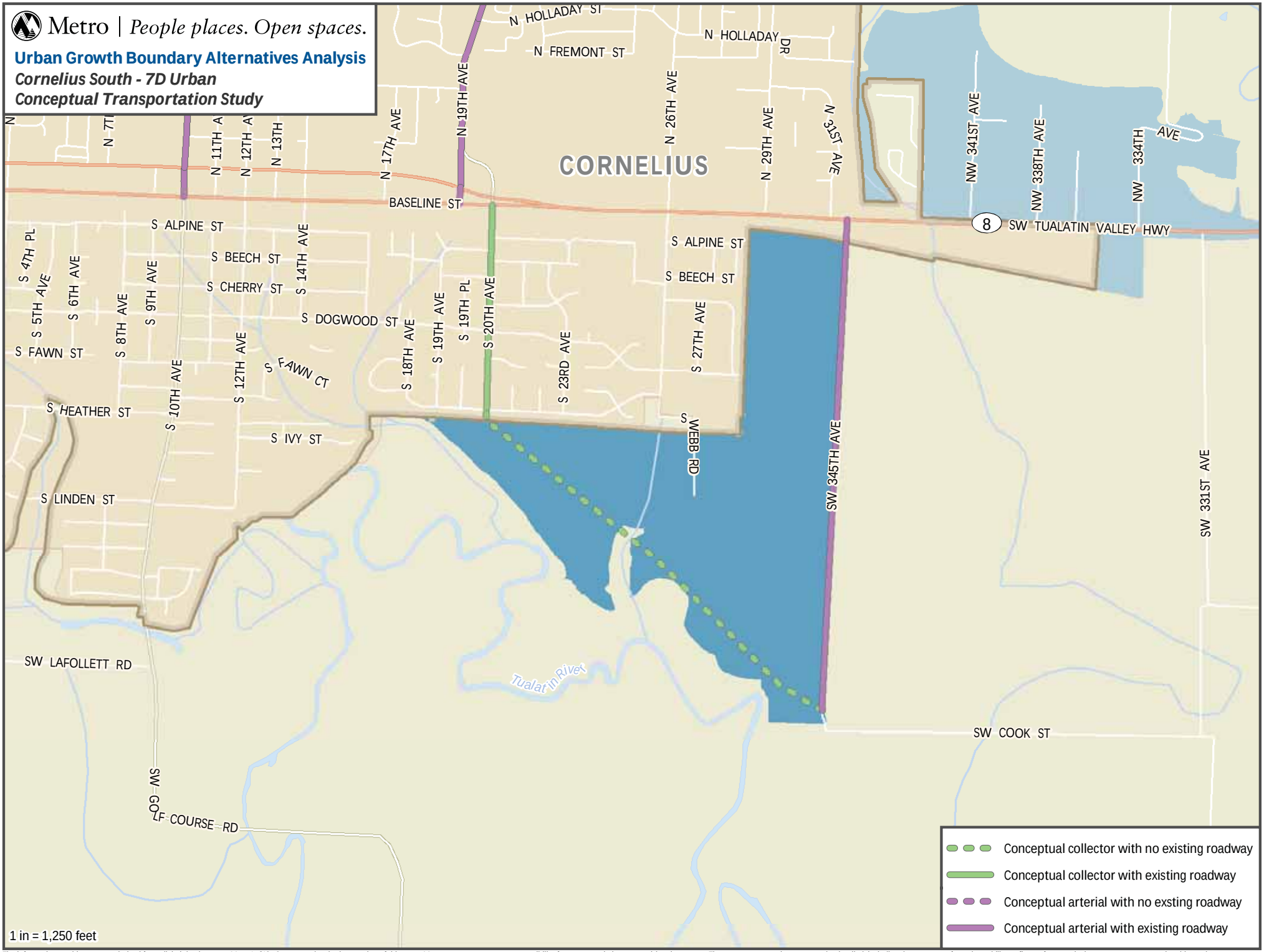


Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

Cornelius South - 7D Urban

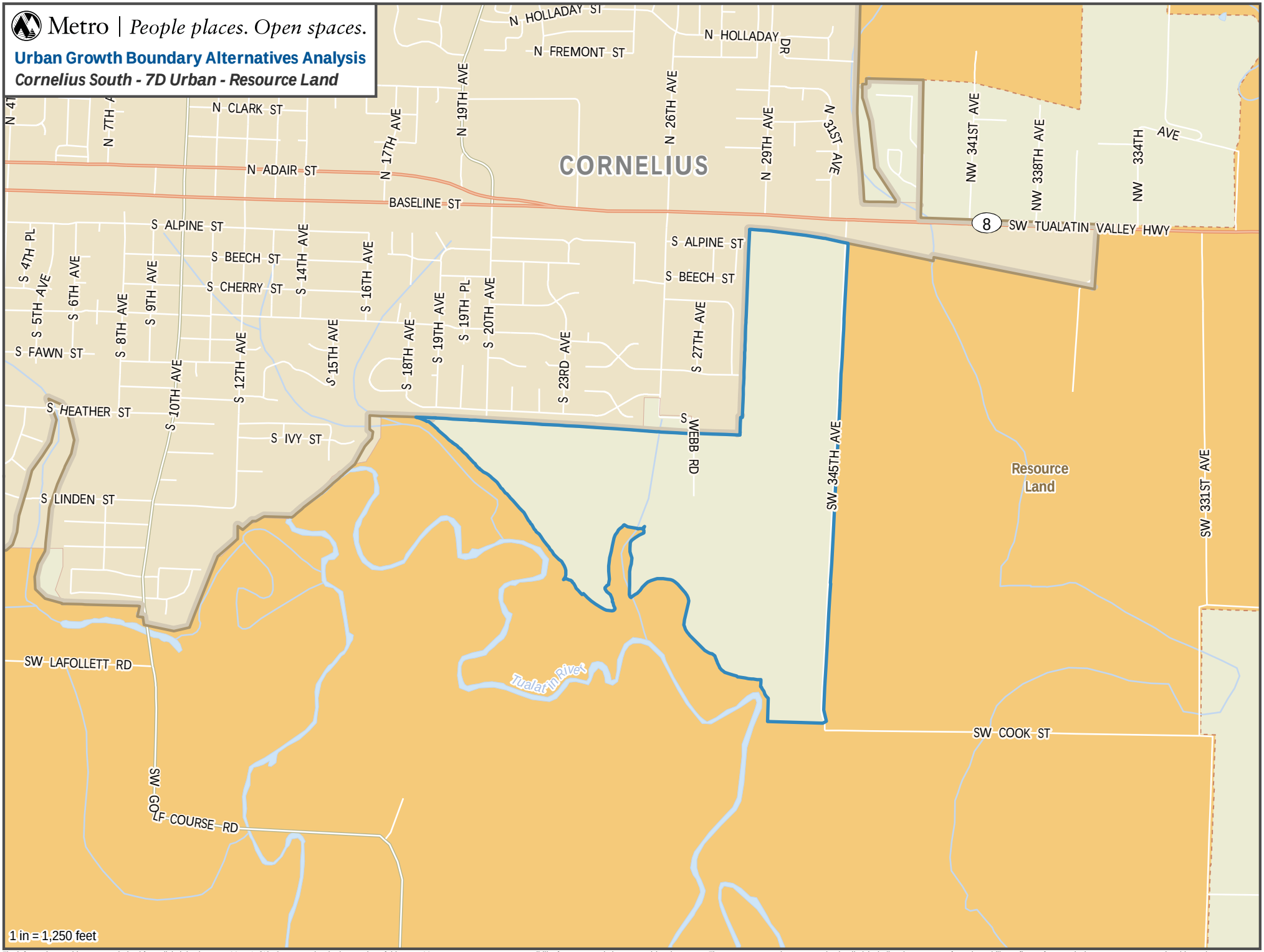




Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

Cornelius South - 7D Urban - Resource Land



CORNELIUS NORTH ANALYSIS AREA (7I)

Cornelius North Analysis Area		Total Acres	203
Gross Vacant Buildable Acres	166	Total Constrained Acres	37
Estimated Dwelling Unit Capacity	0	• Title 13 Significant Habitat	33
Estimated Employment Acres	135	• Public Land	

General Description (see attached map)

The Cornelius North Analysis Area, a portion of the larger Cornelius North Urban Reserve, lies just to the north of the city of Cornelius, and totals 203 acres of land. The area is bounded by the UGB to the south, NW Susbauer Road to the east, NW Cornelius-Schefflin Road to the west, and tax lot lines to the north approximately halfway to NW Long Road. The area is served primarily by NW Susbauer Road and NW Cornelius-Schefflin Road running north-south, and is not directly served by east-west arterials although both north-south arterials connect with Highway 8 in Cornelius. Council Creek runs along the southern edge of the study area and it is generally flat outside of stream corridors.

Parcelization, Building Values, Development Pattern (see attached aerial)

Cornelius North contains 24 tax lots, all of which are completely within the study area boundary. There are five parcels that are larger than five acres, and all but two of the remaining lots are between one and five acres. Median parcel size is 4.1 acres, with a maximum of 45 acres. Improvements are recorded for 11 tax lots, with a median value of $165,540 and only one lot with improvements valued over $250,000. Land use is primarily agricultural, with a mix of rural residential development on smaller parcels in the south and southwest and one rural industrial use. Agricultural uses are predominantly for field crops, and are part of a large block of surrounding farmland to the north of Cornelius and Forest Grove. To the south, urban development extends up to edge of Council Creek, which separates the analysis area from the current UGB and Cornelius city limits.

Available data does not suggest the existence of power line easements. The Emanuel Lutheran Cemetery sits along NW Cornelius-Schefflin Road and covers just over four acres.

GOAL 14 LOCATIONAL FACTORS (METRO CODE SECTION 3.01.020)

Public Facilities and Services

Orderly and economic provision of public facilities and services

The preliminary sanitary sewer, water and transportation suitability analyses completed by the Core Four Technical Team for the urban and rural reserve study area indicated this general location had high suitability for sanitary sewer services, water services and transportation connectivity. The City of Cornelius' Pre-Qualifying Concept Plan, completed as part of the Washington County urban and rural reserve designation process, indicates that the city has the ability and willingness to provide urban services and all major infrastructure systems are either available or can be extended to serve this area.

The following cost estimates represent preliminary estimates for the major components of the individual systems. The estimates were generated using very general assumptions about the level of large site industrial development that could occur in the analysis area. More detailed concept plans, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11 will be necessary to develop more refined cost estimates. Attachment 5 contains the breakdown for the transportation cost estimates. A map of the proposed collector and arterial transportation network is attached to this summary.

Sanitary Sewer Services - $2,808,000

Water Distribution Services -$1,455,000

Storm Sewer Services - $1,343,500

Transportation Services - $91,660,000

ESEE Analysis

Comparative environmental, energy, economic and social consequences

Environmental

Council Creek forms the southern edge of the analysis area, constitutes the most significant natural feature in the area and contains 6.6 acres of wetlands and 18 acres of 100-year flood plain. A small tributary flows south into Council Creek through the west half of the analysis area, and another small stream flows out of the area on the east side, bordering NW Susbauer Road. There are few locations of steep slopes over 25% that total 1.5 acres and occur within stream riparian areas. Two natural area parks owned by Metro are adjacent to the analysis area to the southeast and east, along Council Creek and contain much of the natural resources in this location. Due to the overall limited amount of natural resources, their location along the edge of the analysis area, and the protective nature of publicly owned open space, future development could occur with minimal

impact to the natural resources. Attachment 6 contains the breakdown of the environmental factors.

Energy, Economic & Social

This small area, composed of 24 parcels is almost completely in agricultural production. The area also includes a few rural residences, a cemetery and a rural industrial use. Nineteen of the 24 parcels are less than five acres. Four of the remaining five parcels are larger than 18 acres, the largest being 43 acres. The loss of the economic impact from the significant agricultural uses in this small area may be considerable; however the potential economic impact of urbanization for industrial use on these large flat parcels will outweigh this loss. There are 32 acres of identified habitat, most of which is along Council Creek on the southern edge of the analysis area. A tributary to Council Creek in the western portion of the area also contains some riparian habitat. The costs for protecting these linear resources will be small in contrast to the potential economic impact of urbanizing the larger internal locations, as their locations easily allow for the preservation of the resource away from development. Urbanization will negatively impact the current residents of the area through the loss of the rural lifestyle, especially for those few residences that are not associated with the large parcels and will realize less of a positive economic impact. Overall this analysis area has low economic, social and energy consequences from urbanization.

Avoidance of conflict with regionally significant fish and wildlife habitat

The area along the south edge of the analysis area, including Council Creek, is part of an identified significant natural landscape feature, and includes 33 acres of regionally significant wildlife habitat and several wetland areas. Two natural area parks owned by Metro are adjacent to the analysis area to the southeast and east, along Council Creek. These areas are directly adjacent to potential future urban development, and have no existing buffers with the exception of NW Susbauer Road for the eastern most open space parcel. The City of Cornelius, the expected governing body, has adopted habitat protection measures that are in compliance with Metro's Title 13 requirements as part of the Tualatin Basin Natural Resource Coordinating Committee's protection program. Existing development within the UGB adjacent to the analysis area has consistently maintained a clearly identified buffer between the stream and urban development. If this pattern continues north of the creek within the analysis area, impacts to regionally significant fish and wildlife habitat will be minimal. The identified habitat area is also buffered by the presence of a 100-year flood plain, limiting development opportunities and further protecting the important habitat areas.

Agricultural/Forest Compatibility

Protection of farmland that is most important for the continuation of commercial agriculture in the region

The urban and rural reserves process designated the most important land for commercial agriculture as rural reserves and the most suitable land for urbanization as urban reserves.

Designation of this area as an urban reserve means farmland within this analysis area is not the most important for the continuation of commercial agriculture in the region.

Compatibility of proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

The UGB borders the Cornelius North urban reserve analysis area on the south. Resource land zoned exclusive farm use (EFU) directly borders the analysis area on the west and north; with the exception of one parcel zoned agriculture forest 20 (AF-20) west of NW Cornelius Schefflin Road adjacent to the UGB (see attached resource land map). This extensive block of farm land extends for miles to the north, west and east and is intensely farmed for numerous agricultural products. There is a 70-acre island of non-farm land north of the analysis area in the vicinity of NW Long Road and NW 366th Place. Adjacent to the east of the analysis area is a 96-acre pocket of non-farm land bounded by NW Hobbs Road and NW Susbauer Road. North of the analysis area there is an unnamed stream that flows east then south in an arc pattern through open farm fields and appears to be controlled to create storage ponds for irrigation, but does act as an edge or buffer. Increased traffic along NW Susbauer Road and NW Cornelius Schefflin Road due to new urban uses within the analysis area may impact agricultural activities in this resource land area. As there are no identifiable edges or buffers between the analysis area and the extensive farm lands to the west, north and east, the proposed urban uses would not be compatible with the agricultural activities that occur on farm land outside the UGB. However mitigation measures could reduce conflicts between urban uses inside the UGB and resource uses outside the UGB.

Clear transition between urban and rural lands, using natural and built features to mark the transition

There are no natural or built features to mark a clear transition between urban and rural lands. Additional buffers will need to be incorporated into the planning of the urban reserve analysis area to provide a clear transition from urban to rural uses. The rural lands north to NW Long Road and east to the Dairy Creek floodplain are part of the larger Cornelius North urban reserve area and may be included in the UGB in the future. Thus, any buffers that are incorporated into the planning study for this analysis area should consider the potential for connecting these two locations in the future.

2040 Growth Concept

Contribution to the purposes of Centers

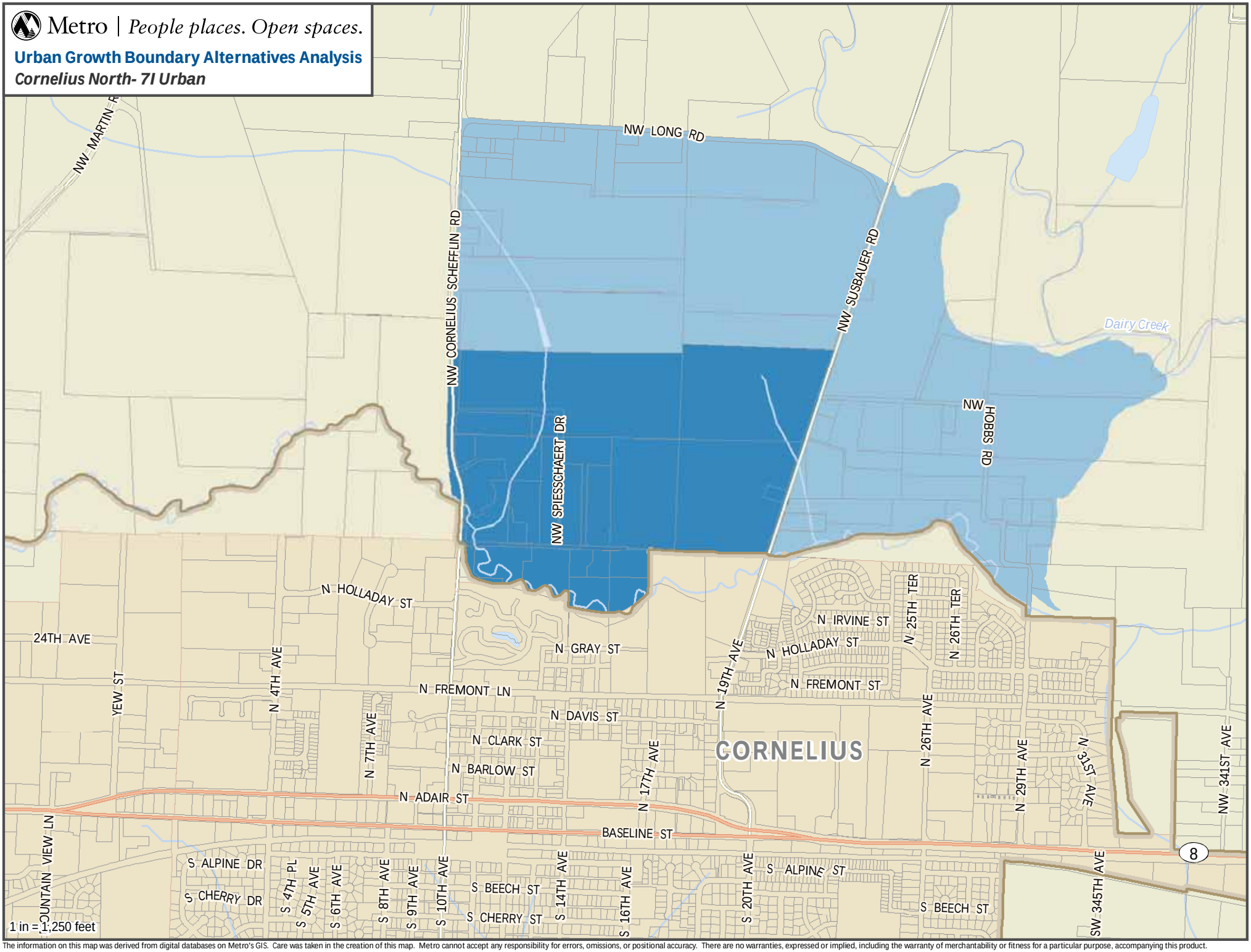
The Cornelius North analysis area is between two 2040 Growth Concept designated centers, the Hillsboro Regional Center and the Forest Grove Town Center. The area is not directly linked to either center, however, and is between 2.5 and 3 miles away along Highway respectively. Urbanization of Cornelius North will therefore not support the continued development of either center due to the distance between the areas and the focus for large site industrial uses in this analysis area.

The City of Cornelius, as part of their pre-qualified concept planning for the Urban and Rural Reserves selection process, envision the creation of a new Town Center over the next 10-20 years. Due to the relatively close proximity of the analysis area (0.5-1.0 mile) to the center of Cornelius, there may be some opportunity to support the creation of a new center in the near future. Urbanization of this area may be able to support the vision and purpose of a town center in Cornelius that is compact, walkable, bikeable, and has an appropriate jobs to housing balance.

Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

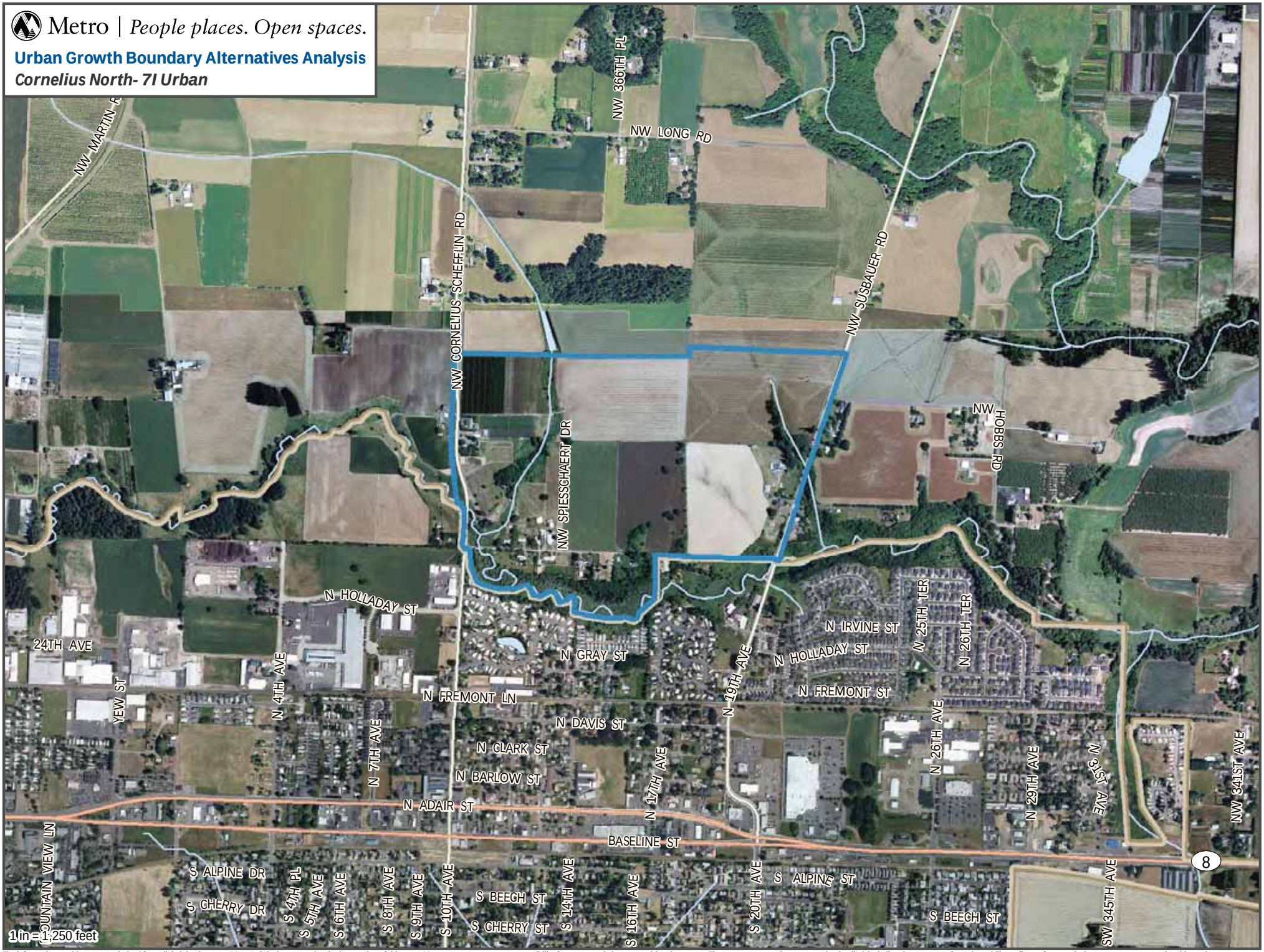
Cornelius North- 7I Urban

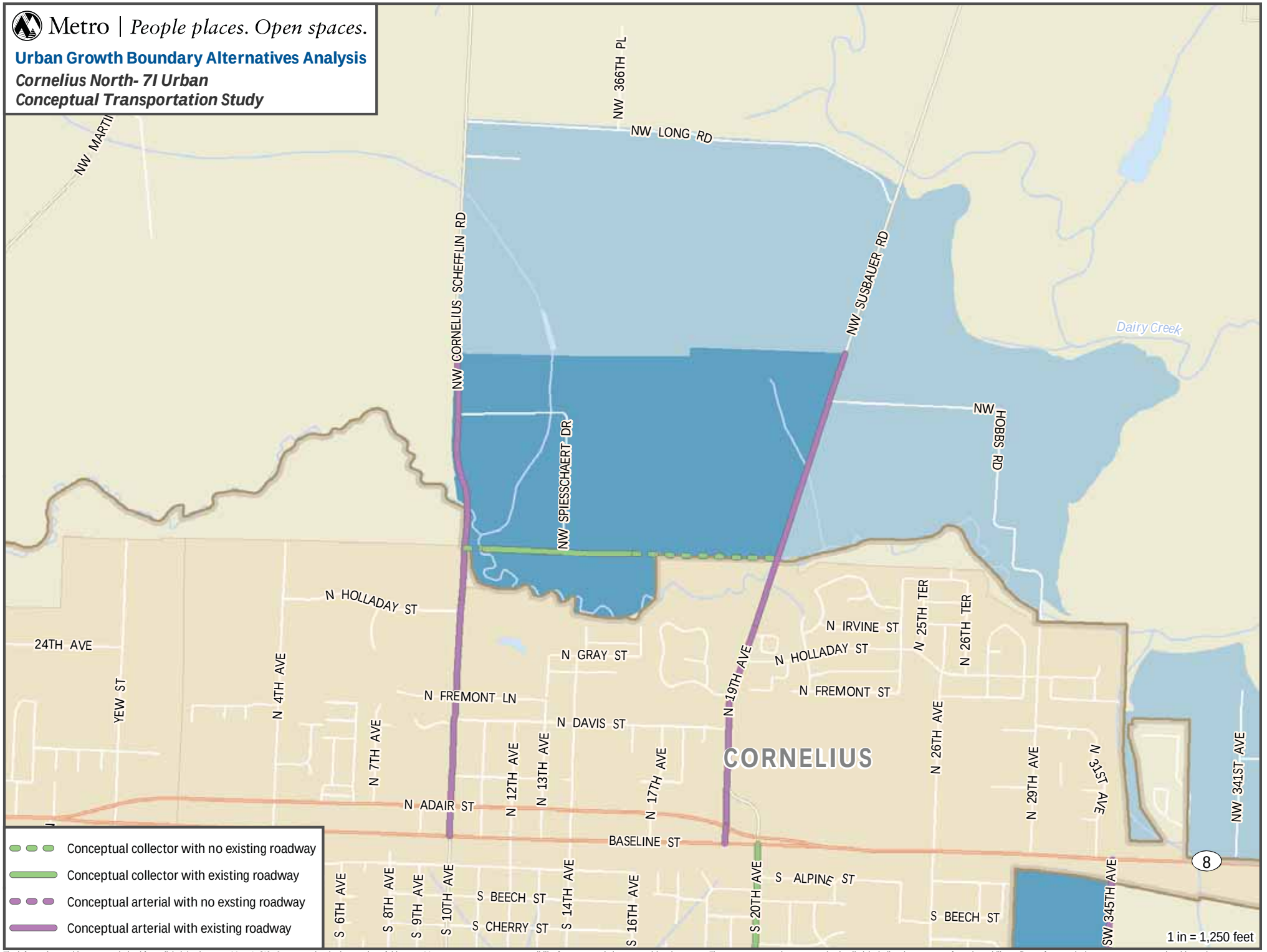


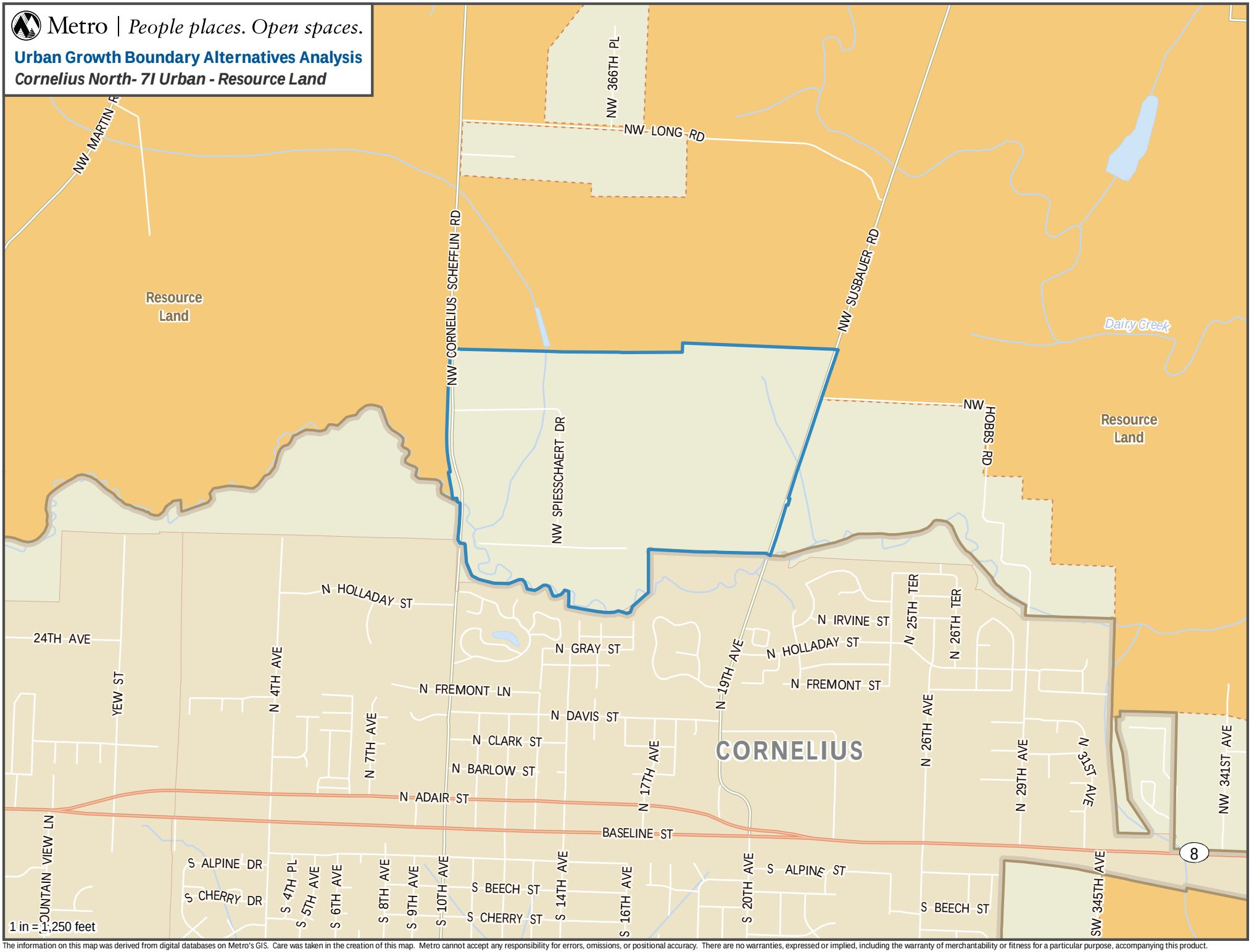
Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

Cornelius North- 7I Urban







HILLSBORO NORTH ANALYSIS AREA (8A)

Hillsboro North Analysis Area		**Total Acres**	**950**
Gross Vacant Buildable Acres	767	Total Constrained Acres	183
Estimated Dwelling Unit Capacity	0	• Title 13 Significant Habitat	137
Estimated Employment Acres	625	• Public Land	0

General Description (see attached map)

The Hillsboro North Analysis Area, a portion of the larger Hillsboro North Urban Reserve, is a wedge-shaped area north of Hillsboro, between the current UGB and Highway 26 and is 950 acres in size. The analysis boundary is defined by the UGB to the south and east, Highway 26 to the north. NW Jackson School Road is the western edge up to Waible Reservoir, after which Storey Creek generally marks the western boundary. The area is served by Highway 26 at both the NW Helvetia Road/NW Shute Road and NW Jackson School Road interchanges. NW Meek Road and NW Sewell Road serve the interior of the area.

Parcelization, Building Values, Development Pattern (see attached aerial photo)

The Hillsboro North Analysis Area contains 76 tax lots, with a median size of two acres. A total of 22 parcels have an area of at least five acres, and account for three-quarters of the total analysis area. Thirteen parcels have an area less than one acre. Improvements are recorded for 57 tax lots, with a median value of $136,370. Improvements with values over $250,000 occur on nine lots, with a maximum value of $509,000. Uses within the study area include a mix of agriculture and rural residential. Agricultural uses are primarily for field crops and there forested parcels along Waible Gulch. There are two blocks of smaller lots, characterized by rural residential development patterns, one at the center of the analysis area around NW Meek Road, the other in the eastern corner near Highway 26 and NW Shute Road.

One power line easement runs east-west, passing through the southwest portion of the analysis area. The south-southwest portion of the analysis area is also adjacent to the Hillsboro airport, which could restrict certain uses in the area and be a source of significantly high air traffic noise.

GOAL 14 LOCATIONAL FACTORS (METRO CODE SECTION 3.01.020)

Public Facilities and Services

Orderly and economic provision of public facilities and services

The preliminary sanitary sewer, water and transportation suitability analyses completed by the Core Four Technical Team for the urban and rural reserve study area indicated this general location had high suitability for sanitary sewer services, water services and transportation connectivity. The City of Hillsboro's Pre-Qualifying Concept Plan, completed as part of the Washington County urban and rural reserve designation process, indicates that the city has the ability and willingness to provide urban services to this area.

The following cost estimates represent preliminary estimates for the major components of the individual systems. The estimates were generated using very general assumptions about the level of large site industrial development that could occur in the analysis area. More detailed concept plans, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11 will be necessary to develop more refined cost estimates. Attachment 5 contains the breakdown for the transportation cost estimates. A map of the proposed collector and arterial transportation network is attached to this summary.

Sanitary Sewer Services - $6,835,000

Water Distribution Services - $6,080,000

Storm Sewer Services – $6,210,500

Transportation Services - $463,670,000

ESEE Analysis

Comparative environmental, energy, economic and social consequences

Environmental

One primary stream, Waible Gulch, runs through the area in an east-west direction. At some locations along the stream, agricultural activities occur right up to the stream bank. The area also includes the Waible Reservoir, just east of Jackson School Rd at the north end of the western half of the analysis area. There are two wetland areas, one along Waible Gulch and one along the south edge of the area, for a total of 24 acres. Waible Gulch also has 57 acres of 100-year flood plain along its length. There are minimal slopes, with only 1.5 acres steeper than 25%, concentrated along the riparian corridor. The limitations on development presented by the flood plain areas, the limited amount of environmental resources within the area and the current level of agricultural activity adjacent to the stream indicate that urbanization can occur in this area with minimal additional impacts to environmental resources due to required urban level protection measures. Attachment 6

contains a breakdown of the environmental factors. Attachment 6 contains the breakdown of the environmental factors.

Energy, Economic & Social

This large analysis area is divided into 76 parcels with 29% of the parcels greater than five acres in size. Seven parcels are greater than 40 acres, the largest being 157 acres. Seventy-five percent of the parcels contain improvements. Agricultural activities dominate significant portions of the area with pockets of rural residences along NW Meek Road and NW Sewell Road. The loss of the economic impact from the significant agricultural uses in this large area may be considerable; however the potential economic impact of urbanization for industrial use on these large flat parcels will reduce or outweigh the impact of this loss. There are 33 acres of identified habitat, mainly along Waible Gulch which runs along the southern edge of the eastern section and the northern edge of the western section of the analysis area. The costs for protecting these linear resources will be small in contrast to the potential economic impact of urbanizing the larger internal locations, as their locations easily allow for preservation away from development. Urbanization will negatively impact the current residents of the rural residential pockets through the loss of the rural lifestyle. Overall this analysis area has medium economic, social and energy consequences from urbanization.

Avoidance of conflict with regionally significant fish and wildlife habitat

Approximately 98 acres of regionally significant riparian habitat are identified within the area, although a significant amount is currently impacted by agriculture activities. Most of the habitat, including an additional 39 acres of upland forest, is concentrated around Waible Gulch at the northern edge of the western half of the analysis area. The City of Hillsboro, the expected governing body for this area, has adopted habitat protection measures in compliance with Metro's Title 13 program through the Tualatin Basin Natural Resource Coordinating Committee's protection program. Based on the development limitations provided by the 100-year flood plain, the location of the regionally significant habitat at the edges of the analysis area, and the expected protection measures that will be in place prior to urbanization, this area could be urbanized with some impacts on regionally significant fish and wildlife habitat.

Agricultural/Forest Compatibility

Protection of farmland that is most important for the continuation of commercial agriculture in the region

The urban and rural reserves process designated the most important land for commercial agriculture as rural reserves and the most suitable land for urbanization as urban reserves. Designation of this area as an urban reserve means farmland within this analysis area is not the most important for the continuation of commercial agriculture in the region.

Compatibility of proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

The UGB borders the Hillsboro North analysis area on the south and east. Resource land zoned exclusive farm use (EFU) directly borders the analysis area on the west and north, across highway 26, with the exception of a 51 acre block of non-farm land located NW Meek Road and NW 273rd Avenue (see attached resource land map). This extensive block of farm land extends for miles to the north and west beyond the city of North Plains and is intensely farmed for numerous agricultural products. There is a 122 acre island of non-farm land west of the analysis area centered on NW Glencoe Road and NW Evergreen Road. Waible Gulch flows west through the analysis area draining into Waible Reservoir, before continuing west as Waible Creek. Storey Creek flows south near the middle portion of the analysis area into Waible Reservoir. Waible Reservoir and Storey Creek, in combination with the rural residences near Storey Creek provide a buffer for the farm land to the northwest of the analysis area. Highway 26 provides a buffer for the farm land that is located on the north side of the Highway 26. NW Jackson School Road provides a western edge to the analysis area; however the road itself would not make the proposed urban uses compatible with the adjacent agricultural activities occurring on farm land south of Waible Creek. In addition, increased traffic along NW Jackson School Road due to new urban uses within the analysis area may impact agricultural activities on these resource lands to the west. The proposed urban uses would be compatible with agricultural activities in the areas where the highway or the stream corridors provide buffers. In the two areas where there are no identifiable edges or buffers between the analysis area and the nearby agricultural activities, the proposed urban uses would not be compatible with the agricultural activities that occur on farm land outside the UGB. However mitigation measures could reduce conflicts between urban uses inside the UGB and resource uses outside the UGB.

Clear transition between urban and rural lands, using natural and built features to mark the transition

There are both natural (Waible Gulch and Reservoir) and built (Highway 26) features that mark a clear transition between urban and rural lands, for a large portion of the analysis area. Even assuming NW Jackson School Road develops as an arterial roadway in the future, the road itself will not provide a clear transition area between future urban and rural uses for the land to the west. Additional buffers will need to be incorporated into the planning of the urban reserve analysis areas near NW Jackson School Road to provide a clear transition from urban to rural uses. The rural lands west of NW Jackson School Road are part of the larger Hillsboro North urban reserve area and may be included in the UGB in the future. Thus, any buffers that are incorporated into the planning study for the analysis area should consider the potential for making urban form connections in this location in the future.

2040 Growth Concept

Contribution to the purposes of Centers

The Hillsboro North analysis area is located near the Hillsboro Regional Center and the Orenco Town Center. The Hillsboro Regional Center is 144 acres, serves all of western Washington County along with many rural areas outside of the urban growth boundary, and is the western terminus of the MAX Blue Line. It is linked to the analysis area by NE Jackson School Road/NE 5th Avenue (2 miles) and via TriMet's route 46. The Orenco Town Center is 174 acres, and primarily serves the surrounding transit-oriented development. Access to the analysis area is via NW Shute Rd (2.3 miles) and does not currently have Tri-Met transit service.

The City of Hillsboro, through the 2020 Vision and other initiatives, has identified the historic downtown as the heart of the Hillsboro community, serving as the primary civic and commercial center of the surrounding area. Despite recent investments in infrastructure, transit and civic resources, many parts of the center have been inactive and stagnant. The City recently completed a Downtown Urban Renewal Plan, indicating a commitment to increased development and revitalization of this important regional center, with higher density mixed use and a thriving unique character. Metro's State of the Centers Report, January 2009, indicates that currently the center has a much higher than average jobs to housing ratio, as well as a high number of people per acre, although it still maintains a small city feel through an active main street and grid street network. The Hillsboro Regional Center is considered a transit-oriented static market that may require catalyzing development opportunities, based on research completed by Metro's Development Center for the TOD Strategic Plan.

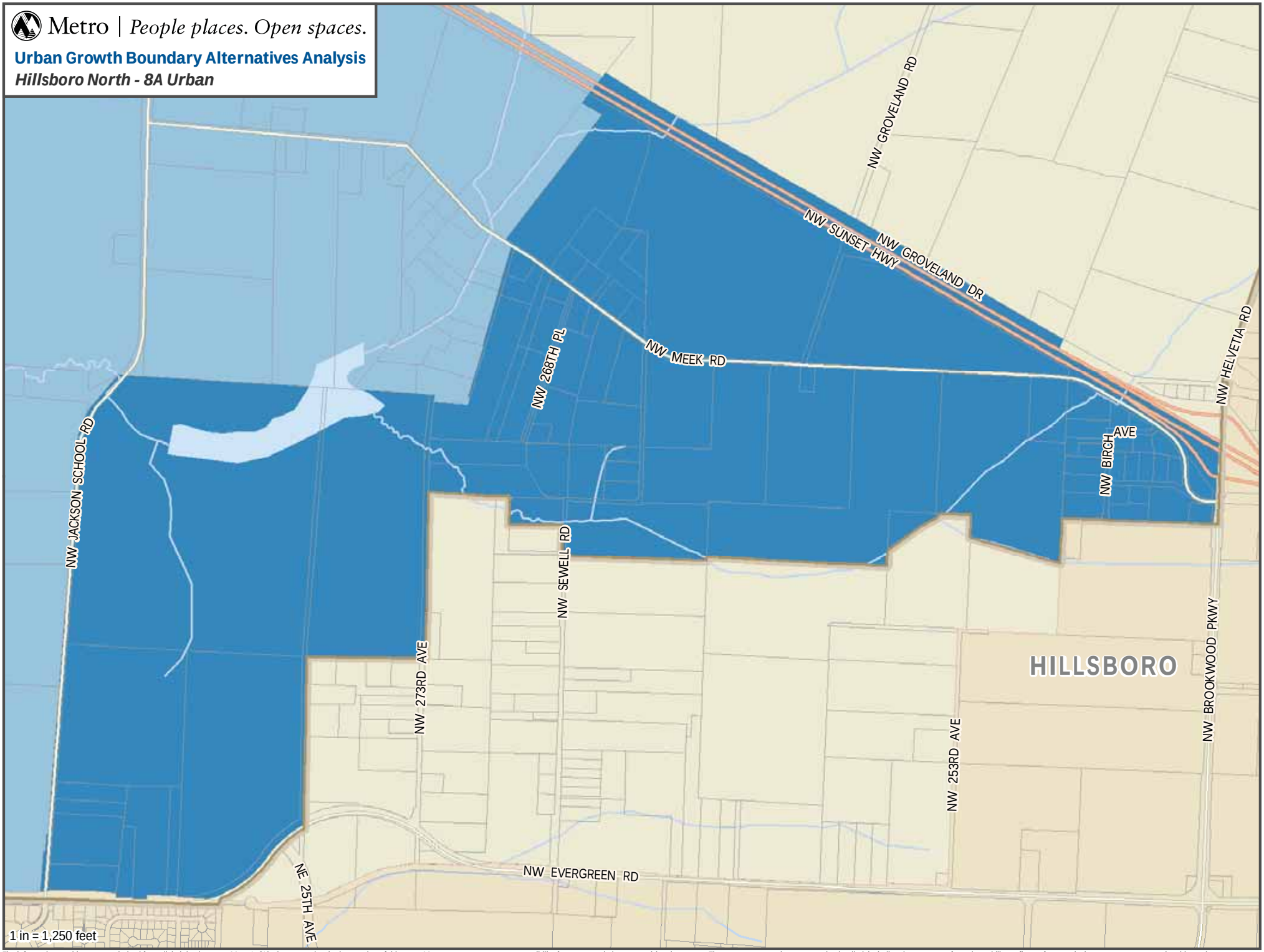
The Orenco Town Center is much more residential in character than the Hillsboro Regional Center. According to the State of the Centers report, it has low jobs to housing ratio, but a much higher than average number of dwelling units per acre. The center was built as a transit-oriented development surrounding Orenco Station, and has some mixed use residential and commercial. The Orenco Town Center is considered an emerging transit center that may be ripe for increased investment and development, based on research completed by Metro's Development Center for the TOD Strategic Plan.

The Hillsboro North analysis area is being evaluated for large-site industrial use, consistent with the city's vision for the area. Urbanization of the Hillsboro North analysis area will not contribute to the vision and purpose of either the Hillsboro Regional Center or the Orenco Town Center. The distance of the analysis area from both centers reduces any impact that large-site industrial development might have, especially for enticing new housing opportunities to the Hillsboro Regional Center as there is other underutilized land located between the two areas. Even though the employment uses identified for the analysis area are not in direct conflict with the types of employment needs that the Orenco Town Center may need to help balance jobs to housing, the presence of a large site industrial user will not directly entice new employment opportunities in a town center over 2 miles away.

Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

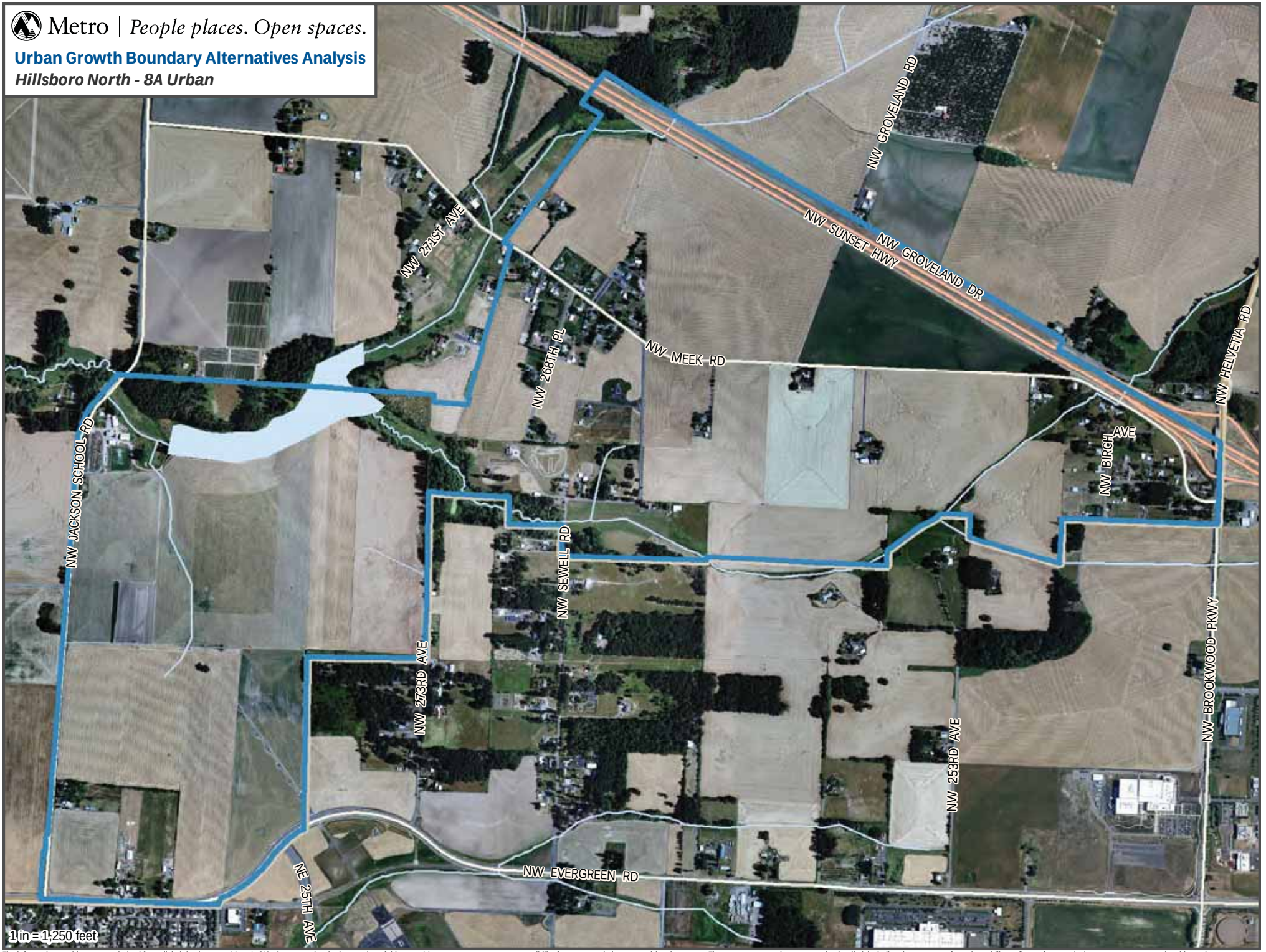
Hillsboro North - 8A Urban

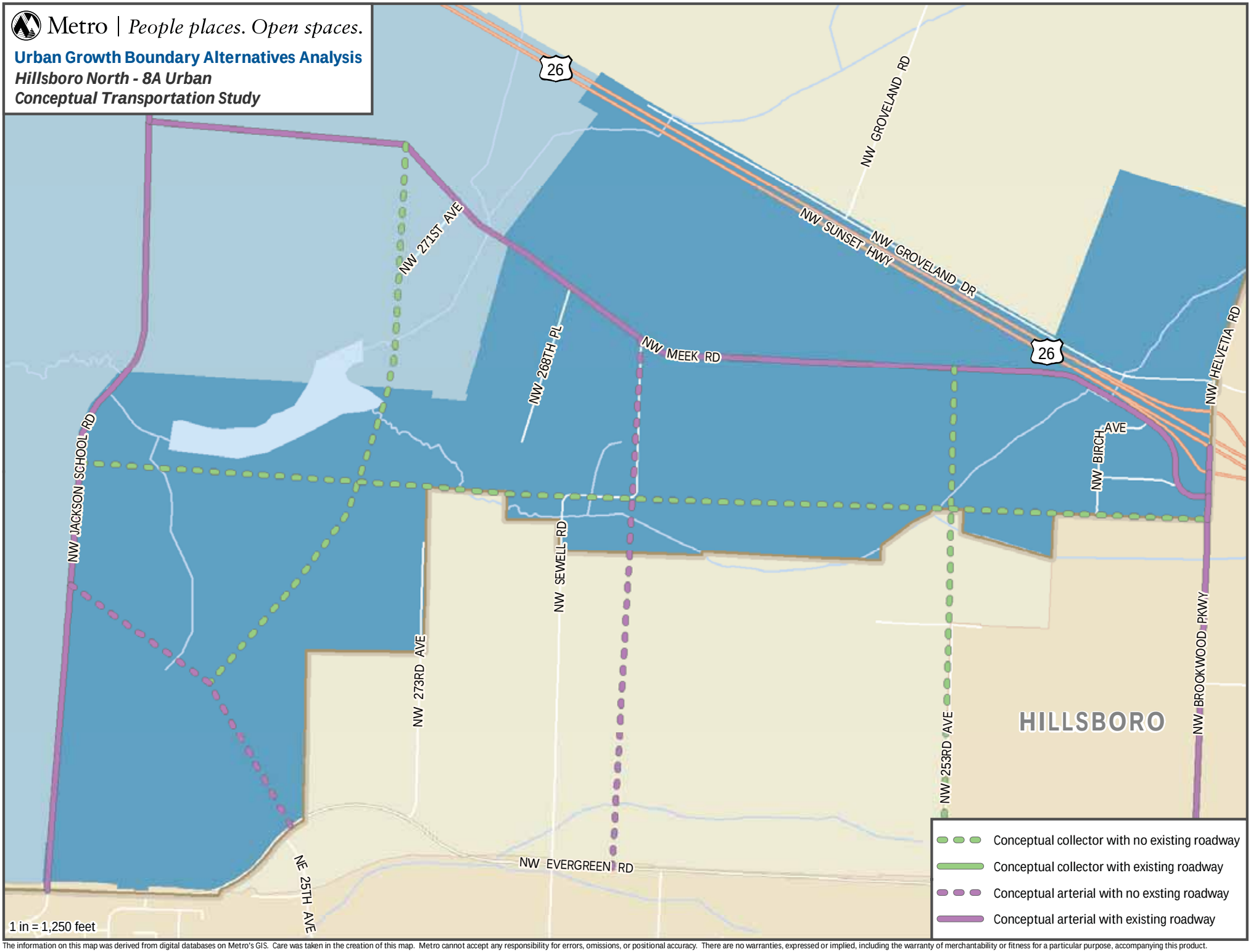


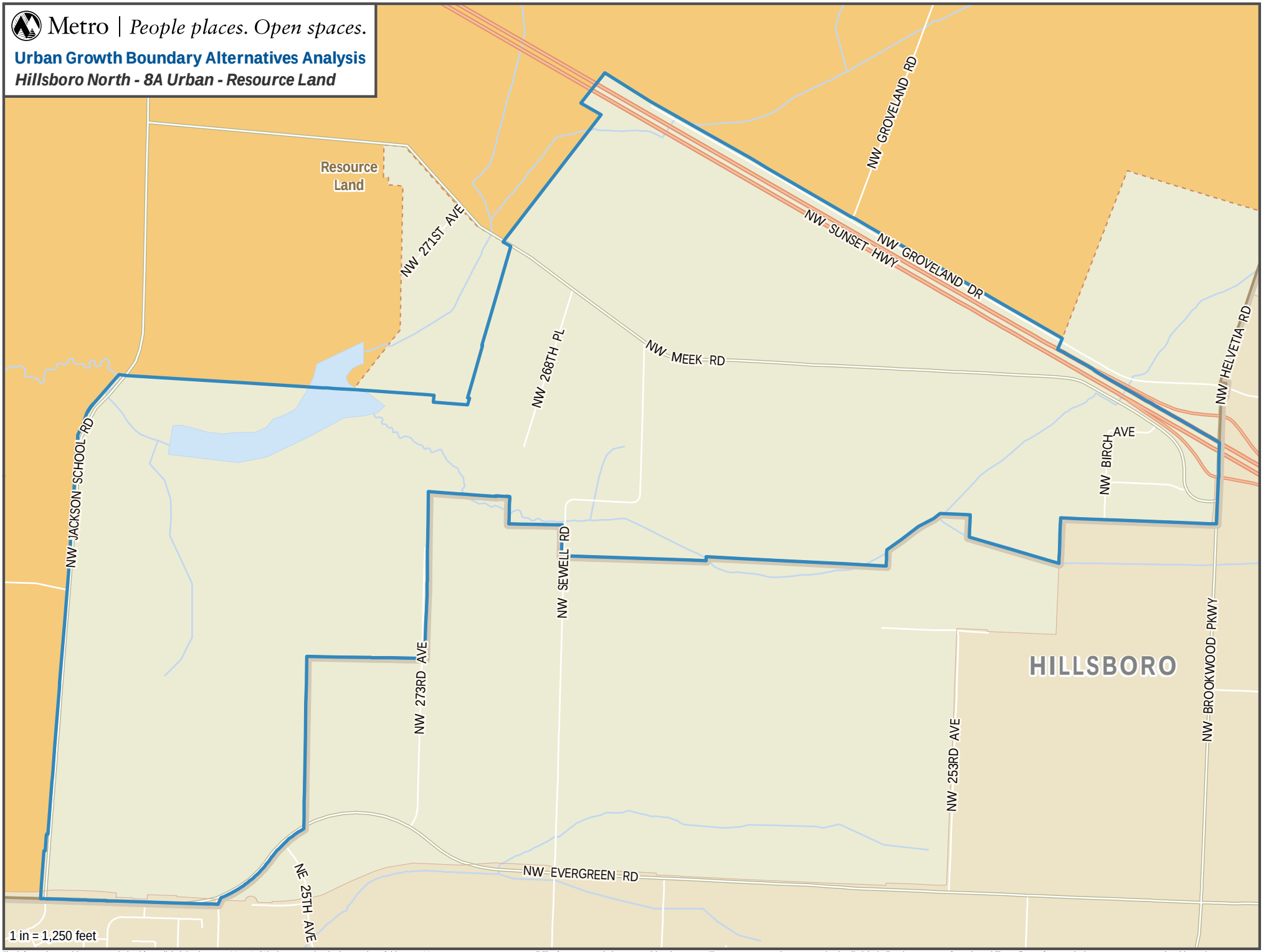
Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

Hillsboro North - 8A Urban







SHUTE ROAD INTERCHANGE ANALYSIS AREA (8B)

Shute Rd. Interchange Analysis Area		Total Acres	86
Gross Vacant Buildable Acres	58	Total Constrained Acres	28
Estimated Dwelling Unit Capacity	0	• Title 13 Significant Habitat	24
Estimated Employment Acres	47	• Public Land	0

General Description (see attached map)

This small area sits to the northwest of the Shute Rd interchange on Highway 26, just north of the Hillsboro North Analysis Area. It totals 86 acres and is bounded by NW Helvetia Road to the east and Highway 26 to the south. The west and north boundaries follow the two large tax lots that comprise the majority of the analysis area. Most of the area is actively cultivated farmland, with the exception of a small wooded area along the southern edge that contains a few rural residences.

Parcelization, Building Values, Development Pattern (see attached aerial photo)

The Shute Rd Interchange area has seven tax lots, although the two largest account for 73 of the 85 acres under analysis. All of the remaining five parcels are less than one acre in size. Five of the seven parcels have improvements, although only 2 have values over $100,000. There is one parcel with an improvement valued at $458,690. The entire analysis area is zoned as agricultural land; however active farming appears to only be occurring on the two larger parcels. The other five lots appear to be for residential use, and a large portion of one of the larger lots contains a stream and associated floodplain.

Available data does not suggest the existence of power lines or public easements within this area.

GOAL 14 LOCATIONAL FACTORS (METRO CODE SECTION 3.01.020)

Public Facilities and Services

Orderly and economic provision of public facilities and services

The preliminary sanitary sewer, water and transportation suitability analyses completed by the Core Four Technical Team for the urban and rural reserve study area indicated this general location had high suitability for sanitary sewer services, water services and transportation connectivity.

The City of Hillsboro's Pre-Qualifying Concept Plan, completed as part of the Washington County urban and rural reserve designation process, indicates that the city has the ability and willingness to provide urban services to this area.

The following cost estimates represent preliminary estimates for the major components of the individual systems. The estimates were generated using very general assumptions about the level of large site industrial development that could occur in the analysis area. More detailed concept plans, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11 will be necessary to develop more refined cost estimates.

Sanitary Sewer Services – $554,000

Water Distribution Services – $525,000

Storm Sewer Services - $476,500

Transportation Services – due to the very small size of the analysis area and its location directly adjacent to the NW Shute Road/Highway 26 interchange, no additional arterials or collectors are needed to serve the area.

ESEE Analysis

Comparative environmental, energy, economic and social consequences

Environmental

There are no wetlands, but there are 23 acres of 100-year flood plain along Waible Gulch running through the southeast corner of the area. The area is very flat, with almost no steep topographic features. There is no other evidence of significant natural resources or environmental features in the analysis area. Given the small amount of resources and their isolated nature in the southeast corner of the analysis area, future urbanization can occur with minimal impact to environmental resources. Attachment 6 contains a breakdown of the environmental factors.

Energy, Economic & Social

This very small area, composed of 7 parcels is mostly in agricultural production with a few rural residences along NW Groveland Drive near the Highway 26 interchange. The two parcels that are in agricultural production are greater than 30 acres and the remaining five parcels, four of which contain improvements are a half acre in size. The loss of the economic impact from the significant agricultural uses in this small area may be considerable; however the potential economic impact of urbanization for industrial use on these large flat parcels near the highway interchange will outweigh this loss. There are 33 acres of identified habitat associated with Waible Gulch which runs through the southern section of the analysis area. The costs for protecting this pocket of resources will be small in contrast to the potential economic impact of urbanizing the remaining northern portion, as its isolated location easily allows for preservation away from development.

Urbanization will negatively impact the few residents along NW Groveland Drive through the loss of the rural lifestyle, although they are currently impacted by urban level traffic. Overall this analysis area has low economic, social and energy consequences from urbanization.

Avoidance of conflict with regionally significant fish and wildlife habitat

There is one location of regionally significant riparian habitat in this analysis area comprised of a small 24 acre block of riparian habitat along the stream corridor in the southeast corner. The City of Hillsboro, the expected governing body for this area, has adopted habitat protection measures in compliance with Metro's Title 13 program through the Tualatin Basin Natural Resource Coordinating Committee's protection program. Due to the isolated location of the habitat and the expected protection measures that will be in place prior to development, urbanization can occur with minimal impact on the identified regionally significant fish and wildlife habitat.

Agricultural/Forest Compatibility

Protection of farmland that is most important for the continuation of commercial agriculture in the region

The urban and rural reserves process designated the most important land for commercial agriculture as rural reserves and the most suitable land for urbanization as urban reserves. Designation of this area as an urban reserve means farmland within this analysis area is not the most important for the continuation of commercial agriculture in the region.

Compatibility of proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

The UGB borders the Shute Road urban reserve analysis area on the east. Resource land zoned exclusive farm use (EFU) directly borders the analysis area on the west and north (see attached resource land map). This extensive block of farm land extends for miles to the north and west and is intensely farmed for numerous agricultural products. There is an island of non-farm land zoned Agriculture Forest 10 (AF-10) a little over a mile to the north in the vicinity of NW Helvetia Road and NW Dierdorff Road. To the south across Highway 26 is a block of non-farm land zoned Agriculture Forest 5 (AF-5) that is centered on NW Oak Drive and NW Birch Avenue. Northwest of the analysis area, Storey Creek and a few tributaries flow south through open farm fields but do not act as an edge or buffer. Increased traffic along NW Helvetia Road and NW West Union Road due to new urban uses within the analysis area could impact agricultural activities in this resource land area, however given the analysis area's location next to Highway 26 little traffic would be expected to travel north. As there are no identifiable edges or buffers between the analysis area and the extensive farm lands to the west, the proposed urban uses would not be compatible with the agricultural activities that occur on farm land outside the UGB. However mitigation measures could reduce conflicts between urban uses inside the UGB and resource uses outside the UGB.

Clear transition between urban and rural lands, using natural and built features to mark the transition

There are no natural or built features to mark a clear transition between urban and rural lands to the north or west. Highway 26 acts a buffer for the rural lands to the south. Additional buffers will need to be incorporated into the planning of the urban reserve analysis area to provide a clear transition from urban to rural uses.

2040 Growth Concept

Contribution to the purposes of Centers

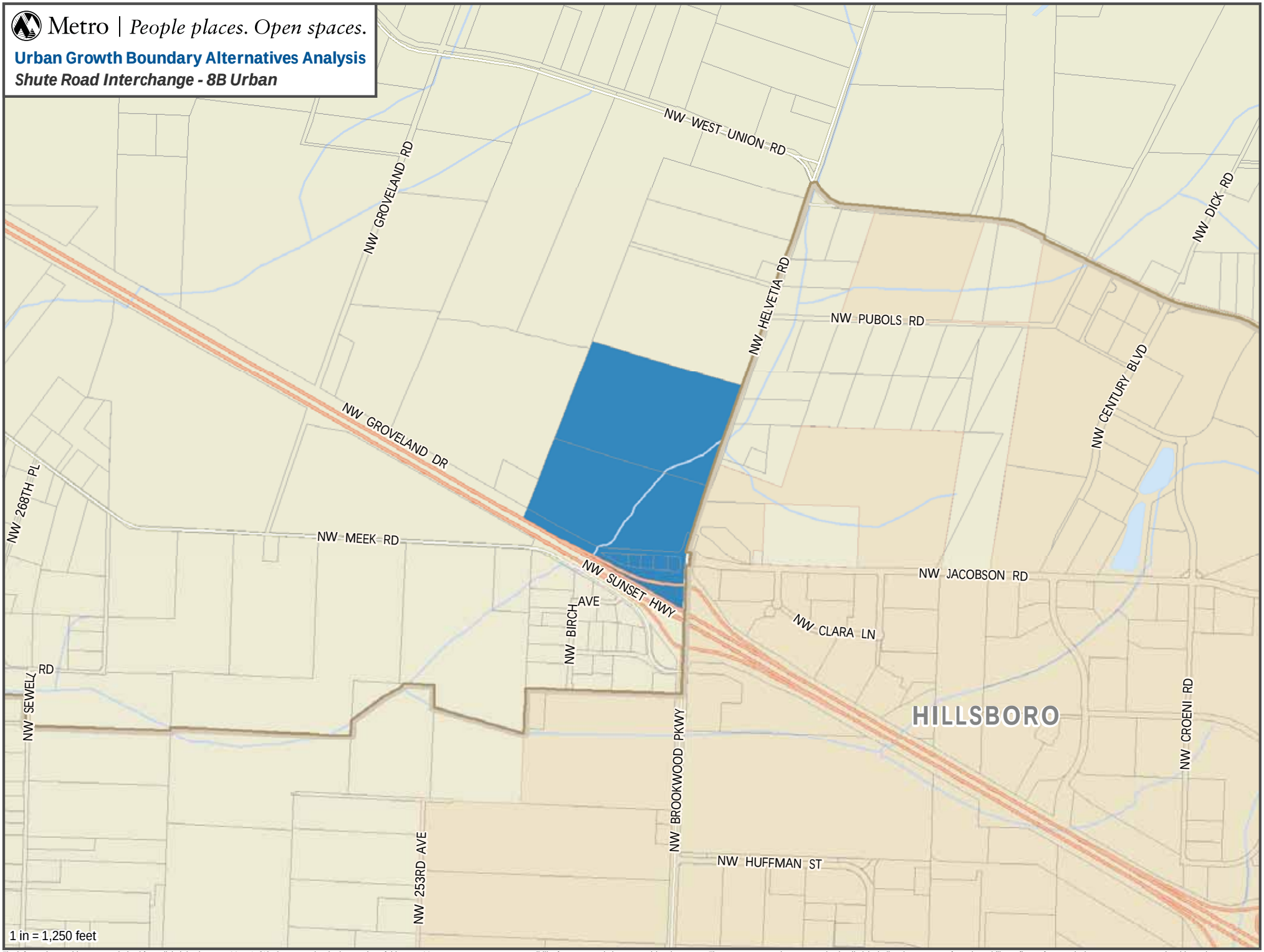
The Shute Rd Interchange analysis area is approximately 2.5 miles north/northwest of the Orenco Town Center. The two areas are linked by NW Shute Road, but do not currently have any public transit connections. The Orenco Town Center is generally residential in character. The center was built as a transit-oriented development surrounding Orenco Station, and has some mixed use residential and commercial. According to the Metro State of the Centers report, it has a low job to housing ratio, but a much higher than average number of dwelling units per acre. The Orenco Town Center is considered an emerging transit center that may be ripe for increased investment and development, based on research completed by Metro's Development Center for the TOD Strategic Plan.

Currently, the City of Hillsboro envisions the analysis area urbanizing primarily with large site industrial uses. Urbanization of the Shute Road Interchange analysis area will not contribute to the vision and purpose of the Orenco Town Center due to the distance between the two areas and the focus of the analysis area on large site industrial development. The employment needs of the town center that would help to balance the jobs to housing ratio, is different than the large site industrial employment focus of the analysis area.

Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

Shute Road Interchange - 8B Urban



Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

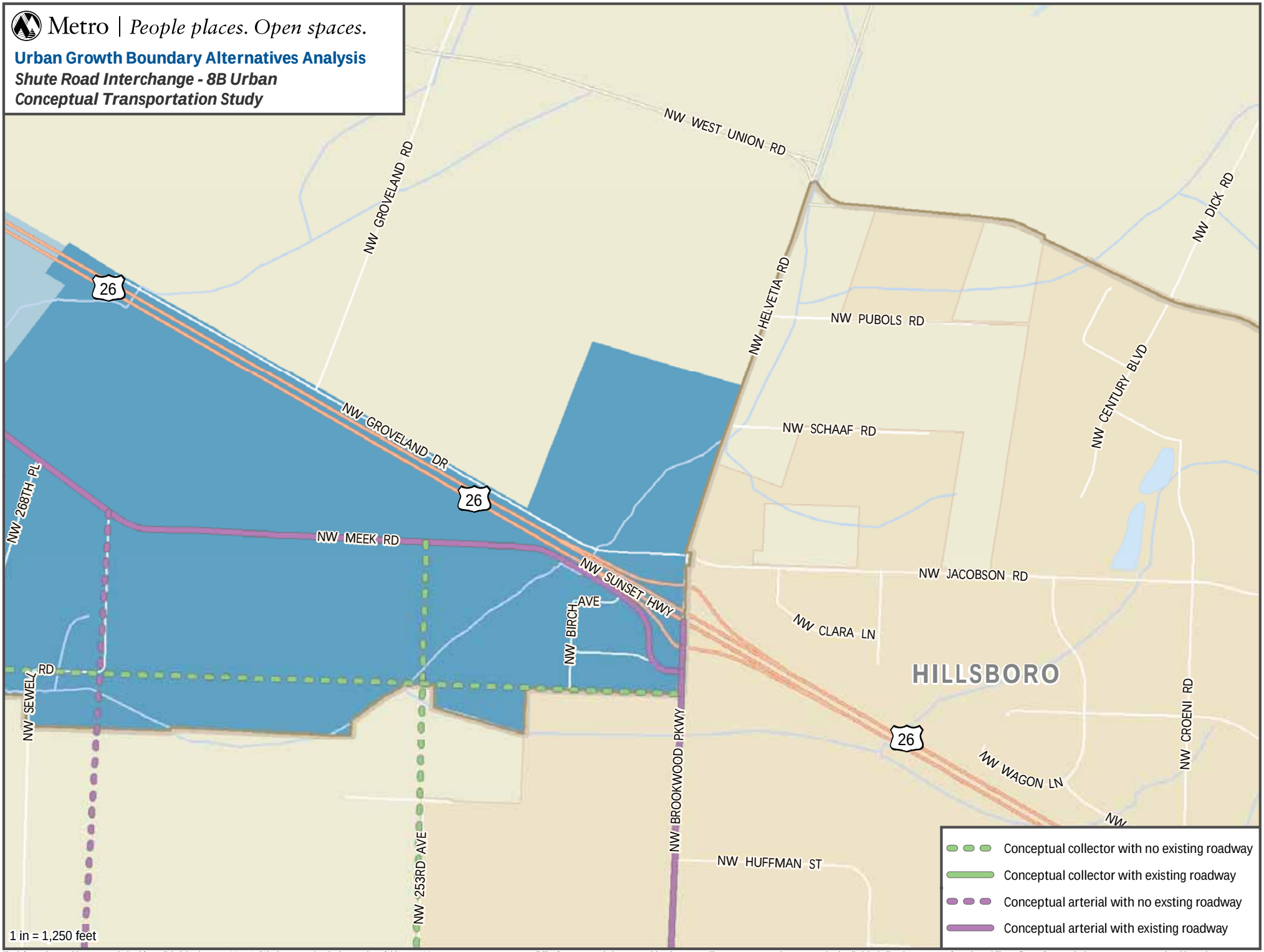
Shute Road Interchange - 8B Urban

Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

Shute Road Interchange - 8B Urban

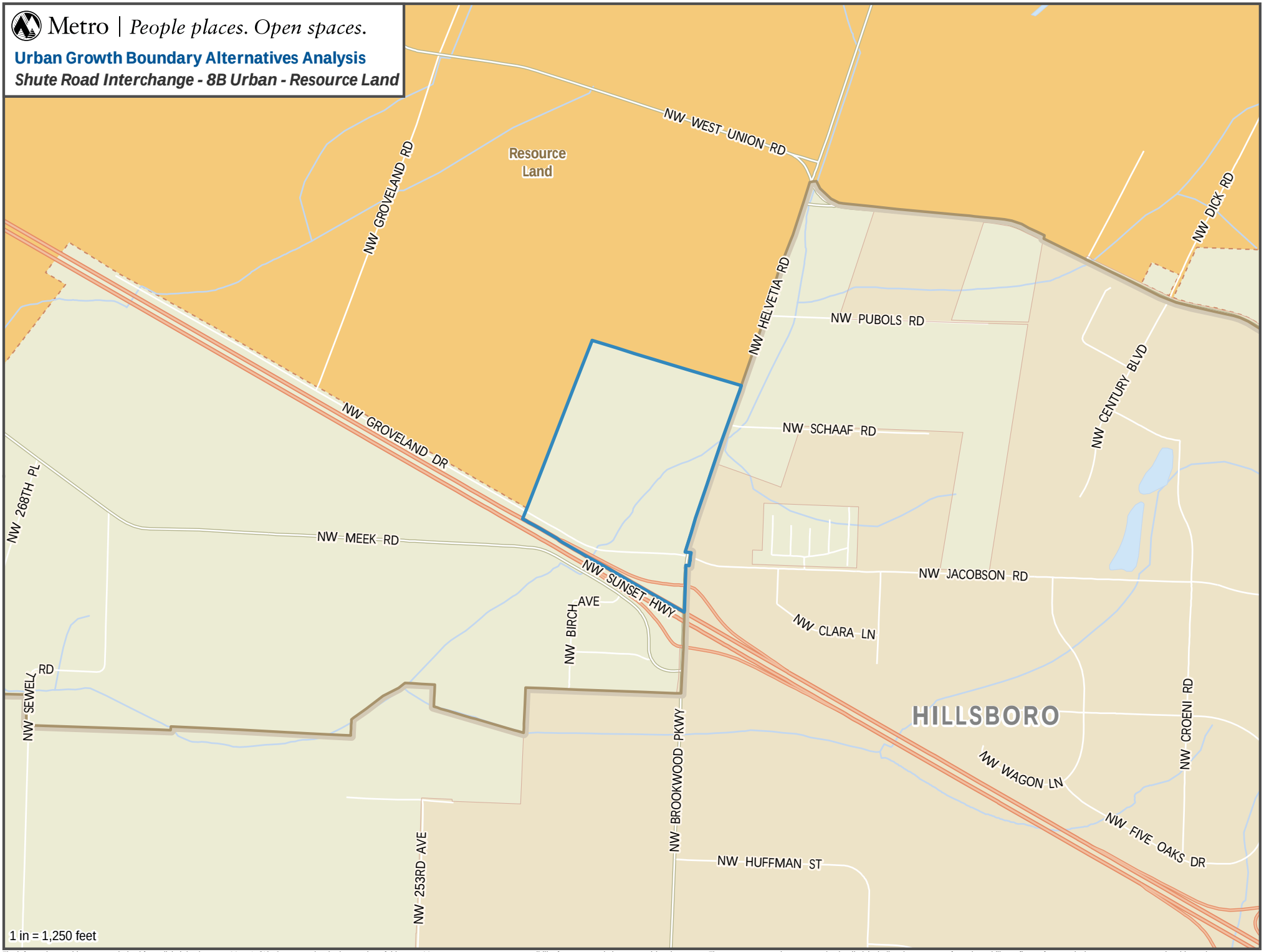
Conceptual Transportation Study



Metro | *People places. Open spaces.*

Urban Growth Boundary Alternatives Analysis

Shute Road Interchange - 8B Urban - Resource Land



GROUP MACKENZIE
CELEBRATING 50 YEARS

TABLE OF CONTENTS

Assessment of Potential Urban Growth Boundary Expansion Areas

To
METRO

Submitted
August 3, 2010

Project Number
2100103.00

GROUP MACKENZIE
Since 1960

RiverEast Center | PO Box 14310 | Portland, OR 97293
1515 SE Water Ave, Suite 100 | Portland, OR 97214
T 503.224.9560 | F 503.228.1285 | www.grpmack.com

SCOPE OF WORK

The overall task taken on by the consultant team involves the analysis and general cost estimating of public infrastructure needed to serve designated urban reserve properties. Metro's Urban Growth Report (UGR) accepted by the Metro Council on December 10, 2009, found, due to a series of factors contained in the report, a potential need for additional residential capacity and a need for industrial lands in large site (greater than 50 buildable acres) configurations.

This analysis is specific to a set of properties proposed to meet this unmet demand for residential and large-site industrial uses. These properties together consist of approximately 8,298 acres of previously designated urban reserve lands. Based on the scope of work, discussions with Metro, and previous experience, our review focused on three topic areas: public utilities, parks, and schools.

The analysis properties were grouped by Metro into 18 areas based on geographic location and expected land use type (residential or large-lot industrial). Individual exhibits were developed for each area to summarize the results of the infrastructure development analysis. The following section presents the methodology used to analyze the 18 reserve areas.

ANALYSIS METHODOLOGY

Given the long-term (10 to 20 years) basis for development considered in this report, cost estimates are, by the scope, both preliminary and general in nature. The estimates have been completed in 2010 dollars and may not include all potential costs of construction. Items that could impact future costs include development densities and patterns within existing, adjacent Urban Growth Boundary (UGB) areas, more detailed analysis and data made available on the proposed areas, and other economic or technological changes.

Specific to each area and based on the data available from the individual service providers, the analysis assumed either the extension of the current level of service or the level of service projected within a 20-year timeframe. In each case, service or jurisdiction was assumed to be provided by the adjacent City or Service District, as noted on each exhibit.

PUBLIC UTILITIES

For public utilities, the review centers on trunk lines and mains as the larger components of the system. This assumes the vast majority of smaller laterals and individual service lines will be installed at the cost of private development. Our figures and costs are derived from review of adjacent and similar sites with the same land use and development pattern.

Using the buildable acreage of the proposed expansion areas assigned by Metro GIS, pipe lengths and sizes are translated from the existing sites to determine a large component system cost. Unit costs are based on recent industry-wide construction data and recent projects bid through our office.

Individual areas are then reviewed, assuming the jurisdiction of adjacent cities and service districts, for likely points of connection and any supply, downstream capacity or treatment issues. This work is completed primarily through review of existing master plans, and existing system capacity is reviewed for general availability to the proposed expansion area – both in terms of access and any limitation due to prior commitment of service to other areas already within the UGB.

The review of public utilities is similar for both residential and industrial uses.

PUBLIC SERVICES

For residential areas, additional consideration is given to an analysis of park and school services. Again, comparable areas are reviewed, and master plans and planned expansions are noted. For parks, the comparison is done on a developable acreage basis, while schools are considered and compared on both an acreage and dwelling unit basis.

PARKS

The development of parks associated with the residential areas in the analysis was based on comparisons with adjacent developed areas within the existing UGB. We recognize that the construction costs for parks can vary widely based on the type of park, location relative to other community public services such as schools, and park facilities expected to be installed. For example, a community park that utilizes athletic fields at an adjacent school property will require significantly different construction costs than a park featuring aquatic facilities, paved running trails, or artificial turf playing surfaces. Also, passive parks are part of community development: natural areas and open park space. The analysis accounts for this variability by providing high and low construction cost estimates based on park acreage, intended to reflect the higher costs associated with increased park features and complexity.

The acreage assigned to community parks versus passive parks was determined through review of National Recreation and Park Association (NRPA) standards for acreage per thousand population. We calculated the ratio, and applied that figure to the overall acreage count.

Cost estimates for parks were developed based on conversations with Metro parks staff as well as recent project bids through our office.

SCHOOLS

The development estimate for school construction in the residential UGB expansion areas was based on anticipated enrollment demand on the affected school districts. The district enrollment growth anticipated from each analysis area was estimated based on demographic projections provided by district long-range planning reports and school district staff. The estimated enrollment growth was compared with the school district's current enrollment and facility capacity to establish the need for new school construction. Enrollment projections were developed based on the expected number of new dwelling units for each area as provided by Metro. In general, the

expected development density corresponds to approximately 15 dwelling units per net buildable acre for most of the analysis areas.

School construction costs were developed based on conversations with facilities managers from several school districts.

TRANSPORTATION

On transportation costs, Metro staff provided cost estimates utilizing the Federal HERS-ST (Highway Economic Requirements System – State Version) software and methodology. This approach estimates initial costs of improvements, reconstructions, and widenings or realignments based on a number of physical considerations (including sensitive lands impact, topography, rail or waterway crossings, etc.) and a cost indexing by state.

Our team took the numbers under review and made comparisons to the expected road network, given analysis similar to those described above. While individual areas could be analyzed to a greater degree in terms of physical constraints, most are not yet included in an agency transportation system plan. For comparative purposes at this conceptual level, no significant differences or exceptions were adopted.

In the discussion of the roadway network and costs the following points were noted:

- Unit estimates were originally determined by ODOT, given their experience and as calculated through the HERS-ST methodology
- "High cost" areas were characterized by bridges over major rivers (Columbia, Willamette, Sandy, Clackamas and Tualatin, of which there are none in these study areas), tunnels (of which there are none in the study areas), wetland and floodplain crossings, rail yard crossings, and slopes greater than 25%. Only the sections of road that fell into these areas were classified as "high cost"
- The estimated cost is based on the number of lane miles and cost per lane mile. Also, the number of lanes for proposed arterials is 5 lanes while number of lanes for proposed collectors is 3 lanes. Almost exclusively, it was assumed that existing roadways in these study areas were 2 lanes each, needing expansion to either 3 or 5 lanes, depending on the designation.
- Unit costs include the bicycle and pedestrian improvements assumed within the typical standard.
- The transportation cost estimates are exclusive to the needs inside the individual expansion area. Impacts and improvements to the greater system outside of the proposed expansion areas were not considered within the HERS-ST framework.

SUMMARY OF DESIGNATED URBAN RESERVE AREAS

In the attachments that follow, each potential expansion area has been assessed to determine preliminary cost estimates for the services described above.

LIST OF INDUSTRIAL AREAS

URA Designation	*URA Local Name*	*URA Local Jurisdiction*	*URA Total Land Area*	*URA Net Buildable Land*
5F	Tonquin	City of Tualatin	120 ac	57 ac
7I	Cornelius North	City of Cornelius	203	166
7B	Forest Grove North	City of Forest Grove	216	175
8A	North Hillsboro	City of Hillsboro	950	767
8B	Shute Road Interchange	City of Hillsboro	86	58

LIST OF RESIDENTIAL AREAS

URA Designation	*URA Local Name*	*URA Local Jurisdiction*	*URA Total Land Area*	*URA Net Buildable Land*
1C	Gresham East	City of Gresham	857 ac	688 ac
3D	Maple Lane	City of Oregon City	573 ac	331 ac
3G	Beaver Creek Bluffs	City of Oregon City	227 ac	124 ac
4D	Norwood	City of Tualatin	337 ac	286 ac
4E	I-5 East Washington County	City of Tualatin	848 ac	558 ac
4F / 4G	Elligsen	City of Wilsonville	891 ac	638 ac
4H	Advance	City of Wilsonville	316 ac	181 ac
5B	Sherwood West	City of Sherwood	496 ac	432 ac
5D	Sherwood South	City of Sherwood	447 ac	216 ac
5G	Grahams Ferry	City of Wilsonville	203 ac	83 ac
6A	South Hillsboro	City of Hillsboro	1063 ac	879 ac
6C	Roy Rogers West	City of Tigard	256 ac	206 ac
7D	Cornelius South	City of Cornelius	210 ac	189 ac

ADDITIONAL CONSIDERATIONS

OPERATIONAL COSTS

In each case, operational costs were considered to be proportional to the expansion area and the related improvements. Where noted, certain new improvements will be accompanied by operational costs specific to the improvement (for example, pump stations). As able, cost items were estimated and provided on individual expansion areas.

Where described by master plans or other agency data, additions to operational costs due to expanded service areas without corresponding infrastructure improvements are listed. In all cases, it should be assumed operational costs of services will increase in relation to the addition of buildable acreage.

NEW TECHNOLOGIES

As part of the scope, the ability to incorporate new technologies for infrastructure services was considered. Given the timelines, it is difficult to apply cost estimating to ideas and inventions not yet developed.

No cost estimate was adjusted or revised in light of expected technology advancement, but in review of individual services, the one most available within the next 10-20 years may be the ability to better treat sanitary waste through more local means, saving the cost of delivery and treatment at a more distant facility. Several new technologies are in use on a limited basis, and as they move ahead, costs and public acceptance could make their use more competitive.

Additionally, certain areas may contain significant water rights available for use in addition to current jurisdictional water supply. While necessarily not a technology advancement, the ability to access and add water capacity locally could be a value to an expansion area and reduce the estimate offered for water supply.

SOURCE DATA

URBAN RESERVE AREAS

GIS mapping data provided by METRO on May 26, 2010, with updated information provided June 18, 2010 and July 28, 2010.

UTILITIES

Sanitary Sewer

Planning Document Title	Service Provider or Jurisdiction	Date of Report
Sewer Master Plan Update	Clean Water Services	March 2009
Capital Improvement Program 2008/09 to 2012/13	City of Gresham	July 2008
Sanitary Sewer Master Plan	City of Oregon City	December 2003
Clackamas County Service District No. 1 Sanitary Master Plan	Water Environment Services	June 2009
Pre-Qualifying Concept Plan	City of Tualatin	September 2009

Stormwater

Planning Document Title	Service Provider or Jurisdiction	Date of Report
Drainage Master Plan	City of Oregon City	January 1998
Capital Improvement Program 2008/09 to 2012/13	City of Gresham	July 2008
Storm Sewer Mapping	Clean Water Services	July 2010

Water

Planning Document Title	Service Provider or Jurisdiction	Date of Report
Water Service Map	City of Beaverton	May 2004
Capital Improvement Program 2008/09 to 2012/13	City of Gresham	July 2008
Water Master Plan	City of Oregon City	October 2004
Water System Master Plan	City of Wilsonville	January 2002

PARK SERVICES

Planning Document Title	Service Provider or Jurisdiction	Date of Report
Parks and Recreation Master Plan Update	City of Oregon City	August 2007
Parks and Recreation, Trails, and Natural Areas Master Plan	City of Gresham	September 2009
Parkland Classification System Guidelines	National Recreation and Park Association	1983

SCHOOL SERVICES

Planning Document Title	Service Provider or Jurisdiction	Date of Report
Facility Plan 2010	Beaverton School District	June 2010
Long Range Facility Plan - Phase 1	Tigard-Tualatin School District	March 2010

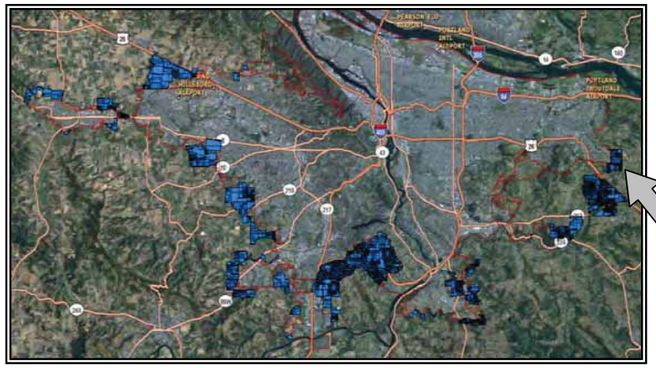
School District Representative	School District
Dick Steinbrugge, P.E.	Beaverton School District
Susan Stark Hayden	Tigard-Tualatin School District
Phil Wentz	Tigard-Tualatin School District

Land Use Type: Residential

Area Data Provided by Metro

Total Reserve Land:	857	acres
Total Constrained Land:	169	acres
Net Buildable Land:	688	acres
Projected Dwelling Units:	7980	DU

Local Jurisdiction:	City of Gresham
Sewer Service Provider:	City of Gresham
Water Service Provider:	City of Gresham
Storm Drainage Service Provider:	City of Gresham
School District:	Gresham-Barlow SD
Parks District:	City of Gresham

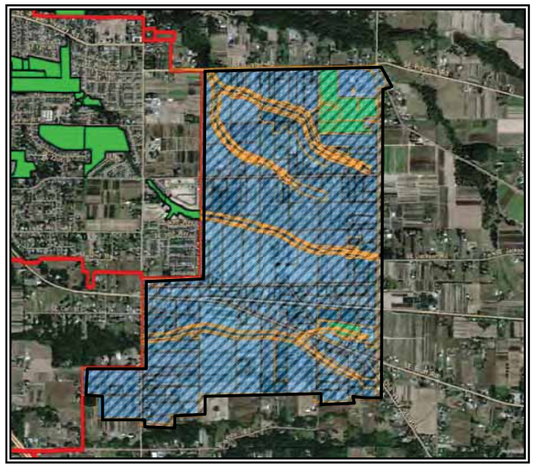


Notes

Sewer, water, and storm pipe lengths and sizing assumed to follow adjacent developed street pattern. Pipe sizing assumed to correlate to street classification, i.e. local streets carry local utilities.

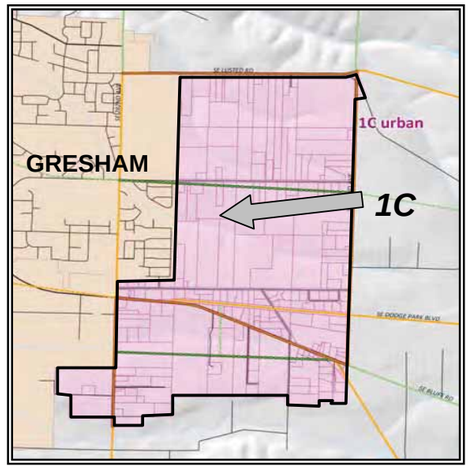
Utility unit costs are based on 2009 development studies.

Overall Vicinity Map



Buildable Lands Map

Buildable Lands Legend
Existing UGB Boundary
Buildable Land Boundary
Urban Reserve Areas
Parks
Analysis Area



Transportation Services Map

Transporation Services Legend
Analysis Area Boundary
Existing UGB Area
Proposed Roadway Upgrade
Proposed New Roadways

Sanitary Sewer Services				
Sewer Pipe Size	8"-12"	12"-18"	18"+	Force
Pipe Classification	Collector	Trunk	Interceptor	Main
Estimated Pipe Length	9700	1900	9800	0
Estimated Pipe Unit Cost	$120	$160	$180	$250
Sewer Pipe Cost	$1,164,000	$304,000	$1,764,000	$0
			Subtotal Cost:	$3,232,000
Pump Station Upgrades			0.6MGD pump station:	$1,500,000
Treatment Facility Upgrades			0.6MGD capacity upsizing:	$14,940,000
			Total Sewer System Cost:	$19,672,000

Water Distribution Services	Estimated Water Demand:		830000 gpd	
Water Pipe Size	8"-12"	12"-18"	18"+	
Estimated Pipe Length	9700	1900	5000	
Estimated Pipe Unit Cost	$100	$150	$200	
Water Transmission Pipe Cost	$970,000	$285,000	$1,000,000	
Water System Upgrade Costs			Storage and pumping	$1,700,000
			Total Water System Cost:	$3,955,000

Storm Sewer Services				
Storm Pipe Size	12"-18"	18"-24"	24"-48"	48"+
Estimated Pipe Length	9700	1900	9800	0
Estimated Pipe Unit Cost	$135	$175	$220	$330
Storm Piping Cost	$1,309,500	$332,500	$2,156,000	$0
Storm System Upgrade Costs		No system upgrades expected		$0
			Total Storm System Cost:	$3,798,000

Park Improvements	Neighborhood Parks	Community Parks
New Park Area (acres)	12.2	54.8
Park Cost per Acre	$200,000	$1,000,000
New Park Cost	$2,440,000	$54,800,000

New School Construction	See report text for details	
Estimated enrollment:	1040	elementary school
	480	middle school
	560	high school
Current capacity estimate:	Expected to exceed capacity	
Estimated school costs:	$60,000,000	(New Elem + Middle Schools)

Transportation Services*

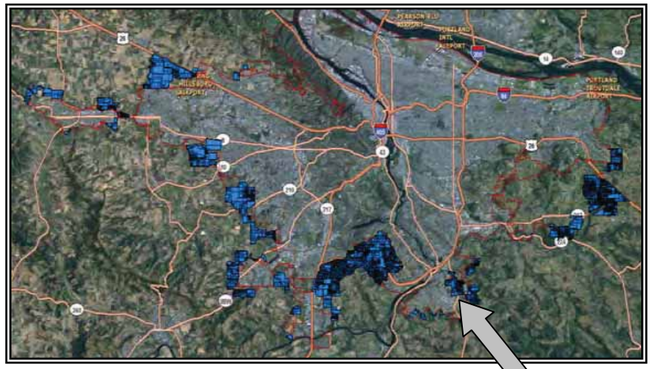
	Lane Miles	Normal Cost (in millions)	High Cost (in millions)	Total Cost (in millions)
Arterials	15.1	$171.84	$3.35	$175.19
Collectors	7.7	$83.21	$1.65	$84.86
Totals	22.8	***Total Road System Cost:***		$260.05

*Data provided by Metro thru the HERS-ST estimating approach

Area Data Provided by Metro

Total Reserve Land:	573	acres
Total Constrained Land:	242	acres
Net Buildable Land:	331	acres
Projected Dwelling Units:	3970	DU

Local Jurisdiction:	City of Oregon City
Sewer Service Provider:	Clackamas County WES
Water Service Provider:	City of Oregon City
Storm Drainage Service Provider:	City of Oregon City
School District:	Oregon City School District
Parks District:	City of Oregon City



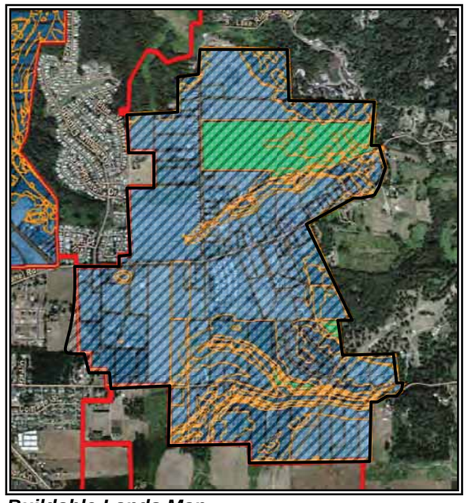
Overall Vicinity Map

SITE

Notes

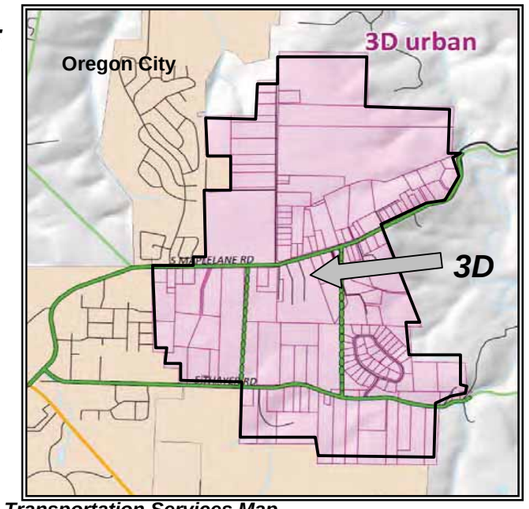
Sewer, water, and storm pipe lengths and sizing assumed to follow adjacent developed street pattern.
Pipe sizing assumed to correlate to street classification, i.e. local streets carry local utilities.

Utility unit costs are based on 2009 development studies.



Buildable Lands Map

Buildable Lands Legend
Existing UGB Boundary
Buildable Land Boundary
Urban Reserve Areas
Parks
Analysis Area



Transportation Services Map

Transporation Services Legend
Analysis Area Boundary
Existing UGB Area
Proposed Roadway Upgrade
Proposed New Roadways

Land Use Type: Residential

Sanitary Sewer Services				
Sewer Pipe Size	8"-12"	12"-18"	18"+	Force
Pipe Classification	Collector	Trunk	Interceptor	Main
Estimated Pipe Length	40500	5000	2600	0
Estimated Pipe Unit Cost	$120	$160	$180	$250
Sewer Pipe Cost	$4,860,000	$800,000	$468,000	$0
			Subtotal Cost:	$6,128,000
Pump Station Upgrades			0.5MGD pump station:	$1,400,000
Treatment Facility Upgrades			Associated increased maintenance:	$500,000
			Total Sewer System Cost:	$8,028,000

Water Distribution Services	Estimated Water Demand:	400000 gpd		
Water Pipe Size	8"-12"	12"-18"	18"+	
Estimated Pipe Length	40500	5000	5000	
Estimated Pipe Unit Cost	$100	$150	$200	
Water Transmission Pipe Cost	$4,050,000	$750,000	$1,000,000	
Water System Upgrade Costs			Storage and pumping	$800,000
			Total Water System Cost:	$6,600,000

Storm Sewer Services				
Storm Pipe Size	12"-18"	18"-24"	24"-48"	48"+
Estimated Pipe Length	40500	5000	2600	0
Estimated Pipe Unit Cost	$135	$175	$220	$330
Storm Piping Cost	$5,467,500	$875,000	$572,000	$0
Storm System Upgrade Costs		No system upgrades expected		$0
			Total Storm System Cost:	$6,914,500

Park Improvements	Neighborhood Parks	Community Parks
New Park Area (acres)	7.1	31.9
Park Unit Cost	$200,000	$1,000,000
New Park Cost	$1,420,000	$31,900,000

New School Construction	See report text for details
Estimated enrollment:	520 elementary school
	240 middle school
	280 high school
Current capacity estimate:	Expected to exceed capacity
Estimated school costs:	$20,000,000 (New Elementary School)

Transportation Services*

	Lane Miles	Normal Cost (in millions)	High Cost (in millions)	Total Cost (in millions)
Arterials	5.3	$54.44	$14.43	$68.87
Collectors	6	$56.78	$17.11	$73.89
Totals	11.3	***Total Road System Cost:***		$142.76

*Data provided by Metro thru the HERS-ST estimating approach

METRO

ASSESSMENT OF POTENTIAL URBAN GROWTH BOUNDARY EXPANSION AREAS

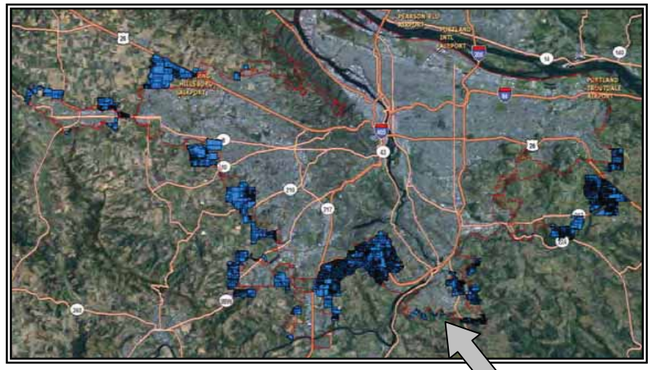
Cost Estimate - Area 3D Maple Lane Project Number - 2100103.00 August 3, 2010

GROUP MACKENZIE CELEBRATING 50 YEARS

Area Data Provided by Metro

Total Reserve Land:	227	acres
Total Constrained Land:	103	acres
Net Buildable Land:	124	acres
Projected Dwelling Units:	1052	DU

Local Jurisdiction:	City of Oregon City
Sewer Service Provider:	Clackamas County WES
Water Service Provider:	City of Oregon City
Storm Drainage Service Provider:	City of Oregon City
School District:	Oregon City School District
Parks District:	City of Oregon City



Overall Vicinity Map

SITE

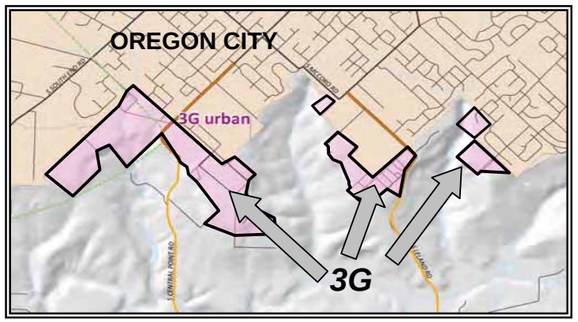
Notes

Sewer, water, and storm pipe lengths and sizing assumed to follow adjacent developed street pattern.
Pipe sizing assumed to correlate to street classification, i.e. local streets carry local utilities.

Utility unit costs are based on 2009 development studies.

Buildable Lands Map

Buildable Lands Legend
Existing UGB Boundary
Buildable Land Boundary
Urban Reserve Areas
Parks
Analysis Area



Transportation Services Map

Transporation Services Legend
Analysis Area Boundary
Existing UGB Area
Proposed Roadway Upgrade
Proposed New Roadways

Land Use Type: Residential

Sanitary Sewer Services				
Sewer Pipe Size	8"-12"	12"-18"	18"+	Force
Pipe Classification	Collector	Trunk	Interceptor	Main
Estimated Pipe Length	14500	3600	0	0
Estimated Pipe Unit Cost	$120	$160	$180	$250
Sewer Pipe Cost	$1,740,000	$576,000	$0	$0
			Subtotal Cost:	$2,316,000
Pump Station Upgrades			0.2MGD pump station:	$1,300,000
Treatment Facility Upgrades			Associated increased maintenance:	$500,000
			Total Sewer System Cost:	$4,116,000

Water Distribution Services	Estimated Water Demand:		150000 gpd	
Water Pipe Size	8"-12"	12"-18"	18"+	
Estimated Pipe Length	14500	3600	5000	
Estimated Pipe Unit Cost	$100	$150	$200	
Water Transmission Pipe Cost	$1,450,000	$540,000	$1,000,000	
Water System Upgrade Costs			Storage and pumping	$300,000
			Total Water System Cost:	$3,290,000

Storm Sewer Services				
Storm Pipe Size	12"-18"	18"-24"	24"-48"	48"+
Estimated Pipe Length	14500	3600	0	0
Estimated Pipe Unit Cost	$135	$175	$220	$330
Storm Piping Cost	$1,957,500	$630,000	$0	$0
Storm System Upgrade Costs		No system upgrades expected		$0
			Total Storm System Cost:	$2,587,500

Park Improvements	Neighborhood Parks	Community Parks
New Park Area (acres)	1.3	5.7
Park Unit Cost	$200,000	$1,000,000
New Park Cost	$260,000	$5,700,000

New School Construction	See report text for details	
Estimated enrollment:	140	elementary school
	70	middle school
	80	high school
Current capacity estimate:	Adequate	
Estimated school costs:	$250,000	(Minor)

Transportation Services*

	Lane Miles	Normal Cost (in millions)	High Cost (in millions)	Total Cost (in millions)
Arterials	4.2	$39.48	$18.55	$58.03
Collectors	0.6	$6.12	$0.00	$6.12
Totals	4.8	***Total Road System Cost:***		$64.14

*Data provided by Metro thru the HERS-ST estimating approach

METRO

ASSESSMENT OF POTENTIAL URBAN GROWTH BOUNDARY EXPANSION AREAS

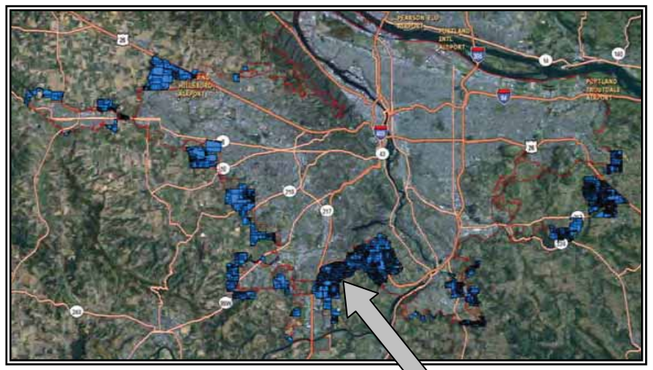
Cost Estimate - Area 3G Beaver Creek Bluffs Project Number - 2100103.00 August 3, 2010

GROUP MACKENZIE CELEBRATING 50 YEARS

Area Data Provided by Metro

Total Reserve Land:	337	acres
Total Constrained Land:	51	acres
Net Buildable Land:	286	acres
Projected Dwelling Units:	3331	DU

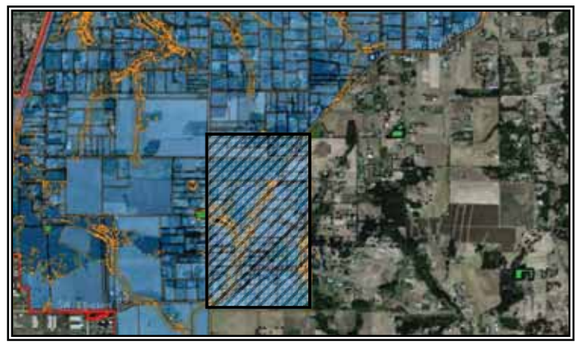
Local Jurisdiction:	City of Tualatin
Sewer Service Provider:	Clean Water Services
Water Service Provider:	City of Tualatin
Storm Drainage Service Provider:	City of Tualatin
School District:	West Linn-Wilsonville SD
Parks District:	City of Tualatin



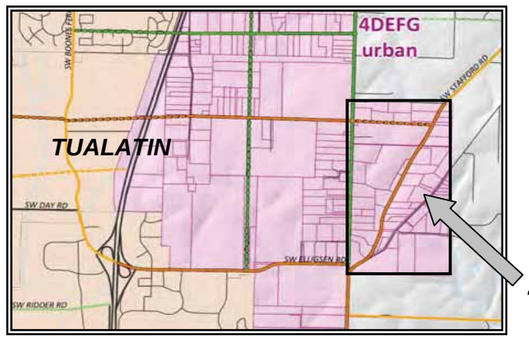
Overall Vicinity Map

Notes
Sewer, water, and storm pipe lengths and sizing assumed to follow adjacent developed street pattern. Pipe sizing assumed to correlate to street classification, i.e. local streets carry local utilities.

Utility unit costs are based on 2009 development studies.



Buildable Lands Map



Transportation Services Map

Buildable Lands Legend
Existing UGB Boundary
Buildable Land Boundary
Urban Reserve Areas
Parks
Analysis Area

Transporation Services Legend
Analysis Area Boundary
Existing UGB Area
Proposed Roadway Upgrade
Proposed New Roadways

Land Use Type: Residential

Sewer Pipe Size	8"-12"	12"-18"	18"+	Force
Pipe Classification	Collector	Trunk	Interceptor	Main
Estimated Pipe Length	40800	1400	2500	0
Estimated Pipe Unit Cost	$120	$160	$180	$250
Sewer Pipe Cost	$4,896,000	$224,000	$450,000	$0
			Subtotal Cost:	$5,570,000
Pump Station Upgrades			0.4MGD pump station:	$1,300,000
Treatment Facility Upgrades			0.4MGD capacity upsizing:	$6,300,000
			Total Sewer System Cost:	$13,170,000

Water Distribution Services	Estimated Water Demand:	350000 gpd		
Water Pipe Size	8"-12"	12"-18"	18"+	
Estimated Pipe Length	40800	1400	5000	
Estimated Pipe Unit Cost	$100	$150	$200	
Water Transmission Pipe Cost	$4,080,000	$210,000	$1,000,000	
Water System Upgrade Costs			Storage and pumping	$700,000
			Total Water System Cost:	$5,990,000

Storm Sewer Services				
Storm Pipe Size	12"-18"	18"-24"	24"-48"	48"+
Estimated Pipe Length	40800	1400	2500	0
Estimated Pipe Unit Cost	$135	$175	$220	$330
Storm Piping Cost	$5,508,000	$245,000	$550,000	$0
Storm System Upgrade Costs			No system upgrades expected	$0
			Total Storm System Cost:	$6,303,000

Park Improvements	Neighborhood Parks	Community Parks
New Park Area (acres)	7.6	34.4
Park Unit Cost	$200,000	$1,000,000
New Park Cost	$1,520,000	$34,400,000

New School Construction	See report text for details
Estimated enrollment:	440 elementary school
	200 middle school
	240 high school
Current capacity estimate:	Expected to exceed capacity
Estimated school costs:	$15,000,000 (New Elementary School)
	$50,000,000 (New Middle School to accommodate 4D,4E,4F,4G,4H students)
	$80,000,000 (New High School to accommodate 4D,4E,4F,4G,4H students)

Transportation Services*

		Normal Cost	High Cost	Total Cost
		(in millions)	(in millions)	(in millions)
Arterials	14.1	$154.46	$17.26	$171.72
Collectors	21.1	$217.96	$23.70	$241.66
Totals	35.2	***Total Road System Cost:***		$413.39

*Data provided by Metro thru the HERS-ST estimating approach

METRO

ASSESSMENT OF POTENTIAL URBAN GROWTH BOUNDARY EXPANSION AREAS

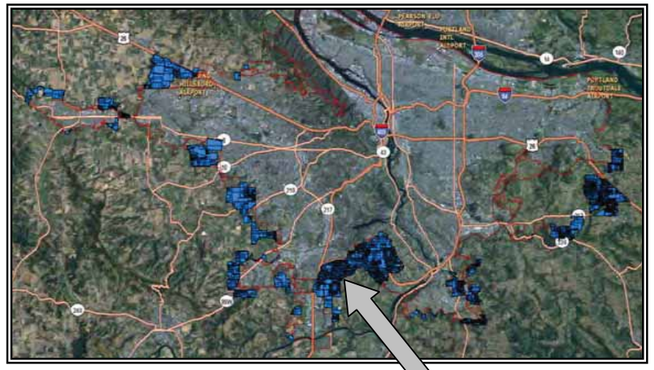
Cost Estimate - Area 4D Norwood Project Number - 2100103.00 August 3, 2010

GROUP MACKENZIE CELEBRATING 50 YEARS

Area Data Provided by Metro

Total Reserve Land:	848	acres
Total Constrained Land:	290	acres
Net Buildable Land:	558	acres
Projected Dwelling Units:	6795	DU

Local Jurisdiction:	City of Tualatin
Sewer Service Provider:	Clean Water Services
Water Service Provider:	City of Tualatin
Storm Drainage Service Provider:	City of Tualatin
School District:	Tigard-Tualatin SD and Sherwood SD
Parks District:	City of Tualatin

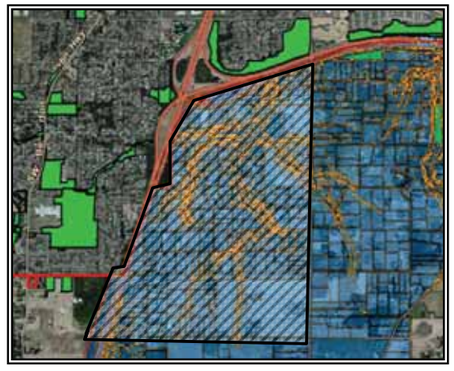


Overall Vicinity Map

Notes

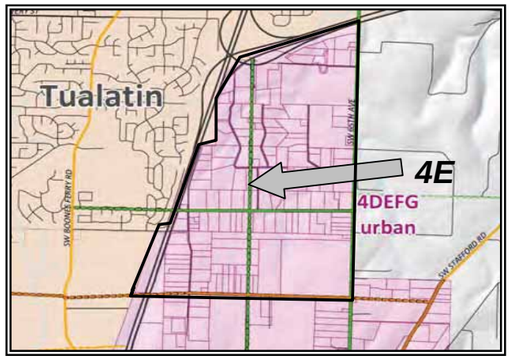
Sewer, water, and storm pipe lengths and sizing assumed to follow adjacent developed street pattern. Pipe sizing assumed to correlate to street classification, i.e. local streets carry local utilities.

Utility unit costs are based on 2009 development studies.



Buildable Lands Map

Buildable Lands Legend
Existing UGB Boundary
Buildable Land Boundary
Urban Reserve Areas
Parks
Analysis Area



Transportation Services Map

Transporation Services Legend
Analysis Area Boundary
Existing UGB Area
Proposed Roadway Upgrade
Proposed New Roadways

Land Use Type: Residential

Sanitary Sewer Services				
Sewer Pipe Size	8"-12"	12"-18"	18"+	Force
Pipe Classification	Collector	Trunk	Interceptor	Main
Estimated Pipe Length	8000	2700	5000	0
Estimated Pipe Unit Cost	$120	$160	$180	$250
Sewer Pipe Cost	$960,000	$432,000	$900,000	$0
			Subtotal Cost:	$2,292,000
Pump Station Upgrades			0.7MGD pump station:	$1,500,000
Treatment Facility Upgrades			0.7MGD capacity upsizing:	$12,060,000
			Total Sewer System Cost:	$15,852,000

Water Distribution Services	Estimated Water Demand:	670000 gpd		
Water Pipe Size	8"-12"	12"-18"	18"+	
Estimated Pipe Length	8000	2700	5000	
Estimated Pipe Unit Cost	$100	$150	$200	
Water Transmission Pipe Cost	$800,000	$405,000	$1,000,000	
Water System Upgrade Costs			Storage and pumping	$1,400,000
			Total Water System Cost:	$3,605,000

Storm Sewer Services				
Storm Pipe Size	12"-18"	18"-24"	24"-48"	48"+
Estimated Pipe Length	8000	2700	5000	0
Estimated Pipe Unit Cost	$135	$175	$220	$330
Storm Piping Cost	$1,080,000	$472,500	$1,100,000	$0
Storm System Upgrade Costs		No system upgrades expected		$0
			Total Storm System Cost:	$2,652,500

Park Improvements	Neighborhood Parks	Community Parks
New Park Area (acres)	15.1	67.9
Park Unit Cost	$200,000	$1,000,000
New Park Cost	$3,020,000	$67,900,000

New School Construction	See report text for details
Estimated enrollment:	890 elementary school
	410 middle school
	480 high school
Current capacity estimate:	Expected to exceed capacity
Estimated school costs:	$20,000,000 (New Elementary School)

Transportation Services*

	Lane Miles	Normal Cost (in millions)	High Cost (in millions)	Total Cost (in millions)
Arterials	14.1	$154.46	$17.26	$171.72
Collectors	21.1	$217.96	$23.70	$241.66
Totals	35.2	***Total Road System Cost:***		$413.39

*Data provided by Metro thru the HERS-ST estimating approach

METRO

ASSESSMENT OF POTENTIAL URBAN GROWTH BOUNDARY EXPANSION AREAS

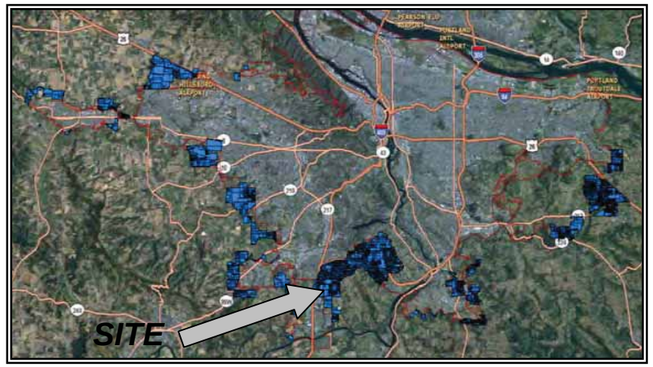
Cost Estimate - Area 4E I-5 East Washington County Project Number - 2100103.00 August 3, 2010

GROUP MACKENZIE CELEBRATING 50 YEARS

Area Data Provided by Metro

Total Reserve Land:	891	acres
Total Constrained Land:	253	acres
Net Buildable Land:	638	acres
Projected Dwelling Units:	7578	DU

Local Jurisdiction: City of Wilsonville
Sewer Service Provider: City of Wilsonville
Water Service Provider: City of Wilsonville
Storm Drainage Service Provider: City of Wilsonville
School District: West Linn-Wilsonville SD and Sherwood SD
Parks District: City of Wilsonville



Overall Vicinity Map

Notes
Sewer, water, and storm pipe lengths and sizing assumed to follow adjacent developed street pattern.
Pipe sizing assumed to correlate to street classification, i.e. local streets carry local utilities.
Utility unit costs are based on 2009 development studies.

Land Use Type: Residential

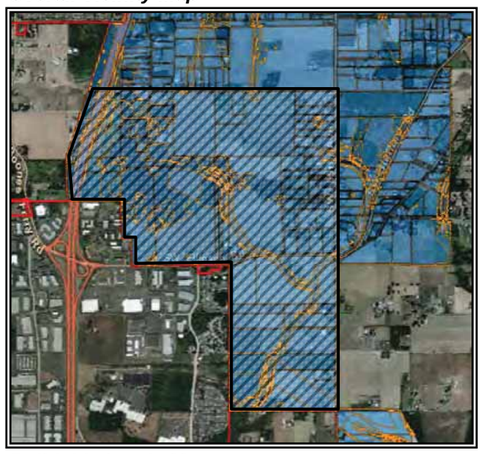
Sanitary Sewer Services				
Sewer Pipe Size	8"-12"	12"-18"	18"+	Force
Pipe Classification	Collector	Trunk	Interceptor	Main
Estimated Pipe Length	91000	3000	5700	0
Estimated Pipe Unit Cost	$120	$160	$180	$250
Sewer Pipe Cost	$10,920,000	$480,000	$1,026,000	$0
			Subtotal Cost:	$12,426,000
Pump Station Upgrades			0.8MGD pump station:	$1,600,000
Treatment Facility Upgrades			0.5MGD capacity upsizing:	$13,860,000
			Total Sewer System Cost:	$27,886,000

Water Distribution Services	Estimated Water Demand:	770000 gpd		
Water Pipe Size	8"-12"	12"-18"	18"+	
Estimated Pipe Length	91000	3000	5000	
Estimated Pipe Unit Cost	$100	$150	$200	
Water Transmission Pipe Cost	$9,100,000	$450,000	$1,000,000	
Water System Upgrade Costs			Storage and pumping	$1,600,000
			Total Water System Cost:	$12,150,000

Storm Sewer Services				
Storm Pipe Size	12"-18"	18"-24"	24"-48"	48"+
Estimated Pipe Length	91000	3000	5700	0
Estimated Pipe Unit Cost	$135	$175	$220	$330
Storm Piping Cost	$12,285,000	$525,000	$1,254,000	$0
Storm System Upgrade Costs			No system upgrades expected	$0
			Total Storm System Cost:	$14,064,000

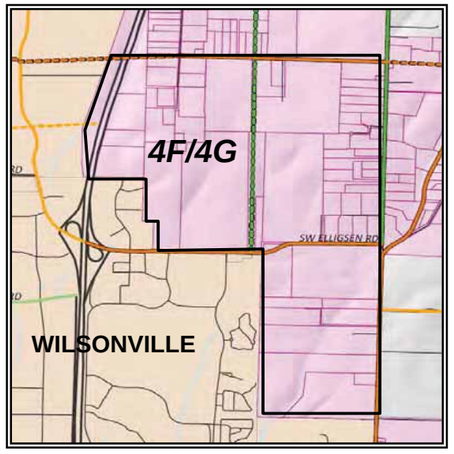
Park Improvements	Neighborhood Parks	Community Parks
New Park Area (acres)	17.3	77.7
Park Unit Cost	$200,000	$1,000,000
New Park Cost	$3,460,000	$77,700,000

New School Construction	See report text for details	
Estimated enrollment:	990	elementary school
	460	middle school
	540	high school
Current capacity estimate:	Expected to exceed capacity	
Estimated school costs:	$20,000,000	(New Elementary School)



Buildable Lands Map

Buildable Lands Legend
Existing UGB Boundary
Buildable Land Boundary
Urban Reserve Areas
Parks
Analysis Area



Transportation Services Map

Transporation Services Legend
Analysis Area Boundary
Existing UGB Area
Proposed Roadway Upgrade
Proposed New Roadways

Transportation Services*

	Lane Miles	Normal Cost (in millions)	High Cost (in millions)	Total Cost (in millions)
Arterials	14.1	$154.46	$17.26	$171.72
Collectors	21.1	$217.96	$23.70	$241.66
Totals	35.2	***Total Road System Cost:***		$413.39

*Data provided by Metro thru the HERS-ST estimating approach
*Data provided for analysis areas 4E and 4F combined

METRO

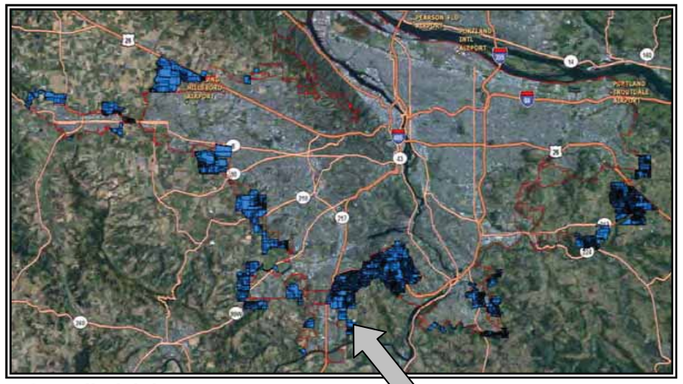
ASSESSMENT OF POTENTIAL URBAN GROWTH BOUNDARY EXPANSION AREAS

Cost Estimate - Area 4F/4G Elligsen | Project Number - 2100103.00 | August 3, 2010

GROUP MACKENZIE CELEBRATING 50 YEARS

Total Reserve Land:	316	acres
Total Constrained Land:	135	acres
Net Buildable Land:	181	acres
Projected Dwelling Units:	2133	DU

Sewer Service Provider:	City of Wilsonville
Water Service Provider:	City of Wilsonville
Storm Drainage Service Provider:	City of Wilsonville
School District:	West Linn-Wilsonville SD
Parks District:	City of Wilsonville



Overall Vicinity Map

Notes
Sewer, water, and storm pipe lengths and sizing assumed to follow adjacent developed street pattern.
Pipe sizing assumed to correlate to street classification, i.e. local streets carry local utilities.

Utility unit costs are based on 2009 development studies.

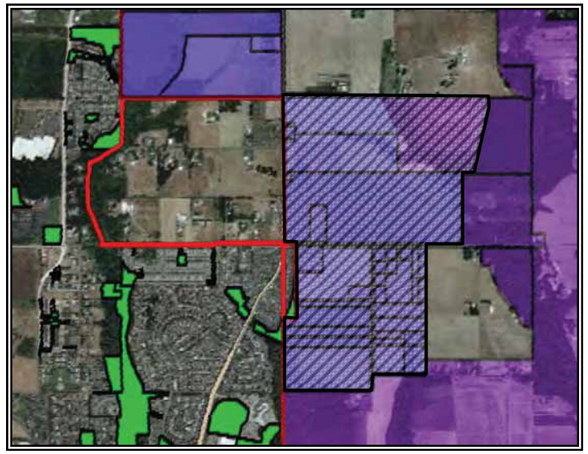
Sanitary Sewer Services				
Sewer Pipe Size	8"-12"	12"-18"	18"+	Force
Pipe Classification	Collector	Trunk	Interceptor	Main
Estimated Pipe Length	25800	900	1600	0
Estimated Pipe Unit Cost	$120	$160	$180	$250
Sewer Pipe Cost	$3,096,000	$144,000	$288,000	$0
			Subtotal Cost:	$3,528,000
Pump Station Upgrades			0.25MGD pump station:	$1,300,000
Treatment Facility Upgrades			0.25MGD capacity upsizing:	$3,960,000
			Total Sewer System Cost:	$8,788,000

Water Distribution Services	Estimated Water Demand:		220000 gpd	
Water Pipe Size	8"-12"	12"-18"	18"+	
Estimated Pipe Length	25800	900	5000	
Estimated Pipe Unit Cost	$100	$150	$200	
Water Transmission Pipe Cost	$2,580,000	$135,000	$1,000,000	
Water System Upgrade Costs			Storage and pumping	$500,000
			Total Water System Cost:	$4,215,000

Storm Sewer Services				
Storm Pipe Size	12"-18"	18"-24"	24"-48"	48"+
Estimated Pipe Length	25800	900	1600	0
Estimated Pipe Unit Cost	$135	$175	$220	$330
Storm Piping Cost	$3,483,000	$157,500	$352,000	$0
Storm System Upgrade Costs			No system upgrades expected	$0
			Total Storm System Cost:	$3,992,500

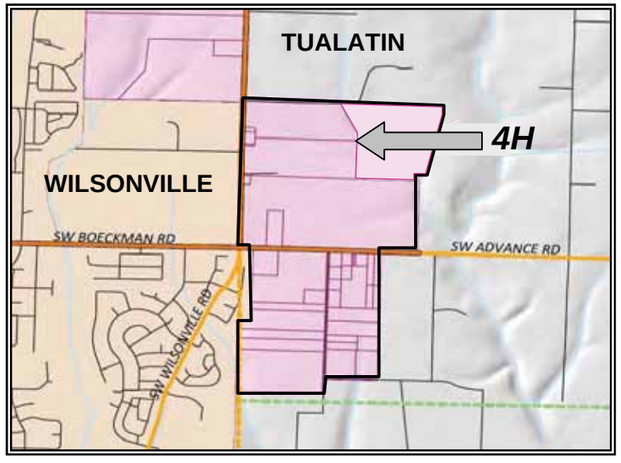
Park Improvements	Neighborhood Parks	Community Parks
New Park Area (acres)	4.9	22.1
Park Unit Cost	$200,000	$1,000,000
New Park Cost	$980,000	$22,100,000

New School Construction	See report text for details
Estimated enrollment:	280 elementary school
	130 middle school
	150 high school
Current capacity estimate:	Expected to exceed capacity
Estimated school costs:	$20,000,000 (New Elementary School)



Buildable Lands Map

Buildable Lands Legend
Existing UGB Boundary
Buildable Land Boundary
Urban Reserve Areas
Parks
Analysis Area



Transportation Services Map

Transporation Services Legend
Analysis Area Boundary
Existing UGB Area
Proposed Roadway Upgrade
Proposed New Roadways

Transportation Services*

	Lane Miles	Normal Cost (in millions)	High Cost (in millions)	Total Cost (in millions)
Arterials	6.9	$78.27	$2.58	$80.85
Collectors	2.4	$25.44	$1.24	$26.68
Totals	9.3	***Total Road System Cost:***		$107.52

*Data provided by Metro thru the HERS-ST estimating approach

METRO

ASSESSMENT OF POTENTIAL URBAN GROWTH BOUNDARY EXPANSION AREAS

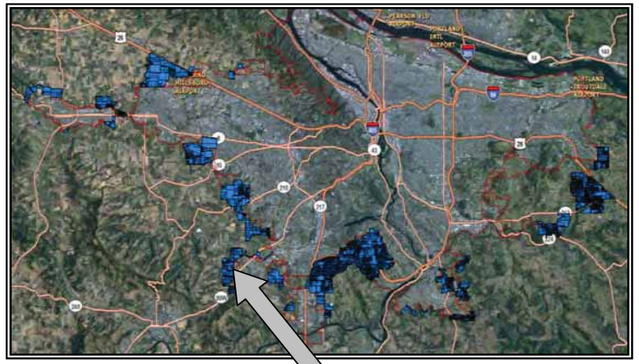
Cost Estimate - Area 4H Advance | Project Number - 2100103.00 | August 3, 2010

GROUP MACKENZIE CELEBRATING 50 YEARS

Area Data Provided by Metro

Total Reserve Land:	496	acres
Total Constrained Land:	64	acres
Net Buildable Land:	432	acres
Projected Dwelling Units:	4891	DU

Local Jurisdiction:	City of Sherwood
Sewer Service Provider:	Clean Water Services
Water Service Provider:	City of Sherwood
Storm Drainage Service Provider:	City of Sherwood
School District:	Sherwood SD
Parks District:	City of Sherwood

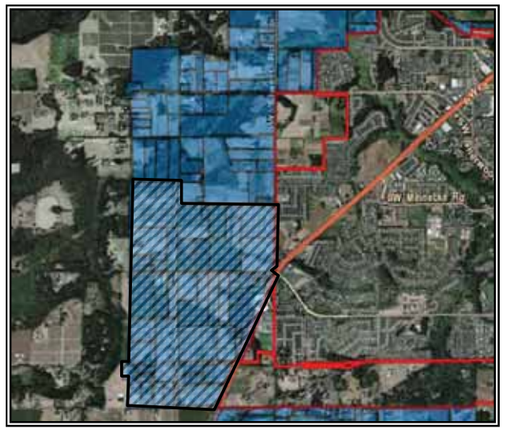


Overall Vicinity Map

Notes

Sewer, water, and storm pipe lengths and sizing assumed to follow adjacent developed street pattern. Pipe sizing assumed to correlate to street classification, i.e. local streets carry local utilities.

Utility unit costs are based on 2009 development studies.



Buildable Lands Map

Transportation Services Map

Buildable Lands Legend
Existing UGB Boundary
Buildable Land Boundary
Urban Reserve Areas
Parks
Analysis Area

Transporation Services Legend
Analysis Area Boundary
Existing UGB Area
Proposed Roadway Upgrade
Proposed New Roadways

Land Use Type: Residential

Sanitary Sewer Services				
Sewer Pipe Size	8"-12"	12"-18"	18"+	Force
Pipe Classification	Collector	Trunk	Interceptor	Main
Estimated Pipe Length	53200	10100	0	0
Estimated Pipe Unit Cost	$120	$160	$180	$250
Sewer Pipe Cost	$6,384,000	$1,616,000	$0	$0
			Subtotal Cost:	$8,000,000
Pump Station Upgrades			0.5MGD pump station:	$1,400,000
Treatment Facility Upgrades			0.5MGD capacity upsizing:	$9,360,000
			Total Sewer System Cost:	$18,760,000

Water Distribution Services	Estimated Water Demand:		520000 gpd	
Water Pipe Size	8"-12"	12"-18"	18"+	
Estimated Pipe Length	53200	10100	5000	
Estimated Pipe Unit Cost	$100	$150	$200	
Water Transmission Pipe Cost	$5,320,000	$1,515,000	$1,000,000	
Water System Upgrade Costs			Storage and pumping	$1,100,000
			Total Water System Cost:	$8,935,000

Storm Sewer Services				
Storm Pipe Size	12"-18"	18"-24"	24"-48"	48"+
Estimated Pipe Length	53200	10100	0	0
Estimated Pipe Unit Cost	$135	$175	$220	$330
Storm Piping Cost	$7,182,000	$1,767,500	$0	$0
Storm System Upgrade Costs			No system upgrades expected	$0
			Total Storm System Cost:	$8,949,500

Park Improvements	Neighborhood Parks	Community Parks
New Park Area (acres)	14.7	66.3
Park Unit Cost	$200,000	$1,000,000
New Park Cost	$2,940,000	$66,300,000

New School Construction	See report text for details
Estimated enrollment:	640 elementary school
	300 middle school
	350 high school
Current capacity estimate:	Expected to exceed capacity
Estimated school costs:	$80,000,000 (New K-8 School)

Transportation Services*

	Lane Miles	Normal Cost (in millions)	High Cost (in millions)	Total Cost (in millions)
Arterials	5.4	$62.15	$0.00	$62.15
Collectors	7.4	$77.53	$5.77	$83.30
Totals	12.8	***Total Road System Cost:***		$145.46

*Data provided by Metro thru the HERS-ST estimating approach

METRO

ASSESSMENT OF POTENTIAL URBAN GROWTH BOUNDARY EXPANSION AREAS

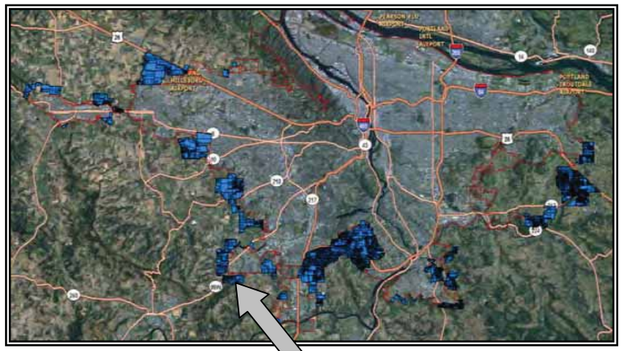
Cost Estimate - Area 5B Sherwood West Project Number - 2100103.00 August 3, 2010

GROUP MACKENZIE CELEBRATING 50 YEARS

Area Data Provided by Metro

Total Reserve Land:	447	acres
Total Constrained Land:	231	acres
Net Buildable Land:	216	acres
Projected Dwelling Units:	1902	DU

Local Jurisdiction:	City of Sherwood
Sewer Service Provider:	Clean Water Services
Water Service Provider:	City of Sherwood
Storm Drainage Service Provider:	City of Sherwood
School District:	Sherwood SD
Parks District:	City of Sherwood



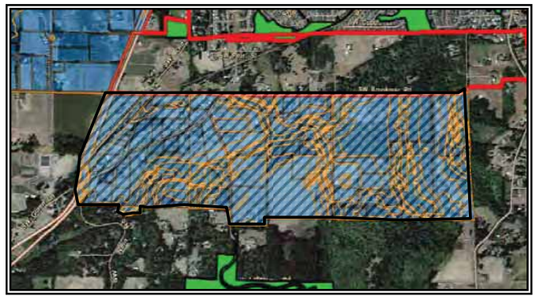
Overall Vicinity Map

SITE

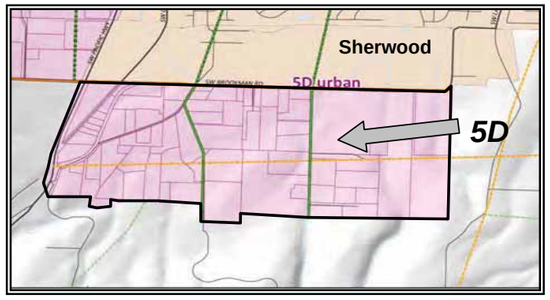
Notes

Sewer, water, and storm pipe lengths and sizing assumed to follow adjacent developed street pattern.
Pipe sizing assumed to correlate to street classification, i.e. local streets carry local utilities.

Utility unit costs are based on 2009 development studies.



Buildable Lands Map



Transportation Services Map

Land Use Type: Residential

Sewer Pipe Size	8"-12"	12"-18"	18"+	Force
Pipe Classification	Collector	Trunk	Interceptor	Main
Estimated Pipe Length	26600	5100	0	0
Estimated Pipe Unit Cost	$120	$160	$180	$250
Sewer Pipe Cost	$3,192,000	$816,000	$0	$0
			Subtotal Cost:	$4,008,000
Pump Station Upgrades			0.25MGD pump station:	$1,300,000
Treatment Facility Upgrades			0.25MGD capacity upsizing:	$4,680,000
			Total Sewer System Cost:	$9,988,000

Water Distribution Services	Estimated Water Demand:		260000 gpd	
Water Pipe Size	8"-12"	12"-18"	18"+	
Estimated Pipe Length	26600	5100	5000	
Estimated Pipe Unit Cost	$100	$150	$200	
Water Transmission Pipe Cost	$2,660,000	$765,000	$1,000,000	
Water System Upgrade Costs			Storage and pumping	$500,000
			Total Water System Cost:	$4,925,000

Storm Sewer Services				
Storm Pipe Size	12"-18"	18"-24"	24"-48"	48"+
Estimated Pipe Length	26600	5100	0	0
Estimated Pipe Unit Cost	$135	$175	$220	$330
Storm Piping Cost	$3,591,000	$892,500	$0	$0
Storm System Upgrade Costs		No system upgrades expected		$0
			Total Storm System Cost:	$4,483,500

Park Improvements	Neighborhood Parks	Community Parks
New Park Area (acres)	7.5	33.5
Park Unit Cost	$200,000	$1,000,000
New Park Cost	$1,500,000	$33,500,000

New School Construction	See report text for details	
Estimated enrollment:	250	elementary school
	120	middle school
	140	high school
Current capacity estimate:	Expected within capacity	
Estimated school costs:	$300,000	(increased maintenance costs)

Transportation Services*

	Lane Miles	Normal Cost (in millions)	High Cost (in millions)	Total Cost (in millions)
Arterials	4	Normal Cost	High Cost	Total Cost
		(in millions)	(in millions)	(in millions)
Collectors	10	$90.96	$35.24	$126.20
Totals	14	***Total Road System Cost:***		$178.12

*Data provided by Metro thru the HERS-ST estimating approach

Buildable Lands Legend
Existing UGB Boundary
Buildable Land Boundary
Urban Reserve Areas
Parks
Analysis Area

Transporation Services Legend
Analysis Area Boundary
Existing UGB Area
Proposed Roadway Upgrade
Proposed New Roadways

METRO

ASSESSMENT OF POTENTIAL URBAN GROWTH BOUNDARY EXPANSION AREAS

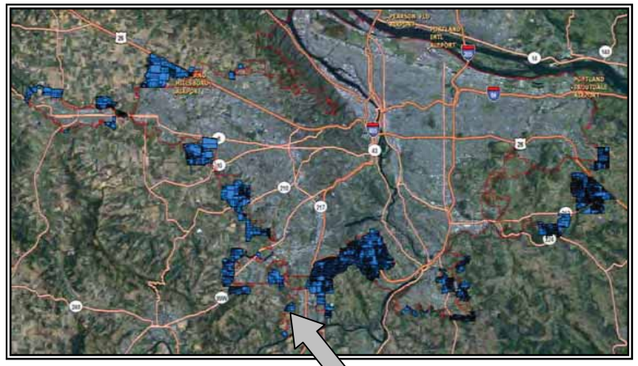
Cost Estimate - Area 5D Sherwood South Project Number - 2100103.00 August 3, 2010

GROUP MACKENZIE CELEBRATING 50 YEARS

Area Data Provided by Metro

Total Reserve Land:	203	acres
Total Constrained Land:	120	acres
Net Buildable Land:	83	acres
Projected Dwelling Units:	1094	DU

Local Jurisdiction:	City of Wilsonville
Sewer Service Provider:	City of Wilsonville
Water Service Provider:	City of Wilsonville
Storm Drainage Service Provider:	City of Wilsonville
School District:	Sherwood SD
Parks District:	City of Wilsonville



Overall Vicinity Map

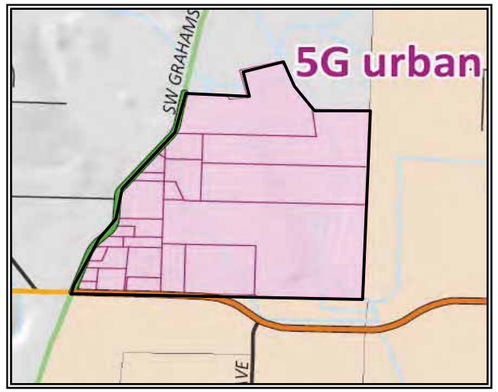
SITE

Buildable Lands Map

Buildable Lands Legend
Existing UGB Boundary
Buildable Land Boundary
Urban Reserve Areas
Parks
Analysis Area

Notes

Sewer, water, and storm pipe lengths and sizing assumed to follow adjacent developed street pattern.
Pipe sizing assumed to correlate to street classification, i.e. local streets carry local utilities.
Utility unit costs are based on 2009 development studies.



Transportation Services Map

Transporation Services Legend
Analysis Area Boundary
Existing UGB Area
Proposed Roadway Upgrade
Proposed New Roadways

Land Use Type: Residential

Sanitary Sewer Services				
Sewer Pipe Size	8"-12"	12"-18"	18"+	Force
Pipe Classification	Collector	Trunk	Interceptor	Main
Estimated Pipe Length	11000	1400	800	0
Estimated Pipe Unit Cost	$120	$160	$180	$250
Sewer Pipe Cost	$1,320,000	$224,000	$144,000	$0
			Subtotal Cost:	$1,688,000
Pump Station Upgrades			0.1MGD pump station:	$1,200,000
Treatment Facility Upgrades			Associated increased maintenance:	$300,000
			Total Sewer System Cost:	$3,188,000

Water Distribution Services	Estimated Water Demand:	100000 gpd		
Water Pipe Size	8"-12"	12"-18"	18"+	
Estimated Pipe Length	11000	1400	5000	
Estimated Pipe Unit Cost	$100	$150	$200	
Water Transmission Pipe Cost	$1,100,000	$210,000	$1,000,000	
Water System Upgrade Costs			Storage and pumping	$200,000
			Total Water System Cost:	$2,510,000

Storm Sewer Services				
Storm Pipe Size	12"-18"	18"-24"	24"-48"	48"+
Estimated Pipe Length	11000	1400	800	0
Estimated Pipe Unit Cost	$135	$175	$220	$330
Storm Piping Cost	$1,485,000	$245,000	$176,000	$0
Storm System Upgrade Costs		No system upgrades expected		$0
			Total Storm System Cost:	$1,906,000

Park Improvements	Neighborhood Parks	Community Parks
New Park Area (acres)	3.3	14.7
Park Unit Cost	$200,000	$1,000,000
New Park Cost	$660,000	$14,700,000

New School Construction	See report text for details
Estimated enrollment:	150 elementary school
	70 middle school
	80 high school
Current capacity estimate:	Expected within enrollment capacity
Estimated school costs:	$300,000 (increased maintenance costs)

Transportation Services*

	Lane Miles	Normal Cost (in millions)	High Cost (in millions)	Total Cost (in millions)
Arterials	4.6	$30.62	$49.46	$80.08
Collectors	3.7	$32.87	$14.84	$47.71
Totals	8.3	***Total Road System Cost:***		$127.78

*Data provided by Metro thru the HERS-ST estimating approach

METRO

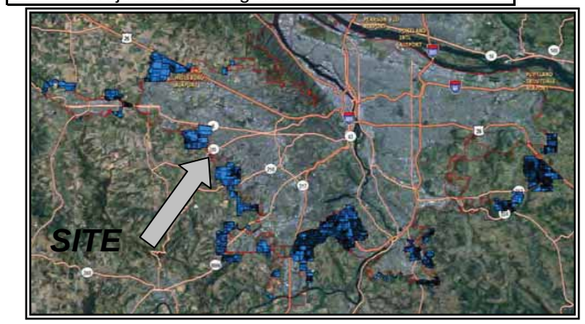
ASSESSMENT OF POTENTIAL URBAN GROWTH BOUNDARY EXPANSION AREAS

Cost Estimate - Area 5G Grahams Ferry Project Number - 2100103.00 August 3, 2010

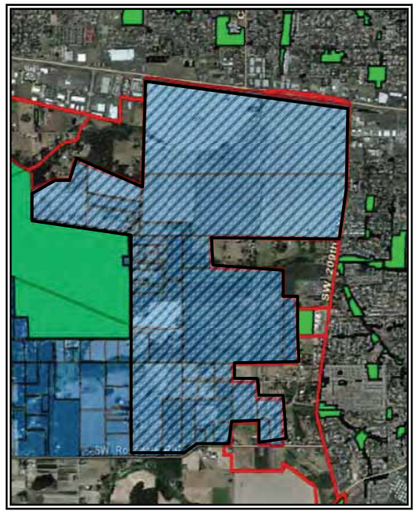
GROUP MACKENZIE CELEBRATING 50 YEARS

Area Data Provided by Metro

Total Reserve Land:	1063	acres
Total Constrained Land:	184	acres
Net Buildable Land:	879	acres
Projected Dwelling Units:	10172	DU



Overall Vicinity Map



Buildable Lands Map

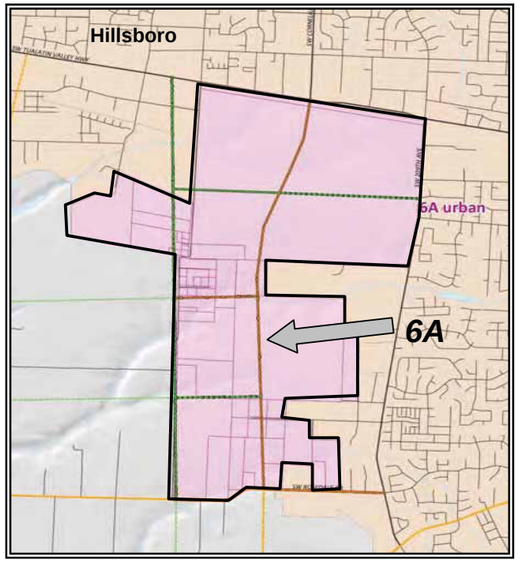
Buildable Lands Legend
Existing UGB Boundary
Buildable Land Boundary
Urban Reserve Areas
Parks
Analysis Area

Local Jurisdiction:	City of Hillsboro
Sewer Service Provider:	Clean Water Services
Water Service Provider:	City of Hillsboro
Storm Drainage Service Provider:	City of Hillsboro
School District:	Hillsboro SD
Parks District:	City of Hillsboro

Notes

Sewer, water, and storm pipe lengths and sizing assumed to follow adjacent developed street pattern.
Pipe sizing assumed to correlate to street classification, i.e. local streets carry local utilities.

Utility unit costs are based on 2009 development studies.



Transportation Services Map

Transporation Services Legend
Analysis Area Boundary
Existing UGB Area
Proposed Roadway Upgrade
Proposed New Roadways

Land Use Type: Residential

Sanitary Sewer Services				
Sewer Pipe Size	8"-12"	12"-18"	18"+	Force
Pipe Classification	Collector	Trunk	Interceptor	Main
Estimated Pipe Length	12500	5200	8000	0
Estimated Pipe Unit Cost	$120	$160	$180	$250
Sewer Pipe Cost	$1,500,000	$832,000	$1,440,000	$0
			Subtotal Cost:	$3,772,000
Pump Station Upgrades			1.1MGD pump station:	$1,700,000
Treatment Facility Upgrades			1.1MGD capacity upsizing:	$19,080,000
			Total Sewer System Cost:	$24,552,000

Water Distribution Services	Estimated Water Demand:	1060000 gpd		
Water Pipe Size	8"-12"	12"-18"	18"+	
Estimated Pipe Length	12500	5200	5000	
Estimated Pipe Unit Cost	$100	$150	$200	
Water Transmission Pipe Cost	$1,250,000	$780,000	$1,000,000	
Water System Upgrade Costs			Storage and pumping	$2,200,000
			Total Water System Cost:	$5,230,000

Storm Sewer Services				
Storm Pipe Size	12"-18"	18"-24"	24"-48"	48"+
Estimated Pipe Length	12500	5200	8000	0
Estimated Pipe Unit Cost	$135	$175	$220	$330
Storm Piping Cost	$1,687,500	$910,000	$1,760,000	$0
Storm System Upgrade Costs			No system upgrades expected	$0
			Total Storm System Cost:	$4,357,500

Park Improvements	Neighborhood Parks	Community Parks
New Park Area (acres)	12.7	57.3
Park Unit Cost	$200,000	$1,000,000
New Park Cost	$2,540,000	$57,300,000

New School Construction	See report text for details	
Estimated enrollment:	1330	elementary school
	620	middle school
	720	high school
Current capacity estimate:	Expected to exceed capacity	
Estimated school costs:	$70,000,000	(New Elem and Middle Schools)

Transportation Services*

	Lane Miles	Normal Cost (in millions)	High Cost (in millions)	Total Cost (in millions)
Arterials	17.4	$156.19	$99.18	$255.37
Collectors	6.7	$71.09	$2.89	$73.98
Totals	24.1	***Total Road System Cost:***		$329.34

*Data provided by Metro thru the HERS-ST estimating approach

METRO

ASSESSMENT OF POTENTIAL URBAN GROWTH BOUNDARY EXPANSION AREAS

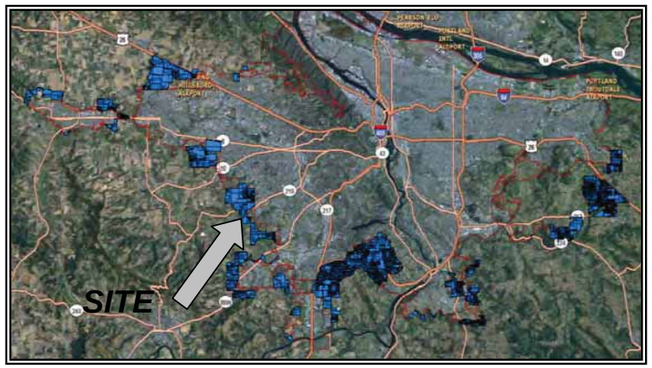
Cost Estimate - Area 6A South Hillsboro | Project Number - 2100103.00 | August 3, 2010

GROUP MACKENZIE CELEBRATING 50 YEARS

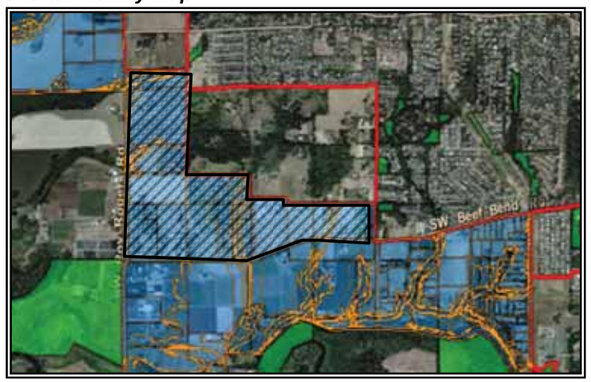
Area Data Provided by Metro

Total Reserve Land:	256	acres
Total Constrained Land:	50	acres
Net Buildable Land:	206	acres
Projected Dwelling Units:	2424	DU

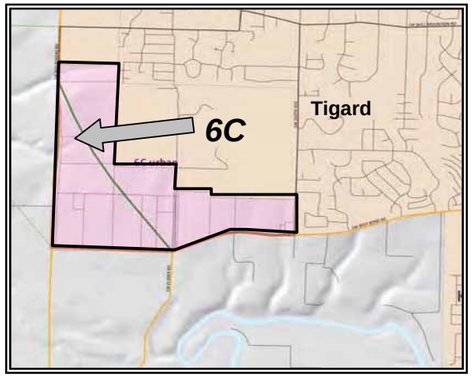
Local Jurisdiction:	City of Tigard
Sewer Service Provider:	Clean Water Services
Water Service Provider:	City of Tigard
Storm Drainage Service Provider:	City of Tigard
School District:	Tigard-Tualatin SD
Parks District:	City of Tigard



Overall Vicinity Map



Buildable Lands Map



Transportation Services Map

Notes

Sewer, water, and storm pipe lengths and sizing assumed to follow adjacent developed street pattern.
Pipe sizing assumed to correlate to street classification, i.e. local streets carry local utilities.

Utility unit costs are based on 2009 development studies.

Buildable Lands Legend
Existing UGB Boundary
Buildable Land Boundary
Urban Reserve Areas
Parks
Analysis Area

Transporation Services Legend
Analysis Area Boundary
Existing UGB Area
Proposed Roadway Upgrade
Proposed New Roadways

Land Use Type: Residential

Sanitary Sewer Services				
Sewer Pipe Size	8"-12"	12"-18"	18"+	Force
Pipe Classification	Collector	Trunk	Interceptor	Main
Estimated Pipe Length	25100	4400	300	0
Estimated Pipe Unit Cost	$120	$160	$180	$250
Sewer Pipe Cost	$3,012,000	$704,000	$54,000	$0
			Subtotal Cost:	$3,770,000
Pump Station Upgrades			0.25MGD pump station:	$1,300,000
Treatment Facility Upgrades			0.25MGD capacity upsizing:	$4,500,000
			Total Sewer System Cost:	$9,570,000

Water Distribution Services	Estimated Water Demand:		250000 gpd	
Water Pipe Size	8"-12"	12"-18"	18"+	
Estimated Pipe Length	25100	4400	5000	
Estimated Pipe Unit Cost	$100	$150	$200	
Water Transmission Pipe Cost	$2,510,000	$660,000	$1,000,000	
Water System Upgrade Costs			Storage and pumping	$500,000
			Total Water System Cost:	$4,670,000

Storm Sewer Services				
Storm Pipe Size	12"-18"	18"-24"	24"-48"	48"+
Estimated Pipe Length	25100	4400	300	0
Estimated Pipe Unit Cost	$135	$175	$220	$330
Storm Piping Cost	$3,388,500	$770,000	$66,000	$0
Storm System Upgrade Costs		No system upgrades expected		$0
			Total Storm System Cost:	$4,224,500

Park Improvements	Neighborhood Parks	Community Parks
New Park Area (acres)	2.9	13.1
Park Unit Cost	$200,000	$1,000,000
New Park Cost	$580,000	$13,100,000

New School Construction	See report text for details	
Estimated enrollment:	320	elementary school
	150	middle school
	170	high school
Current capacity estimate:	Expected to exceed elementary capacity	
Estimated school costs:	$20,000,000	(new elementary school)

Transportation Services*

	Lane Miles	Normal Cost	High Cost	Total Cost
		(in millions)	(in millions)	(in millions)
Arterials	6.1	$67.56	$4.64	$72.20
Collectors	2	$21.62	$0.00	$21.62
Totals	8.1		***Total Road System Cost:***	$93.82

*Data provided by Metro thru the HERS-ST estimating approach

METRO

ASSESSMENT OF POTENTIAL URBAN GROWTH BOUNDARY EXPANSION AREAS

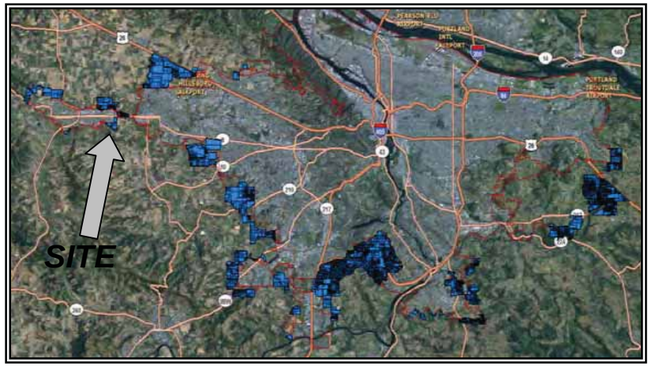
Cost Estimate - Area 6C Roy Rogers West Project Number - 2100103.00 August 3, 2010

GROUP MACKENZIE CELEBRATING 50 YEARS

Area Data Provided by Metro

Total Reserve Land:	210	acres
Total Constrained Land:	21	acres
Net Buildable Land:	189	acres
Projected Dwelling Units:	2188	DU

Local Jurisdiction:	City of Cornelius
Sewer Service Provider:	Clean Water Services
Water Service Provider:	City of Cornelius
Storm Drainage Service Provider:	City of Cornelius
School District:	Hillsboro SD and Forest Grove SD
Parks District:	City of Cornelius



Overall Vicinity Map

Notes

Sewer, water, and storm pipe lengths and sizing assumed to follow adjacent developed street pattern.
Pipe sizing assumed to correlate to street classification, i.e. local streets carry local utilities.

Utility unit costs are based on 2009 development studies.

Land Use Type: Residential

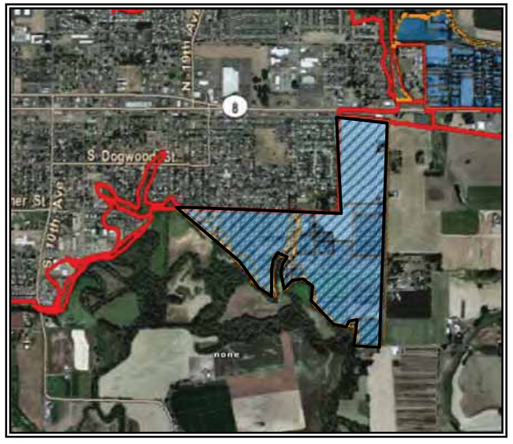
Sanitary Sewer Services				
Sewer Pipe Size	8"-12"	12"-18"	18"+	Force
Pipe Classification	Collector	Trunk	Interceptor	Main
Estimated Pipe Length	26500	100	3800	0
Estimated Pipe Unit Cost	$120	$160	$180	$250
Sewer Pipe Cost	$3,180,000	$16,000	$684,000	$0
			Subtotal Cost:	$3,880,000
Pump Station Upgrades			0.25MGD pump station:	$1,300,000
Treatment Facility Upgrades			0.25MGD capacity upsizing:	$4,140,000
			Total Sewer System Cost:	$9,320,000

Water Distribution Services	Estimated Water Demand:		230000 gpd	
Water Pipe Size	8"-12"	12"-18"	18"+	
Estimated Pipe Length	26500	100	5000	
Estimated Pipe Unit Cost	$100	$150	$200	
Water Transmission Pipe Cost	$2,650,000	$15,000	$1,000,000	
Water System Upgrade Costs			Storage and pumping	$500,000
			Total Water System Cost:	$4,165,000

Storm Sewer Services				
Storm Pipe Size	12"-18"	18"-24"	24"-48"	48"+
Estimated Pipe Length	26500	100	3800	0
Estimated Pipe Unit Cost	$135	$175	$220	$330
Storm Piping Cost	$3,577,500	$17,500	$836,000	$0
Storm System Upgrade Costs		No system upgrades expected		$0
			Total Storm System Cost:	$4,431,000

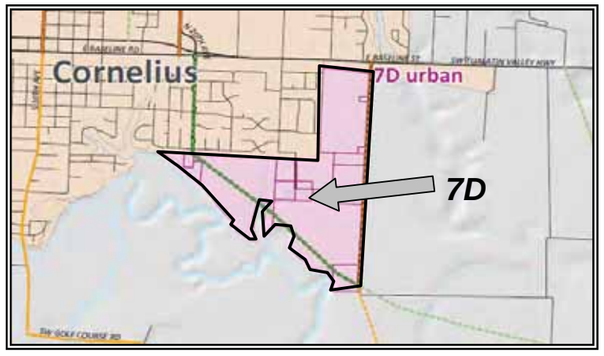
Park Improvements	Neighborhood Parks	Community Parks
New Park Area (acres)	1.5	6.5
Park Unit Cost	$200,000	$1,000,000
New Park Cost	$300,000	$6,500,000

New School Construction	See report text for details	
Estimated enrollment:	290	elementary school
	140	middle school
	160	high school
Current capacity estimate:	Expected within existing capacity	
Estimated school costs:	$500,000	(increased maintenance costs)



Buildable Lands Map

Buildable Lands Legend
Existing UGB Boundary
Buildable Land Boundary
Urban Reserve Areas
Parks
Analysis Area



Transportation Services Map

Transporation Services Legend
Analysis Area Boundary
Existing UGB Area
Proposed Roadway Upgrade
Proposed New Roadways

Transportation Services*

	Lane Miles	Normal Cost (in millions)	High Cost (in millions)	Total Cost (in millions)
Arterials	2.9	$33.61	$0.00	$33.61
Collectors	3.1	$33.09	$1.65	$34.74
Totals	6	***Total Road System Cost:***		$68.35

*Data provided by Metro thru the HERS-ST estimating approach

METRO

ASSESSMENT OF POTENTIAL URBAN GROWTH BOUNDARY EXPANSION AREAS

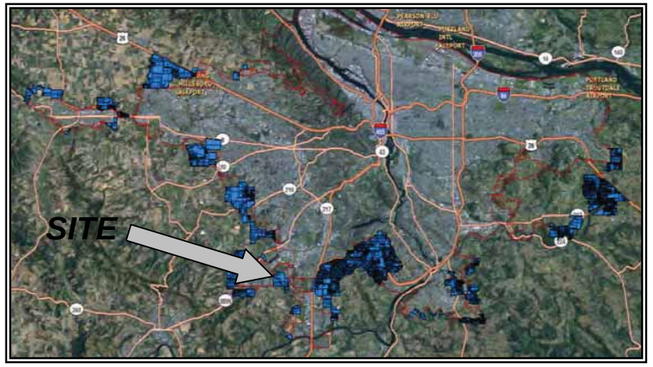
Cost Estimate - Area 7D Cornelius South Project Number - 2100103.00 August 3, 2010

GROUP MACKENZIE CELEBRATING 50 YEARS

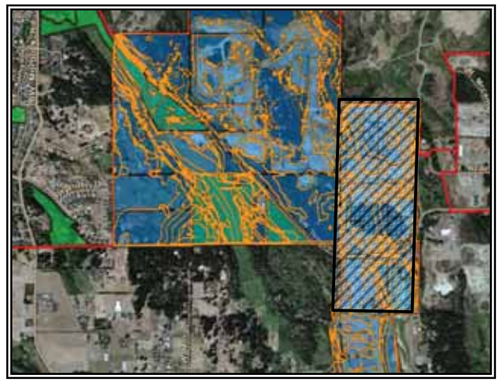
Area Data Provided by Metro

Total Reserve Land:	120	acres
Total Constrained Land:	63	acres
Net Buildable Land:	57	acres

Local Jurisdiction:	City of Tualatin
Sewer Service Provider:	Cleanwater Services
Water Service Provider:	City of Tualatin
Storm Drainage Service Provider:	Cleanwater Services

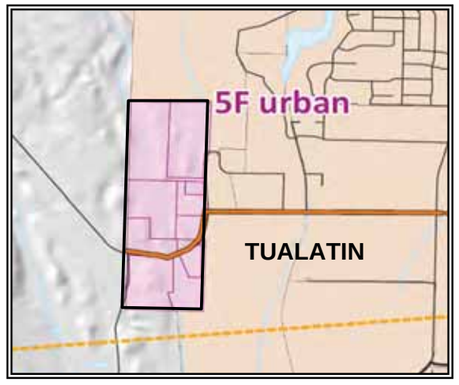


Overall Vicinity Map



Buildable Lands Map

Buildable Lands Legend
Existing UGB Boundary
Buildable Land Boundary
Urban Reserve Areas
Parks
Analysis Area



Transportation Services Map

Transporation Services Legend
Analysis Area Boundary
Existing UGB Area
Proposed Roadway Upgrade
Proposed New Roadways

Land Use Type: Large-Site Industrial

Sanitary Sewer Services				
Sewer Pipe Size	8"-12"	12"-18"	18"+	12+" Force
Estimated Pipe Length	1300	400	400	200
Estimated Pipe Unit Cost	$120	$160	$180	$250
Sewer Pipe Cost	$156,000	$64,000	$72,000	$50,000
			Subtotal Cost:	$342,000
Pump Station Upgrades			No pump station expected	$0
Treatment Facility Upgrades			Associated increased maintenance	$250,000
			Total Sewer System Cost:	$592,000

Water Distribution Services	Estimated Water Demand:		57000 gpd	
Water Pipe Size	12"-18"	18"-24"	24"+	
Estimated Pipe Length	1600	400	800	
Estimated Pipe Unit Cost	$100	$150	$200	
Water Pipe Cost	$160,000	$60,000	$160,000	
Treatment or System Upgrades			Increased associated maintenance	$250,000
			Total Water System Cost:	$630,000

Storm Sewer Services				
Storm Pipe Size	12"-18"	18"-24"	24"-48"	48"+
Estimated Pipe Length	600	500	800	400
Estimated Pipe Unit Cost	$135	$175	$220	$330
Storm Piping Cost	$81,000	$87,500	$176,000	$132,000
			Total Storm System Cost:	$476,500

Transportation Services*

	Lane Miles	Normal Cost (in millions)	High Cost (in millions)	Total Cost (in millions)
Arterials	5.7	$57.55	$18.29	$75.84
Collectors	0	$0.00	$0.00	$0.00
Totals	5.7	***Total Road System Cost:***		$75.84

*Data provided by Metro thru the HERS-ST estimating approach

Notes

Sewer, water, and storm pipe lengths are estimated based on average utility inventories of similar developments.

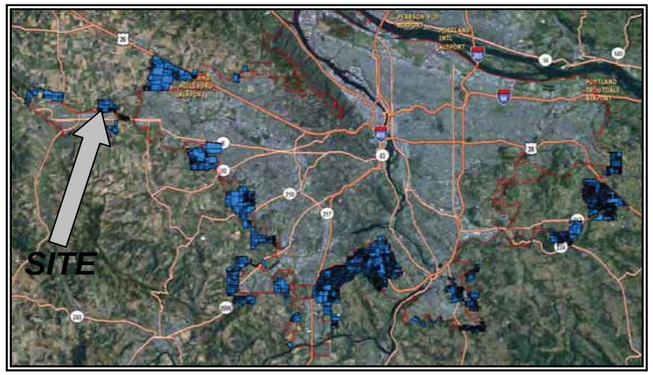
Utility unit costs are based on 2009 development studies.

METRO

Area Data Provided by Metro

Total Reserve Land:	203 acres
Total Constrained Land:	37 acres
Net Buildable Land:	166 acres

Local Jurisdiction:	City of Cornelius
Sewer Service Provider:	Cleanwater Services
Water Service Provider:	City of Cornelius
Storm Drainage Service Provider:	City of Cornelius



Overall Vicinity Map

Buildable Lands Map

Transportation Services Map

Buildable Lands Legend
Existing UGB Boundary
Buildable Land Boundary
Urban Reserve Areas
Parks
Analysis Area

Transporation Services Legend
Analysis Area Boundary
Existing UGB Area
Proposed Roadway Upgrade
Proposed New Roadways

Land Use Type: Large-Site Industrial

Sanitary Sewer Services				
Sewer Pipe Size	8"-12"	12"-18"	18"+	12+" Force
Estimated Pipe Length	3900	1200	1100	600
Estimated Pipe Unit Cost	$120	$160	$180	$250
Sewer Pipe Cost	$468,000	$192,000	$198,000	$150,000
			Subtotal Cost:	$1,008,000
Pump Station Upgrades			0.25MGD pump station	$1,300,000
Treatment Facility Upgrades			Associated increased maintenance	$500,000
			Total Sewer System Cost:	$2,808,000

Water Distribution Services	Estimated Water Demand:		166000 gpd	
Water Pipe Size	12"-18"	18"-24"	24"+	
Estimated Pipe Length	4800	1300	2400	
Estimated Pipe Unit Cost	$100	$150	$200	
Water Pipe Cost	$480,000	$195,000	$480,000	
Treatment or System Upgrades			Associated increased maintenance	$300,000
			Total Water System Cost:	$1,455,000

Storm Sewer Services				
Storm Pipe Size	12"-18"	18"-24"	24"-48"	48"+
Estimated Pipe Length	1700	1400	2300	1100
Estimated Pipe Unit Cost	$135	$175	$220	$330
Storm Piping Cost	$229,500	$245,000	$506,000	$363,000
			Total Storm System Cost:	$1,343,500

Transportation Services*

	Lane Miles	Normal Cost (in millions)	High Cost (in millions)	Total Cost (in millions)
Arterials	5.9	$61.92	$13.65	$75.57
Collectors	1.3	$11.14	$4.95	$16.09
Totals	7.2	***Total Road System Cost:***		$91.66

*Data provided by Metro thru the HERS-ST estimating approach

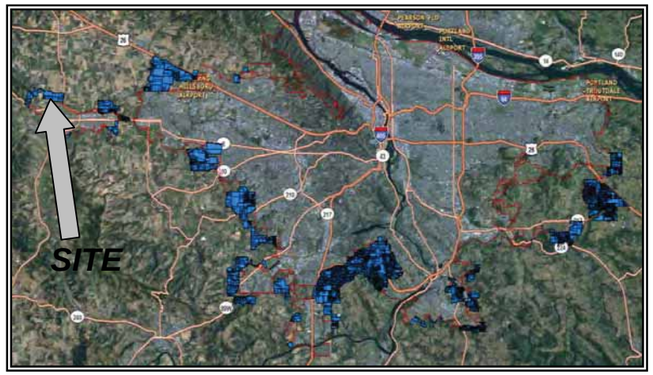
Notes

Sewer, water, and storm pipe lengths are estimated based on average utility inventories of similar developments. Utility unit costs are based on 2009 development studies.

Area Data Provided by Metro

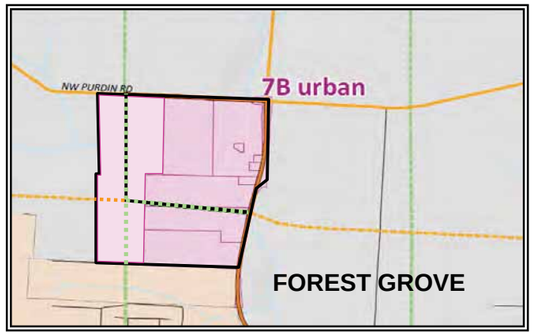
Total Reserve Land:	216 acres
Total Constrained Land:	41 acres
Net Buildable Land:	175 acres

Local Jurisdiction:	City of Forest Grove
Sewer Service Provider:	Cleanwater Services
Water Service Provider:	City of Forest Grove
Storm Drainage Service Provider:	City of Forest Grove



Overall Vicinity Map

Buildable Lands Map



Transportation Services Map

Buildable Lands Legend
Existing UGB Boundary
Buildable Land Boundary
Urban Reserve Areas
Parks
Analysis Area

Transporation Services Legend
Analysis Area Boundary
Existing UGB Area
Proposed Roadway Upgrade
Proposed New Roadways

Land Use Type: Large-Site Industrial

Sanitary Sewer Services				
Sewer Pipe Size	8"-12"	12"-18"	18"+	12+" Force
Estimated Pipe Length	4100	1300	1100	600
Estimated Pipe Unit Cost	$120	$160	$180	$250
Sewer Pipe Cost	$492,000	$208,000	$198,000	$150,000
			Subtotal Cost:	$1,048,000
Pump Station Upgrades			0.25MGD pump station	$1,300,000
Treatment Facility Upgrades			Associated increased maintenance	$500,000
			Total Sewer System Cost:	$2,848,000

Water Distribution Services	Estimated Water Demand:		175000 gpd	
Water Pipe Size	12"-18"	18"-24"	24"+	
Estimated Pipe Length	5100	1400	2600	
Estimated Pipe Unit Cost	$100	$150	$200	
Water Pipe Cost	$510,000	$210,000	$520,000	
Treatment or System Upgrades			Associated increased maintenance	$350,000
			Total Water System Cost:	$1,590,000

Storm Sewer Services				
Storm Pipe Size	12"-18"	18"-24"	24"-48"	48"+
Estimated Pipe Length	1800	1500	2400	1200
Estimated Pipe Unit Cost	$135	$175	$220	$330
Storm Piping Cost	$243,000	$262,500	$528,000	$396,000
			Total Storm System Cost:	$1,429,500

Transportation Services*

	Lane Miles	Normal Cost (in millions)	High Cost (in millions)	Total Cost (in millions)
Arterials	4.1	$43.97	$6.96	$50.93
Collectors	2.4	$23.04	$6.18	$29.22
Totals	6.5	***Total Road System Cost:***		$80.15

*Data provided by Metro thru the HERS-ST estimating approach

Notes

Sewer, water, and storm pipe lengths are estimated based on average utility inventories of similar developments. Utility unit costs are based on 2009 development studies.

METRO

ASSESSMENT OF POTENTIAL URBAN GROWTH BOUNDARY EXPANSION AREAS

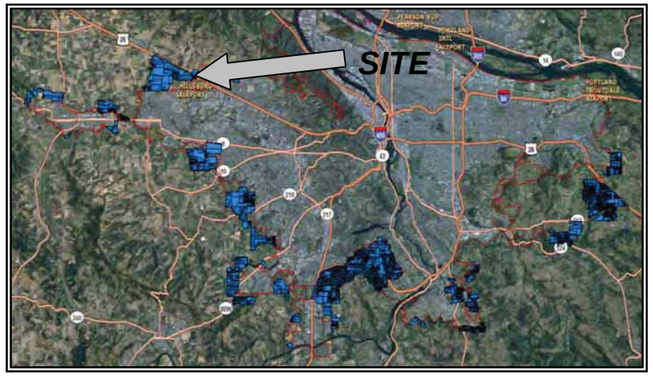
Cost Estimate - Area 7B Forest Grove North | Project Number - 2100103.00 | August 3, 2010

GROUP MACKENZIE CELEBRATING 50 YEARS

Area Data Provided by Metro

Total Reserve Land:	950 acres
Total Constrained Land:	183 acres
Net Buildable Land:	767 acres

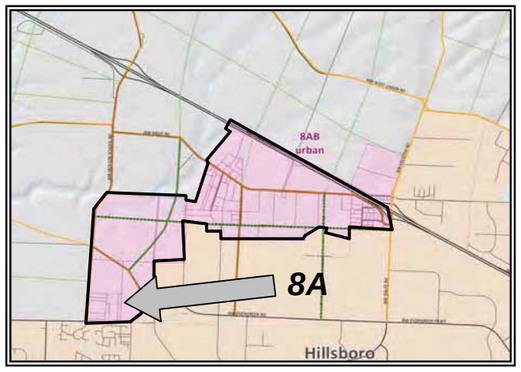
Local Jurisdiction:	City of Hillsboro
Sewer Service Provider:	Cleanwater Services
Water Service Provider:	City of Hillsboro
Storm Drainage Service Provider:	City of Hillsboro



Overall Vicinity Map

Buildable Lands Map

Buildable Lands Legend
Existing UGB Boundary
Buildable Land Boundary
Urban Reserve Areas
Parks
Analysis Area



Transportation Services Map

Transporation Services Legend
Analysis Area Boundary
Existing UGB Area
Proposed Roadway Upgrade
Proposed New Roadways

Land Use Type: Large-Site Industrial

Sanitary Sewer Services				
Sewer Pipe Size	8"-12"	12"-18"	18"+	12+" Force
Estimated Pipe Length	17900	5500	4900	2700
Estimated Pipe Unit Cost	$120	$160	$180	$250
Sewer Pipe Cost	$2,148,000	$880,000	$882,000	$675,000
			Subtotal Cost:	$4,585,000
Pump Station Upgrades			0.75MGD pump station expected	$1,500,000
Treatment Facility Upgrades			Associated increased maintenance	$750,000
			Total Sewer System Cost:	$6,835,000

Water Distribution Services	Estimated Water Demand:		767000 gpd	
Water Pipe Size	12"-18"	18"-24"	24"+	
Estimated Pipe Length	22200	6000	11300	
Estimated Pipe Unit Cost	$100	$150	$200	
Water Pipe Cost	$2,220,000	$900,000	$2,260,000	
Treatment or System Upgrades			Assocated increased maintenance	$700,000
			Total Water System Cost:	$6,080,000

Storm Sewer Services				
Storm Pipe Size	12"-18"	18"-24"	24"-48"	48"+
Estimated Pipe Length	8000	6500	10500	5100
Estimated Pipe Unit Cost	$135	$175	$220	$330
Storm Piping Cost	$1,080,000	$1,137,500	$2,310,000	$1,683,000
			Total Storm System Cost:	$6,210,500

Transportation Services*

	Lane Miles	Normal Cost (in millions)	High Cost (in millions)	Total Cost (in millions)
Arterials	24.8	$272.67	$28.85	$301.52
Collectors	13.4	$128.97	$33.18	$162.15
Totals	38.2	***Total Road System Cost:***		$463.67

*Data provided by Metro thru the HERS-ST estimating approach

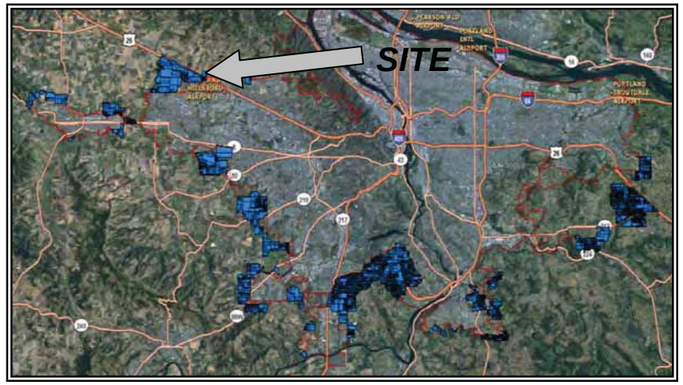
Notes

Sewer, water, and storm pipe lengths are estimated based on average utility inventories of similar developments.
Utility unit costs are based on 2009 development studies.

Area Data Provided by Metro

Total Reserve Land:	86 acres
Total Constrained Land:	28 acres
Net Buildable Land:	58 acres

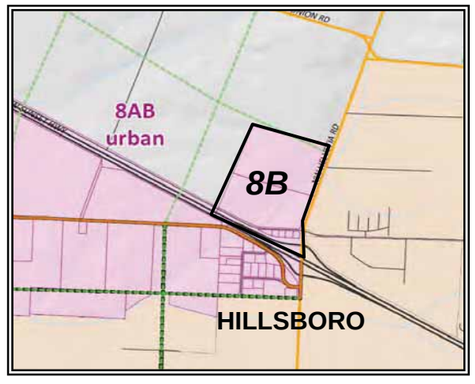
Local Jurisdiction:	City of Hillsboro
Sewer Service Provider:	Cleanwater Services
Water Service Provider:	City of Hillsboro
Storm Drainage Service Provider:	City of Hillsboro



Overall Vicinity Map

Buildable Lands Map

Buildable Lands Legend
Existing UGB Boundary
Buildable Land Boundary
Urban Reserve Areas
Parks
Analysis Area



Transportation Services Map
(See adjacent area 8A for transportation cost data)

Transporation Services Legend
Analysis Area Boundary
Existing UGB Area
Proposed Roadway Upgrade
Proposed New Roadways

Land Use Type: Large-Site Industrial

Sanitary Sewer Services				
Sewer Pipe Size	8"-12"	12"-18"	18"+	12+" Force
Estimated Pipe Length	1400	400	400	200
Estimated Pipe Unit Cost	$120	$160	$180	$250
Sewer Pipe Cost	$168,000	$64,000	$72,000	$50,000
			Subtotal Cost:	$354,000
Pump Station Upgrades			No pump station expected	$0
Treatment Facility Upgrades			Associated increased maintenance	$200,000
			Total Sewer System Cost:	$554,000

Water Distribution Services	Estimated Water Demand:		58000 gpd	
Water Pipe Size	12"-18"	18"-24"	24"+	
Estimated Pipe Length	1700	500	900	
Estimated Pipe Unit Cost	$100	$150	$200	
Water Pipe Cost	$170,000	$75,000	$180,000	
Treatment or System Upgrades			Associated increased maintenance	$100,000
			Total Water System Cost:	$525,000

Storm Sewer Services				
Storm Pipe Size	12"-18"	18"-24"	24"-48"	48"+
Estimated Pipe Length	600	500	800	400
Estimated Pipe Unit Cost	$135	$175	$220	$330
Storm Piping Cost	$81,000	$87,500	$176,000	$132,000
			Total Storm System Cost:	$476,500

Transportation Services
Note: transportation costs for this area have been incorporated into the adjacent 8A area.
No additional transportation improvements are needed to serve this area.

Notes
Sewer, water, and storm pipe lengths are estimated based on average utility inventories of similar developments.
Utility unit costs are based on 2009 development studies.

Attachment 4
Public Facilities and Services Cost Summary

	Sanitary Sewer	*Water Distribution*	*Storm Sewer*	*Transportation*	*Parks*	*Schools*
1C - East Gresham	$15,272,000	$3,240,000	$2,858,500	$260,050,000	$43,560,000.00	$60,000,000
3D - Maplelane	$8,028,000	$6,600,000	$6,914,500	$142,760,000	$33,320,000.00	$20,000,000
3G - Beaver Creek Bluffs	$4,116,000	$3,290,000	$2,587,500	$64,140,000	$5,960,000.00	$250,000
4D - Norwood	$13,170,000	$5,990,000	$6,303,000	$80,580,000	$35,920,000.00	$15,000,000
4E - I-5 East	$15,852,000	$3,605,000	$2,652,500	$124,290,000	$70,920,000.00	$20,000,000
4F/G - Elligsen	$27,886,000.00	$12,150,000.00	$14,064,000.00	$238,260,000.00	$81,160,000.00	$20,000,000.00
4H - Advance	$9,788,000	$4,570,000	$4,513,000	$107,520,000	$25,600,000.00	$20,000,000
5B - Sherwood West	$18,760,000	$8,935,000	$8,949,500	$145,460,000	$69,240,000.00	$80,000,000
5D - Sherwood South	$9,988,000	$4,925,000	$4,483,500	$178,120,000	$35,000,000.00	$300,000
5F - Tonquin	$592,000.00	$630,000.00	$476,500.00	$75,840,000.00	-	-
5G - Grahams Ferry	$3,188,000	$2,510,000	$1,906,000	$127,780,000	$15,360,000.00	$300,000
6A - South Hillsboro	$24,552,000	$5,230,000	$4,357,500	$329,340,000	$59,840,000.00	$70,000,000
6C - Roy Rogers West	$9,570,000	$4,670,000	$4,224,500	$93,820,000	$13,680,000.00	$20,000,000
7B - Forest Grove North	$2,848,000.00	$1,590,000.00	$1,429,500.00	$80,150,000.00	-	-
7D - Cornelius South	$9,320,000	$4,165,000	$4,431,000	$68,350,000	$6,800,000.00	$500,000
7I - Cornelius North	$2,808,000.00	$1,455,000.00	$1,343,500.00	$91,660,000.00	-	-
8A - Hillsboro North	$6,835,000.00	$6,080,000.00	$6,210,500.00	$463,670,000.00	-	-
8B - Shute Road Interchange	$554,000.00	$525,000.00	$476,500.00	n/a*	-	-

*See analysis summary report for more details.

Attachment 5
Transportation Analysis Summary

	Existing lane miles	*Conceptual lane miles*	*Lanes miles to be built*	*Square miles*	*Total cost (in millions)*	*Cost/square mile (in millions)*	*Cost/added lane mile (in millions)*	*Cost/system lane mile (in millions)*	*Distance to bus (in miles)*	*Distance to LRT (in miles)*
1C - East Gresham	12.03	34.79	22.76	1.34	$260.05	$194.07	$11.43	$7.47	0	2.44
3D - Maplelane	7.54	18.87	11.33	0.9	$142.76	$158.62	$12.60	$7.57	0.53	6.01
3G - Beaver Creek Bluffs	3.88	8.6	4.72	0.35	$64.14	$183.26	$13.59	$7.46	0.74	6.63
4D - Norwood	2.2	8.4	6.2	0.5	$80.58	$153.20	$13.01	$9.58	1.41	9.92
4E - I-5 East	8.2	19.1	10.8	1.3	$124.29	$93.81	$11.46	$6.52	0.25	8.68
4F/G - Elligsen	7.9	28.6	20.7	1.4	$238.26	$171.17	$11.49	$8.32	0.19	9.98
4H - Advance	6.35	15.64	9.29	0.42	$107.52	$256.01	$11.57	$6.87	1.53	1.53
5B - Sherwood West	5.23	18.01	12.78	0.77	$145.46	$188.90	$11.38	$8.08	1.08	3.53
5D - Sherwood South	4.58	18.63	14.05	0.7	$178.12	$254.45	$12.68	$9.56	0.9	2.49
5F - Tonquin	2.23	7.94	5.71	0.19	$75.84	$399.16	$13.28	$9.55	0.24	0.24
5G - Grahams Ferry	4.28	12.6	8.32	0.32	$127.78	$399.33	$15.36	$10.14	0.18	0.18
6A - South Hillsboro	7.19	31.26	24.07	1.66	$329.34	$198.40	$13.68	$10.54	0.01	1.75
6C - Roy Rogers West	5.06	13.09	8.03	0.4	$93.82	$234.56	$11.68	$7.17	1.35	3
7B - Forest Grove North	2.73	9.23	6.5	0.22	$80.15	$364.31	$12.33	$8.68	1.2	5.73
7D - Cornelius South	2.75	8.78	6.03	0.33	$68.35	$207.11	$11.33	$7.78	0.03	2.02
7I - Cornelius North	4.53	11.7	7.17	0.32	$91.66	$286.44	$12.78	$7.83	0.38	2.7
8A - Hillsboro North	10.78	49.01	38.23	1.62	$463.67	$286.22	$12.13	$9.46	0	1.8
8B - Shute Rd. Interchange	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Attachment 6
Environmental Analysis Summary

	Total (ac.)	*Wetlands (ac.)*	*Floodplain (ac.)*	*Total Habitat (ac.)*	*Slopes >25% (ac.)*	*Fully Constrained (ac.)*	*Partially Constrained (ac.)*
1C - East Gresham	857	0.27	0.00	116.57	20.30	104.13	65.06
3D - Maplelane	573	2.06	0.00	181.04	48.14	153.14	88.81
3G - Beaver Creek Bluffs	227	1.50	0.00	82.94	32.28	53.61	48.94
4D - Norwood	337	0.12	0.00	46.01	8.87	18.58	31.93
4E - I-5 East	848	4.74	0.00	280.68	50.37	95.75	193.77
4F/G - Elligsen	890	6.35	0.00	202.59	41.67	109.40	144.57
4H - Advance	317	0.00	0.00	72.65	17.97	103.00	32.00
5B - Sherwood West	495	0.42	0.00	44.52	22.80	33.18	31.21
5D - Sherwood South	447	4.54	44.60	203.85	45.68	117.69	112.57
5F - Tonquin	120	13.49	12.60	36.29	27.00	60.06	3.28
5G - Grahams Ferry	203	44.56	36.88	115.22	0.44	54.39	65.55
6A - Hillsboro South	1063	35.98	37.66	132.46	2.60	108.40	76.12
6C - Roy Rogers West	256	0.00	0.00	43.25	6.25	17.82	31.92
7B - Forest Grove North	216	4.08	35.58	39.32	0.00	31.00	10.00
7D - Cornelius South	210	0.00	0.00	21.09	0.59	3.39	17.94
7I - Cornelius North	203	6.62	17.78	32.86	1.55	24.88	12.11
8A - Hillsboro North	950	24.63	57.12	137.42	1.57	118.13	65.14
8B - Shute Road Interchange	85	0.00	23.15	24.11	0.17	16.98	11.30