Appendix 7
to 2024 Urban Growth Report

Goal 14 Boundary Location Factors
Analysis of UGB Expansion Candidate Areas

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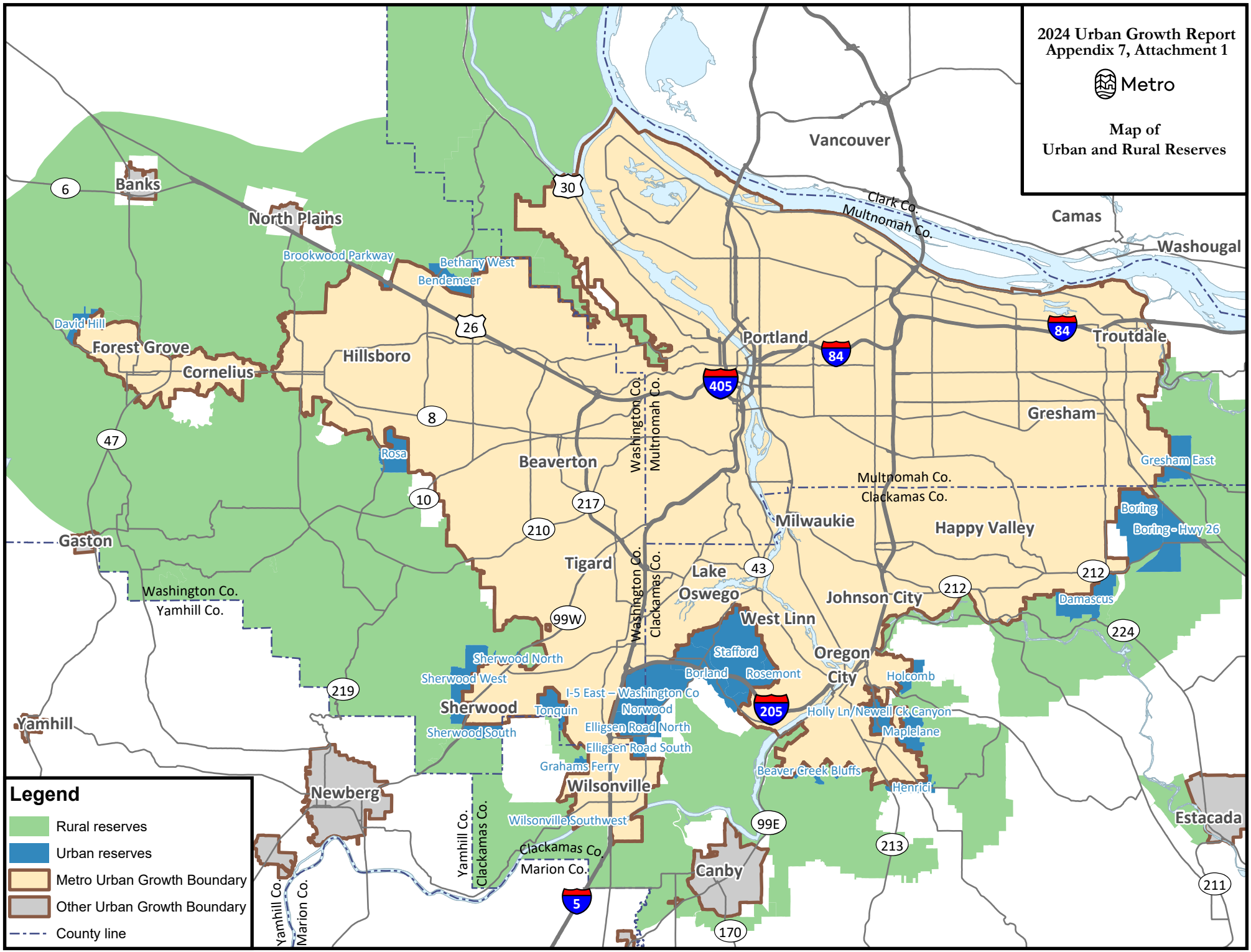
2024 Urban Growth Report
Appendix 7, Attachment 1
Metro
Map of
Urban and Rural Reserves
Vancouver
Clark Co.
Multnomah Co.
Camas
Washougal
Banks
North Plains
Brookwood Parkway
Bethany West
Bendemeer
David Hill
Forest Grove
Cornelius
Hillsboro
Portland
Troutdale
Gresham
Gresham East
Rosa
Beaverton
Multnomah Co.
Clackamas Co.
Milwaukie
Happy Valley
Boring
Boring - Hwy 26
Gaston
Washington Co.
Yamhill Co.
Tigard
Lake Oswego
Johnson City
Damascus
West Linn
Stafford
Borland
Rosemont
Oregon City
Holcomb
Holly Ln/Newell Ck Canyon
Maplelane
Sherwood North
Sherwood West
Sherwood
Tonquin
Sherwood South
I-5 East – Washington Co
Norwood
Elligsen Road North
Elligsen Road South
Grahams Ferry
Wilsonville
Wilsonville Southwest
Beaver Creek Bluffs
Henrici
Yamhill
Newberg
Clackamas Co.
Marion Co.
Canby
Estacada
6
30
26
84
405
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47
10
217
210
43
212
99W
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205
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Legend
Rural reserves
Urban reserves
Metro Urban Growth Boundary
Other Urban Growth Boundary
County line

GOAL 14 BOUNDARY LOCATION FACTORS
ANALYSIS OF UGB EXPANSION CANDIDATE AREAS

INTRODUCTION

The Metro Council considers how to accommodate the Metro region's forecasted 20-year population and employment growth in the Council's 2024 growth management decision. One option the Council has for accommodating forecasted growth is an amendment to Metro's urban growth boundary (UGB). A decision to amend the UGB must be supported by a comparative analysis of alternative locations for expanding the UGB, if an expansion is needed to accommodate future growth projected in the 2024 Urban Growth Report. The alternative locations that are analyzed are Metro's 27[1] urban reserves.

Both Statewide Planning Goal 14, as well as provisions of the Metro Code, identify factors that analysis must consider. The alternatives analysis in two parts: Part 1, which considers the factors of Goal 14; and Part 2, which considers the factors in the Metro Code.

The results of this Goal 14 boundary location factors analysis described here in Appendix 7 ultimately identify seven of the 27 urban reserves as unsuitable for urbanization in the short term. Those seven areas are therefore not considered further in the Metro Code Factors analysis in Appendix 7A.

Statewide Planning Goal 14

Statewide Planning Goal 14, *Urbanization*, lists four factors that must be considered to determine the location of, and changes to, the UGB:

Factor 1 – Efficient accommodation of identified land needs

Factor 2 – Orderly and economic provision of public facilities and services

Factor 3 – Comparative environmental, energy, economic and social consequences

Factor 4 – Compatibility of the proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

While the Goal 14 boundary location factors are evaluated separately in this analysis, each factor is not necessarily as important as the others for determining the appropriate UGB location; the analysis weights certain factors above others and provides an overall assessment of the suitability of each urban reserve to accommodate future growth.

[1] The 27 analyzed urban reserves, listed on Page 18, do not include Urban Reserve 8A located between the cities of North Plains and Hillsboro, because the approximately 35-acre area is comprised only of Hwy 26 right-of-way and connecting onramps and offramps to and from NW Jackson School Rd. It therefore is not capable of accommodating any new urban residential or employment uses if included in the UGB.

Contributors

As was done with previous growth management decisions, Metro staff completed the majority of the Goal 14 analysis, assessing each reserve according to Factors 1, 3, and 4 above.

The "public facilities and services" referred to in Factor 2 include water, sanitary sewer, stormwater, and transportation services. Metro staff completed the transportation element of the Factor 2 analysis following a review of local transportation system plans and consultation with transit service providers, including TriMet; the methodologies used in the transportation-related analysis are detailed further in Pages 7-10. Metro also contracted with Mackenzie, Inc., a Pacific Northwest multidisciplinary design firm with expertise in civil and structural engineering, land use planning, and architecture, to assist with background research on water, sanitary sewer, and stormwater system capacities and needs; Mackenzie's assumptions and methodology are detailed in Attachment 4.

BUILDABLE LAND ASSESSMENT

The analyses for Goal 14 Factors 1 and 2 were based on assumptions of each reserve's potential future urban development, which began with an assessment of the amount of "buildable" (i.e., developable) land.

The buildable land assessment followed general procedures used for most buildable lands studies: vacant portions of the study areas (i.e., the urban reserves) are first identified; those vacant portions that are unbuildable due to topographical or environmental constraints, such as steep slopes, flood hazards, and wetlands, are then removed from vacant lands inventory; specific categories of public and other tax-exempt lands that are unlikely to be developed for residential or employment uses are also considered unbuildable and are therefore removed from the inventory; and, finally, the inventory is further reduced to account for future streets and public facilities needed to accommodate urbanization.

Most 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, floodplains, and zoning areas. All 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 such as 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 and used to identify tax-exempt lands comes directly from county assessment offices, where local updates may be conducted at different intervals. For a variety of reasons such as these, this Goal 14 boundary location factors analysis helps to illustrate *general patterns* and to make *overall comparisons* of each reserve's potential suitability for urban development using consistent methodology, but cannot be expected to be highly precise at small levels of geography, especially prior to comprehensive local planning.

Additional details on the various steps used to conduct the buildable land assessment follow below.

Step 1: Determine "vacant" lands

The first step in conducting the buildable lands assessment is to determine which lands within the study areas (i.e., the 27 urban reserves) are vacant and available for new urban development following inclusion in the UGB. It is understood that some existing uses, such as high-value rural residences, will remain even as an area is urbanized; however, whether a rural land use is discontinued to accommodate new urban development is generally dependent on a property owner's personal and unpredictable interests, so it is not practicable to determine with meaningful certainty which existing rural uses in each reserve would actually remain or for how long. Therefore, for the purposes of this higher-level Goal 14 analysis, *all* land in each urban reserve is assumed at first to be "vacant", with the working supposition that even existing rural land uses in the urban reserves would *most likely* redevelop with urban uses, at least eventually.

There are approximately **20,212 acres** considered "vacant", equal to the total combined area of all 27 analyzed urban reserves.

Step 2: Subtract topographically and environmentally constrained areas

Lands that are considered vacant may not necessarily be buildable for new urban land uses. Therefore, the next step in a buildable lands assessment is to subtract those areas from the vacant lands inventory that are topographically or environmentally constrained. The following constrained areas were not considered buildable in this analysis and were removed from the vacant lands inventory:

1. Urban Growth Management Functional Plan (UGMFP) Title 3, *Water Quality and Flood Management Areas*, consisting of:
    - Flood hazard areas (e.g., FEMA "100-year" floodplains and 1996 flood inundation areas)
    - Wetlands (e.g., from an enhanced National Wetlands Inventory and local wetlands inventories)
    - Wetland areas, measured 50 feet from the edge of a wetland or up to 200 feet from the edge of wetland located adjacent to slopes greater than 25 percent
    - Vegetated corridors between 15 feet and 200 feet in width, depending on the area drained by the water feature and the slope of the land adjacent to the water feature
2. UGMFP Title 13, *Nature in Neighborhoods*, areas identified as riparian habitat Class I and II and upland habitat Class A and B on the Metro Regionally Significant Fish and Wildlife Habitat Inventory Map

3. Areas with slopes greater than 25 percent

Metro's Title 13 regulations do not preclude all development within inventoried areas, so an additional step described below (Step 5) recognizes that some limited development will likely occur even in these locations. Additionally, in almost all circumstances, the identified Title 13 significant riparian and upland habitats already encompass the Title 3 Water Quality and Flood Management Areas, meaning areas removed from the vacant lands inventory for having a Title 3 classification are typically the same areas that would otherwise be removed for having a Title 13 classification.

The requirements of Titles 3 and 13 apply only to areas within the Metro service district (i.e., jurisdictional) boundary. Some of the urban reserves analyzed are currently located outside of the boundary, but would be annexed in when they are added to the UGB.[2] The Title 13 Regionally Significant Fish and Wildlife Habitat Inventory already extends beyond the jurisdictional boundary and shows environmental constraints in all urban reserves. Metro has also compiled a supplemental data layer representing Title 3 protections for urban reserves outside the jurisdictional boundary to understand how much land in each reserve could potentially be constrained; however, as noted above, these Title 3 areas are generally already encompassed in the Title 13 areas.

In total, approximately **6,741 acres** were removed from the vacant lands inventory due having topographic or environmental constraints.

Step 3: Subtract other areas not considered buildable

Certain urban reserve lands considered "vacant" and not constrained by topographic or environmental features are nonetheless highly unlikely to (re)develop with urban uses and, therefore, also warrant being removed from the vacant lands inventory.

Tax-exempt lands (e.g., federal-, state-, county-, and city-owned properties, school properties, and places of worship) identified from the tax assessment database were removed from the inventory, as it is reasonable to assume such properties would not be readily available for development with urban residential or employment land uses if included in the UGB. Lands already occupied by cemeteries, golf courses, parks, home owners association (HOA) owned common areas, existing road rights-of-way, and tax lots smaller than 1,000 square feet were removed for similar reasons.

Step 3 removes a total of approximately **3,134 additional acres** from the vacant lands inventory.

Step 4: Add back some Title 13 constrained land

Metro's Title 13 data layer was created almost 20-years ago at the regional scale, largely relying on aerial imagery available at that time. A key step in planning for areas added to the UGB is the

[2] ORS 268.390(3)(b)

development of an *updated* environmentally constrained land data layer, using current GIS tools and other resources that allow for a more accurate assessment of the localized landscape and the riparian and upland wildlife habitat areas. As documented in recent UGB expansion area plans, the natural resource protected areas identified by the refined mapping analysis often differs from the areas originally mapped by Metro. In addition, experience has shown that it is not uncommon for some of the originally mapped upland habitat areas to have been degraded through forestry practices and other rural land use activities prior to inclusion in the UGB, potentially resulting in additional unconstrained (i.e., buildable) land. Furthermore, Title 13 provides that development may sometimes encroach into even still-existing natural habitat, depending on the specific circumstances of the site and the development proposal.

Recognizing the expected change in mapped habitat areas and the possibility of encroachment, 10 percent of the mapped Metro Title 13 constrained land (**363 acres**) is added back into the vacant lands inventory.

Resulting gross vacant buildable land

Table 1 below shows the results of Steps 1-4 above, as applied to the 27 analyzed urban reserves. The table shows that there are approximately **10,700 acres of gross vacant buildable land** in Metro's urban reserves that are available for urban development when added to the UGB.

Table 1 – Gross Vacant Buildable Urban Reserve Land

Step #	Land Type	Acres
Step 1	Urban reserves (i.e., "vacant")	20,212
Step 2	Topographically/environmentally constrained	6,741 (-)
Step 3	Otherwise constrained (e.g., tax-exempt, ROW)	3,134 (-)
Step 4	10% of Title 13 areas	363 (+)
	Total Gross Vacant Buildable Land:	**10,700 acres**

Step 5: Subtract lands needed for certain future land uses

As urbanization proceeds, some gross vacant buildable land will be used for different types of new public facilities, such as streets/roads, parks, and schools, as well as for other non-residential and non-employment uses, such as places of worship and assembly. Estimates of future land needed to accommodate these uses, listed in Table 2 below, are therefore subtracted from the gross vacant buildable land. The reduction estimates are the same as the reductions used in Metro's 2010, 2018, and 2023 Goal 14 analyses. Refined acreage needs will be developed through the concept planning requirements of UGMFP Title 11, *Planning for New Urban Areas*.

The calculations in Table 2 demonstrate that approximately **7,971 acres** of land in all of Metro's 27 analyzed urban reserves could potentially accommodate new urban residential and employment land uses, referred to as "net buildable land".

Table 2 – Portion of Gross Vacant Buildable Land Subtracted for Future Land Uses		
Subtracted Future Land Use	**Percent**	**Acres**
Streets/roads	18.5	1,980
Parks	2.2	235
Schools	2.9	310
Places of worship/assembly	1.9	203
Total Subtracted for Future Land Uses:	**25.5**	**2,729 (rounded)**
Total Net Buildable Land in Analyzed Urban Reserves (Gross Vacant Buildable Land – Total Subtracted for Future Land Uses):		**7,971 acres**

EXPLANATION OF GOAL 14 BOUNDARY LOCATION FACTORS

Following is an explanatory summary of how each of the four Goal 14 boundary location factors were applied to Metro's urban reserves. The results of the analysis for each urban reserve can be found in Attachment 3.

Factor 1: Efficient accommodation of identified land needs

The 27 urban reserves were analyzed for how efficiently they could accommodate an identified land need, based on a number of considerations.

Some primary considerations were the overall amount of gross and net buildable land in each reserve, and whether that land is cohesive or dispersed in disconnected pockets/sub-areas.

Parcelization (i.e., the number of tax lots), tax lot sizes and locations, existing development patterns and their assessed value, and potential transportation connections to the existing UGB were considered as well. Tax lot data was sourced in February 2024. Given the potential for discrepancies between, and regular updates to, surveys, county tax maps, and GIS layers, and inevitable shifts in geodetic controls over time, tax lots that were observed to have less than five percent of their area in an urban reserve, and tax lots smaller than 1,000 square feet with less than 10 percent of their area in an urban reserve, were not considered to be located within an urban reserve at all for purposes of this evaluation.

The analysis for Factor 1 also considered whether each urban reserve is located near existing/planned residential or employment areas, major transportation corridors (e.g., highways), schools, or parks, trails, or other recreational facilities that could support residential and/or employment land uses.

However, the primary consideration in evaluating whether an urban reserve could efficiently accommodate an identified land need is whether it has an adopted concept plan under Title 11 of Metro's Urban Growth Management Functional Plan. The purpose of concept planning is to ensure that there is a detailed local plan for future urban development, including estimated costs

of infrastructure and potential methods for financing, prior to an area being added to the UGB. Also, having a concept plan that has been formally adopted by local officials following public engagement indicates a local willingness to urbanize and significantly increases the likelihood that the reserve will develop and efficiently accommodate identified land needs within a reasonable timeframe. As noted in the following pages, only one urban reserve, the Sherwood West Urban Reserve, has a locally-adopted concept plan. Accordingly, in the analysis of which urban reserve demonstrates the highest likelihood of efficiently accommodating the identified land needs under Factor 1, the Sherwood West Urban Reserve rises to the top of the list.

Factor 2: Orderly and economic provision of public facilities and services

For the purposes of Factor 2, and consistent with Oregon Administrative Rules (OAR) chapter 660, division 24, "public facilities and services" means water, sanitary sewer, stormwater management, and transportation facilities and services. The analysis under this factor requires an evaluation and comparison of the relative costs, advantages, and disadvantages of alternative UGB expansion areas with respect to the provision of these public facilities and services as needed to urbanize alternative boundary locations. The evaluation and comparison considers:

1. The impacts to existing water, sanitary sewer, stormwater, and transportation facilities that serve nearby areas already inside the Metro UGB;
2. The capacity of existing public facilities and services to serve areas already inside the UGB as well as areas proposed for addition to the UGB;
3. The need for new transportation facilities such as highways and other roadways, interchanges, arterials and collectors, additional travel lanes, other major improvements on existing roadways and the provision of public transit service; and
4. Whether there is a locally-adopted concept plan for the expansion area that identifies how water, sanitary sewer, stormwater management, and transportation facilities could be extended to serve urban development and how such facilities and services could be financed, as such a preliminary plan will facilitate the orderly and economic provision of these facilities and services in the future.

As noted earlier, Metro contracted with Mackenzie for background research (Attachment 4) that was needed to address the first two topics above for water, sanitary sewer, and stormwater management services, including development of preliminary cost estimates for providing these services to urban residential and employment land needs. The water, sanitary sewer, and stormwater analysis focused on the larger components of the systems and preliminary cost estimates for the urban services addressed, at a minimum, the following:

- For water service, availability of source, availability of treatment capacity, storage, pump station and transmission line requirements, and existing local system improvements;
- For sanitary sewer service, availability of treatment capacity, trunk line and pump station requirements, and existing local system improvements; and

- For stormwater management service, existing local system improvements, including a need for sub-regional systems.

Metro staff completed the transportation-related components of Factor 2. Preliminary conceptual future arterial/collector level road networks that may be needed to serve urban development of each reserve were developed based on a review of local jurisdictions' plans, topography, existing rights-of-way, and the connectivity standards in the Regional Transportation Plan (RTP). The preliminary road networks recognize that the ideal spacing for arterials is one mile apart, and that the ideal spacing for collectors is one-half mile from another collector or arterial, as this spacing can provide significant benefits to the multimodal transportation network by spreading out motor vehicle traffic on multiple roadways and providing options for walking, biking, and transit connectivity. Arterials were assumed to be an 80-foot-wide roadway within a 120-foot-wide right-of-way; collectors were assumed to be a 50-foot-wide roadway within an 80-foot-wide right-of-way.

The preliminary road network was also used to develop rough cost assumptions for future roadway system improvements in each urban reserve, though more detailed estimating (e.g., during comprehensive planning following addition to the UGB) will of course be necessary to determine exact costs and phasing of construction. The roadway cost assumptions in this analysis are only for the arterials and collectors and do not include local roads that are assumed to be paid for by future developers.

The roadway cost assumptions are per mile and include construction of surface elements for a "complete street" (i.e., sidewalks, bike lanes, curbs, and gutters) and right-of-way acquisition, but do not include stormwater pipes, as stormwater system costs were calculated separately by Mackenzie and included with the stormwater services analyses. Each arterial was assumed as either a four-lane divided roadway or five-lane roadway, 80 feet in width within a 120-foot-wide right-of-way; each collector was assumed as either a two-lane divided roadway or a three-lane roadway, 50 feet in width within an 80-foot-wide right-of-way. The assumed roadway costs are expressed in ranges ("normal" expected costs and "high" expected costs) in Table 3 on the next page; higher per-mile costs were assumed for elements that traverse steeper topography or water bodies. The per-mile costs in the table are the same as used in Metro's Goal 14 boundary location factors analysis in 2018, but with an additional 40 percent to account for increased construction/materials costs and general inflation. This approach is consistent with the project cost inflation factoring used for the 2023 RTP. The proposed road network and a summary of the expected transportation costs for each separate urban reserve can be found in Attachment 2.

Table 3 – Roadway Per-Mile Cost Assumptions[3]			
Arterials			
	Surface Elements	ROW Acquisition	**Total Cost**
Normal:	$35,280,000	$26,040,000	**$61,320,000**
High:	$108,780,000	$26,040,000	**$134,820,000**
Collectors			
	Surface Elements	ROW Acquisition	**Total Cost**
Normal:	$22,540,000	$17,360,000	**$39,900,000**
High:	$58,380,000	$17,360,000	**$75,740,000**

Additional elements of the Goal 14 transportation analysis concern: the capacity of the existing transportation system to serve areas already inside the UGB; the capacity of that existing transportation system to serve urban development of each reserve; and impacts of each reserve's urbanization on existing transportation facilities.

Metro's 2018 Goal 14 analysis addressed these factors primarily by considering the peak evening two-hour volume-to-capacity ratio ("V/C ratio") targets adopted in the 2018 RTP for roadways near and connected to each urban reserve.[4] Notably, the 2018 RTP failed to meet its V/C-based mobility targets, particularly for the region's throughway system, prompting Metro and the Oregon Department of Transportation (ODOT) to consider alternative approaches for measuring mobility in the region.

From 2019 to 2023, Metro and ODOT worked together to develop a new regional mobility policy that no longer uses the V/C ratio to measure adequacy of the transportation system. Adopted in Chapter 3 of the 2023 RTP, the new policy identifies three mobility performance measures:

1. Vehicle miles traveled (VMT) per capita;
2. System completion for all modes (including transportation demand management and transportation system management and operations); and
3. Throughway reliability using travel speed.

The new policy is a critical step toward developing more housing, jobs, and services in designated growth areas across the region and ensuring those areas and existing communities have improved access to safe and affordable transportation options. The policy represents an important advancement in measuring mobility for all modes and reliability of the region's

[3] The per mile cost assumptions are a range of potential costs, from a typical estimated cost per mile to higher-end per-mile estimates. The actual per-mile costs are expected to vary due to location-specific factors, such as existing development, environmental impacts, complexity of design, and other engineering issues.

[4] The V/C ratio is a measure of vehicle congestion on roads and at intersections, specifically the number of motor vehicles relative to the motor vehicle capacity of a given roadway during peak travel times (e.g., 4:00-6:00 PM on weekdays).

interstates and major highways. The policy also prioritizes the development of a complete and well-connected transportation system that gives people safe and reliable transportation options and helps reduce the region's climate pollution.

The Factor 2 assessment in this 2024 Goal 14 analysis applies the new 2023 RTP mobility policy rather than the 2018 RTP V/C ratio in the analysis of the transportation system's adequacy. Consistent with the 2023 RTP mobility policy, the assessment considers whether urban development of each reserve would increase home-based VMT per capita of the area, the availability of transportation options, existing safety deficiencies, and the reliability of the throughway system in the area.

Home-based VMT per capita is limited when people are able to meet their daily needs closer to where they live; therefore, evaluating the capacity of the existing transportation system warrants considering whether a given urban reserve and areas adjacent to it do/can contribute to more "complete" communities, with their own mixture of residential, employment, institutional, and recreational uses. The amount of VMT per capita is further limited when multiple transportation options are available (e.g., transit service, bike lanes, sidewalks, crosswalks, and trails). Generally, areas along the "urban edge" are often the least likely to have a mixture of land uses and well-connected network of multimodal transportation options to serve daily needs of the people living and working there. Some urban reserves are also not close to urban centers or higher density development and some are also too small, fragmented, and/or constrained by topography or other environmental features to likely develop as, or contribute to, a "complete" community. Accordingly, many reserves do not score high on this factor. However, it is worth noting there is typically less road congestion at the urban edge, and urbanization of an urban reserve is unlikely to create additional motor vehicle traffic that causes travel on nearby throughways and other roadways to slow below performance standards.

A variety of data sources were used to assess transportation system adequacy and potential impacts for Factor 2, including maps of the following from Chapter 4 of the 2023 RTP:

- Existing regional network gaps in: the planned regional transit service; the planned regional pedestrian and bicycle facilities, and trails; and the planned regional motor vehicle network;
- Existing regional high injury corridors and intersections; and
- Existing throughway reliability performance (2019).

Aerial photos from 2022 and GIS data layers showing existing roadways, on-street bike and sidewalk facilities, off-street trails, transit lines, and transit stops were also used.

TriMet and South Metro Area Regional Transit (SMART), which are the transit agencies that may potentially serve the analyzed urban reserves, completed preliminary evaluations of the feasibility and potential costs of providing future transit service to urban development of each reserve. The findings of those evaluations were incorporated in the assessments under Factor 2. These are only high-level, preliminary findings are intended as a tool for policymakers to

understand, to some degree, the feasibility and costs associated with providing additional transit service to each of the analysis areas; they do not guarantee transit service to any particular area in the future. Ultimately, any investment in new transit service will depend on the actual level of development that occurs in an area and the corridors leading up to it, as well as other variables.

Only one urban reserve, the Sherwood West Urban Reserve, has a locally-adopted concept plan. That plan identifies how water, sanitary sewer, stormwater management, and transportation facilities could be extended to serve urban development of the reserve and how such facilities and services could be financed.

Factor 3: Comparative environmental, social, energy, and economic consequences

Factor 3 requires an assessment of the long-term environmental, social, energy, and economic (ESEE) consequences that could result from urbanization of land considered for inclusion within the UGB. The four ESEE consequences must be evaluated for each urban reserve and the results of this ESEE analysis help to inform which lands should be selected for inclusion in the UGB.

Statewide Planning Goal 2, *Land Use Planning*, suggests that, when considering the conversion of land from rural to urban uses, the ESEE analysis should consider the positive and negative effects of urbanization on the study areas and the advantages and disadvantages of urbanizing a particular site versus another site. The analysis must demonstrate that, on balance, the lands being considered for inclusion in the UGB are no worse than other areas under consideration for urbanization.

The four ESEE consequences were all evaluated in this Goal 14 boundary location factor analysis, but only the environmental consequence is reported out separately in Attachment 2, as it is more quantitative in nature, whereas the other three consequences are more qualitative and merit being reported together. Outlined below are general descriptions of the expected ESEE consequences and the expected consequences to each factor because of urbanization.

Environmental

Environmental features such as streams and wetlands can be relatively easily identified and their characteristics (e.g., size, proximity) can be quantified, which helps in determining their importance and in assessing the potential effects of urbanization on those features. Additionally, there are often regulatory programs in place to ensure that urbanization will occur in a regionally consistent manner through required protection standards.

UGMFP Title 3, for example, provides performance standards to protect and improve water quality and to reduce the risk and impacts of flooding. Land added to the UGB is subject to the requirements of Title 3 through the concept planning and comprehensive planning requirements of UGMFP Title 11. UGMFP Title 13 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 also subject to the requirements of Title 13 through the concept planning and comprehensive planning requirements of Title 11.

However, even with protection requirements, urbanization may still impact natural resources through the degradation of water quality and wildlife habitat, the loss of floodplain functions, and increased instability of steep slopes. Urbanization can also affect the function of these areas when vegetated corridors are reduced, and when impervious surfaces are increased and lead to additional storm sewer runoff that impacts stream water quality.

Still, inclusion of land into the UGB and subsequent urbanization do not necessarily mean greater negative impacts to natural resources. Indeed, *rural* uses can impact natural resources in ways that are 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 natural riparian habitat. In an urban context, however, the same stream would typically have a required vegetative riparian corridor where development could not occur, with urbanization thereby resulting in a positive impact on the longer-term health of that stream. In other words, lands included in the UGB can be subject to greater natural resource productions than land outside the UGB.

Social

There can be both positive and negative social consequences of urbanizing a previously rural area, due to changes to the built environment, the natural landscape, and the area's demographics. Urbanization can also positively and negatively impact the lifestyles of current residents and employees of the area, as well as cultural and historic resources valued by both those living both inside and outside the UGB.

For example, development of a new urban area can create new social, commercial, recreational, and educational opportunities for both current and new residents of the area and for nearby established residential communities already inside the UGB. This is particularly so when there is a more compact urban form with mixed-use areas that are part of a planned "complete community" because, in these areas, people can live closer to and more easily access jobs, businesses, needed services, recreational opportunities, places of worship, and other social gathering places. Such proximity can also increase the feasibility and attractiveness of active transportation (e.g., walking and bicycling) and the use of transit, which can have their own social benefits.

However, urbanization can also degrade the rural character of the area, which is a negative social impact at least on those who desire preservation of rural lifestyles and environments. Those currently engaged in farming nearby land may also feel pressure from encroaching urbanization to curtail their farming activities.

Energy

Statewide Planning Goal 13, *Energy Conservation*, states:

> "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".

Depending on density, mix of land uses, roadway layout, availability of transit and active transportation facilities, and other factors, urbanization can increase VMT and increased VMT, particularly by internal combustion engine vehicles, can increase energy consumption. Maintaining a compact urban form, providing both service and employment opportunities near residential development, and increasing density along high-capacity transportation corridors will result in smaller increases in energy consumption than disjointed, unplanned large-lot development.

OAR 660-023-0190(1) states that energy sources, for the purposes of Goal 5, 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 necessitates adopting comprehensive plan provisions and implementing land use regulations that both limit new conflicting uses within the impact area of the site, and that authorize future development or use of the energy source of the site. There are no known sources of energy in the urban reserves as defined in OAR 660-023-0190(1), although some areas contain easements for electric power, petroleum, and natural gas transmission facilities.

Economic

The land in Metro's urban reserves is currently being used for rural uses that include farming and forestry activities, larger-lot single-family residential uses, schools, places of worship, and limited commercial and industrial uses. Permitted commercial uses are generally confined to wholesale and retail sales of farming and forestry related products, as well as other incidental uses, including convenience stores, or service-based businesses, under prescribed conditions. Industrial uses are mainly related to farm crop and timber processing and wholesaling and other resource-based industries, such as sand and gravel mining and equipment storage.

Urbanization allows for a concentration of residential, commercial, industrial, and office uses that benefit from economies of scale. As land is brought into the UGB, the range of uses and development types increase. The resulting diversified urban economy will serve both the current and new residents of the area, as well as the nearby established residential communities already inside the UGB.

Inclusion in the UGB, and the addition of public facilities and infrastructure, can increase the economic value of the land by providing the opportunity to divide and sell off property and to develop it with new uses. These development options would not be available without inclusion of the land in the UGB and the subsequent urban services that are provided.

However, as land values increase with urbanization, activities that are land-intensive, such as agriculture, forestry, and equipment storage, may be preferred less and even be less economical. As mentioned above, urbanization can also put pressures on nearby commercial agriculture to curtail their farming practices.

Oregon's agriculture industry continues to be a major component of the state's economy, so these impacts are worth considering. According to the Oregon Department of Agriculture (ODA), there were 37,200 farms in Oregon in 2020, with a value per crop land acre of $3,120. The top five agricultural commodities based on value of production that year were: greenhouse and nursery products ($1.19 billion); cattle and calves ($588 million); hay ($569 million); milk ($557 million); and grass seed ($458 million). Oregon has been one of highest-ranking states in the nation, if not the highest, for production of hazelnuts, onions, potatoes, pears, blueberries, cherries, cranberries, hops, nursery stock, Christmas trees, and many types of peas, clover, and seed.[5]

Urbanization of land that is currently in agricultural production, particularly nursery stock, hay, and caneberry (e.g., raspberry and blackberry) production, which is common in the three-county Metro region, could be economically significant. Loss of agricultural land to urbanization can also adversely impact agricultural processors (e.g., wineries) and agri-tourism.

Timber harvesting and related forest product activities have been important components of Oregon's economy as well. According to the Oregon Forest Resources Institute, in 2019, Oregon was the top softwood lumber-producing state in the country, as well as the top plywood-producing state, and Oregon had more than 61,000 forest sector jobs.[6] In fiscal year 2022, the Oregon Department of Forestry harvested approximately 198 board feet of timber, generating $95 million in net revenue; 36,900 (nearly 20 percent) of those board feet were harvested in Clackamas and Washington Counties.[7] Loss of productive timber lands to urbanization, and pressures of urbanization on forestry practices, can have adverse consequences on the state's and Metro region's forestry-related economy.

As also noted previously, there can be greater regulatory protections on the natural environment inside the UGB than in rural areas. When environmental protections of an area are increased by including the area in the UGB, that can be perceived as a loss of

[5] Oregon Agricultural Statistics, October 2021: https://www.nass.usda.gov/Statistics_by_State/Oregon/Publications/facts_and_figures/facts_and_figures.pdf

[6] https://site.oregonforests.org/sites/default/files/2021-01/OFRI_2021ForestFacts_WEB3.pdf

[7] https://www.oregon.gov/odf/Documents/workingforests/cftlc-annual-report-2022.pdf

some development/use potential. But this perceived loss must be balanced with the value – including economic value – of protecting open spaces and 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 is considered cost effective to concentrate development in areas where impacts to natural resources can be minimized and to avoid impacts that would require expensive restoration and mitigation.

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, and railroad ballast. Due to the finite nature of aggregate and the limited supply of aggregate mines located in the region, its value is expected to increase. Moreover, because of high transportation costs, it is most economical for the construction industry to use resources that are closest to where development is occurring. The value of the aggregate resource, the importance of this resource to the construction industry, and the costs involved with extraction and transportation underscore the economic importance of preserving aggregate mining. 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 recreation, open space, or general development. The presence of mineral and aggregate resource sites in reserves is noted as appropriate.

Factor 4: Compatibility of the proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

The fourth Goal 14 factor requires an analysis of the compatibility of proposed urban land uses (e.g., urban residential and employment-related development) with nearby agricultural and forest activities occurring on farm and forest land outside the UGB. The methodology for the analysis in this factor is the same as that which accompanied the legislative amendments to the UGB in previous years, including in 2018 and 2023.

The ODA's January 2007 study titled "*Identification and Assessment of the Long-term Commercial Viability of Metro Region Agricultural Lands*"[8] 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. In addition, in 2014 and 2015, Washington County completed issue papers that addressed natural buffers and compatibility between urban uses and agricultural practices that provide additional

[8] https://www.oregon.gov/aviation/AVB/Documents/2019/10_30/Read%20Ahead%20Materials/Board%20Packet%201%20of%202/Agenda%20Item%2020/12_City%20of%20Aurora%2010.1%20to%2010.4.2019/Comments%20from%20City%20of%20Aurora%2010.1.2019/20.%20Foundation%20Ag%20Land.pdf

information for determining compatibility between the two uses. The concepts and importance of buffering support the methodology used in this analysis.

Resource Land Zoning Data

The analysis in Factor 4 requires a review of certain land use activity on rural lands outside the UGB. Counties designate these lands as either resource land (farm and/or forest land) or "exception land" through their comprehensive planning processes, and their designations must be acknowledged by Oregon Department of Land Conservation and Development (DLCD). The term "exception land" refers to rural lands that have been granted an exception to the requirements in Statewide Planning Goals 3, *Agricultural Lands*, and 4, *Forest Lands*, for protection of lands for farming and forestry activities; exception lands are generally used for rural residential, rural commercial, or rural industrial purposes. Counties must go through a formal process of having these exception lands acknowledged. For purposes of Factor 4, farm and forest lands are those natural resource lands that are not exception lands.

Metro has identified these lands according to local zoning, which was obtained from regularly updated county records in Metro's RLIS. The zoning types and associated labels used differ from county to county. The resource land zoning designations shown in Table 4 below were used for this analysis.

Table 4 – County Resource Land Designations

County	Resource Land Designations
Clackamas	Exclusive Farm Use (EFU)
	Ag/Forest (AG/F)
	Timber (TBR)
Multnomah	Exclusive Farm Use (EFU)
	Multiple Use Forest (MUF)
	Commercial Forest Use (CFU, CFU-1, CFU-2, CFU-3, CFU-4, and CFU-5)
Washington	Exclusive Farm Use (EFU)
	Agriculture and Forest (AF20)
	Exclusive Forest and Conservation (EFC)

Agricultural and Forest Activities

Agricultural and forest activities occurring on these resource lands outside the UGB were interpreted from computerized aerial photographs taken in the year 2022. Metro recognizes that, depending on the season and the weather patterns of when a particular area's aerial images was taken, some crops may be young and difficult to identify. Agricultural crops that were observed were generally grouped into broad categories of

nursery stock, orchards, Christmas tree farms, row crops (e.g., corn, vineyards, caneberries, etc.), and field crops (e.g., grasses and grains).

Commercial forestry activities are particularly difficult to detect from aerial photos that represent a snapshot in time due to the very long timber harvest cycle, but some timber lots are nonetheless discernible from tax assessor ownership records and historic aerials. Metro recognizes that this evaluation may not precisely identify all commercial forestry activities.

Considering "Compatibility"

When evaluating the compatibility of urban land uses with agricultural and forestry activities, the following were considered:

- Increased traffic resulting from urbanization that may impede the movement of farm or forestry 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.
- Nuisance conflicts may arise between urban residents/business and rural farmers/foresters due to the dust, noise, and odors generated from and pesticides/chemicals used in farming and forestry practices.
- An increase in impervious surface generates additional stormwater runoff 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 can generate different levels and kinds of impacts. In addition, a farmer's crops may change over time to reflect market conditions, changes in weather trends, and other factors. 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.

RESULTS

A table summarizing the results of the Goal 14 boundary location factors analysis of all 27 urban reserves can be found in Attachment 3. The analysis clearly identifies the following seven urban reserves as unsuitable for urbanization in the short term:

- Boring
- Boring – Highway 26
- Damascus
- Norwood
- Rosemont
- Stafford
- Tonquin

These urban reserves are therefore not further evaluated for possible inclusion in the UGB in the Metro Code Factors analysis in Appendix 7A.

There are significant infrastructure hurdles that would need to be addressed prior to urban services, such as water and sanitary sewer services, being available for new urban development in the seven urban reserves listed above. For instance, the closest sanitary sewer services to the Boring and Damascus urban reserves is well over a mile away and sanitary sewer service for the Rosemont and urban reserves would need to flow through the Borland Urban Reserve, thus requiring the Borland urban reserve to be urbanized first.

As noted, the Goal 14 analysis's preliminary cost estimates for providing water, sanitary sewer, stormwater, and transportation services to new urban development in the 27 urban reserves were estimated using very general assumptions on future growth expectations. Detailed concept plans consistent with the requirements UGMFP Title 11 will develop refined cost estimates that better reflect the expected development pattern and uses and that take into consideration costs for infrastructure materials at the expected time of construction, which may be a number of years ahead.

ATTACHMENTS

Attachment 1: Map of Urban and Rural Reserves

Attachment 2: Goal 14 Boundary Location Factor Analysis Narratives (27, with maps):

- Beaver Creek Bluffs
- Bendemeer
- Bethany West
- Boring
- Boring – Highway 26
- Borland
- Brookwood Parkway (8B)
- Damascus
- David Hill
- Elligsen Road North
- Elligsen Road South
- Grahams Ferry
- Gresham East
- Henrici
- Holcomb
- Holly Lane – Newell Creek Canyon
- I-5 East – Washington County
- Maplelane
- Norwood
- Rosa
- Rosemont
- Sherwood North
- Sherwood South
- Sherwood West
- Stafford
- Tonquin
- Wilsonville Southwest

Attachment 3: Goal 14 Boundary Location Factors Analysis Results

Attachment 4: Mackenzie Utility Analysis Report

BEAVER CREEK BLUFFS URBAN RESERVE

Total Reserve Area	228 acres
Total Tax Lot Area in Reserve (without Right-of-Way)	224 acres
Gross Vacant Buildable Area	142 acres
Net Vacant Buildable Area	**106 acres**

The Beaver Creek Bluffs Urban Reserve is located along the bluffs south of Oregon City and is comprised of three disconnected "sub-areas". The western sub-area (approximately 163 acres) lies on both sides of S Central Point Road, above Beaver Creek to the south and the UGB to the north. This western sub-area is bisected by multiple powerline easements. The central sub-area (approximately 43 acres) sits between Mud Creek and a tributary of Beaver Creek, and is bounded by S Leland Road to the east, bluffs to the south and west, and the UGB to the north. A single three-acre tax lot separated from the rest of the central sub-area is located at the end of S McCord Road. The eastern sub-area (approximately 22 acres) is made up of one tax lot at the southwest end of S Century Drive and three other tax lots at the southwest end of Nobel Road. Of the roughly 228 total acres within these three sub-areas, 31 are constrained by steep slopes of 25 percent or greater. The remainder of the reserve is generally flat.

GOAL 14 BOUNDARY LOCATION FACTORS

Factor 1: Efficient accommodation of identified land needs

The Beaver Creek Bluffs Urban Reserve is comprised of 43 tax lots, which have a combined area of approximately 224 acres within the reserve. According to aerial images, most of the smaller tax lots have rural residential uses or other structures that are at least 20 years old, and some of the larger tax lots do appear from aerial images to have minor agricultural activities. As noted above, the entire reserve contains 142 gross vacant buildable acres and 106 net vacant buildable acres.

This reserve is not a cohesive unit of land, but rather is composed of the three disconnected sub-areas described above. The eastern sub-area contains four tax lots that are entirely within the reserve and range in size from three to eight acres each. The central sub-area contains at least a portion of 17 tax lots, with the in-reserve portion of all but one of these tax lots less than five acres in area. The reserve's remaining tax lots in the western sub-area are nearly entirely within the reserve and range from less than one acre in area to nearly 40 acres. Twenty-six of the reserve's tax lots have improvements, with a median assessed value of those tax lots' improvements being nearly $307,000; 17 of the tax lots have improvements assessed at more than $250,000. There are three sets of powerlines running through the western sub-area and crossing through six tax lots.

Several streets within the UGB stub or otherwise connect to the reserve, including S Central Point Road, Kolar Drive, S White Lane, Cypresswood Street, S Century Drive, and Nobel Road. The nearest transit stop and employment areas to the reserve are about a mile from the eastern sub-area. The nearest highway, Highway 213, is more than a mile away and the nearest interstate, I-205, is several miles away. Wesley Lynn Park is approximately a quarter mile from the central sub-area.

The Mahonia Land Trust Conservancy owns a large parcel immediately adjacent to the eastern edge of the western sub-area.

Given the relatively small size of the three sub-areas, their location on a flatter "bench" at the top edge of a steep-sloped area, their proximity of parks and natural areas and distance from highways, and their location adjacent to existing residential development and street stubs, this reserve is considered able to efficiently accommodate a residential land need, but not an employment land need.

Factor 2: Orderly and economic provision of public facilities and services

Water Services

With regard to water services, the Beaver Creek Bluffs Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

The City of Oregon City serves lands within their corporate boundary. Lands within the jurisdiction of Clackamas County are served by Clackamas River Water (CRW). Both Oregon City and the CRW South System receive water from the South Fork Water Board (SFWB). SFWB's water treatment process includes flocculation, sedimentation, filtration, and chlorination of raw water from the Clackamas River to remove harmful bacteria. There are currently no known major treatment system deficiencies.

The existing city and CRW water distribution facilities are understood to have capacity to serve areas already inside the UGB. Under existing conditions, the Boynton, Henrici, and Mountainview reservoirs have a combined storage surplus of 5.89 MG and the Mountainview Pump Station has a surplus of 3,409 GPM. According to the Oregon City Master Plan, the existing Oregon City distribution system performs adequately, with fire flow deficiencies generally isolated to small diameter or dead-end pipes. There are plans to construct a backbone connecting the South System to the North System and the CRW water treatment plant in the future.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

CRW has done planning for service to the area of the Beaver Creek Bluffs Urban Reserve, and most the reserve is in CRW's service area. However, CRW will not likely be the service provider once the reserve is annexed to a city (i.e., Oregon City) and urbanized. Rather, when Oregon City annexes the reserve, the city will likely take ownership of any water related infrastructure within the area, except potentially for facilities that are needed to go beyond the annexed area, such as large-scale transmission lines. Accordingly, CRW, like many water service providers, may be cautious about investing in improvements for currently rural areas that may one day be annexed to cities. While there is some surplus storage and pumping capacity that could be available to serve

urban development of the reserve, once annexed to the city, that surplus is likely insufficient and additional storage and pumping facilities may be necessary. The existing distribution system, however, may be adequate to serve development of the reserve, with fire flow deficiencies generally isolated to small diameter or dead-end pipes.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

As noted above, there are distribution networks in place for the wider area that are expected to be able to serve the reserve without significant upgrades; however, it is likely that Oregon City will need to provide new facilities for storage and pumping.

d. Estimated water service-related costs for reserve development

Water piping, pumping, and storage costs	Cost
10-inch pipe	$0.91 million
12-inch pipe	$0
16-inch pipe	$0
Pumping	$4.06 million
Storage	$0.15 million
Total:	**$5.12 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$2,418**

Sanitary Sewer Services

With regard to sanitary sewer services, the Beaver Creek Bluffs Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Oregon City provides sanitary sewer service to properties within its corporate limits, as well as to some properties near the reserve that are already in the UGB but still in unincorporated Clackamas County. Wastewater flows to the Tri-City Sewer District (TCSD) trunks, interceptors, and, eventually, the Tri-City Water Resource Recovery Facility (WRRF), all of which are owned and operated by Water Environment Services (WES).

Some surcharging, ranging from minor to severe, exists throughout the existing city collection system. There are also known capacity deficiencies in several locations in the WES system. Two of the 12 existing pump stations (Settler's Point and Cook Street) have existing peak flows that exceed their firm capacity. The Parish Road Pump Station has a total capacity of 760 GPM and a future demand of 535 GPM, leaving a surplus of 225

GPM. The Nobel Ridge Pump Station has a total capacity of 140 GPM and a future demand of 55 GPM, leaving a surplus of 85 GPM. There are several locations within the existing system that have predicted flooding under future conditions.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Additional growth beyond the current UGB is going to challenge the existing sanitary sewer system due to the existing deficiencies and limited capacity of major treatment and conveyance facilities. While the Parish Road Pump Station and the Nobel Ridge Pump Station have capacity surpluses, these surpluses are likely not significant enough to serve urban development of the reserve.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Development of the reserve is expected to contribute to further surcharging. New pumping facilities will also likely be needed.

d. Estimated sanitary sewer service-related costs for reserve development

Sanitary sewer piping and pumping costs	Cost
10-inch pipe	$3.93 million
12-inch pipe	$0
15-inch pipe	$0
Pump station	$1.26 million
Force mains	$1.61 million
Total:	**$6.8 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$3,216**

Stormwater Management Services

With regard to stormwater management services, the Beaver Creek Bluffs Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

The City of Oregon City's 2019 Stormwater Master Plan identifies certain system issues related to flooding, infrastructure, maintenance, or natural channels. An undersized conveyance system in the vicinity of Central Point Road is further complicated by a series of irregular flow patterns and structure connections. There are concerns about the ongoing capacity of the Coffee Creek area near Hazelwood Drive. The Plan also identifies a need for an upsized conveyance system in the South End Basin to support future development and expansion of South End Road. Capital improvement projects are identified to address these issues.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The system issues noted above could be exacerbated if future Beaver Creek Bluffs urban development is connected to that system. However, capital improvement projects are planned for that existing system and stormwater from Beaver Creek Bluffs urban development may be conveyed, treated, and disposed of within the reserve itself; therefore, it is not anticipated that existing facilities would necessarily be utilized or further challenged.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Stormwater will likely be detained and treated within the reserve and, based on topography, outfall directly to Mud Creek and tributaries of Beaver Creek; therefore, no impacts to the existing stormwater infrastructure in the UGB are anticipated.

d. Estimated stormwater service-related costs for reserve development

Stormwater piping and water quality/detention	Cost
18-inch pipe	$3.2 million
24-inch pipe	$1.74 million
30-inch pipe	$0
Water quality/dentition	$1.13 million
Total:	**$6.07 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$2,870**

Transportation Services

With regard to transportation services, the Beaver Creek Bluffs Urban Reserve is given a "low-medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(e) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Figure 4.36 in Chapter 4 of the 2023 Regional Transportation Plan (RTP) displays 2020 home-based vehicle miles traveled (VMT) per capita by Metro transportation analysis zone, with average VMT per capita considered 11.32. According to Figure 4.36 in Chapter 4, areas in the UGB adjacent to the Beaver Creek Bluffs Urban Reserve had a home-based VMT per capita in 2020 that was significantly above the regional average.

Metro's adopted 2040 Growth Concept Map designates a regional center in the adjacent City of Oregon City. Regional centers are generally meant to: serve populations of hundreds of thousands of people; surround high-quality transit service and multi-modal

street networks; and offer larger commercial uses, healthcare facilities, local government services, and public amenities. The Oregon City Regional Center aligns with the 2040 Growth Concept Map designation.

The City of Oregon City's plans for the Oregon City Regional Center include mixed-use development, enhancements to the main street, and the creation of new open spaces that will provide direct connections to the river. The regional center is also home to Willamette Falls and the Willamette Falls Legacy Project, a public/private partnership working to connect the Falls to Downtown Oregon City through the development of housing, public spaces, habitat restoration, education, and employment opportunities. The regional center currently has a drug store, restaurants, and other retail commercial uses, banks, medical/dental facilities, community centers, government offices, and auto-oriented uses. Metro's 2017 State of the Centers Atlas showed less than 400 people living in the regional center, as well as a low population density (5.2 people per acre), low total employees, and low dwelling unit density compared with other regional centers; in fact, the average population of all regional centers in 2017 was more than 6,000 people and the average population density was 22.8 people per acre. The city's vision to attract more housing and employees to the regional center will elevate it to the activity spectrum levels comparable to other regional centers in the region.

There are also employment uses, including industrial uses, grocery stores, and other commercial uses, as well as education and medical facilities, government offices, and parks, closer to the reserve in the Red Soils area near the intersection of Beavercreek Road and Molalla Avenue and between Highway 213 and Beavercreek Road.

Growth in and near the regional center and other employment areas will not necessarily cause a significant increase in home-based VMT per capita in the future, as area residents will be able to access some daily needs and find employment opportunities with relatively short trips. The transit service and bike and pedestrian facilities that serve these areas, described further below, can also help to ensure that additional growth nearby does not adversely impact home-based VMT per capita.

Four TriMet bus lines serve Oregon City, all of which generally focus on the regional center and the central portion of the city along Molalla Avenue. Service is provided to Clackamas Community College and the employment areas near the intersection of Beavercreek Road and Molalla Avenue and between Highway 213 and Beavercreek Road; however, large portions of the City, including a roughly three-square-mile residential area in the UGB north of the reserve, are not served by TriMet. Figure 4.3 in Chapter of the 2023 RTP indicates that there are gaps in planned frequent regional transit service network along certain routes in the UGB near the reserve, including along Leland Road, S Meyers Road, and South End Road.

Oregon City has at least 29 miles of dedicated bike lanes and 3.5 miles of established bikeways, with most of them located in the "up-top" section (southern end) of the City. The Park Place neighborhood is also fairly well served and Highway 213 has dedicated

bike lanes. Most of the downtown streets are classified as "bike with caution" streets and the South End neighborhood has minimal bike facilities. There are dedicated bike facilities along most of Beavercreek Road and Molalla Avenue, as well as on a few streets in the UGB nearer to the reserve, including Frontier Parkway, S Meyers Road, and South End Road. Those existing bike facilities on Beavercreek Road, Molalla Avenue, S Meyers Road, South End Road, and others in the City are identified as part of the regional bike network on Figure 4.5 in Chapter 4 of the 2023 RTP. However, the figure also identifies gaps in the planned regional network in areas near the reserve and areas closer to the regional center.

The regional center is well served by sidewalks, as are employment areas near the intersection of Beavercreek Road and Molalla Avenue and between Highway 213 and Beavercreek Road. Much of the residential areas in the UGB near to the reserve also have sidewalks. However, there are a number of pockets of older subdivisions that do not yet have sidewalks. Of the roads in the UGB near the reserve, S Finnegans Way, S Impala Lane, South End Road, and Wheeler Farm Road have sections lacking complete sidewalks on both sides. Chapter 4, Figure 4.4 of the 2023 RTP identifies gaps in the planned regional pedestrian network along S Central Point Road, Leland Road, and South End Road. There are also gaps in the planned regional trail network in the UGB near the reserve, as indicated in Chapter 4, Figure 4.6 of the 2023 RTP.

Figure 4.14 in Chapter of the 2023 RTP identifies Molalla Avenue inside the UGB as a high injury corridor.

The sections of Highway 99E, Highway 213, and I-5 in Oregon City are identified as a throughways Chapter 4, Figure 4.7 of the 2023 RTP. Figure 4.8 of that chapter indicates that these highway sections currently meet travel speed reliability performance thresholds, with no more than four hours per day when travel speeds fall below the identified minimum speed. RTP models indicate this reliability will continue at least to the year 2045.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Highway 213 is the nearest RTP-designated throughway to the reserve, but is more than one mile away. As noted above, the section of the highway in the City currently meets travel speed reliability performance thresholds. Considering the distance of the reserve to this highway, and the relatively small size of the reserve, development of the reserve is not expected to jeopardize the throughway reliability of the highway.

There is currently no TriMet bus service to the reserve. The nearest stop is on Molalla Avenue, roughly one mile from the eastern sub-area of the reserve; the nearest stop to the western sub-area is nearly two miles away on Warner Milne Road.

There are no existing dedicated bike facilities on roads adjacent to the reserve. The closest bike lanes to any of the reserve's sub-areas are on Frontier Parkway, Leland Road, S Meyers Road, and South End Road, each generally about a quarter of a mile from

a reserve sub-area. Central Point Road has been classified as a "bike with caution" street.

Many of the local residential streets stubbing to the reserve have sidewalks, including Cypresswood Street, Derringer Drive, Kolar Drive, Myrtlewood Way, Nobel Road, and Parrish Road. White Lane, stubbing to the western sub-area, appears to have sidewalks only on one side. However, there are gaps in the pedestrian connections between the adjoining residential neighborhoods and other areas of the City.

It was noted in response to Factor 1 that the reserve is not likely to be able to efficiently accommodate an employment land need, but could support a small residential land need. However, the regional center is approximately three miles to the reserve via either S Central Point Road or S Leland Road, and then by S Linn Avenue and the eastern sub-area is roughly a mile from the commercial uses on Molalla Avenue. Considering the distance between the reserve and areas where future residents could access daily services and employment opportunities, and considering the lack of direct transit service and connecting bike facilities, it is likely that future residents will rely primarily on private motor vehicle transportation.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

S Central Point Road, S Century Drive, Leland Road, S McCord Road, Molalla Avenue, Myrtlewood Way, Nobel Road, and Orchard Grove Drive would be expected to see additional private vehicle traffic from development of the reserve. Existing bike and pedestrian facilities nearby would also be expected to see additional use.

As noted above, future residents of the reserve will likely rely primarily on private motor vehicle transportation to access their daily needs and employment opportunities. However, in part given the relatively small size of the reserve, it is not expected that development of the reserve would significantly increase home-based VMT per capita of the area. Considering the distance of the reserve to Highway 213, development of the reserve is also not expected to jeopardize this highway's throughway reliability. Any additional motor vehicle traffic on Molalla Avenue resulting from development of the reserve, however, may exacerbate its high-crash conditions.

d. Need for major transportation facility improvements and associated costs

A preliminary analysis's illustration of road network improvements potentially needed to serve urban development of the reserve is included in a following map. A roughly 0.26-mile section of S Central Point Road and a 0.31-mile length of Parrish Road may need to be improved to urban collector standards to serve the western sub-area, including with acquisition of some additional right-of-way for each road. The needed Parrish Road improvements are considered half-street improvements in this analysis, as a portion of the relevant roadway section is already inside the UGB. A new collector, extending south from Parrish Road through the western sub-area and ultimately arcing west through the UGB to connect with S South End Road, may also be needed; the nearly

half-mile-long portion of this new collector's length within/adjacent to the reserve is figured in the costs below. Some of the transportation facility improvement costs will be higher than normal on a per-mile basis due in part to topography.

Facilities	Cost
Arterials, existing/improved full street	$0
Arterials, existing/improved half street	$0
Arterials, new	$0
Collectors, existing/improved full street	$6.99 million
Collectors, existing/improved half street	$7.78 million
Collectors, new	$23.41 million
Total:	**$38.18 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$18,043**

e. Provision of public transit service

TriMet evaluated the reserve for providing transit service. Actual service will depend, in part, on the level of development in the reserve and in the corridors leading to it. Nonetheless, in TriMet's review of planned and conceptual roads in the reserve, and the dispersed natured of the reserve, they determined that transit service may not be supportable. There are few corridors into/around the reserve and on the adjacent lands that would be required to support transit service.

Prior to land being included in the UGB, a more detailed concept plan, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11, will be required. This concept plan process will develop more refined public facility and service needs and cost estimates.

Factor 3: Comparative environmental, social, energy, and economic consequences

Environmental consequences

Approximately 327 feet of Mud Creek flows through a ravine on the edge of the eastern sub-area of the Beaver Creek Bluffs Urban Reserve. About 2,100 feet of an unnamed stream also flows south through the western sub-area; a 900-foot segment of this stream, including an associated 1.5-acre National Wetland Inventory wetland, is located on the flat portion of the sub-area above the bluff. Riparian and upland habitat are identified along both stream segments.

Urbanization may impact the stream, wetland, and upland habitat areas on the flatter portion of the western sub-area, but the remainder of the unnamed stream flows through a wooded sloped area and would be minimally impacted by urbanization of the western sub-area. Mud Creek and its associated habitat areas would be less impacted by urbanization, in part because the stream is located over 200 feet from the flat portion of the eastern sub-

area were development would likely occur. There are no currently identified streams or wetlands in or near the central sub-area.

Inclusion in the UGB will provide some increased protection for streams, habitat areas, and floodplains, but there may be some impacts. Overall, development of this urban reserve is considered to have comparatively low environmental consequences, particularly for the streams and wetlands described above. Additional environmental consideration, however, specifically regarding avoidance of conflict between urban development and regionally significant fish and wildlife habitat, is provided in the Metro Code Factors Analysis (Appendix 7A).

Considering the comparative environmental consequences of urbanization, the Beaver Creek Bluffs Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Social, energy, and economic consequences

As noted above, this reserve is made up of three very small and disconnected sub-areas. Over half of the reserve is adjacent to existing urban residential subdivisions, with much of the remaining reserve's area adjacent or nearly adjacent to undeveloped urban land zoned largely for low density residential uses. The primary land use in this rural reserve is rural residential development, with the majority of tax lots already having improvements. Existing urban streets provide access to the reserve's tax lots. Urbanization of the reserve will not cause significant changes for current residents of the reserve or for the wider area. Indeed, the small sub-areas are, in some senses, already more urban than rural due to their existing development and proximity to urban development.

As detailed more fully in response to Factor 2, it is likely that future residents of the reserve will rely primarily on private motor vehicle transportation, which will have some energy consequences.

There are comparatively minimal agricultural activities occurring in this reserve and urbanization would result in a relatively small loss of farm-related economic activity.

This analysis finds that, in part because of the reserve's small buildable area, there would be comparatively low social, energy, and economic consequences from urbanization of this reserve. The Beaver Creek Bluffs Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Factor 4: Compatibility of the proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

All of the land outside of the UGB adjacent to the Beaver Creek Bluffs Urban Reserve has Goal 3 or 4 resource land zoning by Clackamas County for agricultural and forest activities, specifically with Exclusive Farm Use (EFU) or Timber (TBR) designations. There are significant slopes along almost the entire southern edge of the reserve's sub-areas; these slopes are generally forested, except

where abutting a powerline easement. Neighboring EFU-zoned land located between the western sub-area and Beaver Creek contains pockets of forest, some rural residences, and very limited agricultural activities consisting of largely of pastureland. Beaver Creek itself provides a natural boundary between a larger tract of EFU-zoned land to the south that also appears to include nursery operations. The majority of the TBR-zoned land adjacent to the reserve drops steeply to the south away from the reserve's sub-areas. Most of these TBR-zoned tax lots include rural residences and streams, including Mud and Canfield Creeks.

Due to the limited nature of the nearby agricultural and forest activities, the number of existing rural residences spread throughout the resource lands, the relatively small developable area of the reserve, and the natural barrier created by topography and water bodies, urban uses of the reserve would have high compatibility with the nearby agricultural and forest activities occurring on farm and forest land.

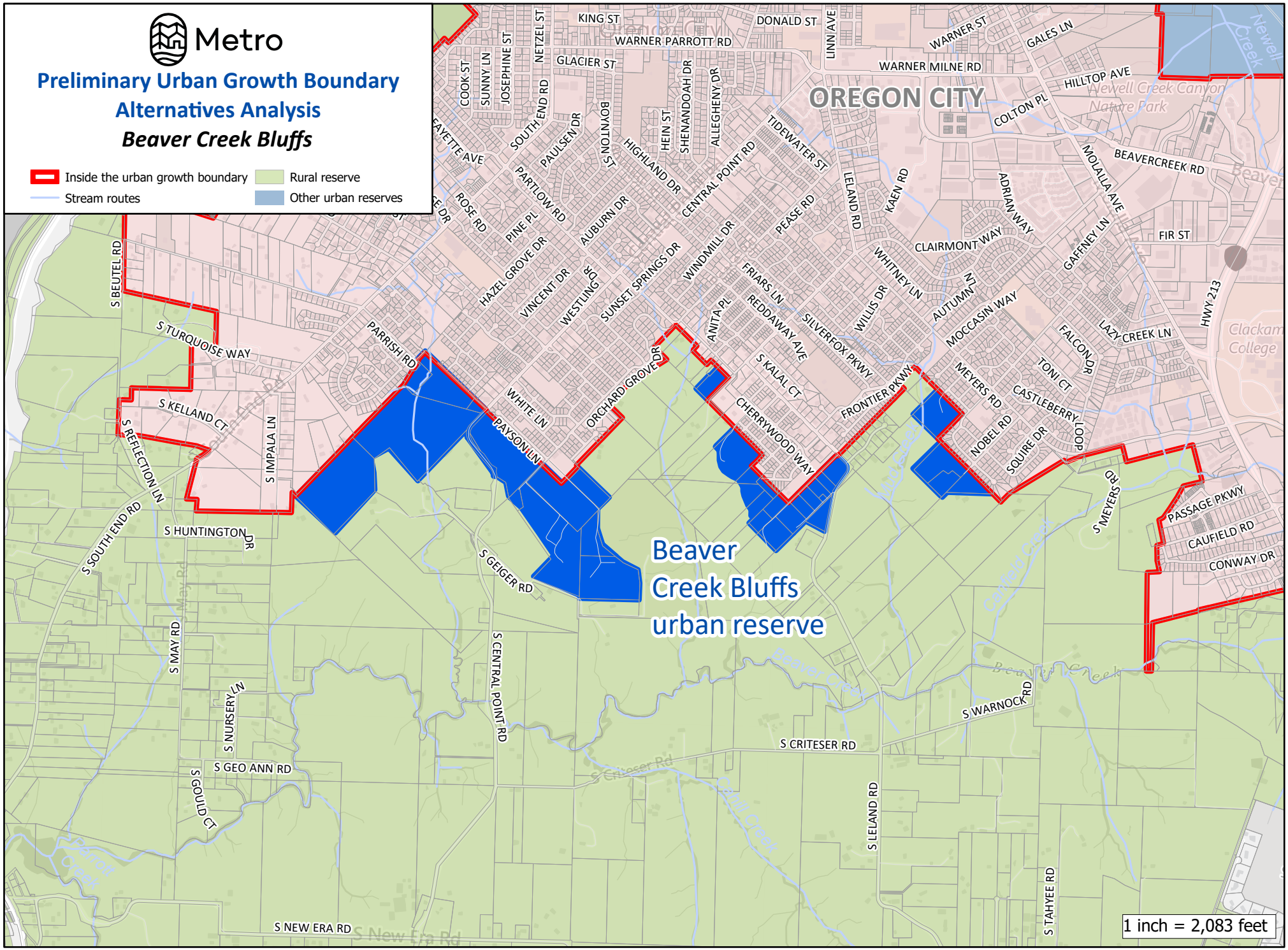
The Beaver Creek Bluffs Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location factor.

Metro

Preliminary Urban Growth Boundary Alternatives Analysis

Beaver Creek Bluffs

Inside the urban growth boundary
Rural reserve
Stream routes
Other urban reserves



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Metro

Preliminary Urban Growth Boundary Alternatives Analysis

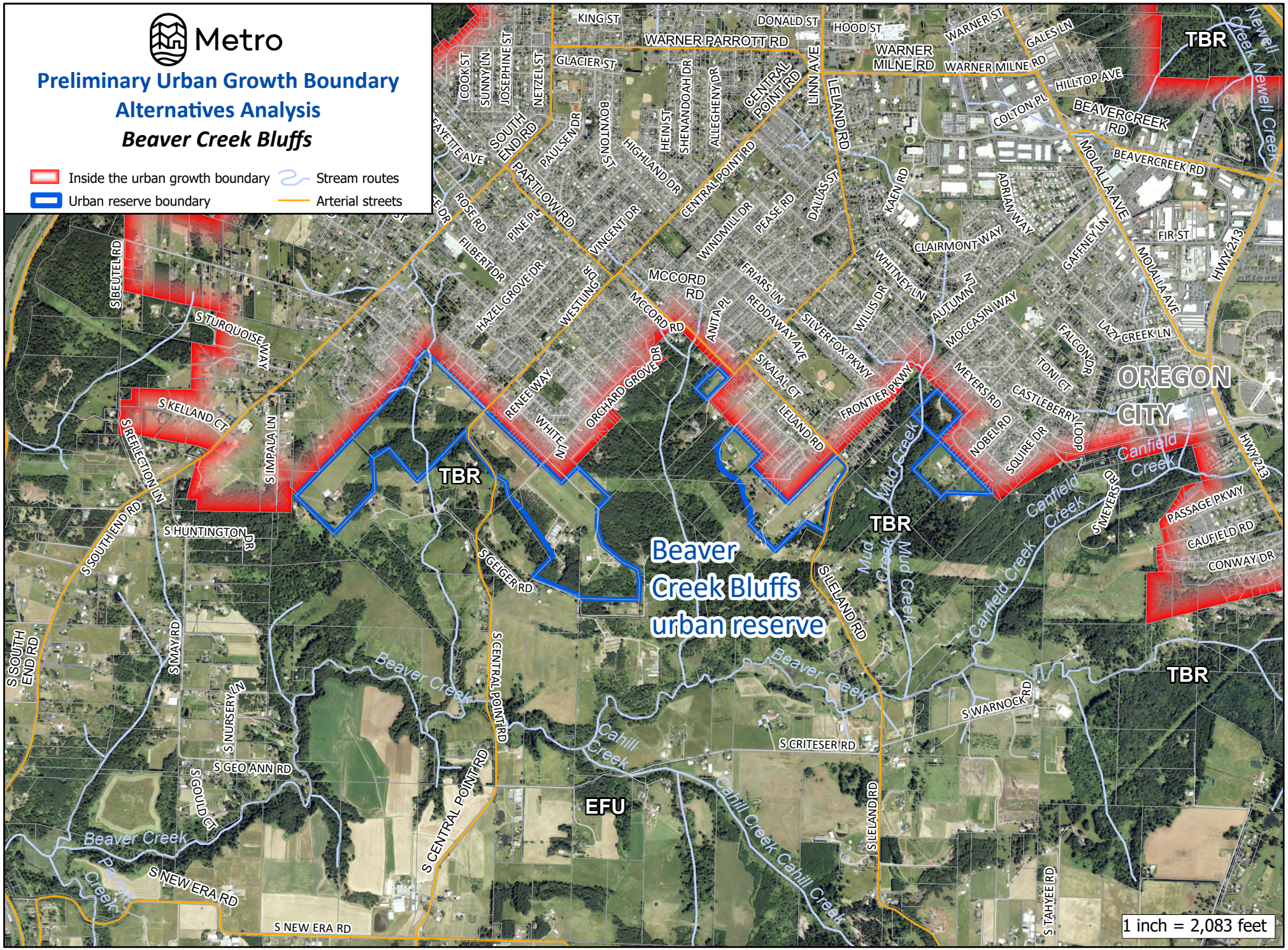
Beaver Creek Bluffs

Inside the urban growth boundary

Urban reserve boundary

Stream routes

Arterial streets



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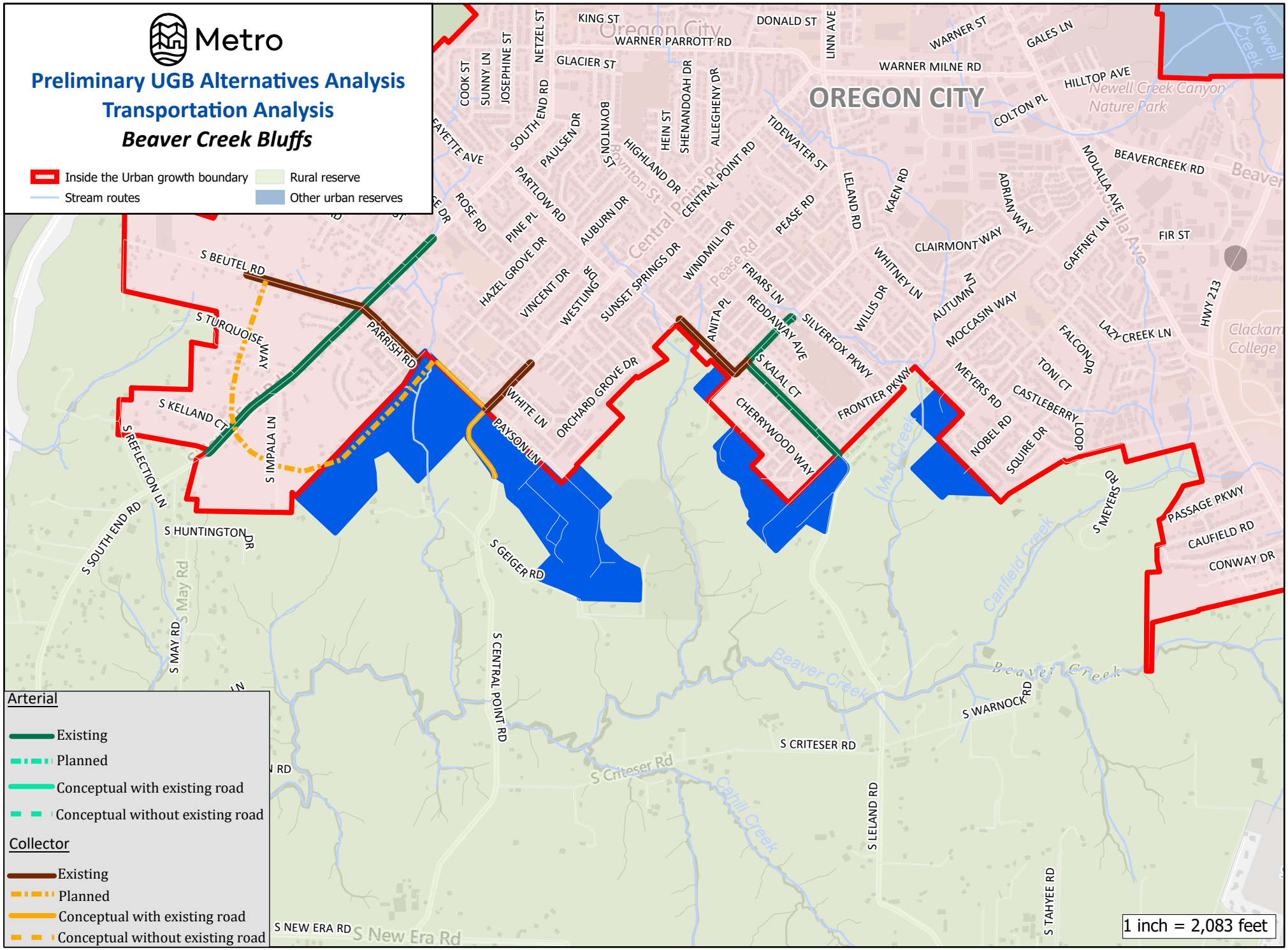

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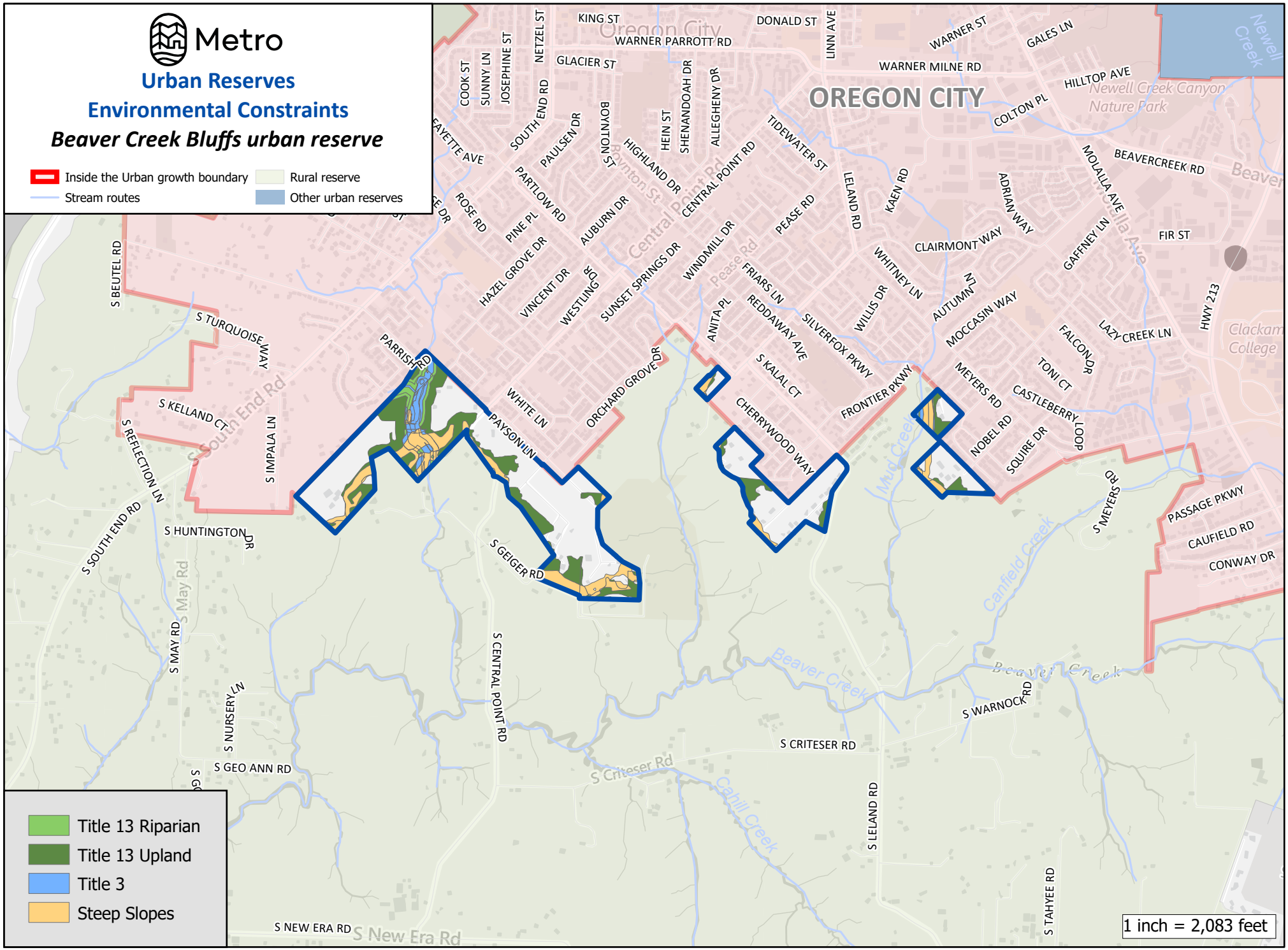

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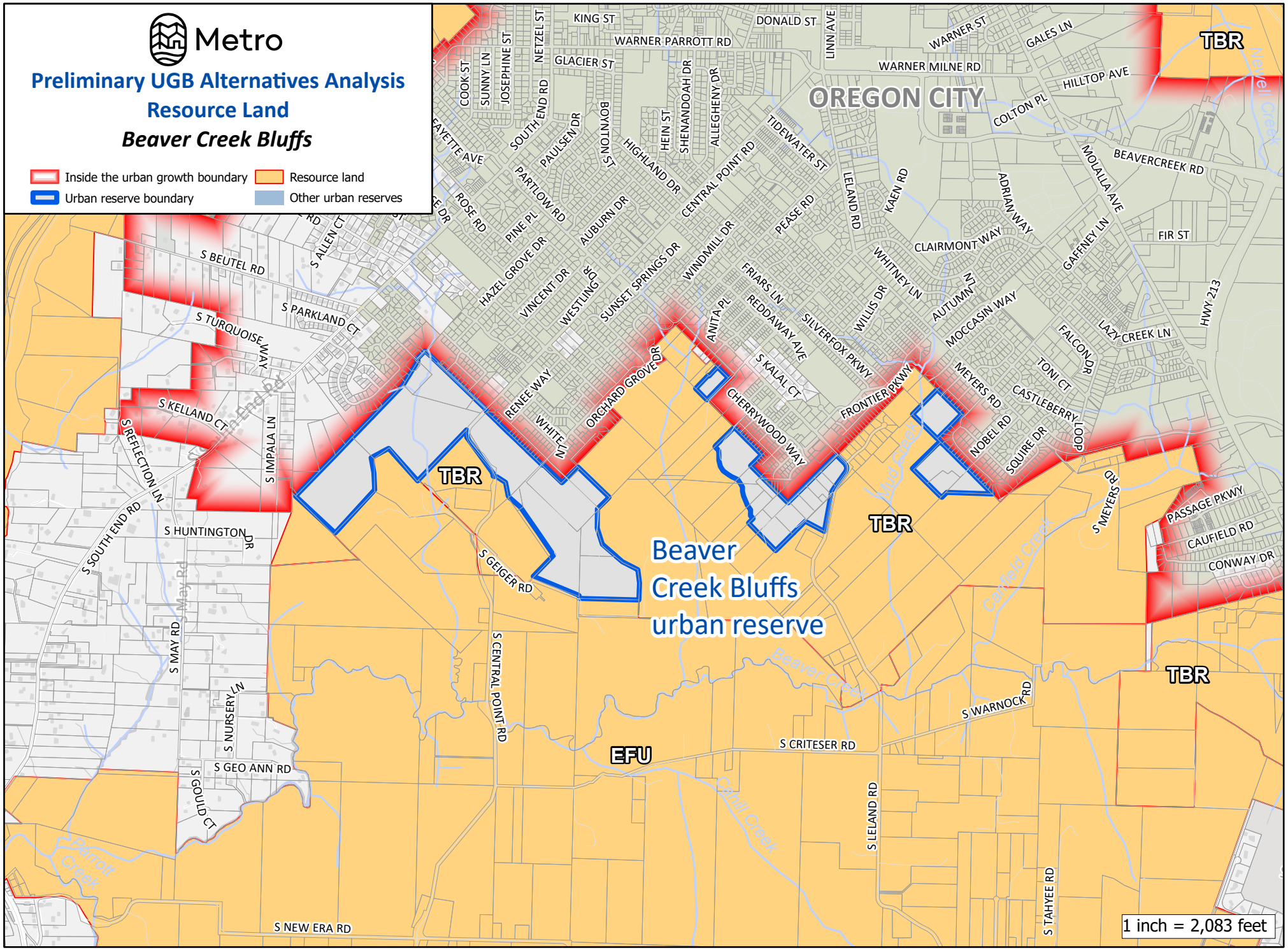

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BENDEMEER URBAN RESERVE

Total Reserve Area	573 acres
Total Tax Lot Area in Reserve (without Right-of-Way)	545 acres
Gross Vacant Buildable Area	318 acres
Net Vacant Buildable Area	**237 acres**

The Bendemeer Urban Reserve is north of NW West Union Road between NW Bendemeer Road and NW 185th Avenue. The UGB is the reserve's eastern and southern boundaries and rural reserves are to the west and north. Most of the adjacent land within the UGB is in the corporate limits of the City of Hillsboro, while the remainder is in unincorporated Washington County. Holcomb Creek and Holcomb Lake form a portion of the northern edge of the reserve. Access to the reserve is provided by NW West Union Road, NW Cornelius Pass Road, and NW 185th Avenue.

GOAL 14 BOUNDARY LOCATION FACTORS

Factor 1: Efficient accommodation of identified land needs

The Bendemeer Urban Reserve is comprised of 73 contiguous tax lots, all but four of which are entirely within the reserve. Of those tax lots entirely within the reserve, nearly 60 percent are less than two acres, more than 80 percent are less than five acres, four are larger than 40 acres, and one is nearly 120 acres. The four tax lots only partially within the reserve each have area within the reserve ranging from nearly four acres to 30 acres. The combined tax lot area for the whole reserve is approximately 545 acres. As noted above, the reserve contains 318 gross vacant buildable acres and 237 net vacant buildable acres.

The western portion of the reserve between NW Bendemeer Road and NW Cornelius Pass Road is developed with rural residences on smaller wooded tax lots, though aerial imagery indicates a few tax lots in this area are engaged in agricultural activity. The area between NW Cornelius Pass Road and NW 185th Avenue, however, is almost entirely in agricultural use, with the exception of a local retail commercial use at its southeast and sections with natural resources (e.g., wetlands and riparian habitat), including a 32-acre Metro-owned tax lots reserved as a natural area along Holcomb Creek. Assessment records suggest that this Metro-owned property may be the only publicly-owned tax lot in the reserve. Overall, 58 of the reserve's tax lots have assessed improvements, with the median assessed value of those tax lots' improvements exceeding $560,000.

At its south, the reserve abuts existing urban low density residential development, multifamily housing, utility facilities, and commercial and industrial uses. Liberty High School, Westview High School, and Lenox Elementary School are all about half a mile of the reserve and the Portland Community College Rock Creek Campus is located on the opposite side of NW 185th Avenue. Bethany Lake Park, Northwest Park, the Rock Creek Country Club, other recreational facilities are also within half a mile of the reserve. Highway 26 is less than a mile away via NW Cornelius Pass

Road. TriMet Route 52 has a stop at the reserve's southeast corner at the intersection of NW West Union Road and NW 185th Avenue.

East of NW Cornelius Pass Road, stream corridors dissect the reserve into a few large locations of relatively flat land that could accommodate residential and employment development. Residential development could be supported by nearby schools, recreational uses, and commercial uses and could be cohesive with the nearby existing residential uses. Employment uses could benefit from the relatively close access to the highway and transit, and could potentially develop on the tax lots that are larger than 30 acres. Therefore, this area is considered able to accommodate both residential and employment land needs.

Factor 2: Orderly and economic provision of public facilities and services

Water Services

With regard to water services, the Bendemeer Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Adjacent lands inside the UGB are served by the Tualatin Valley Water District (TVWD), which purchases water from the Portland Water Bureau (PWB) and the Joint Water Commission (JWC). According to TVWD, the water from PWB currently accounts for nearly three-quarters of TVWD's supply; this water primarily comes from the Bull Run watershed, is piped to a 50-million gallon storage reservoir on Powell Butte on the east side of Portland, and is treated with chlorine and ammonia. PWB also obtains water from wells and aquifers in the Columbia South Shore Wellfield. JWC, which is jointly owned by TVWD and the Cities of Hillsboro, Beaverton, and Forest Grove, obtains water from Hagg Lake (Scoggins Reservoir) and the Barney Reservoir released into the upper portion of the Tualatin River. When flows are available, water from the Tualatin River is used. It is then withdrawn and filtered through the JWC water treatment plant. Chlorine and pH adjustments are added before leaving the plant, where chlorine and pH adjustments are added to the water. TVWD is working on a new Willamette River sourced water supply system; that expanded system is expected to be online in 2026 and will allow TVWD to transition off its PWB supply, though an emergency connection to the PWB system will remain in the event of a regional water emergency.

According to TVWD, they: maintain more than 700 miles of pipe and 12 pumping stations; have a gravity line capacity of 42.3 MGD, with another 10 MGD available from JWC; can access emergency standby pumping with a capacity of 20 MGD when needed to back up the gravity flow main; and utilize a storage system with 22 active covered reservoirs with a combined storage capacity of about 65 million gallons.

TVWD has indicated that there is sufficient capacity in terms of water supply, treatment, storage, and piping to serve areas that are both within the current UGB and in their service district.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

TVWD is understood to have the system capacity to serve urban development of the Bendemeer Urban Reserve, though some local pipe upsizing may be necessary.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

It does not appear at this time that TVWD's water facilities already inside the UGB will experience marked impacts resulting from being connected to new urban development in the Bendemeer Urban Reserve, though, as noted above and depending on specific future urban land uses and other regional development patterns, there may be some pipe and other facility upsizing needed to ensure not adverse impacts to areas already inside the UGB.

d. Estimated water service-related costs for reserve development

Water piping, pumping, and storage costs	Cost
10-inch pipe	$3.31 million
12-inch pipe	$0
16-inch pipe	$0
Pumping	$0
Storage	$0.32 million
Total:	**$3.63 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$698**

Sanitary Sewer Services

With regard to sanitary sewer services, the Bendemeer Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Clean Water Services (CWS) provides sewer service in the adjacent areas of the UGB in unincorporated Washington County. The City of Hillsboro has existing facilities that extend near the intersection of NW West Union Road and NW Cornelius Pass Road, which feed into the CWS system. CWS provides wastewater treatment at the Rock Creek Wastewater Treatment Plant. The treatment plant is understood to have sufficient capacity to serve lands already inside the UGB. An existing 24-inch sanitary trunk line

running parallel to Rock Creek, a likely point of connection for development in the Bendemeer Urban Reserve, is also believed to have adequate capacity.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The topography of the reserve suggests that sewer from development of the reserve will likely flow from the eastern portion of the reserve toward the existing 24-inch CWS Rock Creek trunk line. Development in the western portion of the reserve, however, may flow toward NW Cornelius Pass Road. As noted above, the City of Hillsboro has existing sewer pipes near the intersection of NW West Union Road and NW Cornelius Pass Road.; these pipes range in size from eight inches to 18 inches in diameter and ultimately to the CWS trunk line. The additional capacity within the existing pipes is not fully known at this time, but it is believed to be adequate to serve development of the Bendemeer Urban Reserve. CWS has previously indicated that there is additional capacity at the Rock Creek treatment plant as well.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Impacts to the treatment plant are expected to be minimal with no anticipated major upgrades needed due to the possible amount of development from the relatively small amount of buildable land in the reserve. The amount of upsizing, if any, that would be needed is not fully known at this time, but CWS is expected to address infrastructure needs to accommodate planned growth.

d. Estimated sanitary sewer service-related costs for reserve development

Sanitary sewer piping and pumping costs	Cost
10-inch pipe	$3.82 million
12-inch pipe	$0
15-inch pipe	$0
Pump station	$1.44 million
Force mains	$1.02 million
Total:	**$5.85 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$1,233**

Stormwater Management Services

With regard to stormwater management services, the Bendemeer Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

There is no indication of significant challenges with existing stormwater management facilities being able to serve existing development in adjacent areas inside the UGB.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Stormwater related to new development in the Bendemeer Urban Reserve is expected to be conveyed, treated, and disposed of within the reserve itself and/or outfall directly to nearby creeks, rather than relying on existing facilities already in the UGB.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

As noted above, stormwater related to new development in the Bendemeer Urban Reserve is expected to be conveyed, treated, and disposed of within the reserve itself and/or outfall directly to nearby creeks, rather than relying on existing facilities already in the UGB. Therefore, no adverse impacts to existing facilities serving areas already inside the UGB are anticipated.

d. Estimated stormwater service-related costs for reserve development

Stormwater piping and water quality/detention	Cost
18-inch pipe	$3.44 million
24-inch pipe	$1.45 million
30-inch pipe	$0
Water quality/dentition	$8.94 million
Total:	**$13.83 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$2,917**

Transportation Services

With regard to transportation services, the Bendemeer Urban Reserve is given a "medium-high" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(e) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Figure 4.36 in Chapter 4 of the 2023 Regional Transportation Plan (RTP) displays 2020 home-based vehicle miles traveled (VMT) per capita by Metro transportation analysis zone, with average VMT per capita considered 11.32. According to Figure 4.36 in Chapter 4, areas in the UGB adjacent to the Bendemeer Urban Reserve had average, above average, and significantly above average home-based VMT per capita in 2020.

Metro's adopted 2040 Growth Concept Map designates two regional centers and separate town centers in the City of Hillsboro, as well as a town center in unincorporated Washington County within the UGB and near to the reserve. Regional

centers are generally meant to: serve populations of hundreds of thousands of people; surround high-quality transit service and multi-modal street networks; and offer larger commercial uses, healthcare facilities, local government services, and public amenities. Town centers are meant to: serve populations of tens of thousands of people; offer more locally-focused retail uses and public amenities; and be well served by transit. The Bethany Town Center in unincorporated Washington County and the Tanasbourne/Amber Glen Regional Center in Hillsboro are the closest 2040 Growth Concept designated centers to the Bendemeer Urban Reserve.

The Bethany Community Plan calls for a mix of local retail and small community-based office uses in the Bethany Town Center that provide a community village atmosphere. The town center is almost completely built out with a mixture of housing types, a grocery store, banks, restaurants, an athletic club, a library, a place of worship, and a small amount of other employment/institutional uses, including a Providence medical facility. The town center scored very high in Metro's 2017 State of the Centers Atlas for parks access and sidewalk and bike route density.

The Tanasbourne/Amber Glen Regional Center is a mixture of higher density residential uses, a grocery store and multiple department stores, banks, and medical facilities, including a Kaiser Permanente hospital and an Oregon Health Sciences University research facility. Metro's 2017 State of the Centers Atlas showed a high level of employees and total population, slightly higher dwelling units per acre, and an average population density compared with other regional centers.

There are also employment uses, including industrial uses and commercial uses, as well as school uses inside the UGB near the reserve on the west side of NE Cornelius Pass Road north of Highway 26. Further still, there is a grocery store and other commercial uses in the UGB at the northeast corner of NW West Union Road and NW 185th Avenue.

Growth in and near these 2040 Growth Concept centers and employment areas near the reserve will not necessarily cause a significant increase in home-based VMT per capita in the future, as area residents will be able to access some daily needs with relatively short trips. The transit service and bike and pedestrian facilities that serve these areas, described further below, can also help to ensure that additional growth nearby does not adversely impact home-based VMT per capita.

Six TriMet bus routes provide service to Hillsboro and/or nearby unincorporated Washington County, mainly along the arterial streets in the central portion of the city, focusing on the Hillsboro and Tanasbourne/Amber Glen Regional Centers, the Orenco Town Center, and employment areas. There is generally more minimal transit service to the southern and northern portions of the city. However, TriMet Route 52 provides service in the portion of the UGB near the reserve, connecting the area to Rock Creek Elementary School, Westview High School, and the Tanasbourne/Amber Glen Regional Center via NW 185th Avenue. Route 52, as well as Route 67, also connect areas within the UGB near the reserve to the Portland Community College (PCC) Rock Creek campus.

The MAX Light Rail Blue Line stops at nine stations within Hillsboro, connecting Hillsboro to Beaverton and Portland. Figure 4.3 in Chapter of the 2023 RTP indicates that there are gaps in planned frequent transit service along certain routes in the UGB near the reserve, including along NW 185th Avenue and NW Springville Road.

Hillsboro has over 54 miles of dedicated bike lanes, more than 24 miles of established bikeways, and numerous streets considered "bike friendly" that, together, create a fairly well-connected system that is focused mostly on the central portion of the city and its two regional centers, including the Tanasbourne/Amber Glen Regional Center. Within the UGB and near the reserve, there are dedicated bike facilities along NW 185th Avenue, NW Cornelius Pass Road, NW Jacobson Street, NW Springville Road, and NW West Union Road. In addition, there are some local trails that provide key connections to the greater bike network. The existing bike facilities on NW 185th Avenue and NW Cornelius Pass Road are identified as part of the regional bike network on Figure 4.5 in Chapter 4 of the 2023 RTP. However, the figure also identifies gaps in the planned network in other areas in the UGB near the reserve.

A large proportion of the residential neighborhoods in Hillsboro, including those in the UGB near the reserve, have sidewalks, although there are other residential areas of the city that do not have sidewalks. The Tanasbourne/Amber Glen Regional Center and the Bethany Town Center have sidewalks, as do the employment areas around NE Cornelius Pass Road near the reserve. Trails, such as the Rock Creek Trail, provide additional pedestrian opportunities. Several existing pedestrian routes in the UGB near the reserve are identified in Chapter 4, Figure 4.4 of the 2023 RTP as in the regional pedestrian network, though there are also gaps, including along NW West Union Road.

Figure 4.14 in Chapter of the 2023 RTP identifies a number of high injury corridors in the area already inside the UGB near the reserve and in Hillsboro, including NW 185th Avenue and NW Cornelius Pass Road. The figure also identifies the intersection of NW 185th Avenue and NE Evergreen Parkway, as well as other intersections in the area, as high injury intersections.

Highway 26 within the UGB near the reserve is identified as a throughway Chapter 4, Figure 4.7 of the 2023 RTP. Figure 4.8 of that chapter indicates that this section of Highway 26 currently meets travel speed reliability performance thresholds, with no more than four hours per day when travel speeds fall below the identified minimum speed. RTP models indicate this reliability will continue at least to the year 2045.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Highway 26, an RTP-designated throughway, is approximately one mile away from the reserve via NW 185th Avenue. As noted above, the section of the highway near the reserve currently meets travel speed reliability performance thresholds.

There is currently no transit service into the reserve itself, though TriMet Routes 52 has stops along NW 185th Avenue adjacent to the southeast corner of the reserve and

connect to Rock Creek Elementary School, Westview High School, and the Tanasbourne/Amber Glen Regional Center. Route 67 has stops on NW Springwille Road near the east side of the reserve, connecting to the PCC Rock Creek Campus, and the Bethany Town Center.

There is a dedicated bike lane on NW 185th Avenue adjacent to a portion of the reserve that extend south past Westview High School and Rock Creek Elementary. NW Springville Road, which extends from the reserve's east, has bike facilities that connect to the PCC Rock Creek Campus and to transit stops. The Rock Creek Trail, which runs east for over two miles and west for over a mile, intersects with NW 185th Avenue. The Waterhouse Trail connects to the Rock Creek Trail, providing a north-south route that extends to Highway 26. NW West Union Road has a short section of a dedicated bike lane on either side of the 185th Avenue intersection. The remainder of NW West Union Road is classified as "bike with caution".

There are sidewalks on NW West Union Road east of the 185th Avenue intersection that extend for approximately one mile with direct connections to the Rock Creek Trail and the Waterhouse Trail. Sidewalks on NW 185th Avenue extend north from NW West Union Road to NW Springville Road on one side and south past Westview High School and Rock Creek Elementary school to south of Highway 26 on both sides of the road. There are a couple of sidewalk connections to the residential neighborhoods south of NW West Union Road, two of which ultimately connect to the Rock Creek Trail. Otherwise, the sidewalks provide internal circulation for the neighborhood. Painted crossings at the intersection of NW 185th Avenue and NW Springville Road lead to sidewalks that connect to the PCC Rock Creek campus. There are also painted crossings at the intersection of NW West Union Road and NE Cornelius Pass Road, and at the intersection of NW West Union Road and NW 185th Avenue, that lead to sidewalks connected to these areas' existing employment uses.

The proximity of existing residential, employment, institutional uses to the reserve, as well as the existing transit services and bike and pedestrian amenities to them, could allow for development of the reserve without significantly increasing home-based VMT per capita.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

NW 185th Avenue, NW Cornelius Pass Road, NW Springville Road, and NW West Union Road would be expected to see additional private vehicle traffic from development of the reserve. Existing bike and pedestrian facilities nearby would also be expected to see additional use.

As noted above, the proximity of existing residential, employment, institutional uses to the reserve, as well as the existing transit services and bike and pedestrian amenities to them, could allow for development of the reserve without significantly increasing home-based VMT per capita. Moreover, if the reserve were to be developed with both

residential and employment uses, as considered possible in response to Factor 1, residents could meet more of their daily needs, and employees could potentially find housing, within the reserve without having to travel longer distances.

With these considerations, development of the reserve may result in only minor impacts to the performance of Highway 26 as a throughway. Any additional motor vehicle traffic on NW 185th Avenue and NW Cornelius Pass Road resulting from development of the reserve, however, may exacerbate these roadways' high-crash conditions.

d. Need for major transportation facility improvements and associated costs

NW Cornelius Pass Road, NW West Union Road, and NW 185th Avenue north of NW Springville Road will likely need to be improved to urban arterial standards, including with acquisition of additional right-of-way. NW West Union Road and the portion of NW 185th Avenue are considered to be half-street improvements in the costs below, as the other half of the roadway will be inside the UGB. A new, nearly half-mile-long arterial is likely needed between NW West Union Road and NW 185th Avenue at NW Springville Road. A new, roughly 0.87-mile-long collector is also likely needed between NW West Union Road and NW Cornelius Pass Road to provide access to the middle of the reserve.

Facilities	Cost
Arterials, existing/improved full street	$26.07 million
Arterials, existing/improved half street	$50.95 million
Arterials, new	$31.27 million
Collectors, existing/improved full street	$0
Collectors, existing/improved half street	$0
Collectors, new	$37.22 million
Total:	**$145.51 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$30,705**

e. Provision of public transit service

TriMet evaluated the Bendemeer Urban Reserve for providing transit service. TriMet could provide services to the reserve, although there is no guarantee of service. Actual service will depend on the level of development in the reserve and in the corridors leading to it. Nearby transit services are expected to be improved by 2045 and could be extended to provide 30-minute off-peak headways, and 15-minute peak service for weekdays, with 30- and 60-minute services on weekends. Two new vehicles would be required with zero-emission bus capital costs being approximately $2,000,000 – $3,000,000 (recurs every 12 years). Annual service cost is $736,320 and grows with inflation each year.

Prior to land being included in the UGB, a more detailed concept plan, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11, will

be required. This concept plan process will develop more refined public facility and service needs and cost estimates.

Factor 3: Comparative environmental, social, energy, and economic consequences

Environmental consequences

Holcomb Creek flows into the Bendemeer Urban Reserve just north of NW Old Pass Road before crossing under NW Cornelius Pass Road and heading southeast for approximately 3,200 feet into Holcomb Lake. Rock Creek enters the reserve just prior to joining Holcomb Creek on the east side of Holcomb Lake and flows south through a Metro-owned natural area for approximately 4,500 feet to NW West Union Road. Two unnamed tributaries to Rock Creek flow through the eastern portion of the reserve for approximately one mile, before ultimately joining Rock Creek at the southern end of the Metro-owned property. Two unnamed streams flow through the middle portion of the reserve and join and flow north into Holcomb Lake; these two streams total approximately 4,900 feet.

There are two wetlands identified on a 1998 National Wetlands Inventory (NWI) that are located in the eastern portion of the reserve. The first, approximately 32 acres in area, is associated with Rock Creek and is mostly on the Metro property; the second, nearly three acres in area, is associated with a tributary of Rock Creek. Additional NWI wetlands associated with Holcomb Creek and Holcomb Lake are located along the northern edge of the reserve and would need to be formally delineated prior to development.

There is riparian and upland habitat associated with the stream corridors and wetlands noted above. Inclusion in the UGB will provide some increased protection for streams, habitat areas, and floodplains; however, given how the stream corridors form four distinct pockets of unconstrained land, significant impacts to the habitat areas may occur depending on street connectivity requirements. Metro ownership of certain property in the reserve can limit east–west street connections in the reserve, leading to additional environmental protections. Overall, urbanization of this reserve may have comparatively moderate to high impacts on stream corridors and habitat areas, though the layout of the urban road system will be a key determinant in the level of environmental impact. Additional environmental consideration, specifically regarding avoidance of conflict between urban development and regionally significant fish and wildlife habitat, is provided in the Metro Code Factors Analysis (Appendix 7A).

Considering the comparative environmental consequences of urbanization, the Bendemeer Urban Reserve is given a “low” score in Attachment 3 for this Goal 14 boundary location sub-factor.

Social, energy, and economic consequences

The western portion of the reserve contains numerous rural residences on tax lots that are generally between half an acre and four acres in size. While the larger tax lots provide some opportunity for additional residential development, the amount of infill would not be

significant and would likely occur over a longer period of time. These rural residential uses are already proximate to urban industrial, commercial, and residential uses as well, so urbanization of this area is not expected to cause significant changes in residents' sense of place or in degradation of an existing rural lifestyle. Moreover, urbanization of the reserve could bring new social, educational, and recreational opportunities for existing residents. There are only a few residences in the remainder of the reserve east of NW Cornelius Pass Road.

As noted previously, the reserve also already contains some commercial uses and the reserve is adjacent to substantial urban development. As detailed more fully in response to Factor 2, additional VMT and, therefore, related energy impacts from urbanization would not be significant.

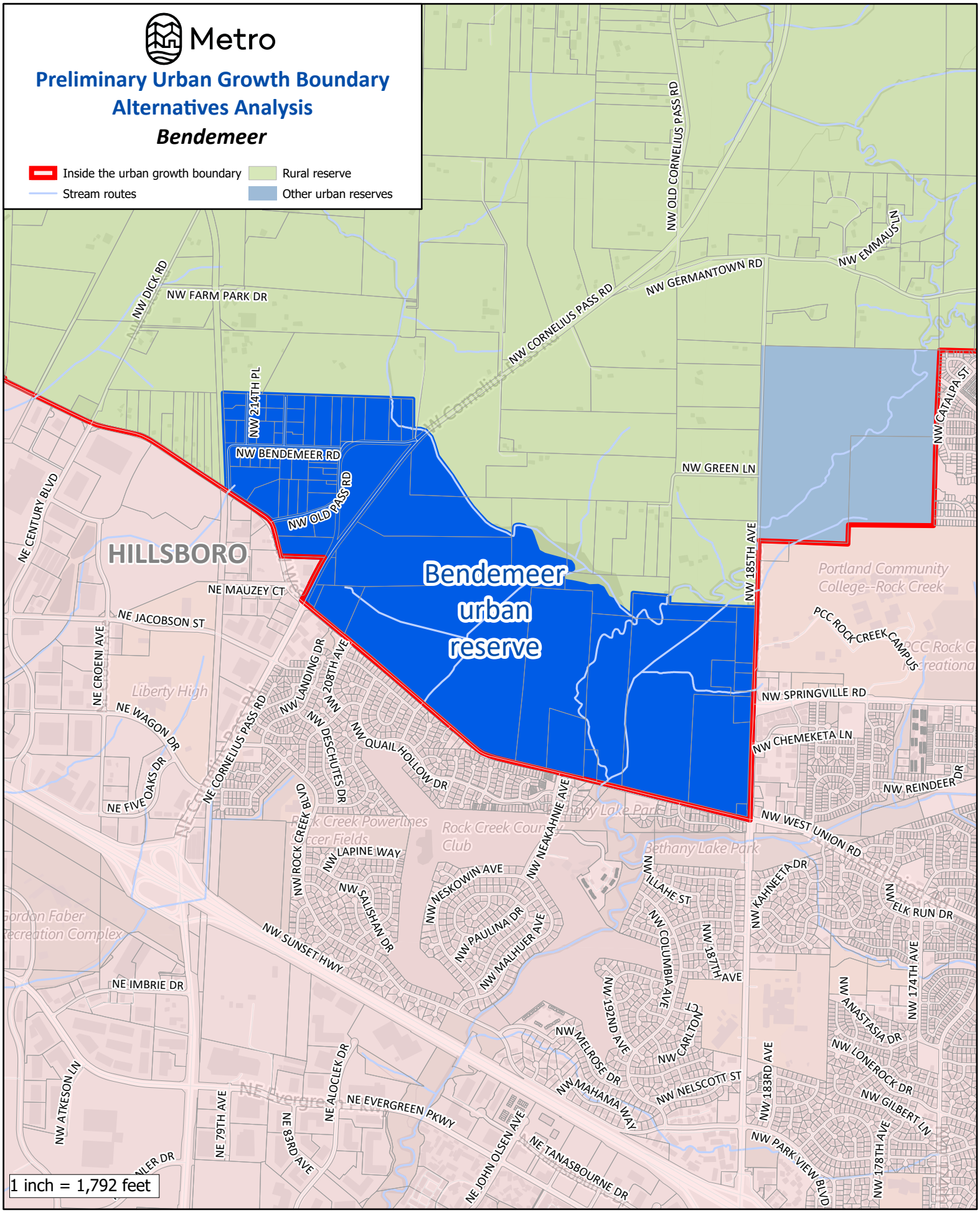
There are about half a dozen sections of agricultural activity occurring in the reserve, with a combined area of about 210 acres. These sections are generally separated from each other by stream corridors, forested areas, and publicly-owned land that is unlikely to be urbanized. So, urbanization of one agricultural area will not necessarily have significant adverse impacts on another. Moreover, the economic consequences of a loss in farming activity in the reserve may be outweighed by the economic benefits of residential and/or employment development of the reserve.

This analysis finds that there would be comparatively low social, energy, and economic consequences from urbanization of this reserve. The Bendemeer Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Factor 4: Compatibility of the proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

Goal 3 agricultural lands, specifically lands zoned Exclusive Farm Use (EFU) by Washington County, border the Bendemeer Urban Reserve to the north and extend further into unincorporated areas for a number of miles. This land is mostly in nursery and field crop production, though there is some rural residential development and stands of trees. Holcomb Creek, Holcomb Lake, and Rock Creek, as well as their associated habitat areas, provide a large buffer to most of the agricultural activities occurring east of NW Cornelius Pass Road. A forested patch, along with some rural residences, provide a buffer for most of the agricultural activities occurring west of NW Cornelius Pass Road. The 100-foot railroad right-of-way along the western edge of the reserve also provides a buffer for the agricultural activities occurring northwest of the area near NW Dick Road. Urbanization of the reserve would increase traffic on NW Cornelius Pass Road and NW 185th Avenue, which could impact the movement of farm goods to Highway 26. Overall, the proposed urban uses have medium to high compatibility with nearby agricultural and forest activities occurring on farm and forest land outside the UGB.

The Bendemeer Urban Reserve is given a "medium-high" score in Attachment 3 for this Goal 14 boundary location factor.



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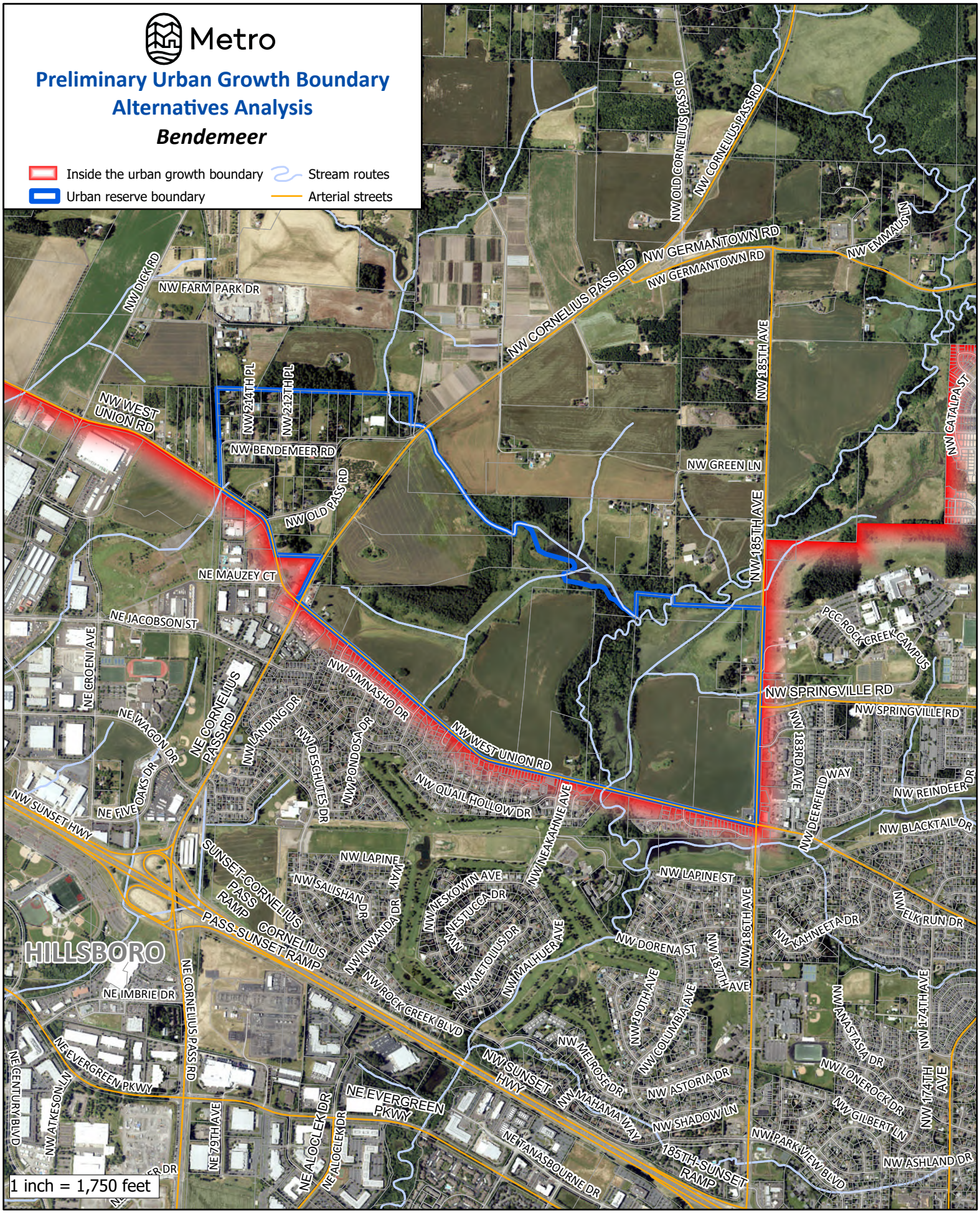
Metro

Preliminary Urban Growth Boundary Alternatives Analysis

Bendemeer

Inside the urban growth boundary
Urban reserve boundary
Stream routes
Arterial streets



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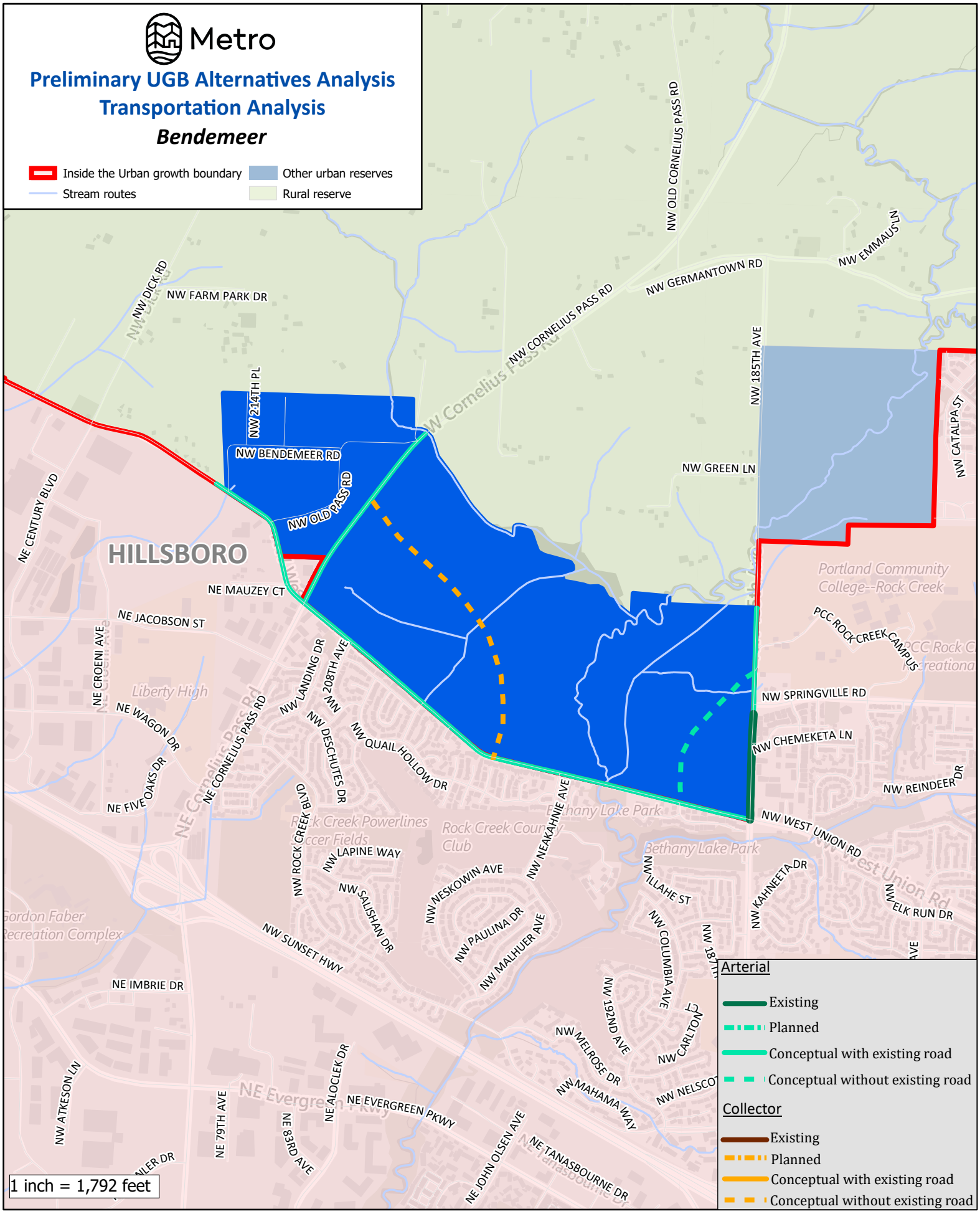

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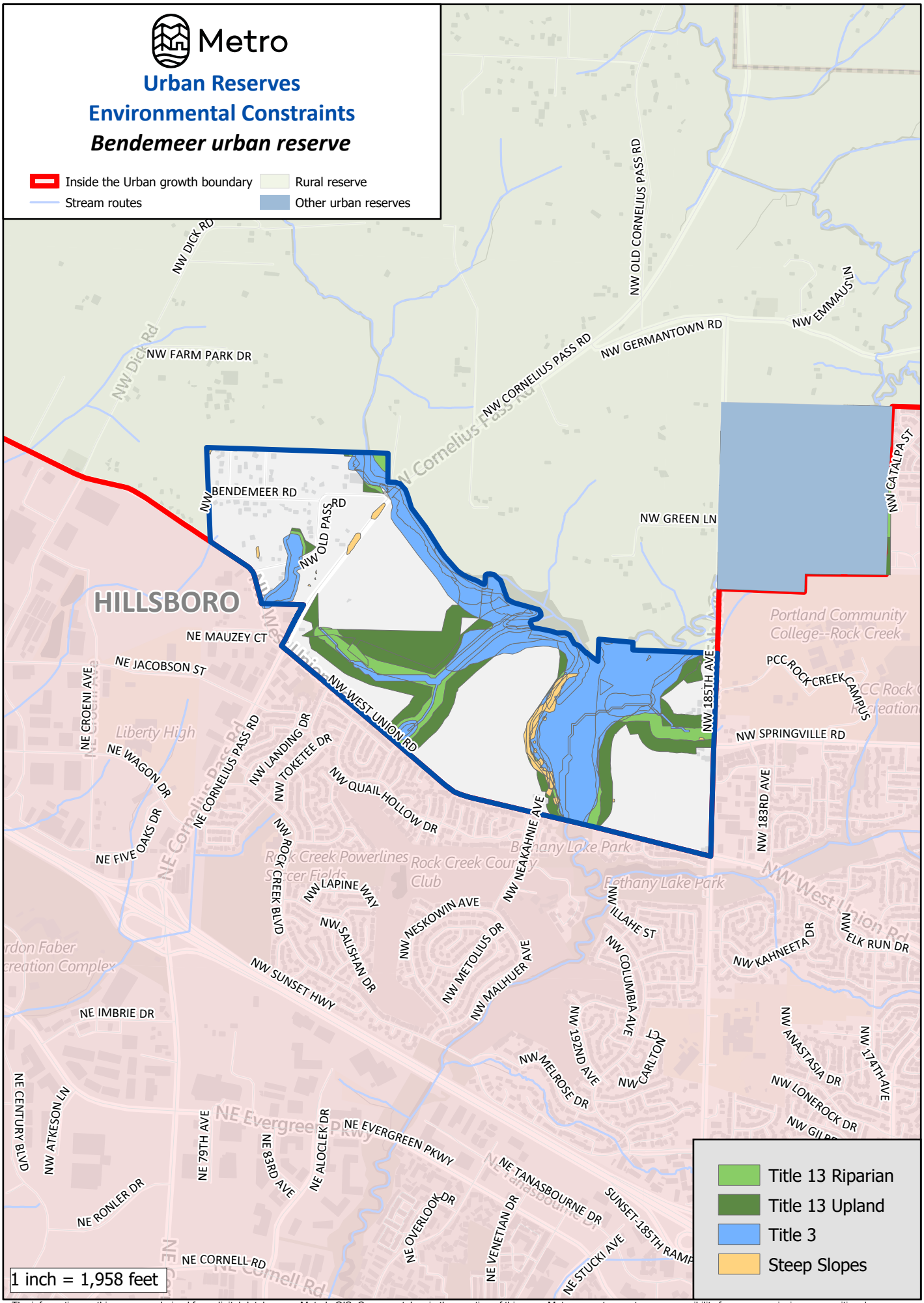

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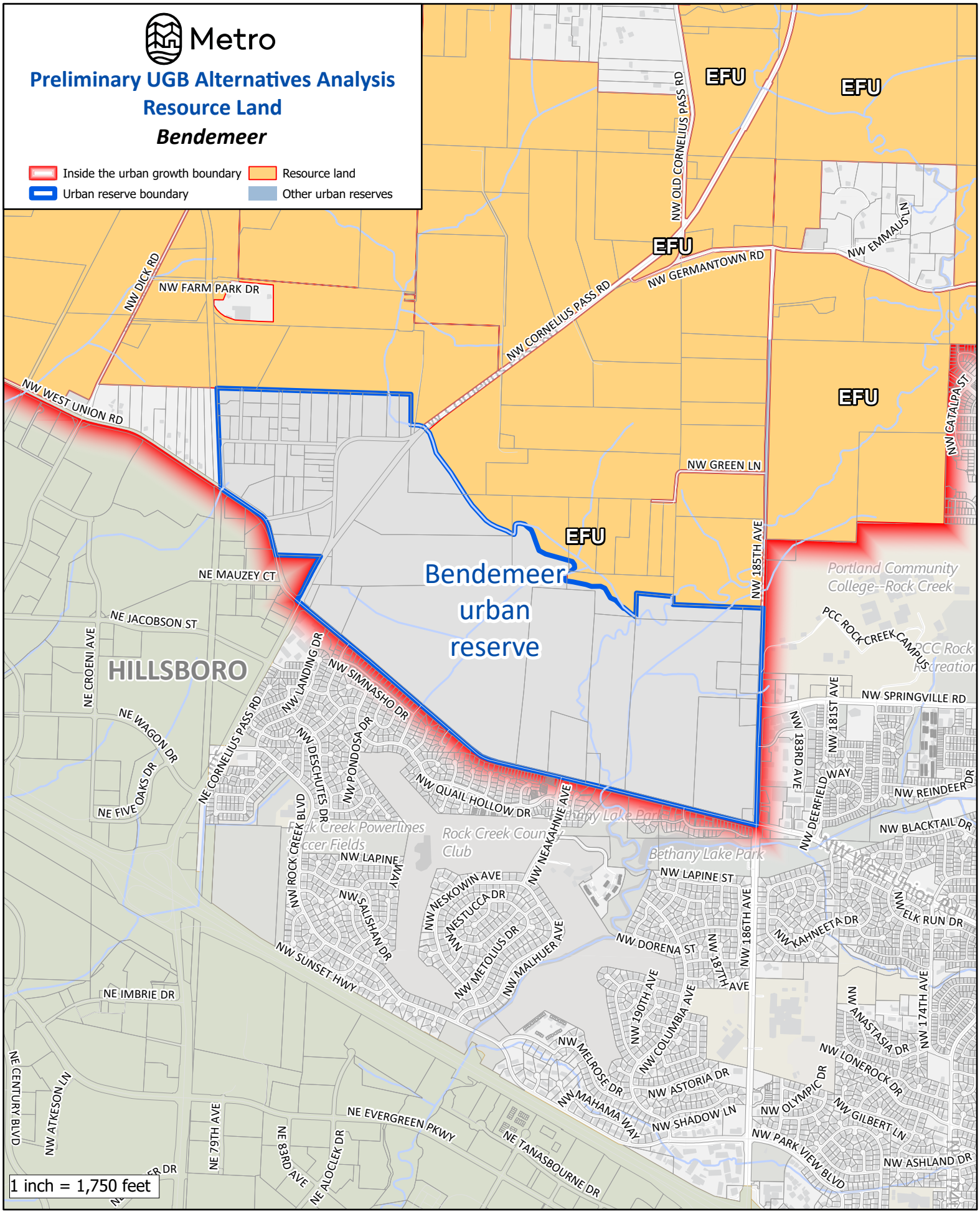

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BETHANY WEST URBAN RESERVE

Total Reserve Area	168 acres
Total Tax Lot Area in Reserve (without Right-of-Way)	167 acres
Gross Vacant Buildable Area	60 acres
Net Vacant Buildable Area	**44 acres**

The Bethany West Urban Reserve is a relatively small, nearly square area on the north side of the Portland Community College Rock Creek campus. The UGB is the reserve's southern and eastern boundaries, while rural reserves are adjacent to the west and north. Access to the urban reserve is provided by NW 185th Avenue and NW Shackelford Road in the community of North Bethany.

GOAL 14 BOUNDARY LOCATION FACTORS

Factor 1: Efficient accommodation of identified land needs

The Bethany West Urban Reserve contains the entirety of one privately-owned 127-acre tax lot and nearly 40 acres of a 203-acre tax lot owned by Portland Community College (PCC). As noted above, the reserve has 60 gross vacant buildable acres and 44 net buildable acres.

According to aerial imagery and tax assessment records, the reserve is essentially undeveloped, except for powerlines crossing both tax lots and some minor agriculture-related structures. Approximately half of the reserve's area is used for field agriculture, while the other half includes Rock Creek and vegetated areas.

There is existing low density residential development to the east of the reserve and the PCC Rock Creek campus neighbors to the south. Springville Elementary School is less than half a mile away and various recreational facilities, including sports fields at the PCC campus, are within one mile of the reserve.

Multiple urban roads, including NW Shackelford Rd and NW Antonio St, stub to the reserve's eastern boundary. Highway 26 is approximately two miles to the south. There is no existing transit service to the reserve, though TriMet Route 67 has stops on the neighboring PCC Rock Creek Campus.

Given the proximity of existing residential uses, as well as educational and residential facilities, the reserve is considered appropriate for accommodating a small residential land need. However, given the relatively flat topography of the portions currently and agricultural uses, the minimal parcelization, the powerlines, and the possibility that employment uses may be a more appropriate buffer to rural land uses to the north and west, the reserve may be suitable for employment uses as well. This reserve is therefore considered able to accommodate both residential and employment land uses.

Factor 2: Orderly and economic provision of public facilities and services

Water Services

With regard to water services, the Bethany West Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Adjacent lands inside the UGB are served by the Tualatin Valley Water District (TVWD), which purchases water from the Portland Water Bureau (PWB) and the Joint Water Commission (JWC). According to TVWD, the water from PWB currently accounts for nearly three-quarters of TVWD's supply; this water primarily comes from the Bull Run watershed, is piped to a 50-million gallon storage reservoir on Powell Butte on the east side of Portland, and is treated with chlorine and ammonia. PWB also obtains water from wells and aquifers in the Columbia South Shore Wellfield. JWC, which is jointly owned by TVWD and the Cities of Hillsboro, Beaverton, and Forest Grove, obtains water from Hagg Lake (Scoggins Reservoir) and the Barney Reservoir released into the upper portion of the Tualatin River. When flows are available, water from the Tualatin River is used. It is then withdrawn and filtered through the JWC water treatment plant. Chlorine and pH adjustments are added before leaving the plant, where chlorine and pH adjustments are added to the water. TVWD is working on a new Willamette River sourced water supply system; that expanded system is expected to be online in 2026 and will allow TVWD to transition off its PWB supply, though an emergency connection to the PWB system will remain in the event of a regional water emergency.

According to TVWD, they: maintain more than 700 miles of pipe and 12 pumping stations; have a gravity line capacity of 42.3 MGD, with another 10 MGD available from JWC; can access emergency standby pumping with a capacity of 20 MGD when needed to back up the gravity flow main; and utilize a storage system with 22 active covered reservoirs with a combined storage capacity of about 65 million gallons.

TVWD has indicated that there is sufficient capacity in terms of water supply, treatment, storage, and piping to serve areas that are both within the current UGB and in their service district.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

TVWD is understood to have the system capacity to serve urban development of the Bethany West Urban Reserve, though some local pipe upsizing may be necessary.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

It does not appear at this time that TVWD's water facilities already inside the UGB will experience marked impacts resulting from being connected to new urban development in the Bethany West Urban Reserve, though, as noted above and depending on specific

future urban land uses and other regional development patterns, there may be some pipe and other facility upsizing needed to ensure not adverse impacts to areas already inside the UGB.

d. Estimated water service-related costs for reserve development

Water piping, pumping, and storage costs	Cost
10-inch pipe	$0.93 million
12-inch pipe	$0
16-inch pipe	$0
Pumping	$0
Storage	$0.06 million
Total:	**$0.99 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$1,112**

Sanitary Sewer Services

With regard to sanitary sewer services, the Bethany West Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Clean Water Services (CWS) provides sewer service in the adjacent areas of the UGB in unincorporated Washington County. CWS provides wastewater treatment at the Rock Creek Wastewater Treatment Plant. An existing 24-inch sanitary sewer trunk crosses the reserve along the north side of Rock Creek; that trunk is believed to have adequate capacity to meet current demands. Flows continue via gravity through the CWS trunk and interceptor sewer lines and reach the treatment plant, which is understood to have sufficient capacity to serve lands already inside the UGB.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The existing 24-inch sewer trunk line that, as noted above, already crosses the reserve is believed to have capacity to serve the limited amount of additional urban development this relatively small reserve would provide. CWS has previously indicated that there is additional capacity at the Rock Creek treatment plant as well.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Impacts to the treatment plant are expected to be minimal with no anticipated major upgrades needed due to the possible amount of development from the relatively small amount of buildable land in the reserve. The amount of upsizing, if any, that would be

needed is not fully known at this time, but CWS is expected to address infrastructure needs to accommodate planned growth.

d. Estimated sanitary sewer service-related costs for reserve development

Sanitary sewer piping and pumping costs	Cost
10-inch pipe	$0.69 million
12-inch pipe	$0
15-inch pipe	$0
Pump station	$0
Force mains	$0
Total:	**$0.69 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$772**

Stormwater Management Services

With regard to stormwater management services, the Bethany West Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

There is no indication of significant challenges with existing stormwater management facilities being able to serve existing development in adjacent areas inside the UGB.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Stormwater related to new development in the Bethany West Urban Reserve is expected to be conveyed, treated, and disposed of within the reserve itself and/or outfall directly to Rock Creek, rather than relying on existing facilities already in the UGB. It is expected that Rock Creek will be able to accommodate this stormwater.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

As noted above, stormwater related to new development in the Bendemeer Urban Reserve is expected to be conveyed, treated, and disposed of within the reserve itself and/or outfall directly to Rock, rather than relying on existing facilities already in the UGB. Therefore, no adverse impacts to existing facilities serving areas already inside the UGB are anticipated.

d. Estimated stormwater service-related costs for reserve development

Stormwater piping and water quality/detention	Cost
18-inch pipe	$1 million
24-inch pipe	$0
30-inch pipe	$0
Water quality/dentition	$1.83 million
Total:	**$2.83 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$3,180**

Transportation Services

With regard to transportation services, the Bethany West Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(e) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Figure 4.36 in Chapter 4 of the 2023 Regional Transportation Plan (RTP) displays 2020 home-based vehicle miles traveled (VMT) per capita by Metro transportation analysis zone, with average VMT per capita considered 11.32. According to Figure 4.36 in Chapter 4, areas in the UGB adjacent to the Bethany West Urban Reserve had above average and significantly above average home-based VMT per capita in 2020.

Metro's adopted 2040 Growth Concept Map designates two regional centers and separate town centers in the City of Hillsboro, as well as a town center in unincorporated Washington County within the UGB and near to the reserve. Regional centers are generally meant to: serve populations of hundreds of thousands of people; surround high-quality transit service and multi-modal street networks; and offer larger commercial uses, healthcare facilities, local government services, and public amenities. Town centers are meant to: serve populations of tens of thousands of people; offer more locally-focused retail uses and public amenities; and be well served by transit. The Bethany Town Center in unincorporated Washington County and the Tanasbourne/Amber Glen Regional Center in Hillsboro are the closest 2040 Growth Concept designated centers to the Bethany West Urban Reserve.

The Bethany Community Plan calls for a mix of local retail and small community-based office uses in the Bethany Town Center that provide a community village atmosphere. The town center is almost completely built out with a mixture of housing types, a grocery store, banks, restaurants, an athletic club, a library, a place of worship, and a small amount of other employment/institutional uses, including a Providence medical

facility. The town center scored very high in Metro's 2017 State of the Centers Atlas for parks access and sidewalk and bike route density.

The Tanasbourne/Amber Glen Regional Center is a mixture of higher density residential uses, a grocery store and multiple department stores, banks, and medical facilities, including a Kaiser Permanente hospital and an Oregon Health Sciences University research facility. Metro's 2017 State of the Centers Atlas showed a high level of employees and total population, slightly higher dwelling units per acre, and an average population density compared with other regional centers. There are also employment uses, including a grocery store and other commercial uses, less than a mile south of the reserve in the UGB at the northeast corner of NW West Union Road and NW 185th Avenue.

Growth in and near these 2040 Growth Concept centers and employment areas near the reserve will not necessarily cause a significant increase in home-based VMT per capita in the future, as area residents will be able to access some daily needs with relatively short trips. The transit service and bike and pedestrian facilities that serve these areas, described further below, can also help to ensure that additional growth nearby does not adversely impact home-based VMT per capita.

Six TriMet bus routes provide service to Hillsboro and/or nearby unincorporated Washington County, mainly along the arterial streets in the central portion of the city, focusing on the Hillsboro and Tanasbourne/Amber Glen Regional Centers, the Orenco Town Center, and employment areas. There is generally more minimal transit service to the southern and northern portions of the city. However, TriMet Route 52 provides service in the portion of the UGB approximately half a mile from the reserve, connecting the area to Rock Creek Elementary School, Westview High School, and the Tanasbourne/Amber Glen Regional Center via NW 185th Avenue. Route 52, as well as Route 67, also connect areas within the UGB near the reserve to the Portland Community College (PCC) Rock Creek campus. The MAX Light Rail Blue Line stops at nine stations within Hillsboro, connecting Hillsboro to Beaverton and Portland. Figure 4.3 in Chapter of the 2023 RTP indicates that there are gaps in planned frequent transit service along certain routes in the UGB near the reserve, including along NW 185th Avenue and NW Springville Road.

Hillsboro has over 54 miles of dedicated bike lanes, more than 24 miles of established bikeways, and numerous streets considered "bike friendly" that, together, create a fairly well-connected system that is focused mostly on the central portion of the city and its two regional centers, including the Tanasbourne/Amber Glen Regional Center. There are dedicated bike facilities on NW Shackelford Road in the UGB adjacent to the east side of the reserve. Within the UGB and less than a mile from the reserve, there are also dedicated bike facilities along NW 185th Avenue and NW Springville Road. In addition, there are some local trails that provide key connections of the area further south to the greater bike network. The existing bike facilities on NW 185th Avenue are identified as part of the regional bike network on Figure 4.5 in Chapter 4 of the 2023 RTP. However,

the figure also identifies gaps in the planned network in other areas in the UGB near the reserve.

A large proportion of the residential neighborhoods in Hillsboro, including those in the UGB near the reserve, have sidewalks, although there are other residential areas of the city that do not have sidewalks. The Tanasbourne/Amber Glen Regional Center and the Bethany Town Center have sidewalks. Trails, such as the Rock Creek Trail, provide additional pedestrian opportunities. Existing portions of NW Springville Road in the UGB near the reserve are identified in Chapter 4, Figure 4.4 of the 2023 RTP as in the regional pedestrian network, though there are also gaps, including along NW 185th Avenue and NW Shackelford Road leading to the reserve.

Figure 4.14 in Chapter of the 2023 RTP identifies a number of high injury corridors in the area already inside the UGB near the reserve and in Hillsboro, including NW 185th Avenue and NW Cornelius Pass Road. The figure also identifies the intersection of NW 185th Avenue and NE Evergreen Parkway, as well as the intersection of NW West Union Road and NW Laidlaw Road, as high injury intersections.

Highway 26 within the UGB, nearly two miles south of the reserve, is identified as a throughway Chapter 4, Figure 4.7 of the 2023 RTP. Figure 4.8 of that chapter indicates that this section of Highway 26 currently meets travel speed reliability performance thresholds, with no more than four hours per day when travel speeds fall below the identified minimum speed. RTP models indicate this reliability will continue at least to the year 2045.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Highway 26, an RTP-designated throughway, is approximately two miles away from the reserve via NW 185th Avenue. As noted above, the section of the highway near the reserve currently meets travel speed reliability performance thresholds.

There is currently no transit service into the reserve itself, though TriMet Routes 52 has stops along NW 185th Avenue approximately half a mile from the southwest corner of the reserve and connect to Rock Creek Elementary School, Westview High School, and the Tanasbourne/Amber Glen Regional Center. Route 67 has stops on NW Springwille Road within a mile of the reserve, connecting to the PCC Rock Creek Campus, and the Bethany Town Center.

There are dedicated bike lanes on NW Shackelford Road stubbing to the east side of the reserve that lead through the adjoining residential areas. There are also dedicated bike facilities on NW 185th Avenue approximately half a mile south of the reserve that extend south to the employment uses at the corner of NW West Union Road and NW 185th Avenue and past Westview High School and Rock Creek Elementary. Nearby NW Springville Road has bike facilities that connect to the PCC Rock Creek Campus and to transit stops. The Rock Creek Trail, which runs east for over two miles and west for over a mile, intersects with NW 185th Avenue roughly one mile south of the reserve. The

Waterhouse Trail also then connects to the Rock Creek Trail, providing a north-south route that extends to Highway 26. NW West Union Road has a short section of a dedicated bike lane on either side of the 185th Avenue intersection. The remainder of NW West Union Road is classified as "bike with caution".

The residential development to the east of the reserve includes local streets with sidewalks that stub to the reserve. There are no sidewalks on the portion of NW 185th Avenue adjacent to the west side of the reserve; however, there are sidewalks on NW 185th Avenue approximately half a mile to the south near the intersection with NW Springville Road that lead to the employment uses at the corner of NW West Union Road and NW 185th Avenue. Painted crossings at the intersection of NW 185th Avenue and NW Springville Road lead to sidewalks that connect to the PCC Rock Creek campus.

The proximity of existing residential, employment, institutional uses to the reserve, as well as the existing nearby transit services and bike and pedestrian amenities to them, could allow for development of the reserve without significantly increasing home-based VMT per capita. Bike and pedestrian facilities will need to be extended on NW 185th Avenue to the reserve in order to provide complete connections.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

NW 185th Avenue, NW Antonio Street, NW Shackelford Road, NW Springville Road, and NW West Union Road would be expected to see additional private vehicle traffic from development of the reserve. Existing bike and pedestrian facilities nearby would also be expected to see additional use.

As noted above, the proximity of existing residential, employment, institutional uses to the reserve, as well as the existing transit services and bike and pedestrian amenities to them, could allow for development of the relatively small reserve without significantly increasing home-based VMT per capita. Moreover, if the reserve were to be developed with both residential and employment uses, as considered possible in response to Factor 1, residents could meet more of their daily needs, and employees could potentially find housing, within the reserve without having to travel longer distances.

With these considerations, development of the relatively small reserve may result in only minor impacts to the performance of Highway 26 as a throughway, roughly two miles south of the reserve. Any additional motor vehicle traffic on NW 185th Avenue resulting from development of the reserve, however, may exacerbate its high-crash conditions.

d. Need for major transportation facility improvements and associated costs

The roughly half-mile length of NW 185th Avenue along the west side of the reserve will likely need to be improved to urban arterial standards, including with acquisition of additional right-of-way. A new half-mile-long collector road will also likely be needed to connect NW 185th Avenue to NW Shackleford Road in the North Bethany area.

Facilities	Cost
Arterials, existing/improved full street	$32.06 million
Arterials, existing/improved half street	$0
Arterials, new	$0
Collectors, existing/improved full street	$0
Collectors, existing/improved half street	$0
Collectors, new	$23.18 million
Total:	**$55.24 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$62,067**

e. Provision of public transit service

TriMet evaluated the Bethany West Urban Reserve for providing transit service. TriMet could provide services to the reserve, although there is no guarantee of service. Actual service will depend on the level of development in the reserve and in the corridors leading to it. Nearby transit services are expected to be improved by 2045 and could be extended to provide 30-minute off-peak headways, and 15-minute peak service, every day, with two additional zero-emission buses at an approximate capital cost of $1,500,000 per bus (recurs every 12 years). Annual service cost is $936,000 and grows with inflation year.

Prior to land being included in the UGB, a more detailed concept plan, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11, will be required. This concept plan process will develop more refined public facility and service needs and cost estimates.

Factor 3: Comparative environmental, social, energy, and economic consequences

Environmental consequences

Rock Creek flows in a southwest direction through wooded and open land in the Bethany West Urban Reserve for 4,700 feet. A second unnamed stream that is located south of Rock Creek also flows in the same direction for approximately 3,180 feet, mostly in open fields. Both streams are located within a large floodplain. Two National Wetland Inventory (NWI) wetlands that are 0.8 and 2.3 acres in area and one PCC-identified 12.5-acre wetland are associated with the stream corridors. There is riparian and upland habitat associated with the streams and floodplain area. Inclusion in the UGB provides some increased protection for streams, habitat areas, and floodplains. When also considering the location of the stream corridors and the powerlines in the southern portion of the reserve adjacent to the PCC Rock Creek campus which will preclude some development, urbanization of this reserve is expected to be able to occur with comparatively minimal impact to stream corridors, wetlands, and habitat areas. Additional environmental consideration, specifically regarding

avoidance of conflict between urban development and regionally significant fish and wildlife habitat, is provided in the Metro Code Factors Analysis (Appendix 7A).

Considering the comparative environmental consequences of urbanization, the Bethany West Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Social, energy, and economic consequences

This relatively small reserve does not appear to have any existing residences, so there are no residents of the reserve that are expected to be affected by its urbanization. Considering the urban residential development adjacent to the reserve has streets stubbing to the reserve, eventual urbanization of the reserve appears to be expected.

As detailed more fully in response to Factor 2, additional traffic and, therefore, related energy impacts from urbanization would not be significant.

Because the reserve has only about 70 acres (42 percent) of land in agricultural use, the economic loss in farming activity from urbanization is not considered significant; indeed, the economic benefits of residential and/or employment development of the reserve, particularly near to the PCC Rock Creek Campus, may outweigh this loss.

This analysis finds that there would be comparatively low social, energy, and economic consequences from urbanization of this small reserve. The Bethany West Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Factor 4: Compatibility of the proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

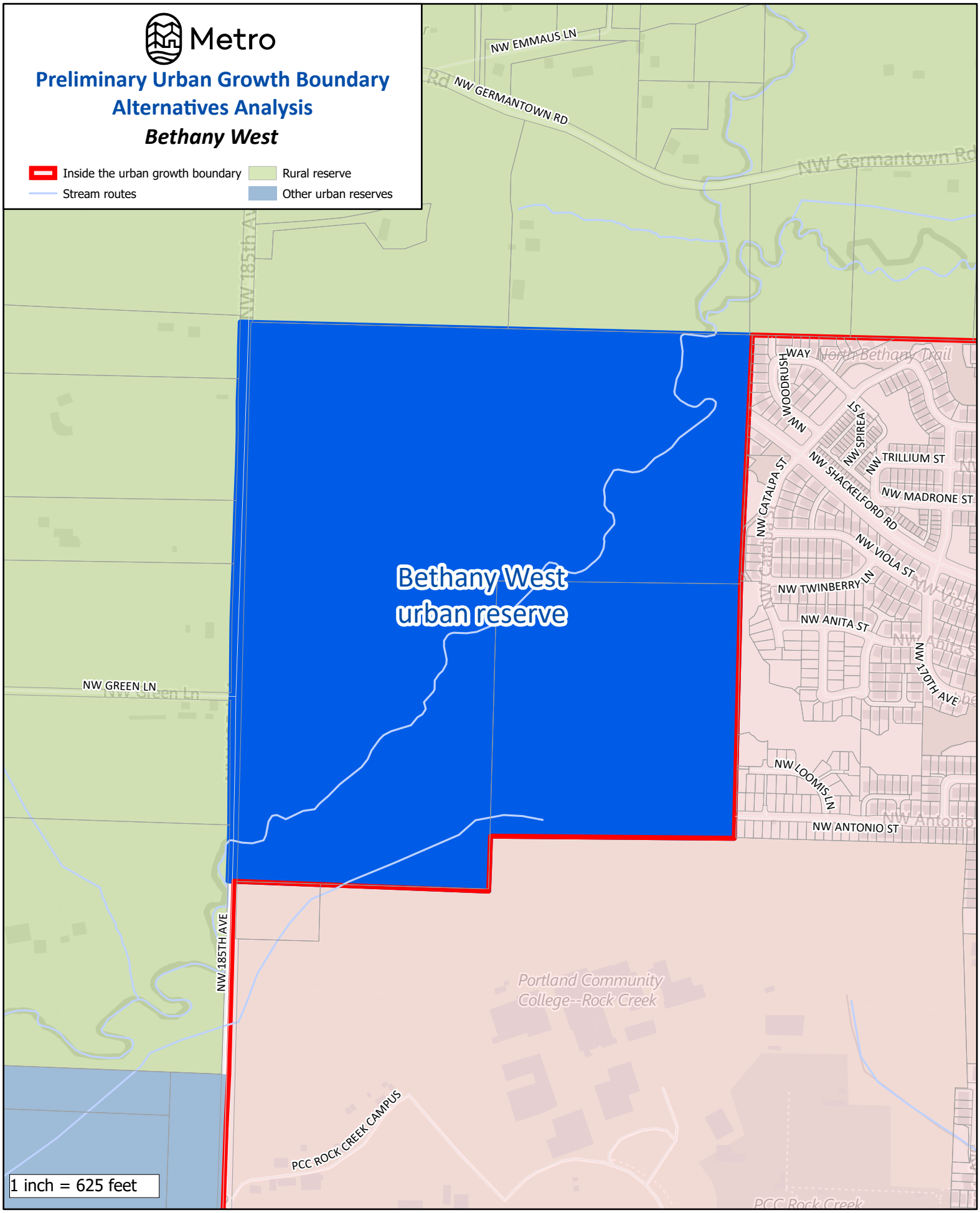
Goal 3 agricultural lands, specifically lands zoned Exclusive Farm Use (EFU) by Washington County, border the Bethany West Urban Reserve to the north and west.

The EFU-zoned land directly to the north appear to have some agricultural activities, including field crops and Christmas tree plantings, as well as some small forested patches and rural residential development. The forested patches are mostly in riparian habitat or near to the residential development, which may limit their use for commercial timber harvesting. Urbanization of the reserve would result in new development directly adjacent to active farm uses, which could result in land use conflicts related to safety, liability, and vandalism and complaints due to noise, odor, dust, and the use of pesticides and fertilizer. Urbanization would also increase traffic on NW 185th Avenue, which could impact the movement of both farm equipment and goods, although most of the traffic would be expected to move south towards Highway 26 away from the agricultural activities. Generally however, the proposed urban uses are considered incompatible with the directly-adjacent agricultural activities occurring to the north.

To the west of the reserve on the opposite side of NW 185th Avenue is a tract of EFU-zoned land that extends for quite a distance and includes field and row crops, nursery production, and some small

stands of trees. The land directly adjacent to the reserve includes a forested tax lot and a few rural residences with some associated agricultural activities. NW 185th Avenue itself would not provide an adequate buffer between urban development and agricultural activity. Development of the reserve could lead to land use conflicts related to safety, liability, and vandalism and complaints due to noise, odor, dust, and the use of pesticides and fertilizer, although the forested areas and rural residential development could help to provide some buffer. The improvement of NW 185th Avenue to urban standards, and associated street light illumination and bicycle and pedestrian movements, may further jeopardize the compatibility of the two uses, though the impacts of urban roadways on adjacent agricultural activity may be minimized through road design. Urbanization of the reserve would increase traffic on NW 185th Avenue, which could impact the movement of both farm equipment and goods, although most of the traffic would be expected to move south towards Highway 26 away from the neighboring agricultural activities. In addition, most of the agricultural activities occurring further west gain access from NW Cornelius Pass Road, rather than NW 185th Avenue. Therefore, the proposed urban uses are somewhat compatible with the agricultural activities occurring on the EFU-zoned land west of NW 185th Avenue, though impact mitigation measures may still be warranted.

Overall, the proposed urban uses are considered to have medium compatibility with nearby agricultural and forest activities occurring on farm and forest land outside the UGB. The Bethany West Urban Reserve is given a “medium” score in Attachment 3 for this Goal 14 boundary location factor.



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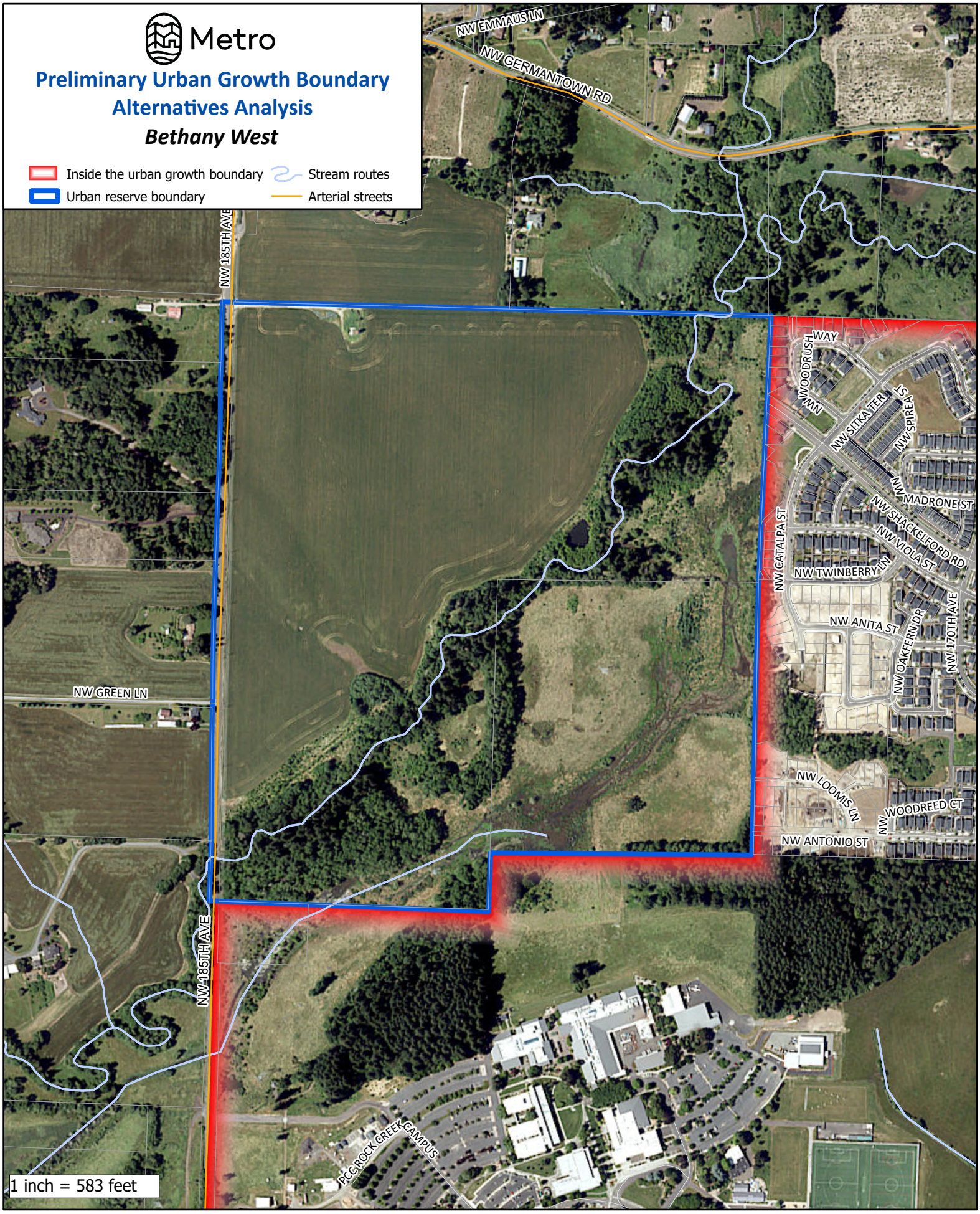
Preliminary Urban Growth Boundary Alternatives Analysis

Bethany West



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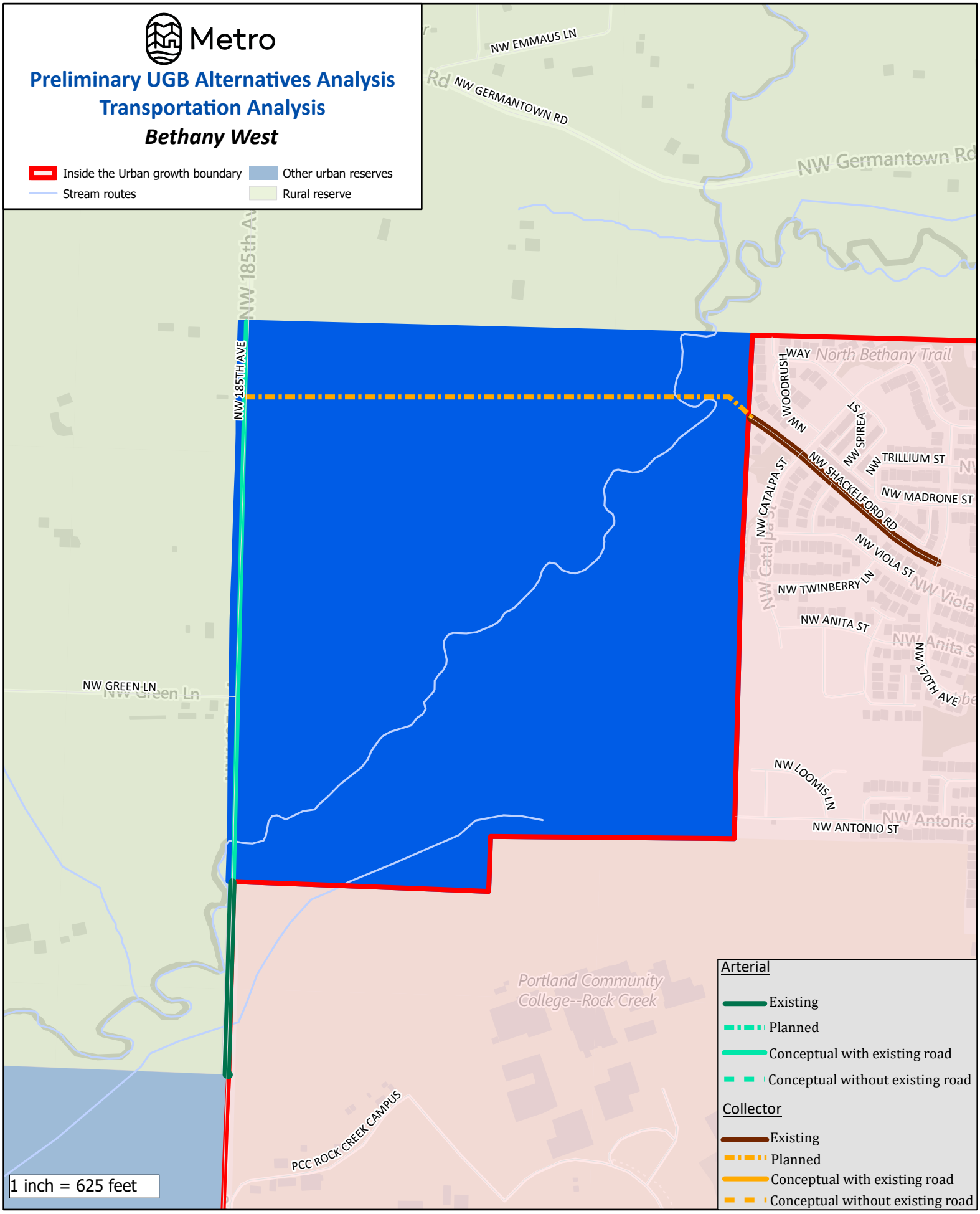

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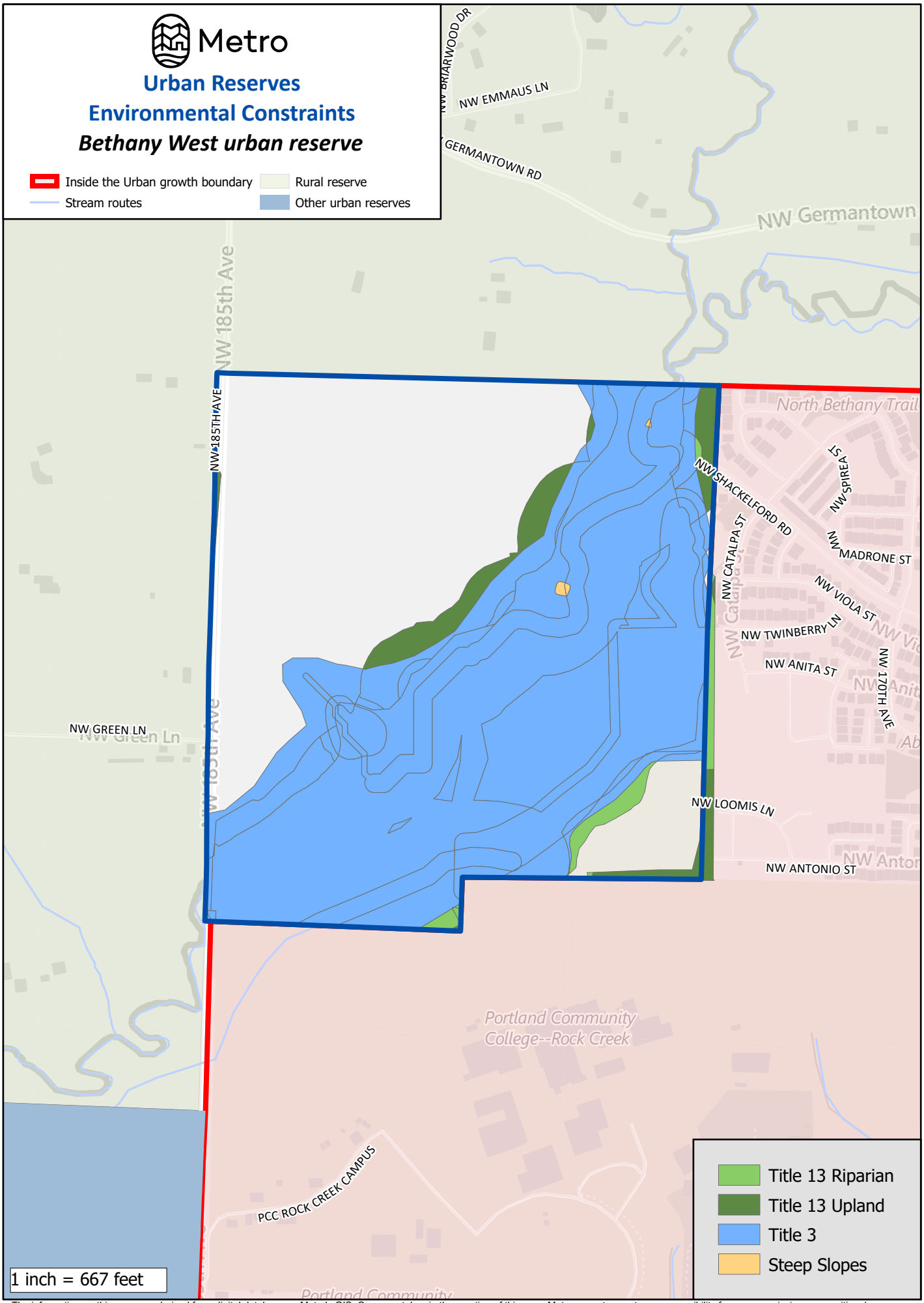

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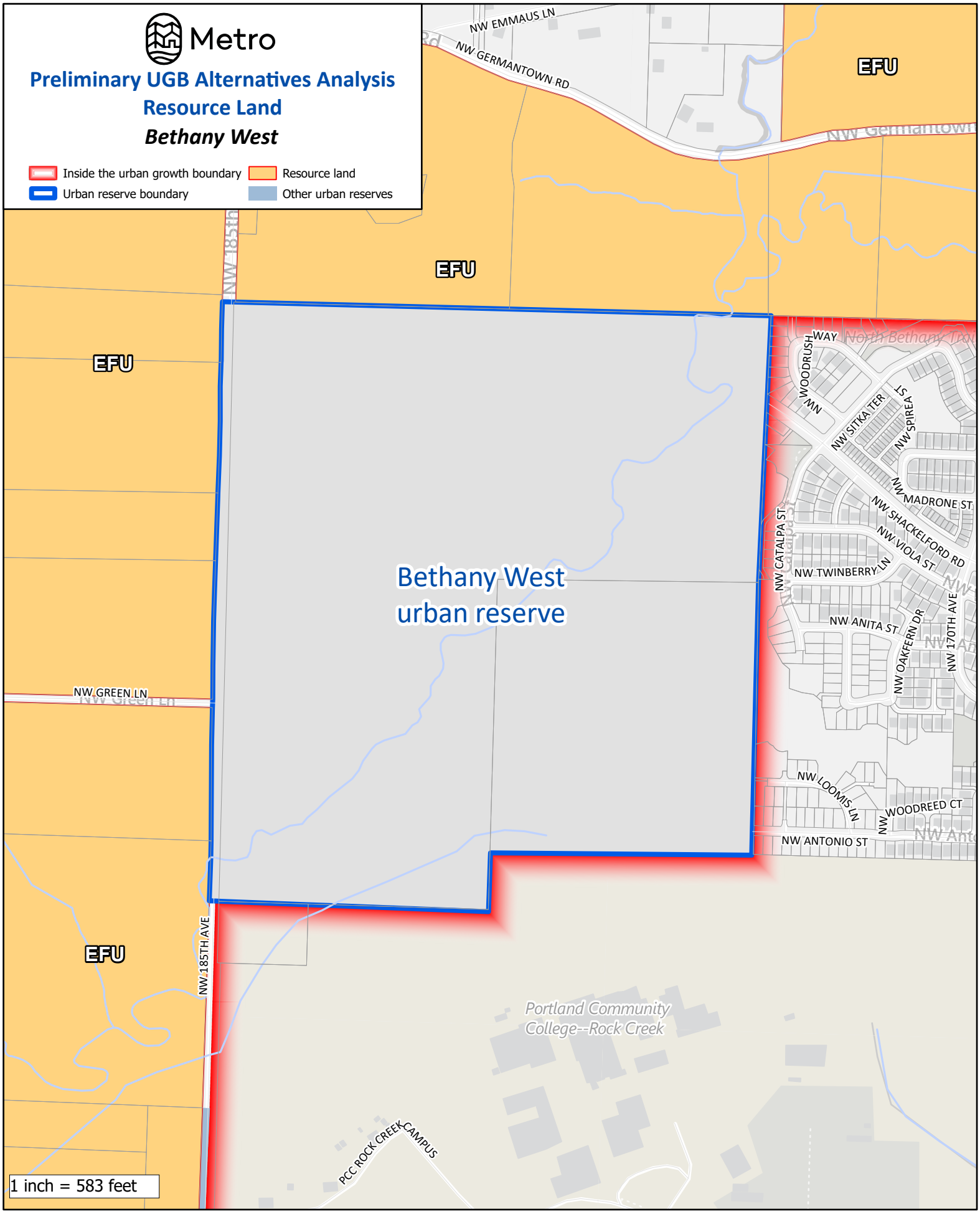

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BORING URBAN RESERVE

Total Reserve Area	2,727 acres
Total Tax Lot Area in Reserve (without Right-of-Way)	2,564 acres
Gross Vacant Buildable Area	1,279 acres
Net Vacant Buildable Area	**953 acres**

The Boring Urban Reserve, which includes some of the business district of the community of Boring, is an irregularly shaped area west of Highway 26 and bounded by SE Rugg Road to the north, SE Kelso Road to the south, SE 242nd Avenue to the west. The UGB is the reserve's northern boundary. The separate "Boring – Highway 26 Urban Reserve" is adjacent to the reserve, on the east side of SE 282nd Avenue and north of Highway 212 and undesignated rural lands removed from the UGB in 2023 border to the west, and nearly four acres undesignated rural lands neighbor to the northwest. The reserve is otherwise entirely surrounded by rural reserve lands.

GOAL 14 BOUNDARY LOCATION FACTORS

Factor 1: Efficient accommodation of identified land needs

The Boring Urban Reserve is comprised of 1,053 contiguous tax lots, all but 21 of which are entirely within the reserve. Of those tax lots entirely within the reserve, more than 65 percent are less than two acres, roughly 90 percent are less than five acres, and only five are larger than 20 acres, with the largest tax lot being less than 50 acres. The 21 tax lots only partially within the reserve have area within the reserve ranging from less than one acre to 53 acres. The combined tax lot area within the reserve is approximately 2,564 acres. As noted above, the entire reserve contains 1,279 gross vacant buildable acres and 953 net vacant buildable acres.

The reserve is bisected by the Springwater Corridor and Cazadero Trails, SE Telford Road, Highway 212, SE Church Road, and North Fork Deep Creek. The reserve is also adjacent to Highway 212 and includes a roughly 1,500-foot section of Highway 26, but access to the highway is about a third of a mile from the reserve's north end via SE Rugg Road, SE 267th Avenue, and SE Stone Road. There is access to the highway about two-thirds of a mile from the reserve's south end via Highway 212, as well. There is currently to transit service to or near the reserve.

Five distinct land uses define the reserve: rural residential development on larger and often forest tax lots on the buttes; small- to mid-sized rural residential development between SE 282nd Avenue and the Springwater Corridor Trail; pockets of agricultural land; golf course lands at the southwest along SE Kelso Road, and the community of Boring, which includes both residential and a variety of employment uses (e.g., a grocery store, auto-oriented retail, landscaping and construction related businesses, and self-storage facilities). Overall, 886 of the reserve's tax lots have assessed improvements, with the median value of those tax lots' improvements being just over $350,000.

The reserve includes: a Clackamas County Water Environment Services (WES) Sanitary Sewer Treatment Facility along SE Richey Road; a PGE substation between the Springwater Corridor Trail and SE 282nd Avenue; two Boring Water District storage facilities; one two-acre tax lot owned by

Sunrise Water Authority at the reserve's west. The reserve also includes the Boring Middle School, Naas Elementary School, and Hoodview Adventist School, as well as several places of worship and the majority of the Mountain View Golf Course. The Springwater Corridor and Cazadero Trails are on land owned by the City of Portland and Clackamas County, and powerlines run along portions of these trails. Metro owns three contiguous tax lots between North Fork Deep Creek and SE Richey Road, with a combined area of approximately two acres.

The western portion of the reserve north of Highway 212 includes two forested buttes, "Tower" and "Zion. Relatively flat areas are located south of Highway 212 and west of SE 282nd Avenue. An intrusion of rural reserve land follows the Springwater Corridor in the North Fork Deep Creek canyon from SE 262nd Avenue/SE Kelso Road to the center of the business district. North Fork Deep Creek, along with a few tributaries, generally flow west towards the canyon area along the Springwater Corridor Trail. A few tributaries to Johnson Creek flow north and west through the area north of Highway 212.

Generally, much of the reserve is either developed or otherwise constrained by natural features, such as steep slopes. Most of the central area of the Boring community is also already built out; however, there is some underdeveloped land in the commercial/business area that could provide additional employment uses. There are also two large pockets of agricultural land near SE Kelso Road that provide an opportunity for either residential or employment uses. While an employment use in these locations would be at the edge of the future urbanized area, such uses could benefit from proximity to Highway 26 and may provide a better buffer than residential uses between new urban development and nearby agricultural activity. There are two areas along SE Haley Road west of SE 282nd Avenue that are better suited to residential uses, considering their smaller tax lots and adjacent existing uses. There are other pockets of land throughout the reserve that could also provide for future residential uses, depending on availability of urban services. The proximity of existing schools, retail commercial uses, and recreational facilities could support residential uses.

The Boring Urban Reserve is considered able to accommodate both residential end employment land needs.

Factor 2: Orderly and economic provision of public facilities and services

Water Services

With regard to water services, the Boring Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Most of the land near to the Boring Urban Reserve that is already inside the UGB is not currently served by public water services, except for a roughly 70-acre area north of Highway 212 and west of SE 257th Avenue, which is served by the Boring Water District. Sunrise Water Authority provides water service to some of the nearby land within the UGB as well, although the district boundary is about two miles from the Boring Urban

Reserve. The Boring Water District also already provides service to most of the unincorporated community of Boring, which includes some of the Boring Urban Reserve.

The Boring Water District has four wells in the deep Troutdale Aquifer and has been granted water rights by Oregon Water Resources Department (OWRD) to withdraw up to 5.8 MGD. Existing storage is provided by three tanks: two tanks are located at Meier Dairy, one of which is sized at 352,000 gallons and another at 443,000 gallons; the other tank is located at SE Wally Road at the top of Polivka Hills and has a capacity of 100,000 gallons. There are no definitive determinations of an existing supply deficit for service to lands already in the UGB. While the Boring Water District's distribution system may be adequate to meet current demands, aged piping may eventually need to be replaced. As of 2009, there was not sufficient storage capacity to provide for peak day demands as well as fire requirements and efforts to improve that capacity are not currently known.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Existing supply and storage facilities are not currently available to meet the demands of urbanization of the Boring Urban Reserve. Urbanization of the reserve would require system-level increases in supply and storage capacity that are not entirely known and therefore not fully included in the costs listed below.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

As noted above, the Boring Water District only serves a small area that is already inside the UGB. However, the district's supply and storage facilities would need to be expanded to serve urban development in the reserve without creating or exacerbating any deficits. Aging/undersized pipes may also need to be replaced/upgraded.

d. Estimated water service-related costs for reserve development

Water piping, pumping, and storage costs	Cost
10-inch pipe	$0
12-inch pipe	$0
16-inch pipe	$11.55 million
Pumping	$0
Storage	$1.32 million
Total:	**$12.87 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$675**

Sanitary Sewer Services

With regard to sanitary sewer services, the Boring Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

There is no existing public sanitary sewer service within the UGB near the Boring Urban Reserve. Rather, this portion of the UGB is currently served by private septic systems. Clackamas Water Environment Services (WES) provides service in the UGB, but its service district boundary in the UGB is nearly five miles to the west. WES also operates a sewer treatment plant (the Boring Water Resource Recovery Facility, or WRRF) in the unincorporated community Boring, outside the UGB. Boring WRRF consists of lagoons and a sand filter to provide tertiary treatment for up to 20,000 gallons per day, which is believed to be just nearly adequate to continue serving existing customers. Considerations have been given to abandoning the Boring WRRF and to have wastewater pumped to another facility for treatment, perhaps in Sandy, Gresham, or another WES facility. Any additional treatment facility costs, and extended distribution system costs, that may be needed to accommodate this service, which are likely to be significant, are not included in the below costs.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The existing treatment plant and facilities are not adequate to serve the Boring Urban Reserve.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Because there is no existing public sanitary sewer service within the UGB near the Boring Urban Reserve, there are no existing facilities necessarily to be impacted. However, as noted above, existing facilities outside the UGB do not have capacity to serve the Boring Urban Reserve.

d. Estimated sanitary sewer service-related costs for reserve development

Sanitary sewer piping and pumping costs	Cost
10-inch pipe	$0
12-inch pipe	$0
21-inch pipe	$19.04
Pump station	$16.56 million
Force mains	$0
Total:	**$35.60 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$1,868**

Stormwater Management Services

With regard to stormwater management services, the Boring Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

No public stormwater management facilities exist to serve the adjacent area already inside the UGB.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

No public stormwater management facilities exist.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Because there is no existing public stormwater service within the UGB near the Boring Urban Reserve, there are no existing facilities necessarily to be impacted. Stormwater conveyance, water quality, and detention for roadways would be developed during construction. Based on topography, it seems likely that stormwater could outfall directly to North Fork Deep Creek.

d. Estimated stormwater service-related costs for reserve development

Stormwater piping and water quality/detention	Cost
18-inch pipe	$9.60 million
24-inch pipe	$5.48 million
30-inch pipe	$2.75 million
Water quality/dentition	$19.22 million
Total:	**$37.05 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$1,944**

Transportation Services

With regard to transportation services, the Boring Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(e) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Figure 4.36 in Chapter 4 of the 2023 Regional Transportation Plan (RTP) displays 2020 home-based vehicle miles traveled (VMT) per capita by Metro transportation analysis

zone, with average VMT per capita considered 11.32. According to Figure 4.36, areas in the UGB adjacent to the Boring Urban Reserve had significantly above average home-based VMT per capita in 2020.

Metro's adopted 2040 Growth Concept Map designates numerous walkable, higher-density, mixed-use centers of employment, housing, cultural and recreational activities, and transit service across the region in the UGB. Those centers are intended to grow the economy, provide affordable housing, and promote vibrant and distinctive communities that minimize transportation costs and allow people to meet their daily needs without having to utilize a private motor vehicle. There are no 2040 Growth Concept centers that have been planned for urban uses within three miles of the reserve; residents of areas already within the UGB near the reserve therefore have to travel several miles to reach a 2040 Growth Concept Center that has been planned for urban uses. Areas already inside the UGB near to the reserve are also about three miles from major commercial uses (e.g., grocery store and other retail uses) in the UGB.

Furthermore, because there are currently no on-road bike facilities and no sidewalks within the UGB near to the reserve, and because there is only limited bus service (i.e., every few hours) on the Sandy Area Metro (SAM) connecting these areas to commercial areas in Damascus and Clackamas, residents of these areas are particularly reliant on private motor vehicle transport to get to services within the UGB. The Springwater Corridor Trail, however, does connect areas within the UGB adjacent to the north side of the reserve with Gresham and its 2040 Growth Concept regional center approximately 2.5 miles to the north.

Figure 4.14 in Chapter of the 2023 RTP identifies several high injury corridors inside the UGB in the areas of Gresham, Happy Valley, and Pleasant Valley, including Foster Road, Powell Boulevard, and sections of Highway 212. The figure also identifies the intersection of SE 242nd Avenue and SE Hoffmeister Road, as well as the intersection of Highway 26 and SE 282nd Avenue, as high injury intersections.

Highway 26 and Highway 212 are identified as throughways in Figure 4.7 in Chapter of the 2023 RTP. Figure 4.8 of the chapter indicates that these routes currently meet travel speed reliability performance thresholds, with no more than four hours per day when travel speeds fall below the identified minimum speed. RTP models indicate these facilities' reliability will continue at least to the year 2045.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Highway 26 and Highway 212 run adjacent to and/or through the reserve. As noted above, these throughways currently meet travel speed reliability performance thresholds.

There is currently no frequent transit service, on-road bike facilities, or sidewalks connecting the reserve to areas already inside the UGB. The Springwater Corridor Trail does, however, run through the reserve and connects the reserve to Gresham to the

north. SAM also provides occasional bus service from the reserve to commercial areas of Damascus and Clackamas. There are sidewalks within the reserve on Highway 212 from about SE Grange Street nearly to SE Jons Lane, as well as along SE 282nd Avenue for about 300 feet northward from the intersection with Highway 212. This intersection also has a dedicated bike lane.

As noted in response to Factor 1, the reserve already contains some commercial uses, including a grocery store, school uses, places of worship, and some residential development. A post office is just across Highway 212 in the separate Boring – Highway 26 Urban Reserve. These existing non-residential uses could support new residential uses in the reserve and help to limit the need for new residents to travel far to access their daily needs. Similarly, if the reserve were to be developed with additional employment uses, those uses could provide nearby employment opportunities to existing residents of the reserve and neighboring areas already inside the UGB, with limited commutes.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Portions of Highway 26, Highway 212, SE Telford Road, and SE 282nd Avenue already within the UGB would be expected to see additional private vehicle traffic from development of the reserve. Indeed, the reserve is several miles from the nearest 2040 Growth Concept center and currently lacks frequent transit service, bike, and pedestrian facilities to commercial areas in Damascus and Gresham, suggesting the need for private motor vehicle use on these roadways. However, as noted in response to Factor 1 and above, the reserve already has a mixture of uses and is considered able to accommodate new residential and employment uses in the future. If the reserve itself were to be developed with a mixture of uses, future residents could get more of their daily needs met locally without having to drive as much on roads already in the UGB. The existing school uses in the reserve will also help to limit driving by new residents on roads already in the UGB. Moreover, nearby residences in the current UGB could provide housing to employees of the reserve, and new employment uses in the reserve could provide jobs for nearby residents of the current UGB, further limiting new traffic impacts on roads already in the UGB.

With these considerations, development of the reserve may result in only moderate impacts to home-based VMT per capita in nearby areas already inside the UGB and the performance of Highway 26 and Highway 212 as throughways. Any additional motor vehicle traffic on Foster Road or Highway 212 resulting from development of the reserve, however, may exacerbate these roadways' high-crash conditions.

Urban development of the reserve would result in greater use of the Springwater Corridor Trail and the existing sidewalks and bike facility already inside the reserve.

d. Need for major transportation facility improvements and associated costs

In order to serve urban development, a 1.39-mile section of SE 282nd Avenue and a 0.58-mile section SE Highway 212 at the east of the reserve will likely need to be improved to urban arterial standards. Both of these roadway sections' improvements are considered to be a half-street improvements in this analysis, as their eastern and northern sides, respectively, would be improved within the urbanization of the separate Boring – Highway 26 Urban Reserve. Another roughly 1.5 miles of SE Highway 212 west of SE 282nd Avenue, as well as 0.83 miles of SE Richey Road and 1.13 miles of SE Kelso Road, will also likely need to be improved/extended to urban arterial standards, including with acquisition of additional right-of-way. It is expected that the following roadway sections will need to be improved to urban collector standards, with acquisition of additional right-of-way: 0.80 miles of SE Church Road; 0.54 miles of SE 257th Avenue; 0.74 miles of SE Stewart Lane; 0.2 miles of SE Fireman Way; 0.26 miles of SE Gillespie Court/SE Zion Hill Drive; 0.28 miles of SE School Avenue; 0.84 miles of SE 272nd Avenue; 1.97 miles of SE Sunshine Valley Road/SE Victoria Street; 0.83 miles of SE 258th Place/SE 257th Drive; 1.09 miles of SE Telford Road; and 0.67 miles of SE Haley Road. In addition, four new collectors with a combined length of approximately 2.81 miles will need to be built. Some sections of these new and improved roadways may need to traverse areas of steeper topography and/or water bodies; therefore, some per-mile costs are higher than normal.

Facilities	Cost
Arterials, existing/improved full street	$166.76 million
Arterials, existing/improved half street	$52.90 million
Arterials, new	$0
Collectors, existing/improved full street	$278.45 million
Collectors, existing/improved half street	$0
Collectors, new	$156.20 million
Total:	**$149.31 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$34,329**

e. Provision of public transit service

The reserve's area was withdrawn from the TriMet service district; thus, no analysis of future/additional transit service was completed by TriMet. As described above, SAM currently serves the reserve.

Prior to land being included in the UGB, a more detailed concept plan, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11, will be required. This concept plan process will develop more refined public facility and service needs and cost estimates.

Factor 3: Comparative environmental, social, energy, and economic consequences

Environmental consequences

North Fork Deep Creek flows westward near the unincorporated community of Boring for nearly a mile in the Boring Urban Reserve, mostly within an intact riparian corridor. About 1.5 total miles of very small tributaries also flow in this area, generally through rural residential development, though about 1,600 feet of these tributaries flow through agricultural land. Riparian habitat is identified along the stream corridors, with some upland habitat near the eastern edge of the reserve.

Two additional tributaries to North Fork Deep Creek, with combined lengths of approximately 6,100 feet, flow south through the southwest corner of the reserve on the north side of Highway 212. These streams cross pastureland and wooded tax lots. Riparian habitat is identified along the stream corridors with some upland habitat identified along the wooded surroundings of the streams. A 2.5-acre wetland identified through the National Wetland Inventory (NWI) is located along North Fork Deep Creek at the eastern edge of the reserve.

The riparian corridors of North Fork Deep Creek and of the tributaries described above, as well as wetlands, floodplains, and upland habitat, could receive enhanced regulatory protections as a result of adding the reserve to the UGB.

The area between SE 282nd Avenue and the Springwater Corridor contains a few tributaries to Johnson Creek that flow north and that have a combined length of approximately two miles. Significant portions of these small streams flow through a forested riparian corridor and the remaining portions generally traverse open fields. Riparian habitat is identified along the stream corridors with some upland habitat identified along the wooded areas near the streams. In several locations, it appears that the streams have been altered to create ponds. Inclusion of the area in the UGB may result in greater protections and even enhancements of the existing forested riparian corridor due to increased urban water quality and habitat regulations.

A 2,000-foot section of stream in the vicinity of SE Sunshine Valley Road and SE 250th Place flows west out of the reserve to connect with other streams and ultimately join Johnson Creek to the north. This stream is in forested portions of large rural residential tax lots and has been identified as having associated riparian and upland habitat.

Urbanization of the flat, less vegetated, developable land near the streams within the reserve could have some impacts water bodies. However, restoration of degraded stream edges and enhancement of wetland buffers would provide protection from urbanization. The tributaries that mostly flow through the rural residential areas may be impacted by future development, as they generally flow through the remaining developable portions of the properties; however, the existing housing pattern and lot consolidation concerns may reduce options for impact reduction measures. Urbanization of the agricultural lands provides the opportunity to restore and enhance the riparian corridor of the streams that

flow along the edges of the fields. There are some significant locations of upland habitat identified in the butte areas, although most of it is also located on slopes greater than 25 percent, which would limit the amount of urbanization that could occur.

This analysis finds that urbanization of the reserve could occur with moderate to high impacts to the stream corridors, habitat areas, and wetlands, but impacts will depend in part on building and lot consolidation patterns and the opportunities to enhance riparian corridors on agricultural lands.

Considering the comparative environmental consequences of urbanization, the Boring Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Social, energy, and economic consequences

The relatively large Boring Urban Reserve has a variety of land uses that would be impacted differently by urbanization.

There is somewhat urban-like development, including residential, commercial, industrial, and institutional uses, in the unincorporated community of Boring around the intersection of Highway 212 and SE 282nd Avenue. Given the levels of existing development and parcelization, new urban development here would be expected to occur more slowly and have less of a noticeable impact on the existing character of the area.

There are also substantial amounts of rural residential development on smaller tax lots near the Mountain View Golf Course. The golf course is not considered buildable land and urban redevelopment of the nearby rural residential areas is likely to occur very slowly, and thereby cause comparatively less change in the character of the area.

The forested buttes north of Highway 212 and west of SE Telford Road are less developed and have more of a rural character, in part because they are not as close to the unincorporated community of Boring and are nearer to more rural and undeveloped areas. Nonetheless, there are a number of rural residences in this area, as well and platted rural residential subdivisions. That existing development, as well as topography and natural resources, may encourage a less dense, smaller-scale urban redevelopment patters that are not as likely to generate a significant change in sense of place or degradation of rural lifestyle for existing residents.

While urbanization may have generate some changes to the character of the area over time, it could also could foster new civic, recreational, and social opportunities for the reserve's existing residents, particularly if it features a mixture of uses.

As detailed more fully in response to Factor 2, urbanization of the reserve may only have moderate impacts on VMT, thereby limiting adverse energy consequences.

While there is the potential for loss of some existing jobs through redevelopment of the existing commercial/employment center of Boring, the potential to generate a significant

number of new jobs with urban employments uses may be a positive for the area. The agricultural activity within the reserve is not insignificant; however, the economic benefits of urban residential development and employment uses may outweigh the economic costs from a loss in farming activity.

Overall, there would be comparatively moderate social, energy, and economic consequences from urbanization of this reserve. The Boring Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Factor 4: Compatibility of the proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

There are three locations where lands outside the UGB but contiguous to the Boring Urban Reserve have Goal 3 or 4 resource land zoning for agricultural and forest activities.

The first location is land along SE 282nd Avenue on the opposite side of Highway 26 from the reserve. This land is zoned Exclusive Farm Use (EFU) by Clackamas County and, while generally lacking in trees, is in active agriculture use. Additional traffic along SE 282nd Avenue to and from Gresham caused by development of the reserve could impede the movement of farm equipment. SE 282nd Avenue itself would not provide an appropriate buffer between urban and agricultural uses; indeed, there could be land use conflicts in this location related to safety, liability, and vandalism and complaints of noise, odor, dust, and the use of pesticides and fertilizer.

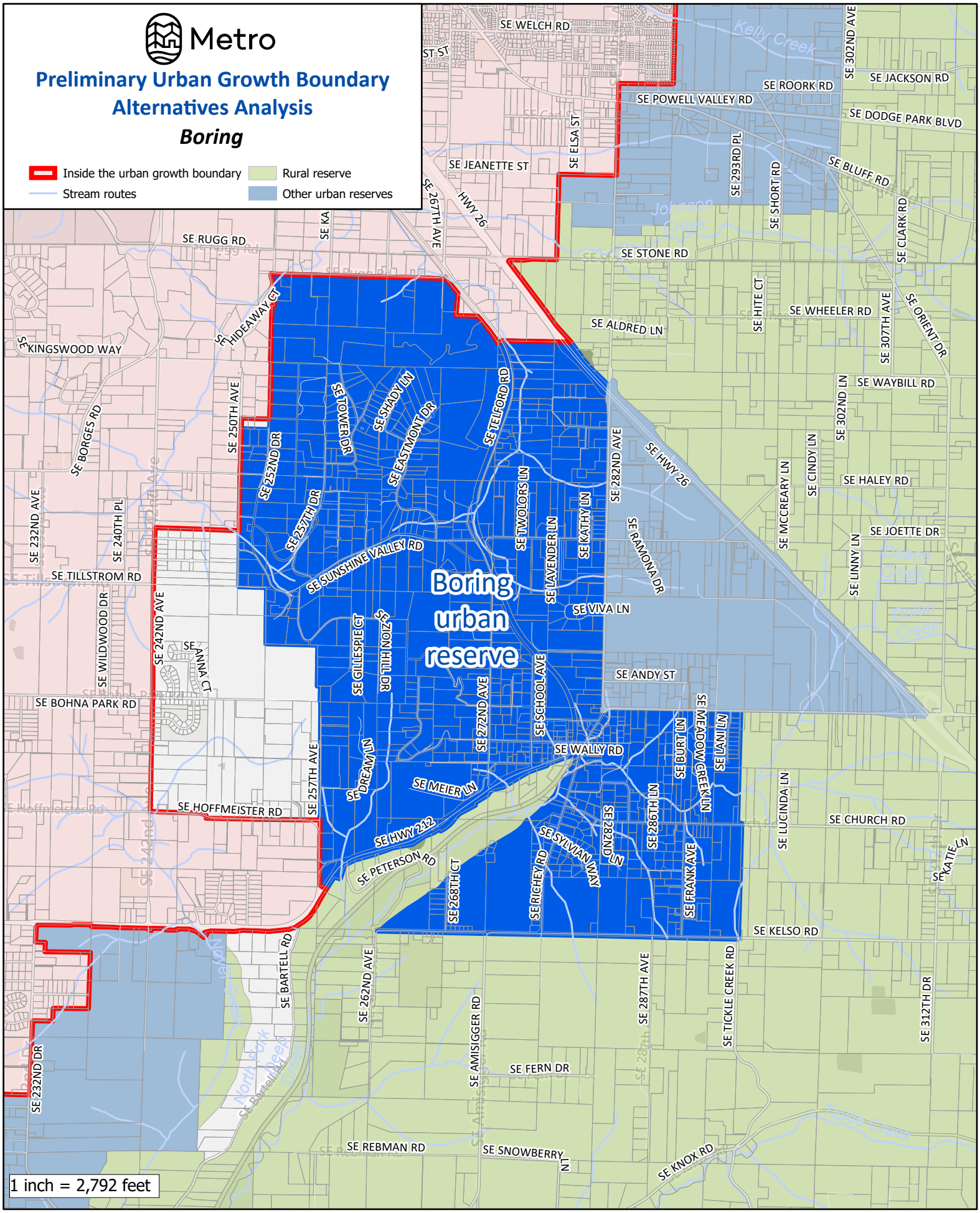
The second location is east of SE 282nd Avenue in the vicinity of SE Viva Lane and consists of one 80-acre tax lot that is part of the larger commercial nursery operation to the east. Additional traffic along SE 282nd Avenue to and from Gresham caused by urbanization of the reserve could impede the movement of farm equipment in this location; however, since this 80-acre tax lot has field access from the remainder of the nursery that is headquartered off Highway 212, there are alternative ways to move equipment. Even though the frontage of the EFU land along SE 282nd Avenue is not very long, the right-of-way width would not provide an appropriate buffer between urban and agricultural uses, and land use conflicts related to safety, liability, and vandalism and complaints due to noise, odor, dust, and the use of pesticides and fertilizer could still occur in this location.

The third location is an extensive tract of EFU-zoned land south of SE Kelso Road and east of the urban reserve along both sides of SE Church Road. The agricultural land south of SE Kelso Road is in nursery production and extends over a mile south in some locations. Additional traffic along SE Kelso Road to and from Highway 26 could impede the movement of farm equipment and goods as that is the most direct route to the highway from this extensive agricultural area. This is especially true if the large tax lots in the reserve are developed with residential uses. SE Kelso Road would not provide an appropriate buffer to between urban and agricultural uses and issues related to safety, liability, and vandalism and complaints due to noise, odor, dust, and the use of pesticides and fertilizer could still occur. The EFU-zoned land adjacent to SE Church Road is in nursery and field crop use and is also more intermixed with pockets of residences. However, there is some large single-owner operations that could be impacted by increased traffic on SE Church Road, which also

provides good access for agricultural activities to Highway 26. Most of the EFU land directly adjacent to the reserve is in residential use and would provide a bit of a buffer between the new urban area and the agricultural activities further east.

The nearby agricultural activities occurring on farm and forest land would be impacted by urbanization of the reserve, especially in the southern portion of the area. Therefore, the proposed urban uses (i.e., urban development of the reserve) would be considered to have low compatibility with the nearby agricultural and forest activities occurring on farm and forest land.

The Boring Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location factor.



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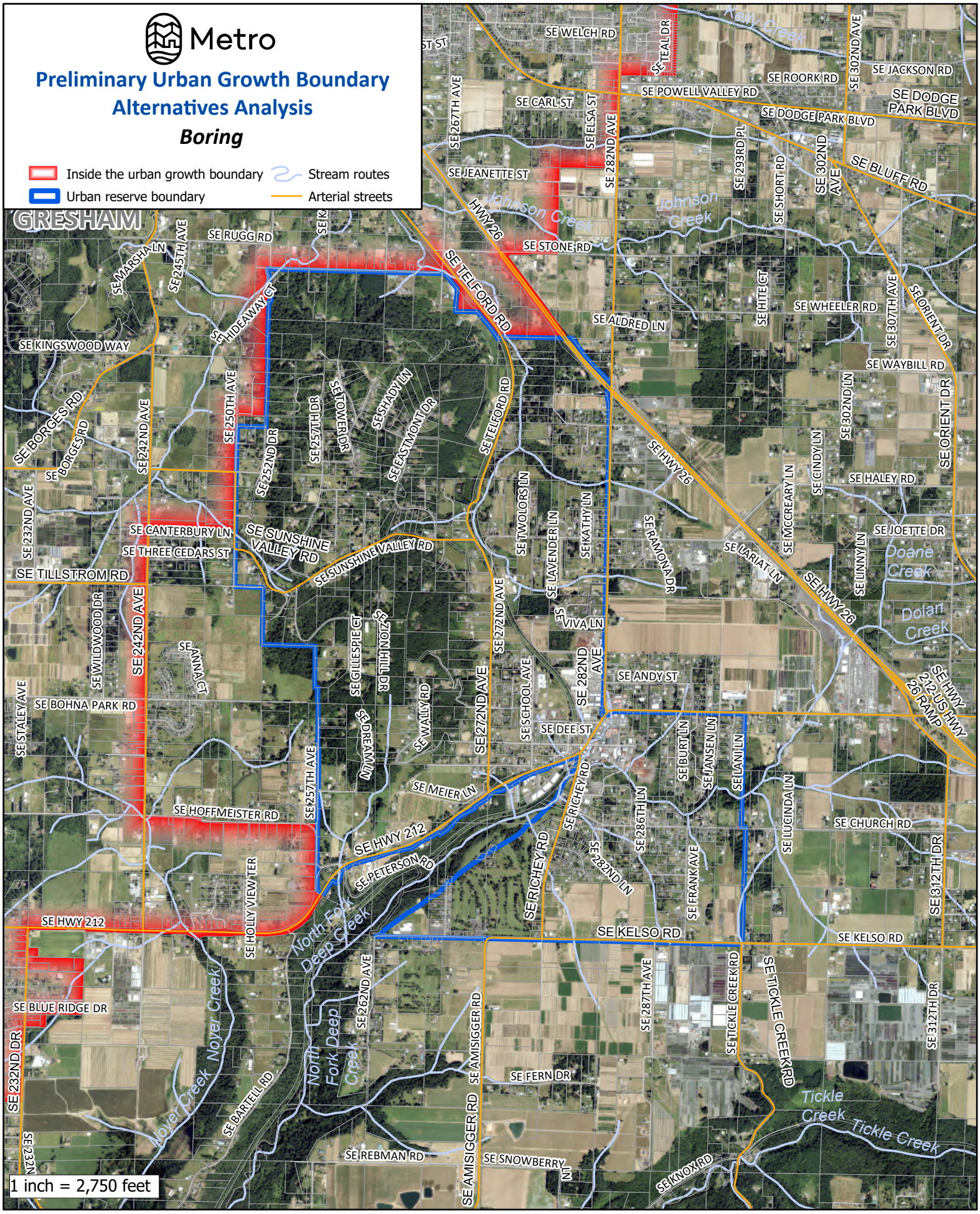
Metro

Preliminary Urban Growth Boundary Alternatives Analysis

Boring

Inside the urban growth boundary
Urban reserve boundary
Stream routes
Arterial streets



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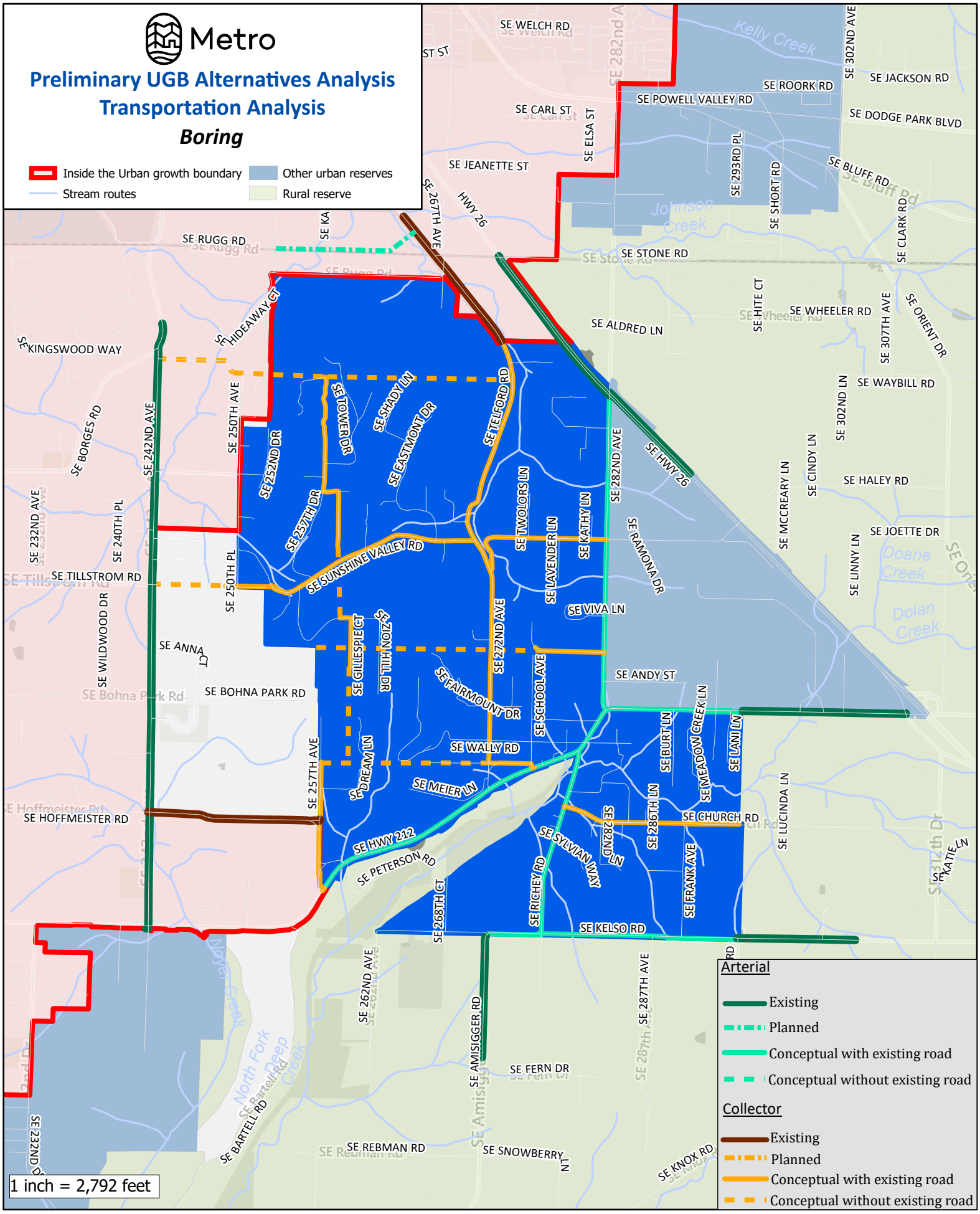

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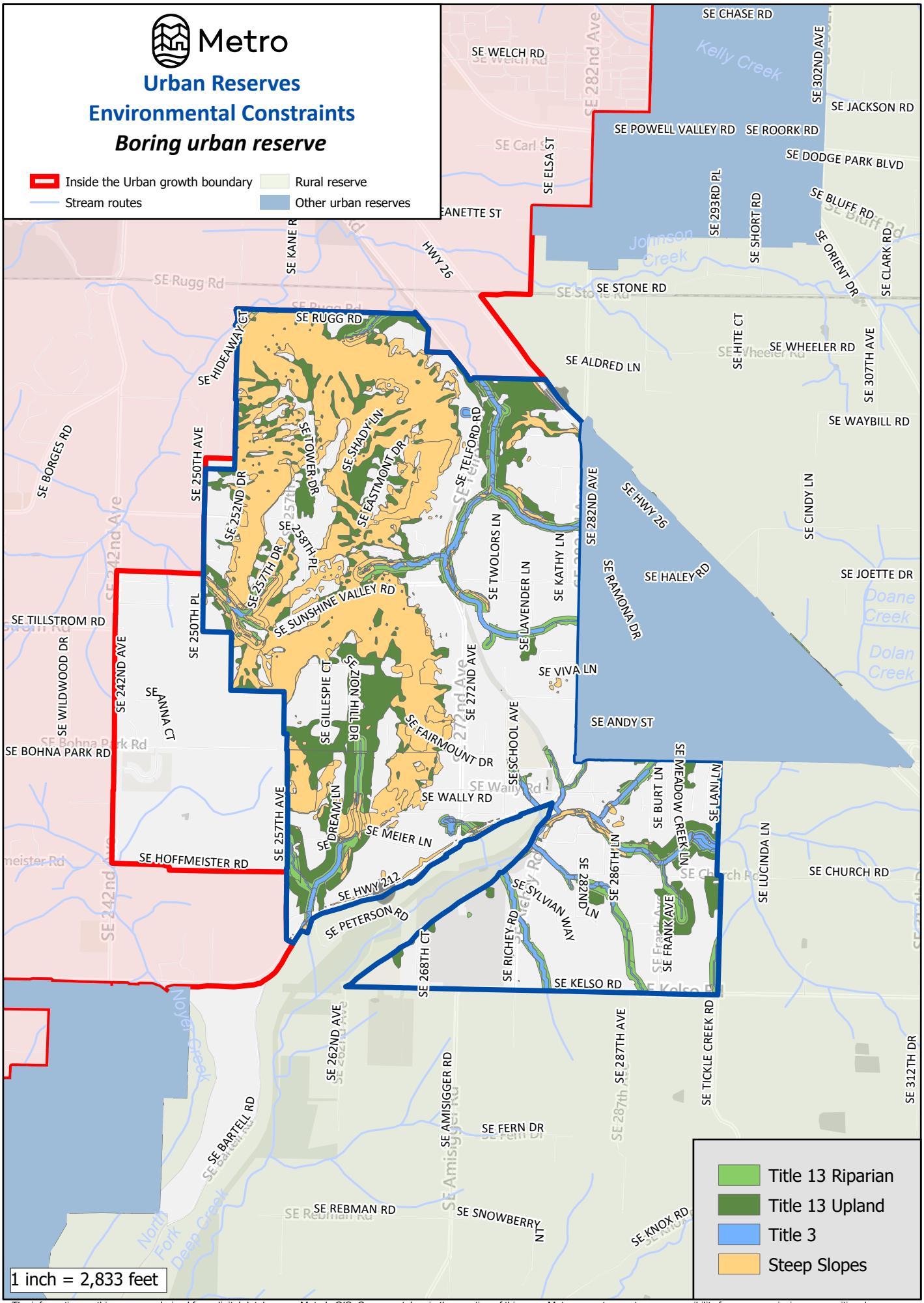

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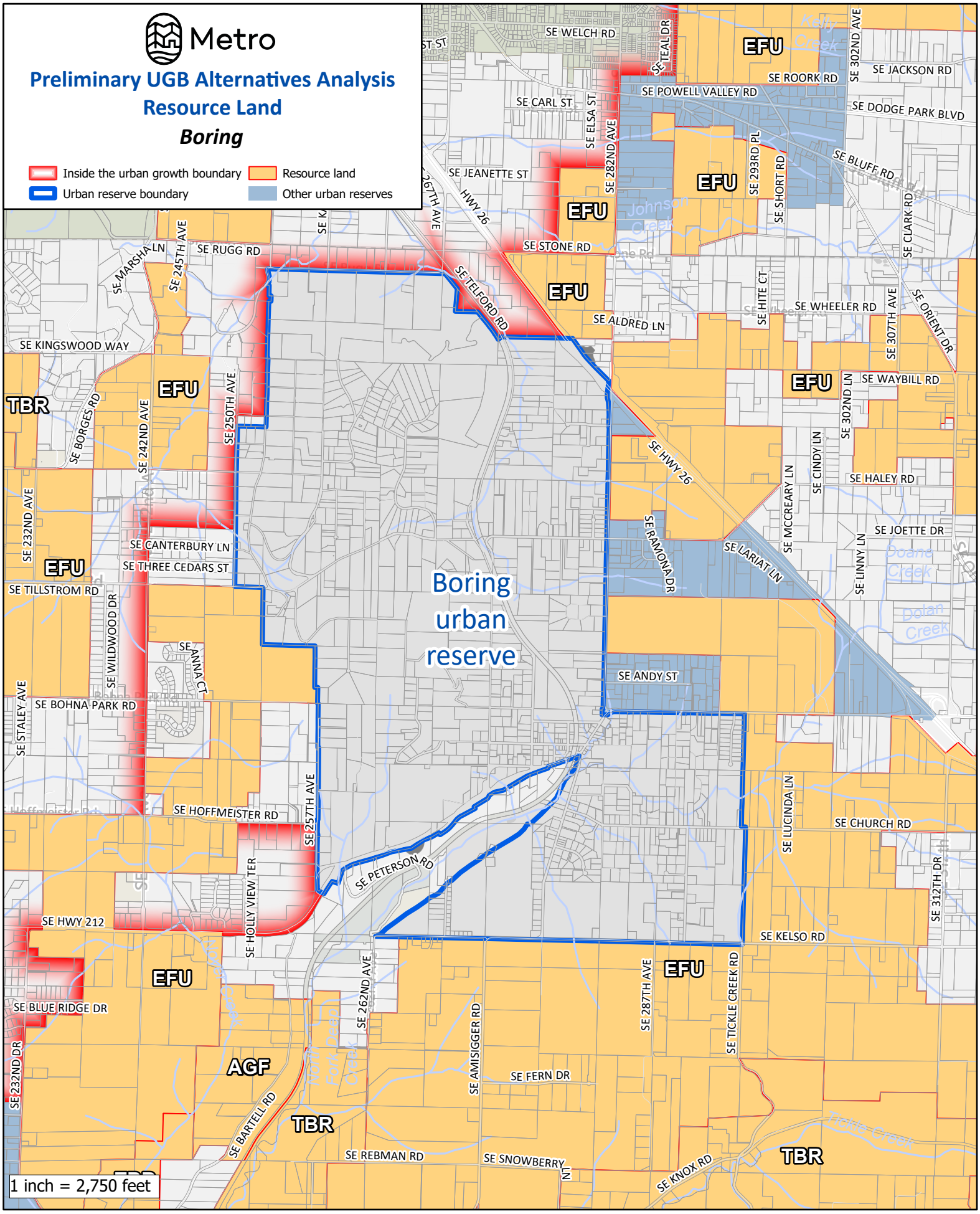

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BORING – HIGHWAY 26 URBAN RESERVE

Total Reserve Area	671 acres
Total Tax Lot Area in Reserve (without Right-of-Way)	591 acres
Gross Vacant Buildable Area	503 acres
Net Vacant Buildable Area	**375 acres**

The Boring – Highway 26 Urban Reserve is a triangular-shaped area with Highway 26 along its northeast side, SE 282nd Avenue along its west side, and Highway 212 along its south side. Uniquely, the Boring – Highway 26 Urban reserve is not immediately adjacent to the UGB, but rather is separated from it by the "Boring Urban Reserve" on the opposite side of SE 282nd Avenue and Highway 212. Rural reserve lands are on the other side of Highway 26 and the east end of Highway 212.

GOAL 14 BOUNDARY LOCATION FACTORS

Factor 1: Efficient accommodation of identified land needs

The Boring – Highway 26 Urban Reserve is comprised of 150 contiguous tax lots, but one of those tax lots, owned by the State of Oregon, is occupied by Highway 26 on- and off-ramps. Of the other 149 tax lots, two-thirds are smaller than two acres each, 85 percent are smaller than five acres each, and 12 are 10 acres or larger, including one that is nearly 80 acres. The combined tax lot area within the reserve is approximately 591 acres. As noted above, the entire reserve contains 503 gross vacant buildable acres and 375 net vacant buildable acres.

Four distinct land uses define the reserve: rural residential pockets along SE Haley Road and SE Andy Street; two significant tracts of agricultural land; a section of the business district of the community of Boring; and wholesaling/industrial uses near the Highway 212 interchange with Highway 26. Along Highway 212, the reserve contains a post office on a 2.7-acre tax lot and a fire district facility on a 4.3-acre tax lot. The Good Sheppard Community Church and School is on a 30-acre tract of land in the center of the reserve along SE Haley Road, and includes a mile-long secondary access from Highway 212 through the John Holmlund Nursery property. Overall, 146 of the reserve's tax lots have assessed improvements, with the median assessed value of those tax lots' improvements being approximately $271,000.

Naas Elementary School, Boring Elementary School, and the Springwater Corridor Trail are less than half a mile from the southwest corner of the reserve via Highway 212 and SE School Avenue. The Mountain View Golf Course is within two miles.

In addition to frontage along Highway 212, the reserve contains two access points to Highway 26, which leads to the City of Gresham just two miles to the north and to the City of Sandy approximately three miles to the south. There is currently no transit service to the reserve.

The reserve is primarily flat, though North Fork Deep Creek flows south through the southeast corner of the reserve and two tributaries of Johnson Creek flow west through the central and northern portion of the reserve.

With its direct highway access, existing commercial and industrial land uses, and relatively large and flat agricultural properties, the reserve is considered able to accommodate an employment need, particularly near to Highway 26, SE Haley Road, and the commercial center of Boring. Close proximity of schools, recreational uses, and commercial services would also benefit residential uses and such uses may be compatible with existing residential development on smaller lots. Therefore, the reserve is considered able to accommodate both a residential and employment land need.

Factor 2: Orderly and economic provision of public facilities and services

Water Services

With regard to water services, the Boring – Highway 26 Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Most of the land near to the Boring – Highway 26 Urban Reserve that is already inside the UGB is not currently served by public water services, except for a roughly 70-acre area north of Highway 212 and west of SE 257th Avenue, which is served by the Boring Water District. Sunrise Water Authority provides water service to some of the nearby land within the UGB as well, although the district boundary is about two miles from the Boring – Highway 26 Urban Reserve. The Boring Water District also already provides service to most of the unincorporated community of Boring, which includes most of the Boring – Highway 26 Urban Reserve.

The Boring Water District has four wells in the deep Troutdale Aquifer and has been granted water rights by Oregon Water Resources Department (OWRD) to withdraw up to 5.8 MGD. Existing storage is provided by three tanks: two tanks are located at Meier Dairy, one of which is sized at 352,000 gallons and another at 443,000 gallons; the other tank is located at SE Wally Road at the top of Polivka Hills and has a capacity of 100,000 gallons. There are no definitive determinations of an existing supply deficit for service to lands already in the UGB. While the Boring Water District's distribution system may be adequate to meet current demands, aged piping may eventually need to be replaced. As of 2009, there was not sufficient storage capacity to provide for peak day demands as well as fire requirements and efforts to improve that capacity are not currently known.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Existing supply and storage facilities are not currently available to meet the demands of urbanization of the Boring – Highway 26 Urban Reserve. Urbanization of the reserve

would require system-level increases in supply and storage capacity that are not entirely known and therefore not fully included in the costs listed below.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

As noted above, the Boring Water District only serves a small area that is already inside the UGB. However, the district's supply and storage facilities would need to be expanded to serve urban development in the reserve without creating or exacerbating any deficits. Aging/undersized pipes may also need to be replaced/upgraded.

d. Estimated water service-related costs for reserve development

Water piping, pumping, and storage costs	Cost
10-inch pipe	$3.19 million
12-inch pipe	$0
16-inch pipe	$0
Pumping	$0
Storage	$0.50 million
Total:	**$3.69 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$492**

Sanitary Sewer Services

With regard to sanitary sewer services, the Boring – Highway 26 Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

There is no existing public sanitary sewer service within the UGB near the Boring – Highway 26 Urban Reserve. Rather, this portion of the UGB is currently served by private septic systems. Clackamas Water Environment Services (WES) provides service in the UGB, but its service district boundary in the UGB is more than five miles to the west. WES also operates a sewer treatment plant (the Boring Water Resource Recovery Facility, or WRRF) in the unincorporated community Boring, outside the UGB. Boring WRRF consists of lagoons and a sand filter to provide tertiary treatment for up to 20,000 gallons per day, which is believed to be just nearly adequate to continue serving existing customers. Considerations have been given to abandoning the Boring WRRF and to have wastewater pumped to another facility for treatment, perhaps in Sandy, Gresham, or another WES facility. Any additional treatment facility costs, and extended distribution system costs, that may be needed to accommodate this service, which are likely to be significant, are not included in the below costs.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The existing treatment plant and facilities are not adequate to serve the Boring – Highway 26 Urban Reserve.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Because there is no existing public sanitary sewer service within the UGB near the Boring – Highway 26 Urban Reserve, there are no existing facilities necessarily to be impacted. However, as noted above, existing facilities outside the UGB do not have capacity to serve the Boring – Highway 26 Urban Reserve.

d. Estimated sanitary sewer service-related costs for reserve development

Sanitary sewer piping and pumping costs	Cost
10-inch pipe	$2.83 million
12-inch pipe	$0
15-inch pipe	$0
Pump station	$0
Force mains	$0.50 million
Total:	**$3.69 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$485**

Stormwater Management Services

With regard to stormwater management services, the Boring – Highway 26 Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

No public stormwater management facilities exist to serve the adjacent area already inside the UGB.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

No public stormwater management facilities exist.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Because there is no existing public stormwater service within the UGB near the Boring – Highway 26 Urban Reserve, there are no existing facilities necessarily to be impacted.

Stormwater conveyance, water quality, and detention for roadways would be developed during construction.

d. Estimated stormwater service-related costs for reserve development

Stormwater piping and water quality/detention	Cost
18-inch pipe	$2.16 million
24-inch pipe	$1.06 million
30-inch pipe	$0
Water quality/dentition	$12.41 million
Total:	**$15.63 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$2,086**

Transportation Services

With regard to transportation services, the Boring – Highway 26 Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(e) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Figure 4.36 in Chapter 4 of the 2023 Regional Transportation Plan (RTP) displays 2020 home-based vehicle miles traveled (VMT) per capita by Metro transportation analysis zone, with average VMT per capita considered 11.32. According to Figure 4.36, areas in the UGB nearest to the Boring – Highway 26 Urban Reserve had significantly above average home-based VMT per capita in 2020.

Metro's adopted 2040 Growth Concept Map designates numerous walkable, higher-density, mixed-use centers of employment, housing, cultural and recreational activities, and transit service across the region in the UGB. Those centers are intended to grow the economy, provide affordable housing, and promote vibrant and distinctive communities that minimize transportation costs and allow people to meet their daily needs without having to utilize a private motor vehicle. There are no 2040 Growth Concept centers that have been planned for urban uses within three miles of the reserve; residents of areas already within the UGB near the reserve have to travel several miles to reach a 2040 Growth Concept Center that has been planned for urban uses. Areas already inside the UGB near to the reserve are also more than three miles from major commercial uses (e.g., grocery store and other retail uses) in the UGB.

Furthermore, because there are currently no on-road bike facilities and no sidewalks within the UGB near to the reserve, and because there is only limited bus service (i.e., every few hours) on the Sandy Area Metro (SAM) connecting these areas to commercial areas in Damascus and Clackamas, residents of these areas are particularly reliant on

private motor vehicle transport to get to services within the UGB. The Springwater Corridor Trail, however, does connect areas within the UGB near to the north side of the reserve with Gresham and its 2040 Growth Concept regional center approximately three miles to the north.

Figure 4.14 in Chapter of the 2023 RTP identifies several high injury corridors inside the UGB in the areas of Gresham, Happy Valley, and Pleasant Valley, including Foster Road, Powell Boulevard, and sections of Highway 212. The figure also identifies the intersection of SE 242nd Avenue and SE Hoffmeister Road, as well as the intersection of Highway 26 and SE 282nd Avenue, as high injury intersections.

Highway 26 and Highway 212 are identified as throughways in Figure 4.7 in Chapter 4 of the 2023 RTP. Figure 4.8 of the chapter indicates that these routes currently meet travel speed reliability performance thresholds, with no more than four hours per day when travel speeds fall below the identified minimum speed. RTP models indicate these facilities' reliability will continue at least to the year 2045.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Highway 26 and Highway 212 run adjacent to and/or through the reserve. As noted above, these throughways currently meet travel speed reliability performance thresholds.

There is currently no frequent transit service, on-road bike facilities, or sidewalks connecting the reserve to areas already inside the UGB. The Springwater Corridor Trail, however, which is less than 1,000 feet from the southwest corner of the reserve, connects to Gresham to the north. SAM also provides occasional bus service from the reserve to commercial areas of Damascus and Clackamas. There are sidewalks within the reserve for about 1,600 feet on Highway 212, as well as along SE 282nd Avenue for about 300 feet northward from the intersection with Highway 212. This intersection also has a dedicated bike lane.

As noted in response to Factor 1, the reserve already contains some commercial uses, school uses, places of worship, a post office, and some residential development. A grocer story is just across Highway 212 in the separate Boring Urban Reserve. These existing non-residential uses could support new residential uses in the reserve and help to limit the need for new residents to travel far to access their daily needs. Similarly, if the reserve were to be developed with additional employment uses, those uses could provide nearby employment opportunities to existing residents of the reserve and neighboring areas already inside the UGB, with limited commutes.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Portions of Highway 26, Highway 212, SE Telford Road, and SE 282nd Avenue already within the UGB would be expected to see additional private vehicle traffic from development of the reserve. Indeed, the reserve is several miles from the nearest 2040

Growth Concept center and currently lacks frequent transit service, bike, and pedestrian facilities to commercial areas in Damascus and Gresham, suggesting the need for private motor vehicle use on these roadways. However, as noted in response to Factor 1 and above, the reserve already has a mixture of uses and is considered able to accommodate new residential and employment uses in the future. If the reserve itself were to be developed with a mixture of uses, future residents could get more of their daily needs met locally without having to drive as much on roads already in the UGB. The existing school uses in the reserve will also help to limit driving by new residents on roads already in the UGB. Moreover, nearby residences in the current UGB could provide housing to employees of the reserve, and new employment uses in the reserve could provide jobs for nearby residents of the current UGB, further limiting new traffic impacts on roads already in the UGB.

With these considerations, development of the reserve may result in only moderate impacts to home-based VMT per capita in nearby areas already inside the UGB and the performance of Highway 26 and Highway 212 as throughways. Any additional motor vehicle traffic on Foster Road or Highway 212 resulting from development of the reserve, however, may exacerbate these roadways' high-crash conditions.

Urban development of the reserve would result in greater use of the Springwater Corridor Trail and the existing sidewalks and bike facility already inside the reserve.

d. Need for major transportation facility improvements and associated costs

In order to serve urban development, a 1.39-mile section of SE 282nd Avenue and a 1.2-mile section SE Highway 212 at along the western and southern edges of the reserve will likely need to be improved to urban arterial standards. Both of these roadway sections' improvements are considered to be a half-street improvements in this analysis, as their western and southern sides, respectively, would be improved within the urbanization of the separate Boring Urban Reserve. A 0.61-mile section of SE Haley Road would likely need to be improved to urban collector standards, and a new 0.75-mile-long collector is expected to be needed to SE Highway 212 to SE Haley Road. Given the relatively flat topography, most of the new and improved facilities would have normal per-mile costs, though there are some potential stream crossings that could increase per-mile costs in a few areas.

Facilities	Cost
Arterials, existing/improved full street	$0
Arterials, existing/improved half street	$75.78 million
Arterials, new	$0
Collectors, existing/improved full street	$17.72 million
Collectors, existing/improved half street	$0
Collectors, new	$29.93 million
Total:	**$123.43 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$16,471**

e. Provision of public transit service

The reserve's area was withdrawn from the TriMet service district; thus, no analysis of future/additional transit service was completed by TriMet. As described above, SAM currently serves the reserve.

Prior to land being included in the UGB, a more detailed concept plan, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11, will be required. This concept plan process will develop more refined public facility and service needs and cost estimates.

Factor 3: Comparative environmental, social, energy, and economic consequences

Environmental consequences

North Fork Deep Creek flows south through the southeast corner of the Boring – Highway 26 Urban Reserve for approximately 2,290 feet. About half of this creek length is in or along the edge of a parking lot, while the other length flows through an open lot that is associated with a nursery before crossing under Highway 212. There are sporadic locations of trees along the stream, but no continuous natural riparian corridor.

A tributary of Johnson Creek, with approximately 2,900 feet within the reserve, flows westward from the central area of the reserve mostly through open fields but also through a couple forested areas. There is no vegetated riparian corridor associated with most of the stream length. A more northerly tributary of Johnson Creek flows through a nursery and consists of two segments that form a "Y". The lower main segment is about 2,800 feet in length and mostly flows through cleared land, although there is a 500-foot segment that is forested. The upper segment is about 950 feet in length and flows through cleared land. Riparian habitat is identified along all the stream corridors.

There are two wetlands in the reserve identified through the National Wetland Inventory (NWI). The first wetland is a 0.6-acre pond located on a commercial property that includes some limited adjacent buffer vegetation. The second wetland, about 5.7 acres in size, is located on a vacant tax lot and appears to have been significantly altered. The proximity of flat, open, developable land adjacent to all the streams and wetlands indicates potential impact from urbanization of this area, except for the forested segment of the Johnson Creek tributary. Required restoration of degraded stream edges and enhancement of the wetland buffer to meet required urban riparian habitat and water quality needs will provide some level of protection from urbanization.

This analysis finds that urbanization of the reserve could occur with comparatively low to moderate impacts to the stream corridors and wetlands, depending on urban street connectivity. Nonetheless, there is the potential with urbanization to significantly improve

the riparian corridors given the increased natural resource protection requirements on land inside the UGB.

Considering the comparative environmental consequences of urbanization, the Boring – Highway 26 Urban Reserve is given a "medium-high" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Social, energy, and economic consequences

The Boring – Highway 26 Urban Reserve, located along two highways, is generally made up of three different land uses: rural residential areas; commercial and industrial uses; and two significant tracts of agricultural lands, largely for nursery stock. The reserve also has a post office, several places of worship, and a fire station. Residential, commercial, industrial, and institutional development is mostly along SE Haley Road and Highway 212. While it is expected that urbanization will result in new development replacing some of these existing rural residences and other existing development, more immediate, larger-scale new development is mostly likely to occur on the larger agricultural tax lots. Considering the unincorporated community of boring already has a semi-urban character, urbanization is less likely to contribute to a change in sense of place for existing residents or degradation of a rural lifestyle. Additionally, new development, particularly if it features a mixture of uses, could foster new civic, recreational, and social opportunities for existing residents. It should also be noted that the adjacent Boring Urban Reserve would likely need to be urbanized before this reserve; so, by the time this reserve is urbanized, the overall character of the Boring community will have already become more urban.

As detailed more fully in response to Factor 2, urbanization of the reserve may generate only moderate VMT, with only moderate energy consequences.

There are approximately 46 acres of rural industrial land with excellent access to Highway 26. While there is the potential for loss of the current rural industrial jobs, the potential to generate a significant number of new jobs with urban employments uses may be a positive for the area. There are two large locations of nursery activity within the reserve. The loss of the economic impact from these agricultural uses may be considerable; however, the potential economic impact of urbanizing these large relatively flat lands would likely outweigh this loss, especially considering potential employment uses.

Overall, there would be comparatively low to moderate social, energy, and economic consequences from urbanization of this reserve. The Boring – Highway 26 Urban Reserve is given a "medium-high" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Factor 4: Compatibility of the proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

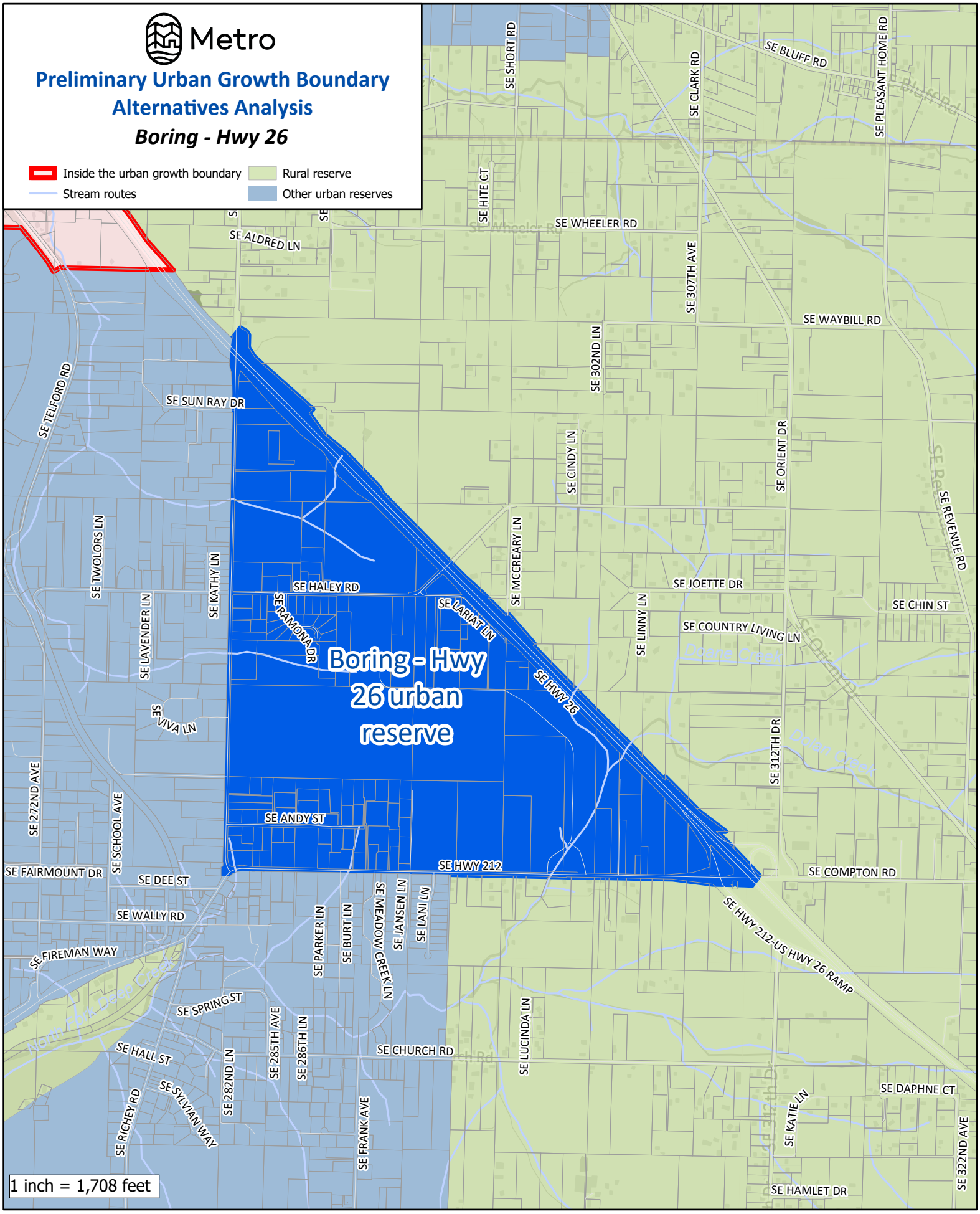
There are three locations where lands outside the UGB but contiguous to the Boring – Highway 26 Urban Reserve have Goal 3 or 4 resource land zoning for agricultural and forest activities.

The first location is a tract of land zoned Exclusive Farm Use (EFU) by Clackamas County, situated on the opposite (east) side of Highway 26 between SE 282nd Avenue and SE Haley Road and adjacent to the northern portion of the reserve. While this area has active agricultural activities and some stands of trees, the more than 200-foot-wide right-of-way of Highway 26 will serve as a buffer between natural resource activities on in this area and development of the reserve. Additional traffic along SE 282nd Avenue to and from Gresham that results from urbanization of the reserve, however, could impede the movement of farm equipment. There is less possibility of traffic impacts along SE Haley Road, however, as most of the increased traffic would not likely continue east into the rural area but rather head along Highway 26.

South of Highway 212, there are two locations where EFU-zoned land abuts the south side of the urban reserve. One of these locations, just east of the rural residential subdivision along SE Lani Lane, has four EFU-zoned tax lots with a 750-foot-long stretch of frontage along Highway 212 adjoining the reserve. These four tax lots don't appear to have any agricultural uses and have relatively few tress, none of which appear to be planted for timber harvesting. The tax lots have residential uses and three are smaller than three acres. The other location, at the southeast corner of the reserve on the opposite side of Highway 212, has two EFU-zoned tax lots with less than 500 feet adjoining the reserve. Neither of these tax lots appear to have agricultural uses or trees being raised for timber production.

In summary, Highway 26 could serve as an effective buffer between urban development of the reserve and agricultural and forest activities occurring on the opposite side of the highway, and there is existing residential development and lack of agricultural and forest activities on the small number of EFU-zoned properties adjoining the reserve south of Highway 212. However, additional traffic along SE 282nd Avenue could impede the movement of farm equipment. Therefore, the proposed urban uses (i.e., urbanization of the reserve) would be considered to have medium to high compatibility with the nearby agricultural and forest activities occurring on farm and forest land.

The Boring – Highway 26 Urban Reserve is given a "medium-high" score in Attachment 3 for this Goal 14 boundary location factor.



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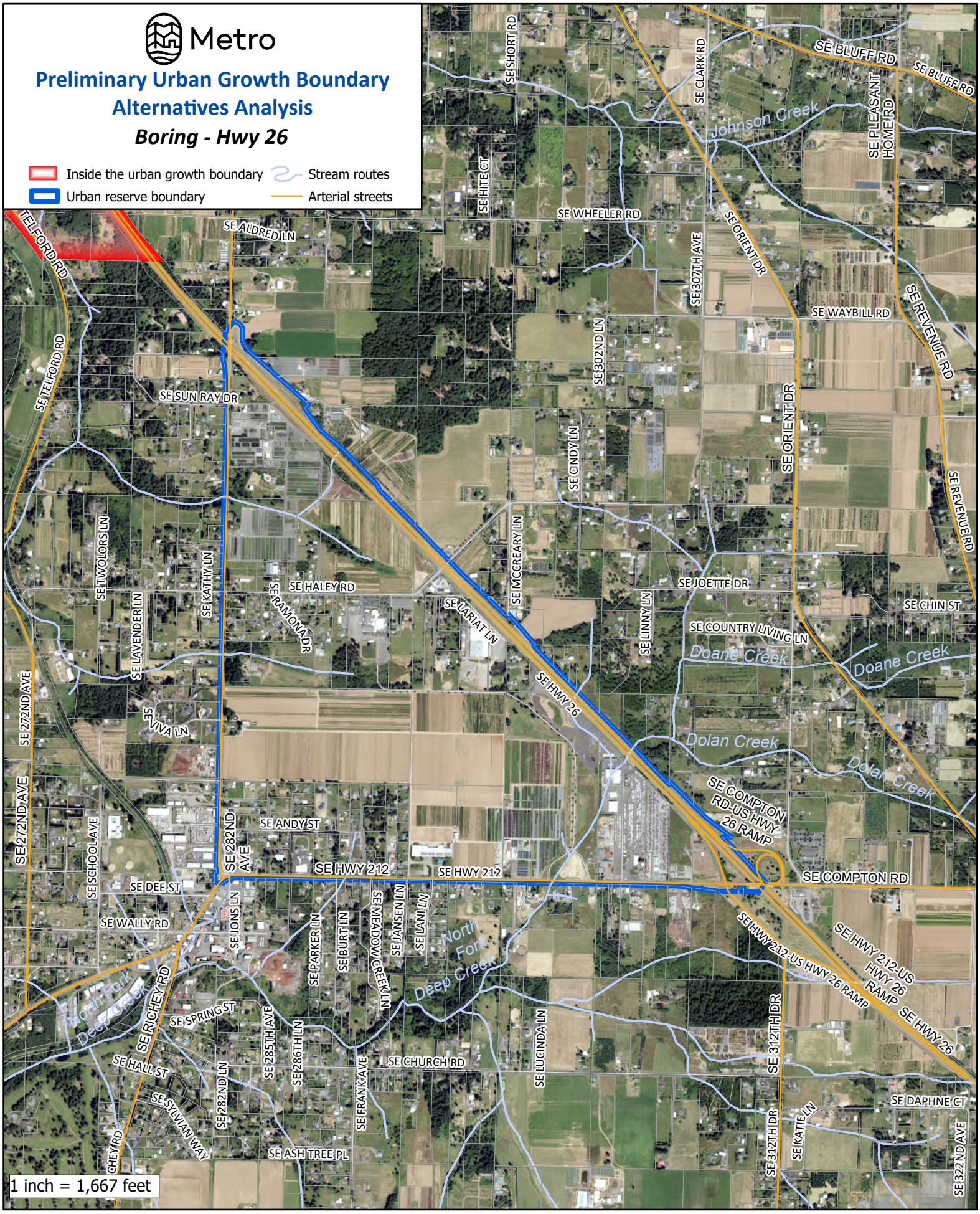
Metro

Preliminary Urban Growth Boundary Alternatives Analysis

Boring - Hwy 26

Inside the urban growth boundary
Urban reserve boundary
Stream routes
Arterial streets



1 inch = 1,667 feet

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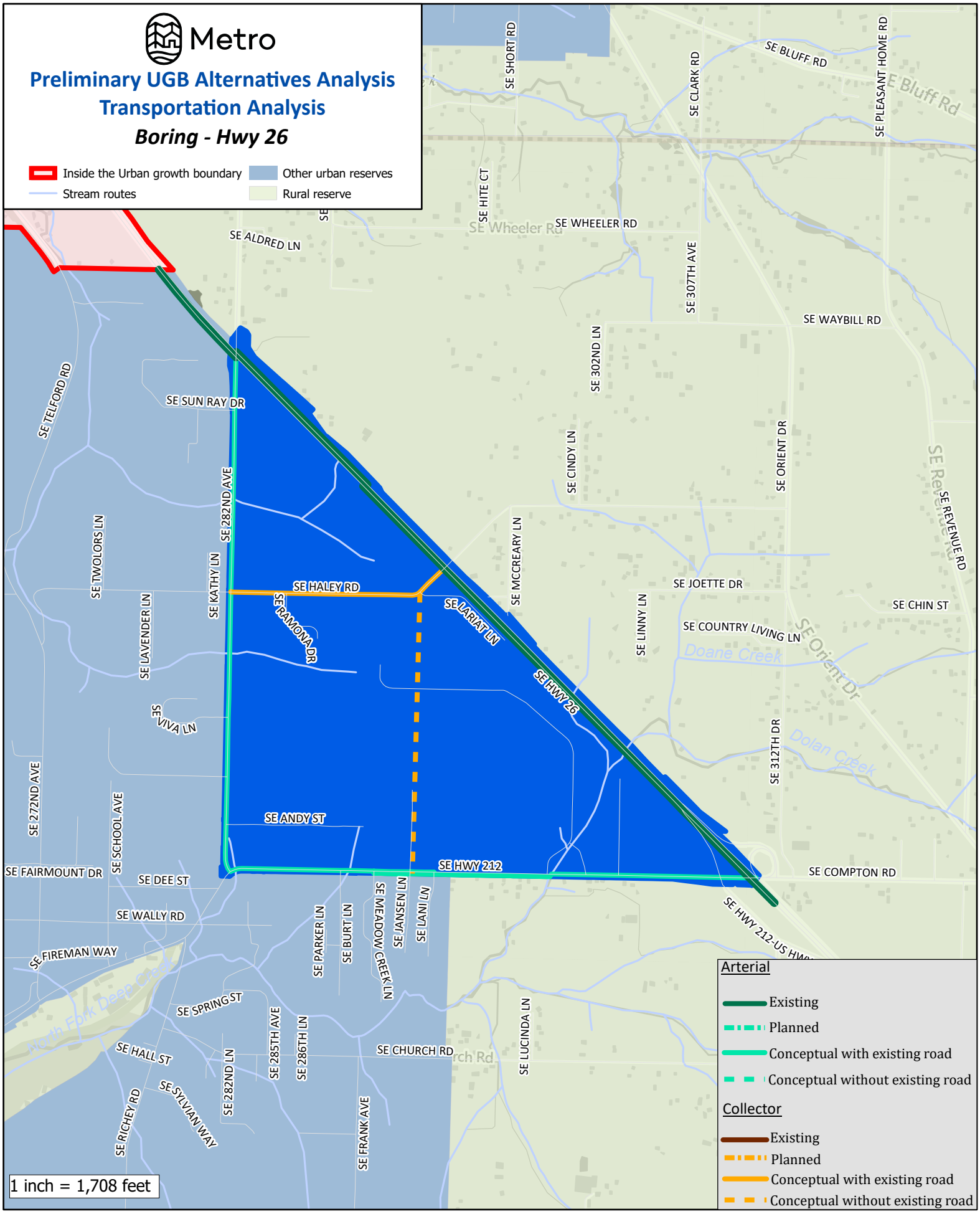

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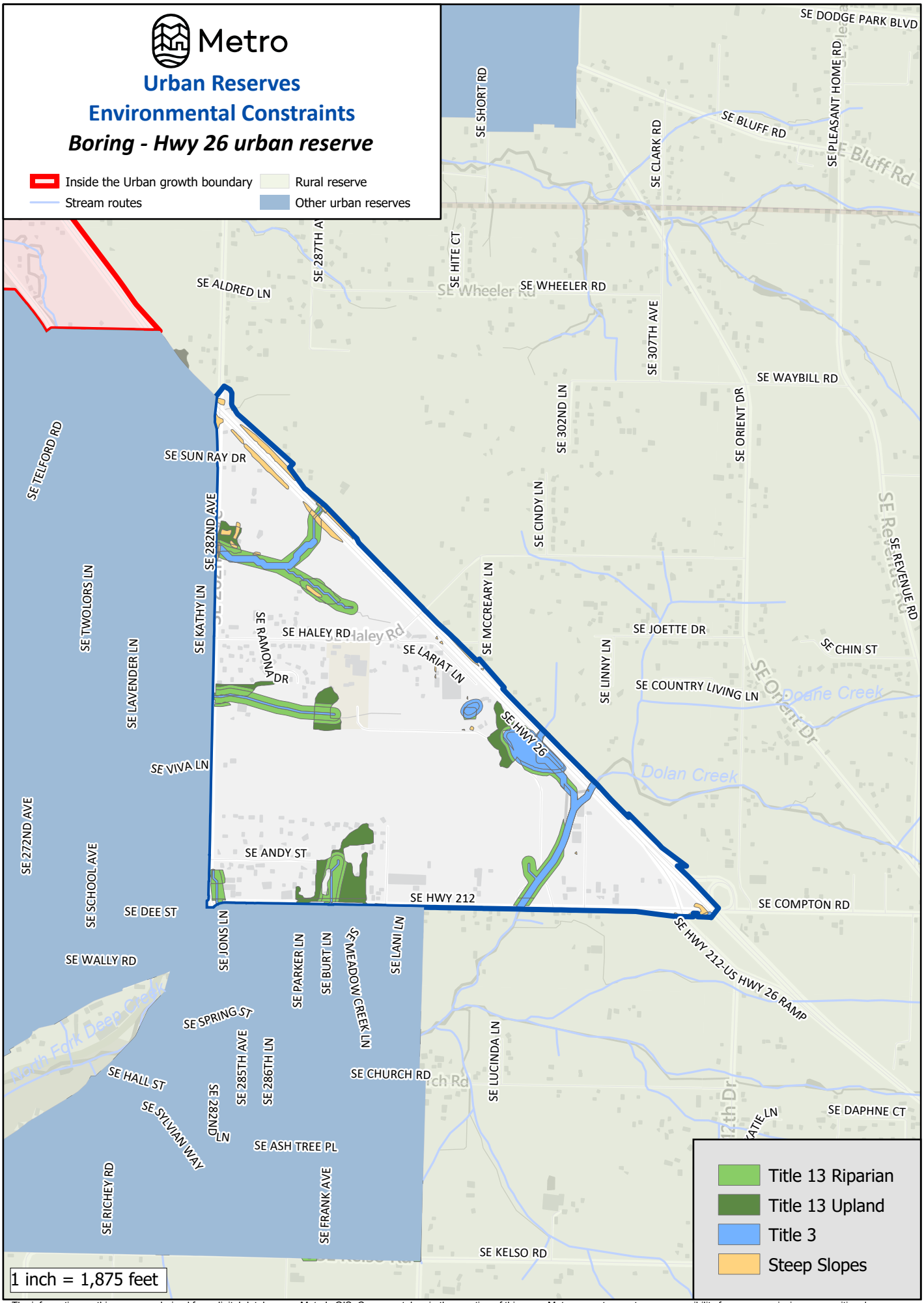

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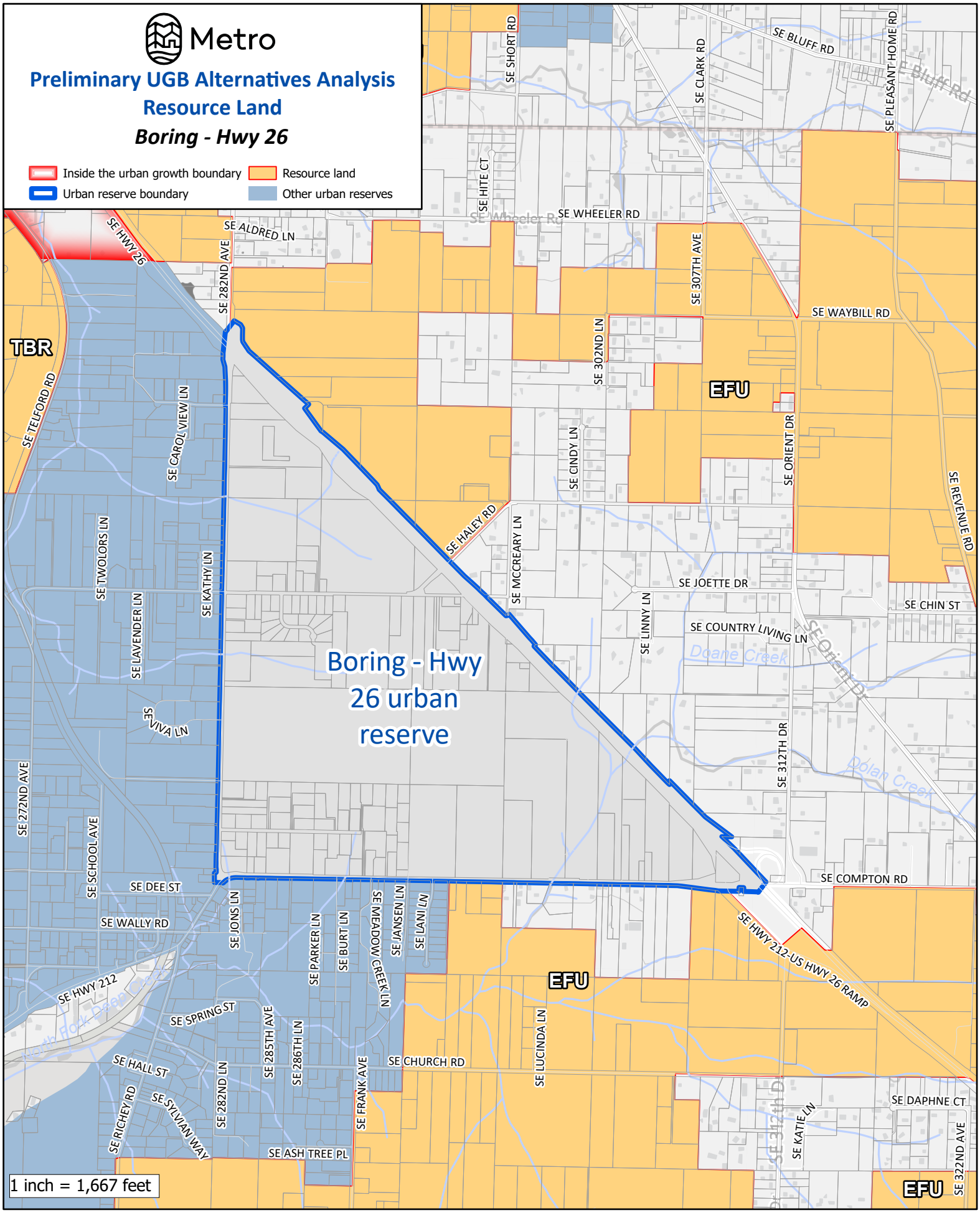

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BORLAND URBAN RESERVE

Total Reserve Area	1,359 acres
Total Tax Lot Area in Reserve (without Right-of-Way)	1,170 acres
Gross Vacant Buildable Area	537 acres
Net Vacant Buildable Area	**400 acres**

The Borland Urban Reserve is a long, somewhat linearly shaped area on both sides of I-205 along SW Borland Road. The reserve's northwestern and southeastern ends are adjacent to the UGB and, respectively, the cities of Tualatin and West Linn. The Tualatin River is the reserve's northern boundary. Land north of the Tualatin River, as well as land south and west of SW Stafford Road, are in other designated urban reserves. Athey Creek and Fields Creek, along with numerous other streams, flow north through the reserve to the Tualatin River. The reserve is generally flat, though there are some slopes greater than 10 percent along the stream corridors and some minor areas of slopes greater than 25 percent. Access to the area is provided by SW Borland Road, SW Ek Road, SW Halcyon Road, SW Stafford Road, and SW Ulsky Road.

GOAL 14 BOUNDARY LOCATION FACTORS

Factor 1: Efficient accommodation of identified land needs

The Borland Urban Reserve is comprised of 343 contiguous tax lots, all of which are entirely within the reserve. The combined area of the reserve's tax lots is approximately 1,170 acres. More than half of the tax lots are smaller than two acres, and nearly 70 percent of those are smaller than one acre. Just 19 tax lots are larger than 10 acres and they include properties owned by Metro, the West Linn – Wilsonville School District (Stafford Primary School and Riverside High School), Clackamas County, and various places of worship. As noted above, the entire reserve contains 537 gross vacant buildable acres and 400 net vacant buildable acres.

According to aerial imagery and assessment records, the reserve is characterized by pockets of rural residential uses, agriculture, schools, and places of worship, and a stretch of rural commercial uses (e.g., a lumber supply store, a landscape supply store, a tavern, and a dog training center) along SW Borland Road. Overall, 269 tax lots have improvements, and the median assessed value of those tax lots' improvements exceeds $383,000.

In addition to the aforementioned primary school and high school within the reserve, Athey Creek Middle School, is essentially adjacent to the south end of the reserve on the opposite side of the Tualatin River across Willamette Falls Drive from Fields Bridge Park. Low density residential development abuts to the north end of the reserve. The nearest 2040 Growth Concept designated Centers, the Willsonville Town Center and the Willamette Town Center, are nearly two miles away. There is currently no transit service directly to the reserve, though, as noted later in response to Factor 2, TriMet is expected to provide an hourly connection of the reserve to Oregon City via Route 76 in the fall of 2024.

Riparian, connecting upland habitat areas, some slopes greater than 10 percent, and the I-205 corridor generally divide the reserve into multiple separate pockets of potentially developable land. Existing development, public ownership, and ownership by places of worship reduce the development opportunities of unconstrained land. Nonetheless, some properties near the SW Borland Road and SW Stafford Road intersection may be large enough to accommodate an employment land need and the I-205 interchange in the middle of the reserve could help to support traffic to small-scale employment uses. School uses within and near to the reserve and existing residential uses could support or be compatible with new residential land uses. This analysis finds that the reserve is able to accommodate residential and employment land needs.

However, regarding the "efficient" accommodation of identified land needs, it is important to note that the cities adjacent to the "Stafford Triangle" area, which includes the Borland Urban Reserve, have for decades opposed UGB expansions in that area, and those cities' elected officials have taken steps to restrict any city's ability to plan for the accommodation of future urban development. In 2019, the cities of Lake Oswego, Tualatin, and West Linn entered into an agreement that prohibits any of those cities from completing a concept plan for any part of the Borland, Rosemont, and Stafford Urban Reserve areas until, at the earliest, December 31, 2028. This restriction and the ongoing opposition of the three adjacent cities to planning, annexing, and developing the Borland Urban Reserve weighs heavily against this area regarding its ability to efficiently accommodate the identified needs for residential or employment land under Factor 1.

Factor 2: Orderly and economic provision of public facilities and services

Water Services

With regard to water services, the Borland Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

The City of Tualatin provides water service to the adjacent areas inside the UGB to the west of the Borland Urban Reserve. Tualatin's sole source of water is treated water purchased from Portland Water Bureau. Water is then delivered through a 36-inch supply line from the Washington County Supply Line. The reserve might be in Pressure Zone B. According to the city's March 2023 Water System Master Plan, the zone has a storage surplus under current conditions, but may have a storage deficit under UGB buildout conditions. The Martinazzi and Boones Ferry Pump Stations previously serving Zone B have reached the end of their usable lives and do not currently operate, and Zone B is now served by the Boones Ferry flow control valve/pressure reducing valve. There are also existing transmission deficiencies in Zone B.

The City of West Linn serves the adjacent areas inside the UGB to the east. The West Linn Water System receives potable water from the South Fork Water Board (SFWB), with a treatment plant in Oregon City jointly owned by the Cities of West Linn and

Oregon City. SFWB's water treatment process includes flocculation, sedimentation, filtration, and chlorination of raw water from the Clackamas River to remove harmful bacteria. The water treatment plant was upgraded in October 2016. There are currently no known major treatment system deficiencies. An emergency supply of water is water is potentially available from the City of Lake Oswego Water Treatment Plant. The SFWB system also includes intake facilities and a transmission pipeline to a pump station located in Oregon City. There are no known storage capacity deficits with the system in West Linn under current, normal (non-emergency) conditions or under UGB buildout conditions; however, it is unclear whether there is sufficient pumping and distribution system capacity to fully serve buildout conditions, at least without system improvements.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Water could be provided from Tualatin, West Linn, or both. Treatment plant upgrades may be needed for either or both cities to serve urban development of the Borland Urban Reserve, depending in part on the amount of development each city would serve. Additional storage capacity, as well as transmission line and pumping system improvements, would also likely be needed. Because service from West Linn would require a new line crossing the Tualatin River, the costs listed below are assume service is provided only by Tualatin.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Additional treatment plant, storage, and distribution system capacity may be needed to serve urban development of the Borland Urban Reserve while avoiding negative impacts to service to areas already inside the UGB.

d. Estimated water service-related costs for reserve development

Water piping, pumping, and storage costs	Cost
10-inch pipe	$9.56 million
12-inch pipe	$0
16-inch pipe	$0
Pumping	$0
Storage	$0.56 million
Total:	**$10.12 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$1,265**

Sanitary Sewer Services

With regard to sanitary sewer services, the Borland Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Wastewater from nearby lands to the west in the City of Tualatin is treated at the Durham Advanced Wastewater Treatment Facility (AWWTF), which is owned and operated by Clean Water Services (CWS) and understood to have sufficient capacity to meet current needs within the UGB. CWS is also responsible for the system's gravity sewers over 24 inches in size, pump stations, and force mains. Borland Urban Reserve development's likely connection point to the Tualatin system would be either the Orchard Hill Pump Station or the Borland Pump Station, both in the Nyberg Basin. There appears to be surplus capacity at these pump stations under current conditions, but there are sections of the Nyberg Trunk line that may have limited remaining additional capacity.

The City of West Linn provides service to nearby lands in the UGB to the east. If urban development to the reserve were to connect to the West Linn system, it would likely be to an existing gravity sanitary main in Willamette Falls Drive in the Willamette Town Basin. From this point of connection, sewage flows southeast toward the Willamette River and the Willamette Pump Station owned by Clackamas Water Environment Services (WES). The Willamette Falls force main follows I-205 and the Willamette River. At the downstream end of the City of West Linn system are WES-owned pumps and force mains. Sewage ultimately gets pumped to the Tri-City Water Resource Recovery Facility (WRRF) located on the east side of the Willamette River. There do not appear to be any capacity issues downstream of the assumed point of connection to the city of West Linn infrastructure under existing conditions, but there are identified deficiencies under UGB buildout conditions. Those deficiencies occur in gravity piping near where the city system crosses the Willamette River. There is a WES capital improvement project currently in the design phase to increase capacity of the Willamette Pump Station to meet future wet weather flows, with expected completion in 2027. It is not clear what the current capacity is or what increased capacity would be provided by the project. The 2019 WES Master Plan identifies an expansion of the existing treatment plant within the 2020-2040 timeframe to increase its capacity.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Sewage from the western portion of the reserve could be routed into the CWS system. While the treatment plant may have sufficient capacity now, additional flows could require plant improvements, particularly if another urban reserve was added to the UGB and connected to the system beforehand. Pump station and trunk line improvements would also likely be needed.

The eastern portion of the reserve may connect to an existing City of West Linn sewer located in Willamette Falls Drive. The city has previously indicated that the treatment plant would likely need some upgrades to accommodate additional flow. The existing piping and pumping deficiencies mentioned above would need to be addressed in order for the system to potentially have sufficient capacity to serve the Borland Urban Reserve. A crossing of the Tualatin River would also be needed.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

As explained above, treatment plant improvements and pumping and piping capacity improvements will likely be needed to avoid negative impacts to service within the existing UGB. Potential treatment plant improvement costs and other system-wide costs are not included in the below figures.

d. Estimated sanitary sewer service-related costs for reserve development

Sanitary sewer piping and pumping costs	Cost
10-inch pipe	$0
12-inch pipe	$2.80 million
15-inch pipe	$0
Pump station	$2.52 million
Force mains	$2.36 million
Total:	**$7.68 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$960**

Stormwater Management Services

With regard to stormwater management services, the Borland Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

There is no indication of major capacity issues with existing stormwater facilities that serve the adjacent land inside the UGB. Based on topography, at least some stormwater from development of the Borland Urban Reserve would likely discharge directly to Saum Creek; the City of Tualatin's 2019 Stormwater Master Plan did not identify the Saum Creek Basin as currently facing capacity challenges. Stormwater could also directly outfall to the Tualatin River.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

At least some stormwater will be conveyed, treated, and disposed of within the reserve and discharge to Saum Creek, rather than connecting to existing facilities in the UGB.

Saum Creek is believed to have sufficient capacity to serve development in the reserve. Stormwater could also directly outfall to the Tualatin River.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

As noted above, at least some stormwater could be conveyed, treated, and disposed of within the reserve and discharge to Saum Creek, rather than connecting to existing facilities in the UGB. Saum Creek is believed to have sufficient capacity. Stormwater could also directly outfall to the Tualatin River without impacting existing facilities in West Linn. Therefore, no adverse impacts to existing facilities are anticipated.

d. Estimated stormwater service-related costs for reserve development

Stormwater piping and water quality/detention	Cost
18-inch pipe	$5.04 million
24-inch pipe	$2.55 million
30-inch pipe	$0
Water quality/dentition	$10.61 million
Total:	**$18.20 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$2,276**

Transportation Services

With regard to transportation services, the Borland Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(e) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Figure 4.36 in Chapter 4 of the 2023 Regional Transportation Plan (RTP) displays 2020 home-based vehicle miles traveled (VMT) per capita by Metro transportation analysis zone, with average VMT per capita considered 11.32. According to Figure 4.36, areas in the UGB adjacent to and near the Borland Urban Reserve had average and above average home-based VMT per capita in 2020.

Metro's adopted 2040 Growth Concept Map designates a town center in the adjoining cities of Tualatin and West Linn. Town centers are meant to: serve populations of tens of thousands of people; offer more locally-focused retail uses and public amenities; and be well served by transit.

The roughly 300-acre Tualatin Town Center aligns with this 2040 Growth Concept Map area. The Tualatin 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. Metro's 2017 State of the Centers Atlas shows that the Tualatin Town Center has a low number of dwelling units per acre and a much higher total number of employees compared with other town centers in the region. The town center has a very high "access to parks" score in the atlas, due in part to the numerous open space/natural areas and the Tualatin Community Park along the Tualatin River nearby. The town center also includes grocery stores and other retail commercial uses, medical/dental facilities, a post office, and multi-family housing, but also storage facilities, auto-oriented uses, and large parking lots. Within the UGB and adjoining the town center are Title 4 designated Industrial Area and Employment Area lands, as well as low- and medium-density residential uses.

Seven TriMet bus lines and the Westside Express Service (WES) Commuter Rail serve Tualatin. The routes are spread out along the major roadways including Highway 99W, SW Tualatin-Sherwood Road, and SW Boones Ferry Road, providing service to the town center and employment areas. WES connects the town center with Beaverton to the north and Wilsonville to the south. Figure 4.3 in Chapter 4 of the 2023 RTP does identify gaps in the planned regional transit network along SW Boones Ferry Road, SW Tualatin – Sherwood Road, and elsewhere in the city.

Nonetheless, the Tualatin Town Center's existing land uses and transit service, and some availability for new development in and near the town center, demonstrate that growth in the current UGB near this town center will not necessarily cause a significant increase in home-based VMT per capita in the future, as residents will be able to access some daily needs with relatively short trips. Growth in other areas of the city where residential uses surround schools and parks are is also unlikely to significantly impact home-based VMT per capita in the future, for similar reasons.

The Tualatin Town Center is more than a mile away from areas in the UGB adjacent to the reserve, and these areas are on the opposite side of I-5 from the reserve. I-5 also separates residential uses in the UGB to the west of the reserve from the town center further to the west; there are just two overpasses that connect these residential uses to the town center, limiting connectivity. Residents of these areas, where there are also fewer bus routes, may be more reliant on private motor vehicle transportation to get to the town center and areas to the west.

Tualatin has a fairly well-established bike route system, with approximately 25 miles of dedicated bike lanes, seven miles of established bikeways, and local trails that connect the employment areas and town center to the residential areas. There are two bike lane connections across I-5 to provide access to the eastern portion of the city. Figure 4.5 in Chapter 4 of the 2023 RTP shows several existing bike facilities in Tualatin as a part of the planned regional bike network, including facilities on SW Boones Ferry Road, SW Nyberg Street, and SW Tualatin-Sherwood Road. There are identified gaps in planned regional bike facilities in the southwest and east of the city.

The Tualatin Town Center has a well-established pedestrian network that also includes access to some trails. Most of the residential areas of Tualatin also have sidewalks, but there are fewer exiting pedestrian facilities in employment areas outside of the town center. The Tualatin River Greenway Trail connects the town center to parks in Durham and Tigard to the north, as well as to Browns Ferry Park along the Tualatin River on the east side of I-5. Figure 4.4 in Chapter 4 of the 2023 RTP shows a number of existing streets in Tualatin as in the regional pedestrian network, including sections of SW Boones Ferry Road, SW Borland Road, and SW Tualatin – Sherwood Road. The figure identifies gaps in the future regional pedestrian network, however, in the south and east of the city.

There is also a town center in neighboring West Linn that aligns with the 2040 Growth Concept Map, the Willamette Town Center. The Willamette Historic District is within the town center. The town center area includes local retail commercial uses, medical facilities, school uses, police and fire stations, and some residential uses. Growth in and near this town center will not necessarily cause a significant increase in home-based VMT per capita in the future, as residents will be able to access some daily needs with relatively short trips.

Two TriMet bus lines serve West Linn, including Route 35, which runs along Willamette Drive, and Route 154, which runs along Willamette Falls Drive. They provide transit service to the Willamette Town Center and other portions of West Linn. Figure 4.3 in Chapter 4 of the 2023 RTP shows these existing routes as in the regional transportation network.

There are more than nine miles of dedicated bike lanes and five miles of bikeways in West Linn, including on portions of Blankenship Road and Willamette Falls Drive that help connect western ends of West Linn to the Willamette Town Center. Figure 4.5 in Chapter 4 of the 2023 RTP shows some existing bike facilities in West Linn, including along Salamo Road, as in the regional bike network. However, there are gaps in the planned regional bike network in the city, such as along Willamette Falls Drive.

Large portions of West Linn are well served by sidewalks, especially in areas that have been developed more recently. There are sidewalks on the SW Borland Road bridge over the Tualatin River that join sidewalks on Brandon Place and Dollar Street in the UGB near to the reserve that connect with the Fields Bridge Park, Athey Creek Middle School, and, eventually, the Willamette Town Center. The Willamette Falls Drive Streetscape Project improved pedestrian accessibility in the historic Willamette neighborhood. The Rosemont and Salamo Trails provide pedestrian connection routes along Rosemont and Salamo Roads and that tie the lower and upper portions of West Linn together on the west side. Figure 4.4 in Chapter 4 of the 2023 RTP shows that there are some gaps in the planned regional pedestrian network in West Linn.

Figure 4.14 in Chapter 4 of the 2023 RTP identifies the SW Tualatin-Sherwood Road in Tualatin as a high injury corridor. The intersection of SW Tualatin-Sherwood Road and

SW Boones Ferry Road, as well as the intersection of SW Martinazzi Avenue and SW Boones Ferry Road, are identified in Figure 4.14 as top five percent high injury intersections. There are no high injury corridors or high injury intersections in West Linn's portion of the UGB identified on Figure 4.14.

The portions of I-5 and I-205 that cross through Tualatin, and the portion of I-205 that crosses through West Linn, are identified as throughways in Figure 4.7 in Chapter 4 of the 2023 RTP. Figure 4.8 of the chapter indicates that the portions of these interstates that cross through these cities currently meet travel speed reliability performance thresholds, with no more than four hours per day when travel speeds fall below the identified minimum speed. RTP models indicate this reliability will continue at least to the year 2045.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The reserve is bisected by I-205 and includes and interchange with I-205 at SW Stafford Road. The portion of I-205 that crosses through the reserve, Tualatin, and West Linn are expected to continue to meet RTP travel speed reliability performance thresholds at least to the year 2045. Town centers, other commercial/employment areas, school uses, and parks are within two miles of both ends of the reserve and accessible with off-interstate roads. There are also commercial uses, school uses, and places of worship within and adjacent to the reserve already. As noted elsewhere, TriMet will begin bus service through the reserve in the fall of 2024. With these conditions, urban development of the reserve is unlikely to generate sufficient traffic on I-205 to cause it to no longer meet performance thresholds. Future residents of the reserve, even if reliant on private motor vehicles for transportation, could use roadways other than these interstates to access employment opportunities and to meet their daily needs closer to home.

TriMet Route 76 runs along SW Borland Road and TriMet plans to extend this route through the reserve in fall of 2024. TriMet Route 154 serving West Linn is approximately two-thirds of a mile from the reserve via Willamette Falls Drive.

A portion of SW Borland Road in Tualatin has a dedicated bike lane; however, it ends approximately 1,000 feet from the west end of the reserve. There also is a bike facility gap between SW 65th Avenue and SW 61st Terrace. SW 50th Avenue and SW Nyberg Lane also have dedicated bike lanes, but do not completely connect with the rest of Tualatin. The Tualatin River Greenway Trail is located fairly close to the reserve and follows a similar route as the bike lane on SW Nyberg Lane. There is a dedicated bike lane on Dollar Street that connects to the Tualatin River Greenway Trail in West Linn and the sidewalks on the bride across the Tualatin River along SW Borland Road/Willamette Drive. There are dedicated bike lanes along portions of SW Borland Road and SW Stafford Road within the reserve as well.

The residential subdivision in Tualatin that is nearest the reserve has sidewalks, although there are numerous gaps along SW Borland Road that connect to other parts of Tualatin. The Tualatin River Greenway Trail, which is close to the reserve, extends along the river to the west side of I-5 with potentially one short gap that may yet to be completed. A small portion of the adjacent residential subdivisions in West Linn contain sidewalks and, as noted above, there are sidewalks along the SW Borland Road bridge that crosses the Tualatin River; however, there are not yet sidewalks leading up to the bridge structure from within the reserve. A short section of the Tualatin River Greenway Trail is nearby, but does not extend beyond Fields Bridge Community Park.

The existing school, park, and employment uses, as well as the medical facilities (e.g., Meridian Park Hospital) already in or within a mile of the reserve could be accessed by future residents of the reserve without significant driving distances. The planned transit service connection through the reserve, and nearby existing transit services and bike and pedestrian facilities, can provide for some alternative modes of transportation. The analysis in Factor 1 noted that the reserve could potentially accommodate both residential and employment uses; if the reserve were to develop with employment uses, residents of nearby existing neighborhoods and Tualatin and West Linn could find employment opportunities in the reserve that don't necessitate long commutes.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

SW Boreland Road, SW Ek Road, and SW Stafford Road would see additional private motor vehicle traffic as a result of urbanization of the reserve. However, TriMet plans to extend transit service through the reserve, as described further below, which can help to limit new private motor vehicle traffic. Moreover, if the reserve were to be developed with a mix of residential and employment uses and if gaps in bike and pedestrian facility connections were to be completed, there could be even less additional traffic on these roadways. Providing the bike and pedestrian facility connections would lead to more use of the existing facilities within the UGB.

Given the distance of SW Tualatin-Sherwood Road from the reserve, development of the reserve is not expected to exacerbate the road's existing high-crash conditions. As future residents of the reserve would be able to use roadways other than I-205 to access nearby schools, parks, places of worship, medical facilities, and employment uses, and with the planned TriMet service route extension and existing nearby bike and pedestrian facilities, development of the reserve is not expected to cause I-205 to no longer meet throughway reliability thresholds.

d. Need for major transportation facility improvements and associated costs

To serve urban development, roughly one mile of SW Stafford Road and 3.31 miles of SW Borland Road would likely need to be improved to urban arterial standards, including with acquisition of additional right-of-way. Approximately 0.88 miles of SW Ek Road would also likely need to be improved to urban collector standards, including with acquisition of additional right-of-way. While the costs below consider that some of

the topography these improved roadways would cross has steeper slopes, the costs do not reflect a likely need for new enhanced crossings (e.g., under- and/or overpasses) on SW Stafford Road or SW Borland Road, as determining the appropriate improvements and their costs with any meaningful accuracy is beyond the scope of this preliminary analysis.

Facilities	Cost
Arterials, existing/improved full street	$198.61 million
Arterials, existing/improved half street	$0
Arterials, new	$0
Collectors, existing/improved full street	$24.73 million
Collectors, existing/improved half street	$0
Collectors, new	$0
Total:	**$223.34 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$27,928**

e. Provision of public transit service

TriMet evaluated the reserve for providing transit service. TriMet is expected to begin hourly service along Borland Road to Oregon City beginning in the fall of 2024 via Route 76, although, due to land use and population factors, service will deviate south at Stafford to use I-205. There would be no additional cost to serve this reserve if/when it is added to the UGB, as Route 76 is already slated for service. As density and development increases, TriMet may reevaluate routing to be entirely local along Borland Road.

Prior to land being included in the UGB, a more detailed concept plan, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11, will be required. This concept plan process will develop more refined public facility and service needs and cost estimates.

Factor 3: Comparative environmental, social, energy, and economic consequences

Environmental consequences

There are six main stream corridors that flow through the Borland Urban Reserve. Saum Creek meanders along the western edge of the reserve for just over a mile. Wetlands, identified in the Tualatin local wetland inventory, coincide with the stream corridor and total approximately 7.1 acres in area. The creek and wetlands are located on wooded portions of smaller rural residential tax lots that are also identified as riparian and upland habitat and contain some areas of slopes greater than 25 percent. In addition, a portion of the northwest corner of the reserve where Saum Creek joins the Tualatin River is within the "100-year" floodplain. The increased protection levels for streams, wetlands, steep slopes, and habitat areas within the UGB will lessen any potential impacts to these environmental

features from urban development. Given the relatively small size of the reserve's tax lots and that so many of them already contain residences, there may be limited amounts of new development that could jeopardize the stream corridors and habitat areas.

Two short tributaries to Saum Creek, both approximately 1,500 feet in length, are located along the western edge of the reserve, one north of I-205 and one south of it. The stream on the north side flows through wooded portions of a few larger tax lots, including the Arbor School of Arts and Sciences property, and includes riparian and upland habitat. The stream south of I-205 flows through a wooded ravine that has slopes greater than 25 percent and also includes a 0.44-acre wetland identified on the National Wetland Inventory (NWI). This stream also has adjacent riparian and upland habitat identified along the corridor, which would receive new protections once the land was added to the UGB. Based on the increased protection levels for streams, wetlands, steep slopes, and habitat areas for streams inside the UGB, these two stream segments could be minimally impacted by future urbanization.

Athey Creek and a small tributary flow north through the reserve for approximately 1.3 miles. The portion of the creek that is south of I-205 flows mostly through a privately-owned cleared area and then is piped under I-205. The portion of the creek north of I-205 flows mainly through a wooded ravine that contains slopes greater than 25 percent. There is a 2.8-acre wetland that coincides with the stream corridor identified in the NWI and an additional pond. Riparian and upland habitat is identified along the stream corridor. In addition, the area where Athey Creek joins the Tualatin River is within the "100-year" floodplain. Most of the tax lots Athey Creek flows through are large enough to be subdivided and the stream corridor would complicate additional east-west transportation connections. However, the location of the public schools on the eastern side of the stream reduces the likelihood of new east-west street connections north of SW Borland Road and the land that is east of Athey Creek and south of SW Borland Road has an existing access point on SW Stafford Road. Again considering the increased protection levels for streams, wetlands, steep slopes, and habitat areas that come with inclusion in the UGB, urbanization could occur with minimal impacts to Athey Creek, depending on local street connection requirements.

The third stream flows north through the area where SW Borland Road crosses under I-205 for approximately 3,100 feet before draining into the Tualatin River. The stream flows mainly through forested portions of tax lots that either contain rural residences or are vacant. Riparian habitat is identified along the stream corridor with some upland habitat identified on the more forested parcels near I-205. There are small locations where the adjacent slopes are greater than 25 percent. A small area of "100-year" floodplain is located where the stream meets the Tualatin River. Most of the stream flows along edges of developed rural residential properties and would not be further impacted by urbanization of the area. However, there are a couple of locations where the stream could be impacted by future development, depending on the density and design of the development and street connection requirements. A second stream or drainage area flows within the I-205 right-of-way and appears to join the first stream on the north side of the highway. Given the

locations of the stream corridors, the increased protection levels for streams and habitat areas on land inside the UGB, urbanization of the area could occur with minimal impact to the streams and habitat areas depending on local street connection requirements.

The fourth stream flows north through the area, just east of the intersection of SW Borland Road and SW Ek Road. This stream flows mainly along the side and back portions of rural residential properties for approximately 2,650 feet. The stream is mainly within a forested canopy and both riparian and upland habitat is identified along the stream corridor. This area is mostly developed with single-family homes on lots that are between one and three acres in size. Impacts to the stream would be minimal given the increased protection level for streams and habitat areas for land inside the UGB.

The fifth stream flows north through the area near the intersection of SW Borland Road and SW Turner Road. This stream corridor flows between two rural residential properties and then through an undeveloped tax lot owned by the Lake Oswego Corporation before it drains into the Tualatin River. Similar to above, the stream is mainly within a forested canopy and both riparian and upland habitat is identified along the stream corridor. In addition, there is an area of "100-year" floodplain where the stream meets the Tualatin River. Given the location of the stream within a narrow location of the reserve and the presence of slopes greater than 25 percent at the "back" of the tax lots that would limit additional development, urbanization could occur with no or very limited impacts to the stream corridor.

Finally, Fields Creek flows through the very eastern portion of the reserve in the vicinity of SW Bosky Dell Lane and SW Elderberry Lane for approximately 2,000 feet. Similar to the other streams, Fields Creek also flows along forested edges of one- to three-acre tax lots that contain rural residences and has riparian and upland habitat identified along the stream corridor. In addition, there is an area of "100-year" floodplain where the stream meets the Tualatin River. Redevelopment of the land near the stream could be challenging and would likely take place over a longer period of time. There are a few locations near SW Bosky Dell Lane where minor impacts on the stream corridor could occur, depending on density and design of the development. The tax lots along SW Elderberry Lane and SW Alderwood Drive are less than one acre each and additional development will also be challenging. Impacts to the stream would be minimal given the increased protection level for streams and habitat areas for land inside the UGB. There is a small 820-foot tributary to Fields Creek that also flows along forested edges of parcels at the end of SW Alderwood Drive. Similarly, redevelopment of the tax lots in this area would be somewhat difficult.

Overall, urbanization of the reserve could occur with comparatively minimal to moderate consequences to the stream corridors and habitat areas. Additional environmental consideration, specifically regarding avoidance of conflict between urban development and regionally significant fish and wildlife habitat, is provided in the Metro Code Factors Analysis (Appendix 7A).

Considering the comparative environmental consequences of urbanization, the Borland Urban Reserve is given a "medium-high" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Social, energy, and economic consequences

There are already numerous rural residences on smaller tax lots in the Borland Urban Reserve, as well as schools, places of worship, and commercial uses. Major roadways, including I-205, SW Stafford Road, and SW Borland Road, already cross through the reserve. The reserve is also near to existing urban development in neighboring Tualatin and West Linn, though somewhat separated from these developments by natural features. There are no rural reserves adjacent to this urban reserve. Urban development of the reserve is, therefore, not expected to cause a significant change in sense of place or degradation of rural lifestyle for the existing residents of the reserve. Moreover, the level of existing development and parcelization could help to slow new development and therefore slow the loss of sense of place and rural lifestyle. Urbanization of the reserve could also bring new social, educational, and recreational opportunities for existing residents.

As more fully detailed in response to Factor 2, urbanization of the reserve will not necessarily result in significant increases in VMT, particularly if the reserve were to be developed with a mixture of uses that allow residents to access more of their daily needs in close proximity. Indeed, as noted above, the reserve already has a mixture of uses, including schools, places of worship, and some commercial uses. Limiting VMT result in limits to energy consequences.

The reserve is primarily in non-agricultural uses and there are only a few sites of commercial agricultural activity in the reserve that are larger than 10 acres each. While there would be economic consequences from urbanization in terms of a loss in these farming activities in the reserve, that loss may be outweighed by the economic benefits of residential and employment development. Moreover, farmlands in the reserve are somewhat separated from each other by I-205, existing development, and natural areas, so urbanization of one area may not necessarily impact agricultural activity that continues to occur on other farmlands until they too are ready to develop.

This analysis finds that there would be comparatively low social, energy, and economic consequences from urbanization of this reserve. The Borland Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Factor 4: Compatibility of the proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

There are two locations where lands outside the UGB but contiguous to the reserve have Goal 3 or 4 resource land zoning for agricultural and forest activities.

The first location is on the north side of the reserve on the opposite side of the Tualatin River, in the vicinity of SW Johnson Road. The land in this area is zoned Exclusive Farm Use (EFU) by Clackamas

County. Only a small portion of this land closest to the river appears to be in agricultural use, with the remainder being forested or developed with rural residential uses. The river, including the riparian habitat along both its banks, provides an adequate buffer between urban development of the reserve and the limited agricultural activities in this area. The forested portions of these EFU-zoned areas are not directly accessible via the reserve.

A roughly 1.1-mile portion of the southern edge of the reserve borders lands zoned Timber (TBR) by Clackamas County. These TBR-zoned lands, located near SW Turner Road, are on a bluff overlooking the reserve and do not appear to have agricultural activity. Most of the tax lots in this TBR-zoned area have high value homes, though some are vacant and forested. Timber harvesting of these vacant tax lots could occur, but forestry operations could use access roads that don't go through the reserve. Topography would also help to limit conflicts between any commercial timber operations and urban development of the reserve.

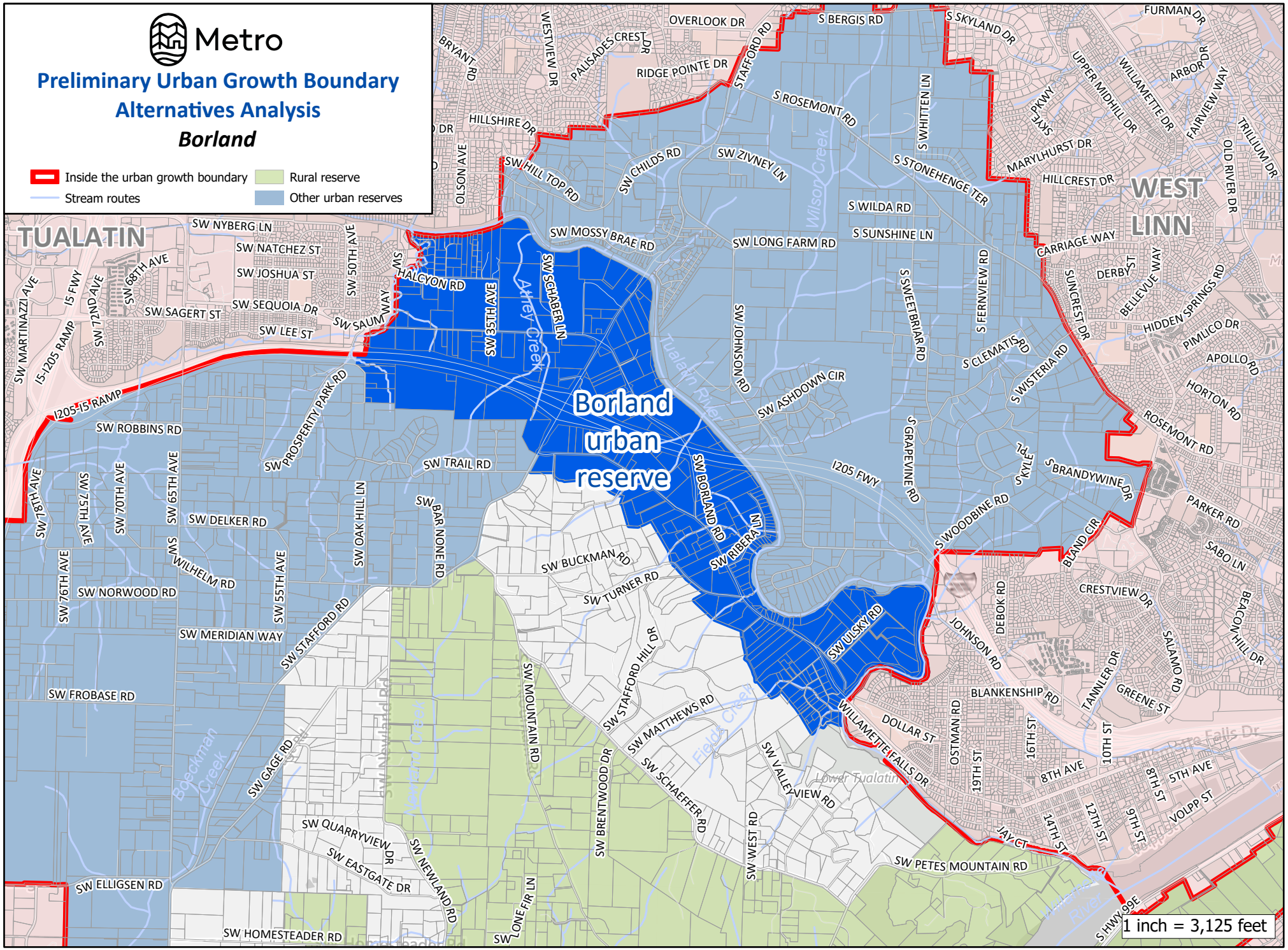
Overall, the proposed urban uses are considered to have medium to high compatibility with nearby agricultural and forest activities occurring on farm and forest land. The Borland Urban Reserve is given a "medium-high" score in Attachment 3 for this Goal 14 boundary location factor.

Metro

Preliminary Urban Growth Boundary Alternatives Analysis

Borland

Inside the urban growth boundary
Rural reserve
Stream routes
Other urban reserves



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Metro

Preliminary Urban Growth Boundary Alternatives Analysis

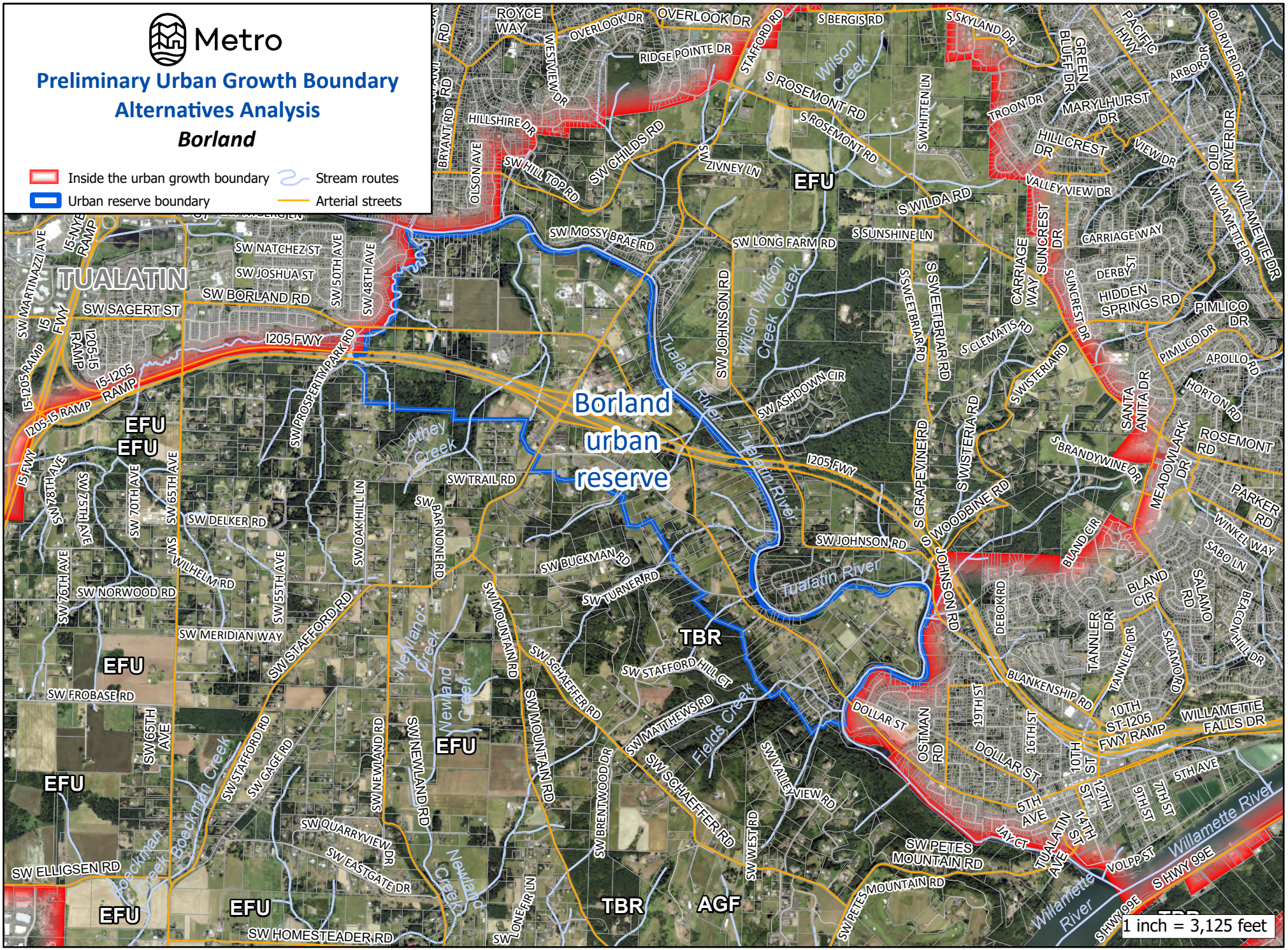
Borland

Inside the urban growth boundary

Urban reserve boundary

Stream routes

Arterial streets



1 inch = 3,125 feet

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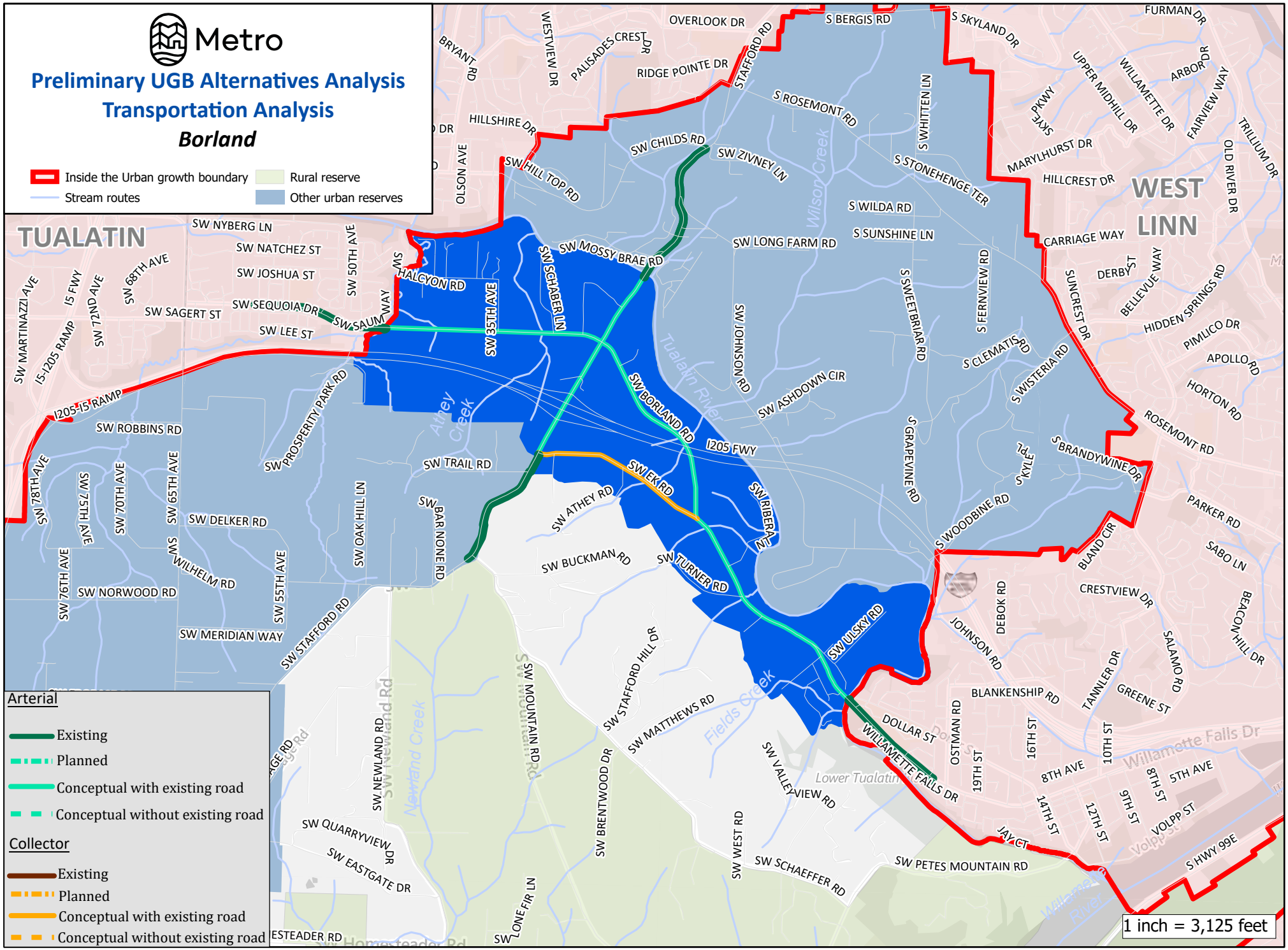

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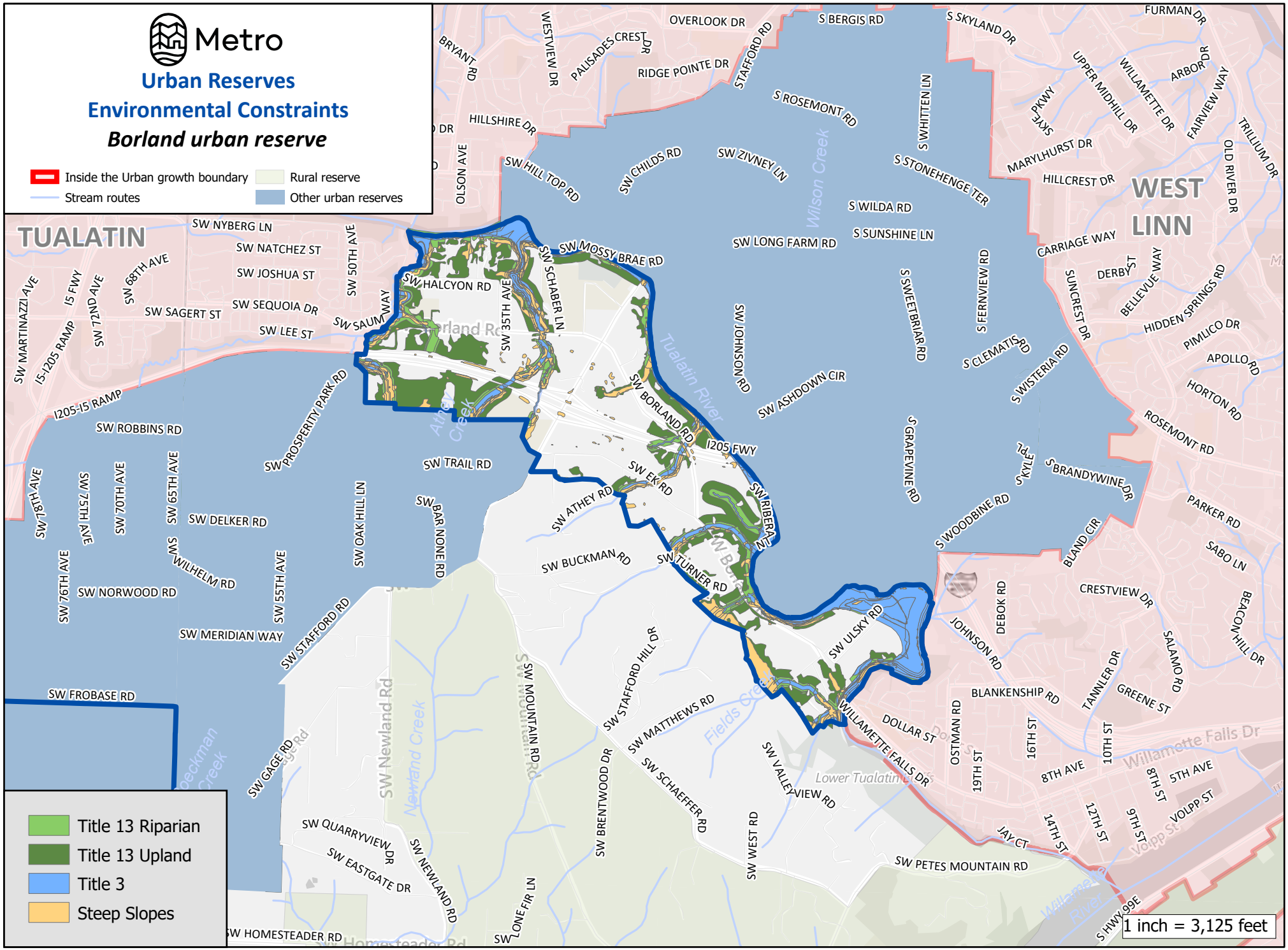

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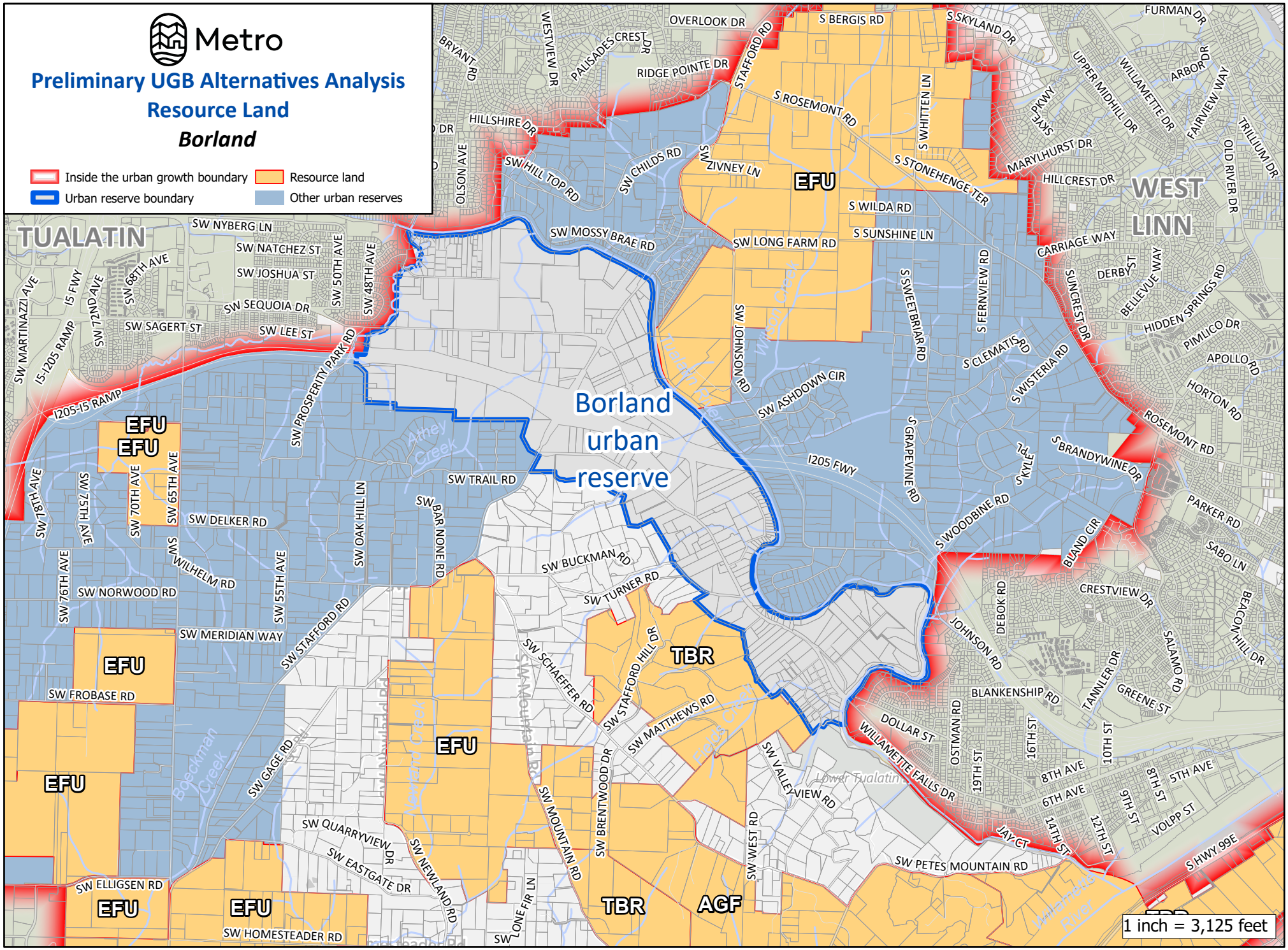
Metro

Preliminary UGB Alternatives Analysis

Resource Land

Borland

Inside the urban growth boundary
Resource land
Urban reserve boundary
Other urban reserves



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BROOKWOOD PARKWAY URBAN RESERVE

Total Reserve Area	62 acres
Total Tax Lot Area in Reserve (without Right-of-Way)	38 acres
Gross Vacant Buildable Area	32 acres
Net Vacant Buildable Area	**24 acres**

The Brookwood Parkway Urban Reserve is a relatively small area on the north side of Hillsboro at the Brookwood Parkway/Highway 26 interchange. Except for its north side, the reserve is entirely surrounded by the UGB and the corporate limits of the City of Hillsboro; Highway 26 occupies and forms the edge to the northern portion of the reserve. Access to the area is provided by NW Meek Road, NW Oak Drive, and NW Birch Ave.

GOAL 14 BOUNDARY LOCATION FACTORS

Factor 1: Efficient accommodation of identified land needs

The Brookwood Parkway Urban Reserve is comprised of 24 contiguous tax lots, all of which are entirely within the reserve. More than 80 percent of the tax lots are smaller than two acres and only one tax lot is larger than five acres; no tax lot in the reserve is larger than 10 acres. The combined tax lot area within the reserve is approximately 38 acres. As noted above, the entire reserve contains 32 gross vacant buildable acres and 24 net vacant buildable acres.

The reserve is characterized by rural residential development, though aerial imagery suggests there is some very limited agricultural activity. Assessment records indicate the North Hillsboro Congregation of Jehovah's Witnesses owns a 3.46-acre tax lot in the reserve's southeast. All but three of the reserve's tax lots have assessed improvements, with the median assessed value of those tax lots' improvements being just under $300,000.

A parking lot for a large-scale industrial use neighbors the reserve to the south. Other industrial uses and undeveloped land zoned for industrial uses neighbor to the west. The Topgolf golfing facility is just across NE Brookwood Parkway to the southeast. On the opposite side of Highway 26 but within one mile of the reserve, there are existing retail commercial uses and the West Union Elementary School. The reserve is adjacent to – indeed, includes a portion of – a Highway 26 interchange with NE Brookwood Parkway. TriMet Route 46 has a stop at the intersection of NE Evergreen Parkway and NE Brookwood Parkway less than a mile to the south of the reserve.

Despite the proximity of existing employment land uses, urban industrial zoning, and the highway, the small size of the reserve's tax lots and their existing residential development make it less likely to be able to accommodate new employment land uses. Rather, the reserve is considered able to accommodate a small residential land need.

Factor 2: Orderly and economic provision of public facilities and services

Water Services

With regard to water services, the Brookwood Parkway Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Adjacent lands inside the UGB are served by the City of Hillsboro. The city owns and operates two municipal drinking water systems, the City System, which is the primary system, and the Upper System, which is a secondary system. It utilizes wholesale water purchased from the Joint Water Commission (JWC). JWC, which is jointly owned by the Tualatin Valley Water District (TVWD) and the Cities of Hillsboro, Beaverton, and Forest Grove, obtains water from Hagg Lake (Scoggins Reservoir) and the Barney Reservoir released into the upper portion of the Tualatin River. When flows are available, water from the Tualatin River is used. It is then withdrawn and filtered through the JWC water treatment plant. Chlorine and pH adjustments are added before leaving the plant, where chlorine and pH adjustments are added to the water. The city is working with TVWD on development of a new water supply system that will draw water from the Willamette River in order to, among other goals, better accommodate growth in the city and surrounding areas. The project is expected to be completed in 2026. There are also plans to an upgrade of the JWC Water Treatment Plant. In the meantime, it is assumed there is generally sufficient treatment, storage, and transmission capacity to meet existing demands, though additional storage may be needed for areas within the existing UGB during regional supply shortage events and to accommodate full buildout.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The City of Hillsboro has previously indicated there is or will be adequate water supply to serve the reserve as it develops, but capacity availability will ultimately depend on specific land uses in the reserve and the timing of any other urban development connected to the system. Additional supply capacity (e.g., from the WWSS project planned for completion in 2026), additional storage capacity, and pipe upsizing may be needed. Connections to existing water lines are potentially available in NE Brookwood Parkway and NE Starr Boulevard. If the reserve were to be connected to new storage facilities on the north side of Highway 26, infrastructure would need to cross the highway.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Additional supply and storage capacity, as well as pipe upsizing, may be needed in order to avoid adversely impacting existing facilities in areas already inside the UGB.

d. Estimated water service-related costs for reserve development

Water piping, pumping, and storage costs	Cost
10-inch pipe	$0
12-inch pipe	$0
18-inch pipe	$2.03 million
Pumping	$0
Storage	$0.04 million
Total:	**$2.07 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$4,908**

Sanitary Sewer Services

With regard to sanitary sewer services, the Brookwood Parkway Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

In adjacent areas already in the UGB, the City of Hillsboro provides sanitary sewer services that feed into the regional sanitary sewer system operated by Clean Water Services (CWS). CWS treats wastewater at the Rock Creek Wastewater Treatment Plant. Capacity is believed to be adequate to meet current demand, though CWS is in the process of developing the West Basin Master Plan (WBMP), which, when completed as early as 2025, will identify projects needed to accommodate redevelopment and new development in the UGB.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

There is an 18-inch sewer line at Brookwood Parkway where future development of the reserve could potentially connect to; alternatively, it may be possible to connect to a 24-inch sewer in Huffman Road. Depending on the type of development that occurs in the reserve, these lines may be sufficient or else upsizing will be needed. The forthcoming WBMP will help to identify projects needed to accommodate development in and beyond the existing UGB. In the meantime, no significant facility improvements are assumed.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

If existing lines where service is connected to are insufficient, upsizing will be needed to avoid adverse impacts to existing facilities already inside the UGB. The WBMP will help to identify projects needed to accommodate development beyond the existing UGB

while maintaining adequate service elsewhere. In the meantime, no significant facility improvements are assumed.

d. Estimated sanitary sewer service-related costs for reserve development

Sanitary sewer piping and pumping costs	Cost
10-inch pipe	$0
12-inch pipe	$0
15-inch pipe	$0
Pump station	$0
Force mains	$0
Total:	**$0**
Per dwelling unit at 20 units per net vacant buildable acre:	**$0**

Stormwater Management Services

With regard to stormwater management services, the Brookwood Parkway Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

There is no indication of significant challenges with existing stormwater management facilities being able to serve existing development in adjacent areas inside the UGB.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Based on topography, stormwater related to new development in the Brookwood Parkway Urban Reserve could potentially discharge directly to Waibel Creak via private and public outfalls, without connecting to other existing stormwater infrastructure.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

As noted above, stormwater related to new development in the Brookwood Parkway Urban Reserve could potentially discharge directly to Waibel Creak via private and public outfalls, without connecting to other existing stormwater infrastructure. Therefore, no adverse impacts to existing facilities serving areas already inside the UGB are anticipated.

d. Estimated stormwater service-related costs for reserve development

Stormwater piping and water quality/detention	Cost
18-inch pipe	$1.20 million
24-inch pipe	$0.30 million
30-inch pipe	$0
Water quality/dentition	$0.77 million
Total:	**$2.27 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$5,379**

Transportation Services

With regard to transportation services, the Brookwood Parkway Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(e) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Figure 4.36 in Chapter 4 of the 2023 Regional Transportation Plan (RTP) displays 2020 home-based vehicle miles traveled (VMT) per capita by Metro transportation analysis zone, with average VMT per capita considered 11.32. According to Figure 4.36 in Chapter 4, areas in the UGB adjacent to the Brookwood Parkway Urban Reserve had below average and above average home-based VMT per capita in 2020.

Metro's adopted 2040 Growth Concept Map designates two regional centers and separate town centers in the City of Hillsboro adjacent to the reserve. Regional centers are generally meant to: serve populations of hundreds of thousands of people; surround high-quality transit service and multi-modal street networks; and offer larger commercial uses, healthcare facilities, local government services, and public amenities. Town centers are meant to: serve populations of tens of thousands of people; offer more locally-focused retail uses and public amenities; and be well served by transit. The Orenco Town Center and the Tanasbourne/Amber Glen Regional Center in Hillsboro are the closest 2040 Growth Concept designated centers to the Brookwood Parkway Urban Reserve.

The Orenco Town Center is essentially fully built out with a mixture of housing types and retail commercial uses. There's also a nearby grocery store, medical facilities, and educational uses. The center was developed as a transit-oriented development surrounding the Orenco Light Rail Station. Metro's 2017 State of the Centers Atlas shows it has a higher-than-average total population, population density, and a much higher than average number of dwelling units per acre compared with other town centers in the region. Orenco also scored very high in the atlas with regard to parks access and sidewalk and bike route density.

The Tanasbourne/Amber Glen Regional Center is a mixture of higher density residential uses, a grocery store and multiple department stores, banks, and medical facilities, including a Kaiser Permanente hospital and an Oregon Health Sciences University research facility. Metro's 2017 State of the Centers Atlas showed a high level of employees and total population, slightly higher dwelling units per acre, and an average population density compared with other regional centers.

Growth in and near these 2040 Growth Concept will not necessarily cause a significant increase in home-based VMT per capita in the future, in part because area residents will be able to access some daily needs with relatively short trips. The transit service and bike and pedestrian facilities that serve these centers, described further below, can also help to ensure that additional growth nearby does not adversely impact home-based VMT per capita.

Six TriMet bus routes provide service to Hillsboro and/or nearby unincorporated Washington County, mainly along the arterial streets in the central portion of the city, focusing on the Hillsboro and Tanasbourne/Amber Glen Regional Centers, the Orenco Town Center, and employment areas. There is generally more minimal transit service to the southern and northern portions of the city. TriMet Routes 46 and 47 respectively have stops approximately three-quarters of a mile and 1.5 miles from the southeast corner of the reserve. The MAX Light Rail Blue Line stops at nine stations within Hillsboro, connecting Hillsboro to Beaverton and Portland. Figure 4.3 in Chapter of the 2023 RTP indicates that there are gaps in planned frequent transit service along certain routes in the UGB near the reserve, including along NE Brookwood Parkway and NW Evergreen Road.

Hillsboro has over 54 miles of dedicated bike lanes, more than 24 miles of established bikeways, and numerous streets considered "bike friendly" that, together, create a fairly well-connected system that is focused mostly on the central portion of the city and its two regional centers, including the Tanasbourne/Amber Glen Regional Center. Within the UGB and near the reserve, there are dedicated bike facilities along NE Brookwood Parkway, NE Evergreen Road, NE Huffman Street, NE Jacobson Street, and NE Starr Boulevard. In addition, there are some local trails that provide key connections to the greater bike network. The existing bike facilities on NE Brookwood Parkway and NE Evergreen Road are identified as part of the regional bike network on Figure 4.5 in Chapter 4 of the 2023 RTP. However, the figure also identifies gaps in the planned network in other areas in the UGB near the reserve.

A large proportion of the residential neighborhoods in Hillsboro have sidewalks, although there are other residential areas of the city that do not have sidewalks. The Orenco Town Center and Tanasbourne/Amber Glen Regional Center have sidewalks, as do the employment areas adjacent to the reserve. Trails, such as the Rock Creek Trail, provide additional pedestrian opportunities. A pedestrian route along a section of NE Brookwood Parkway in the UGB near the reserve is identified in Chapter 4, Figure 4.4 of the 2023 RTP as in the regional pedestrian network, though there are also gaps,

including along NE Brookwood Parkway north of Highway 26 and along NE Huffman Street.

Figure 4.14 in Chapter of the 2023 RTP identifies a number of high injury corridors in the area already inside the UGB near the reserve and in Hillsboro, including NE Brookwood Parkway north of Highway 26 and NE Evergreen Road east of NE Brookwood Parkway. The figure also identifies the intersection of NE Brookwood Parkway and NE Cornell Road as a high injury intersection.

Highway 26 within the UGB adjacent to the reserve is identified as a throughway Chapter 4, Figure 4.7 of the 2023 RTP. Figure 4.8 of that chapter indicates that this section of Highway 26 currently meets travel speed reliability performance thresholds, with no more than four hours per day when travel speeds fall below the identified minimum speed. RTP models indicate this reliability will continue at least to the year 2045.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Highway 26, an RTP-designated throughway, is adjacent to – indeed, crosses through – the reserve. As noted above, the section of the highway near the reserve currently meets travel speed reliability performance thresholds.

There is currently no transit service into the reserve itself, though TriMet Routes 46 and 47 respectively have stops approximately three-quarters of a mile and 1.5 miles from the southeast corner of the reserve.

There is a dedicated bike lane on NE Brookwood Parkway adjacent to the reserve that connects to a dedicated bike lane on NW Jacobsen Road, north of the Highway 26 interchange; this bike lane extends east through an employment area to NW Cornelius Pass Road. An established bikeway also runs south from the southern edge of the reserve on NE Brookwood Parkway to south of NE Evergreen Parkway. A dedicated bike lane on NE Huffman Street connects to a dedicated bike lane on NE Starr Boulevard that is just west of the western edge of the reserve. The dedicated bike lane on NE Huffman Road that is east of NE Brookwood Parkway runs through an employment area and connects to the Gordon Faber Recreation Complex via NE Bennett Street. This bike lane continues south on NE Century Boulevard to connect with numerous other bike facilities.

Sidewalks on NE Brookwood Parkway connect the reserve to employment areas to the east on NE Huffman Street and to the south of NE Evergreen Road. There is a short, roughly 250-foot gap in sidewalks on the west side of NE Brookwood Parkway adjacent to the east side of the reserve north of NW Meek Road. There are painted pedestrian crossings at the intersection of NE Brookwood Parkway and the Highway 26 on- and off-ramps. Currently, there are no sidewalks along NW Meek Road leading to the north end of the reserve, nor are there sidewalks within the reserve itself.

As noted in response to Factor 1, the reserve is considered able to efficiently accommodate a small residential land need but not necessarily an employment land need. Future residential development would be very close to industrial uses, where future residents may find employment opportunities that do not require a significant commute. Existing bike and pedestrian facilities to/near the reserve would facilitate access to nearby employment uses and to existing transit stops further to the south. However, the reserve is moderately distant from the Orenco Town Center, the Tanasbourne/Amber Glen Regional Center, and to other areas where future residents could meet more of their daily needs (e.g., a grocery store, schools, medical facilities). Without current direct transit service, it is expected that future residents of the reserve would be somewhat reliant on private motor vehicle transportation.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

NE Brookwood Parkway, NE Huffman Street, NE Jacobson Street, and NE Evergreen Road would be expected to see additional private motor vehicle traffic from development of the reserve. Existing bike and pedestrian facilities nearby would also be expected to see additional use. However, with such a relatively small buildable area, the amount of development from this reserve is not likely to meaningfully impact home-based VMT per capita or have major impacts to the performance of Highway 26 as a throughway. Any additional motor vehicle traffic on NE Brookwood Parkway or NE Evergreen Road resulting from development of the reserve, however, may exacerbate these roadways' high-crash conditions.

d. Need for major transportation facility improvements and associated costs

No major transportation facility improvements (i.e., new or improved urban arterial or collector roads) are expected to be needed to serve urban development of the Brookwood Parkway Urban Reserve.

Facilities	Cost
Arterials, existing/improved full street	$0
Arterials, existing/improved half street	$0
Arterials, new	$0
Collectors, existing/improved full street	$0
Collectors, existing/improved half street	$0
Collectors, new	$0
Total:	**$0**
Per dwelling unit at 20 units per net vacant buildable acre:	**$0**

e. Provision of public transit service

TriMet evaluated the reserve for providing transit service. TriMet determined that it could provide services to the reserve, although there is no guarantee of service. Actual service will depend on the level of development in the reserve and in the corridors

leading to it. Nearby transit services are expected to be improved by 2045, with future Route 66 traveling along Evergreen Road less than a mile from the southern portion of the reserve. There would be no additional cost to serve this reserve in the future.

Prior to land being included in the UGB, a more detailed concept plan, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11, will be required. This concept plan process will develop more refined public facility and service needs and cost estimates.

Factor 3: Comparative environmental, social, energy, and economic consequences

Environmental consequences

Waible Gulch flows in a southerly direction through the northwest corner of the Brookwood Parkway Urban Reserve for approximately 1,120 feet. The stream crosses both cleared land and a small wooded section of a residential tax lot and is located within a mapped floodplain. There is riparian habitat associated with the stream, but there are no currently identified wetlands in the reserve. The stream isolates a small corner of the reserve; however, since the land to the west is within the UGB, this isolated corner can likely be accessed from the west without the need to provide a stream crossing for connectivity. Given the increased protection levels for streams, habitat areas, and floodplains within the UGB, and the ability to provide access from the west to the isolated corner, urbanization of the area can occur with comparatively minimal impact to this stream corridor and habitat areas. Additional environmental consideration, specifically regarding avoidance of conflict between urban development and regionally significant fish and wildlife habitat, is provided in the Metro Code Factors Analysis (Appendix 7A).

Considering the comparative environmental consequences of urbanization, the Brookwood Parkway Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Social, energy, and economic consequences

It is expected that urbanization of the Brookwood Parkway Urban Reserve will result in new housing replacing at least some of the reserve's existing rural residences. However, the small amount of vacant land and the small size of the reserve's tax lots may slow the redevelopment process and thereby slow any change in sense of place and degradation of rural lifestyle. Indeed, this small rural pocket is already adjacent to Highway 26 and has

developed or developing land inside the UGB to the west, south, and east, all of which already limits the reserve's rural character.

As detailed more fully in response to Factor 2 and due in part to the reserve's small size, additional VMT and, therefore, related energy impacts from urbanization would be relatively minimal.

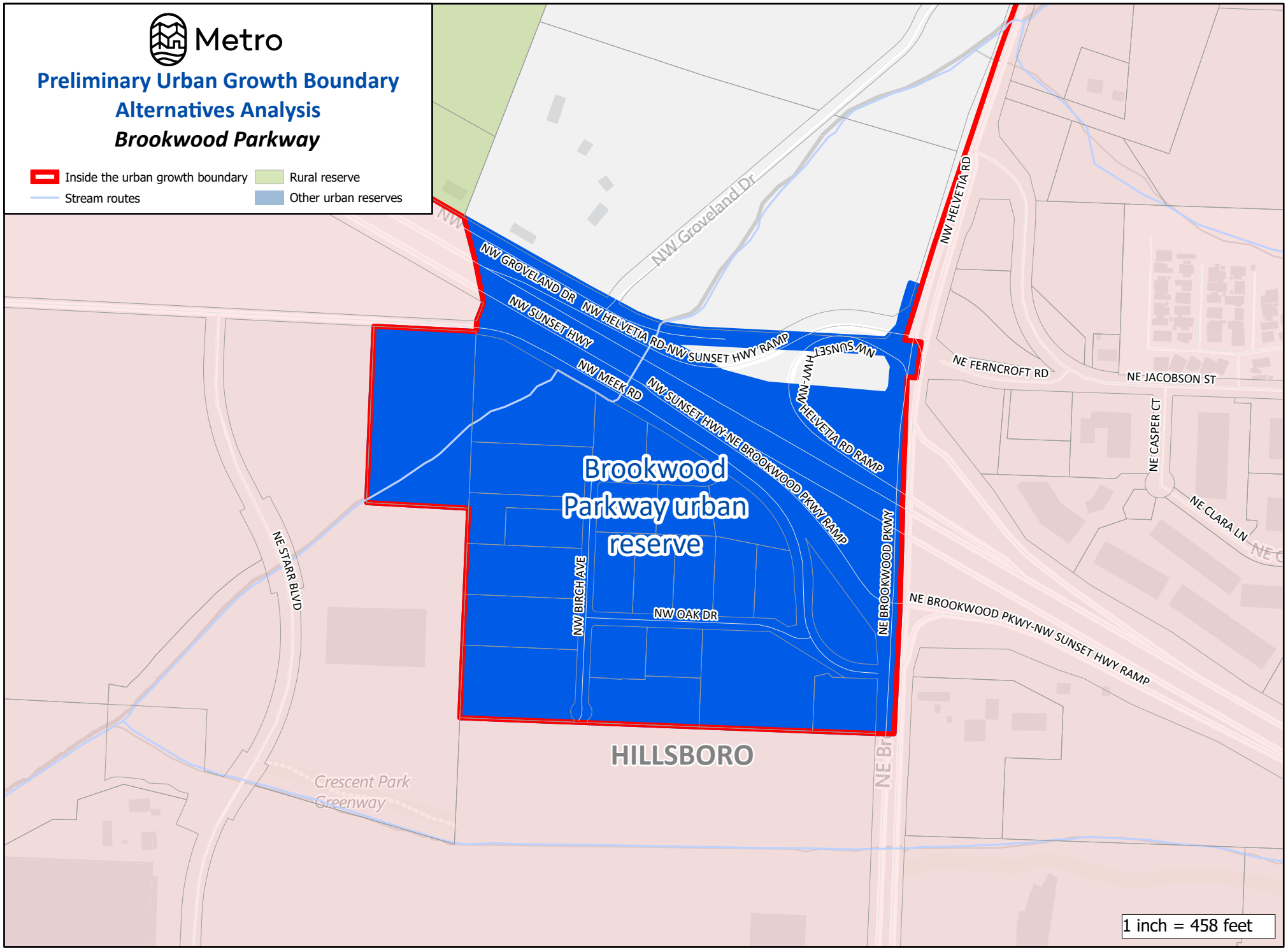
The reserve does not appear to have any commercial agricultural occurring, so urbanization would not have economic consequences as a result of a loss of farming activity in the reserve.

Overall, there would be comparatively low social, energy, and economic consequences from urbanization of this small reserve. The Brookwood Parkway Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Factor 4: Compatibility of the proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

Goal 3 agricultural lands, specifically lands zoned Exclusive Farm Use (EFU) by Washington County, border the Brookwood Parkway Urban Reserve to the north, on the opposite side of Highway 26 from the developable portions of the reserve. This EFU-zoned land is mostly in field croup production; however, the 300-foot-wide Highway 26 right-of-way and the Waible Gulch stream corridor provide an adequate buffer between the reserve and these agricultural activities and urban development of the relatively small reserve is unlikely to result in land use conflicts with agricultural activity. Therefore, the proposed urban uses are considered to have high compatibility with the nearby agricultural and forest activities occurring on the farmland outside the UGB.

The Brookwood Parkway Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location factor.



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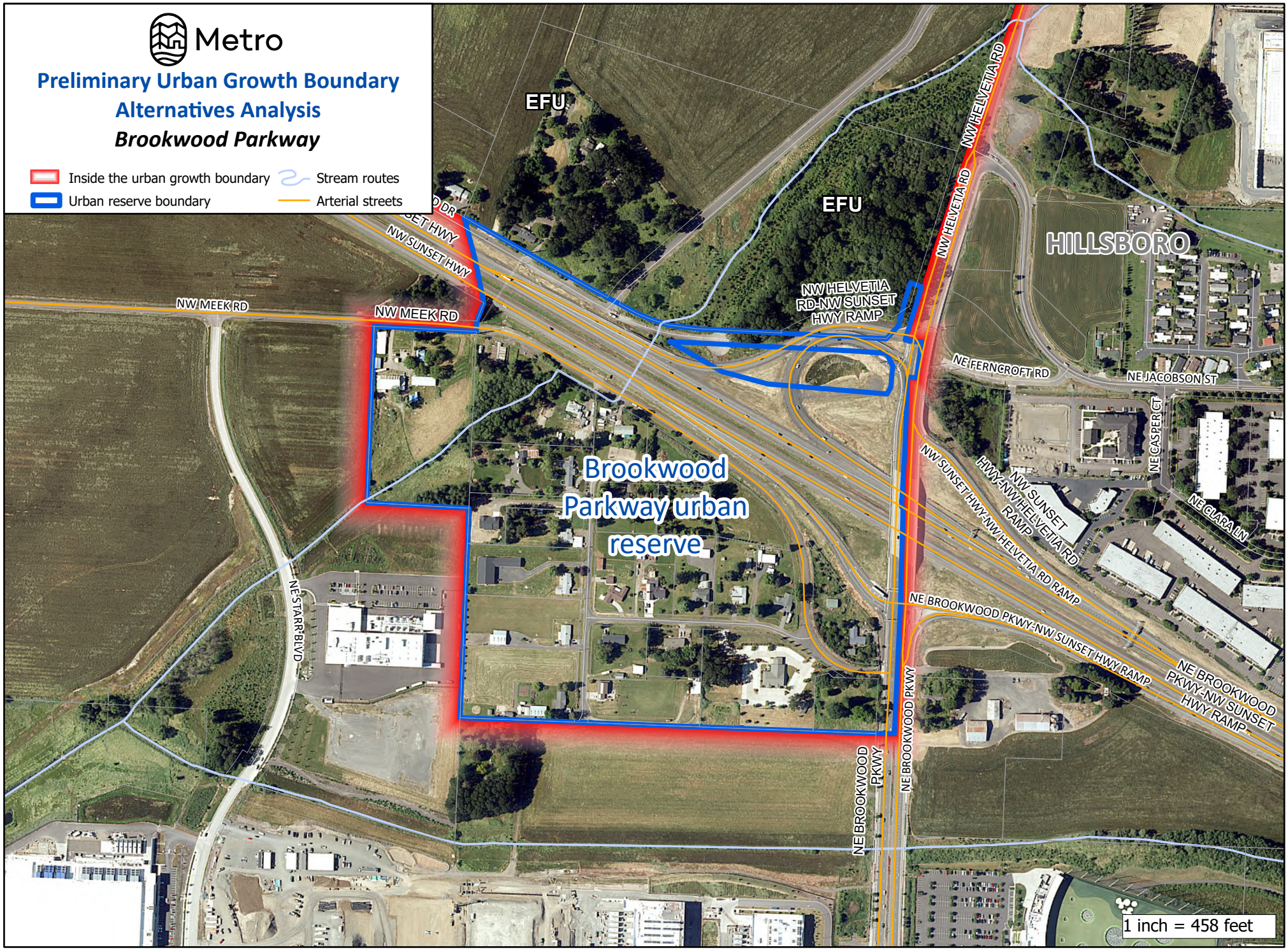

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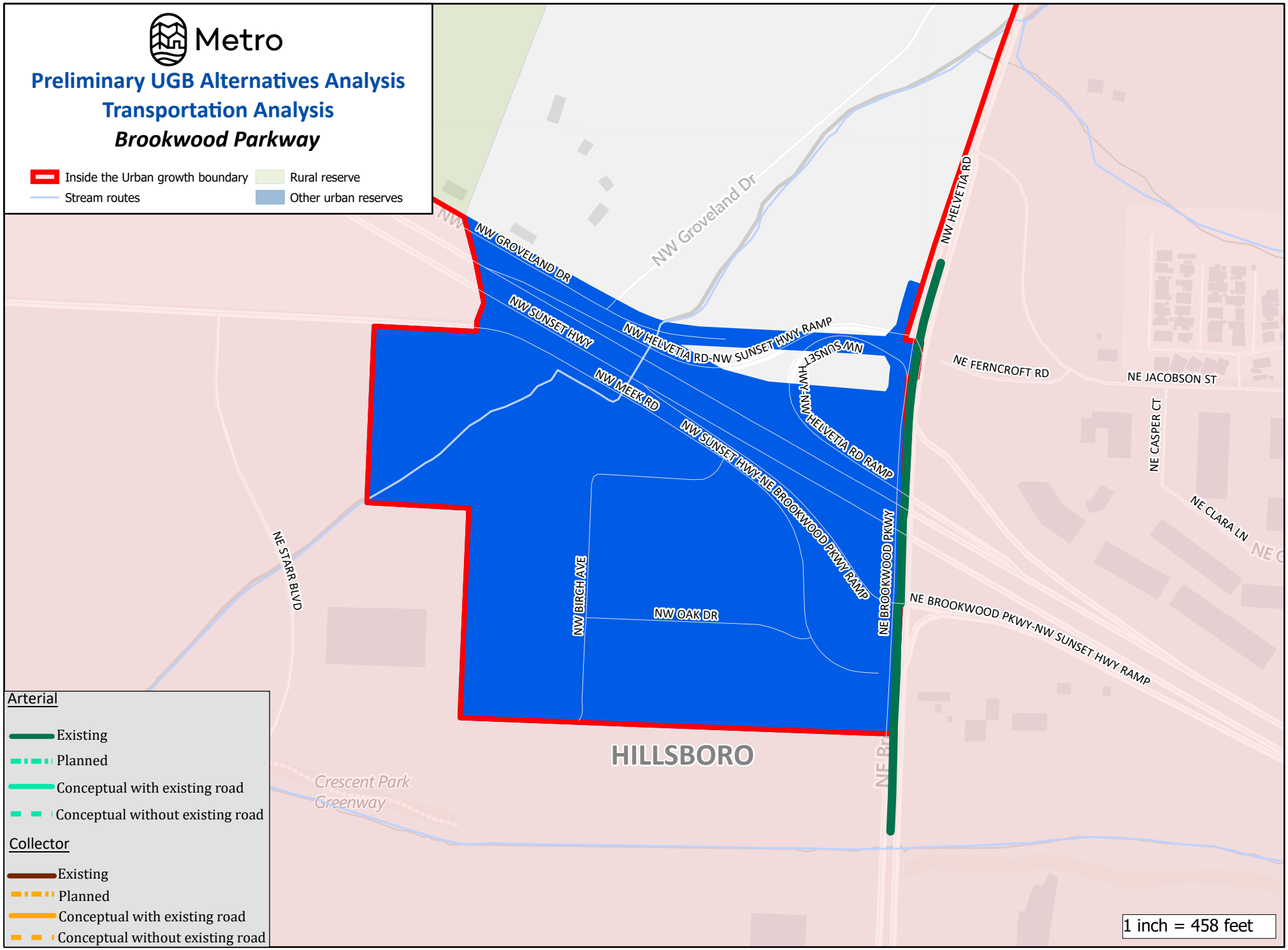

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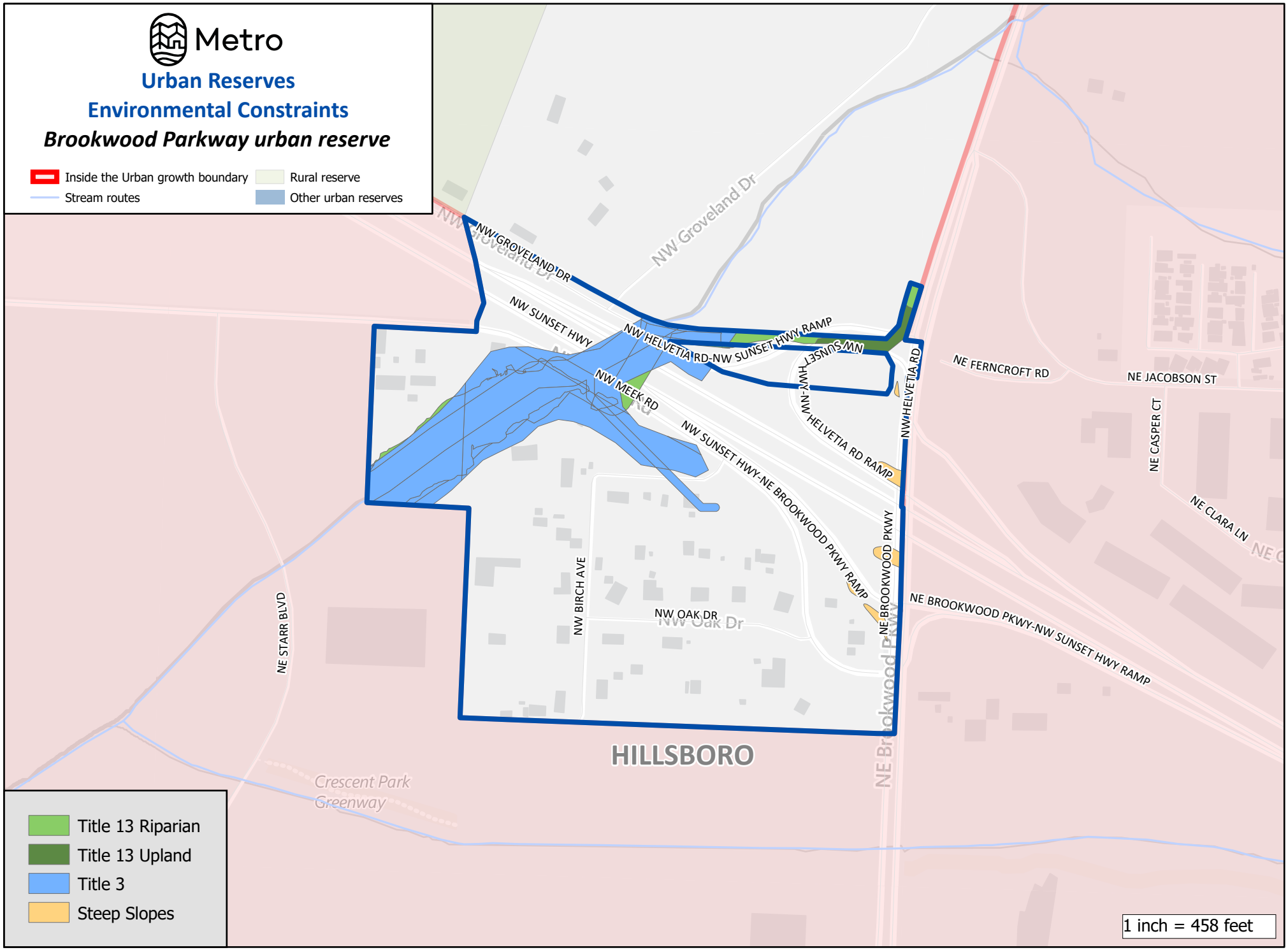

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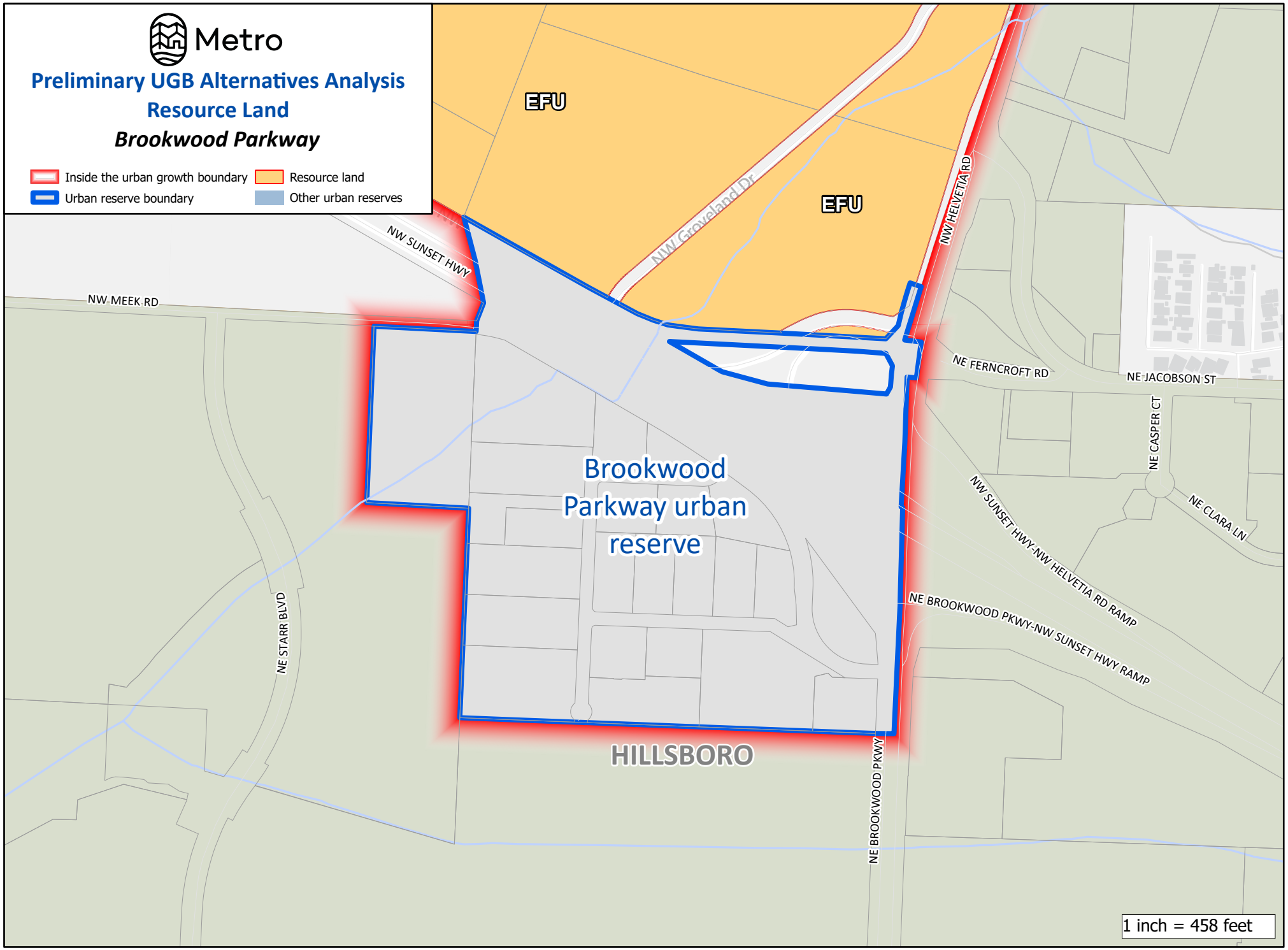

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DAMASCUS URBAN RESERVE

Total Reserve Area	1,239 acres
Total Tax Lot Area in Reserve (without Right-of-Way)	1,208 acres
Gross Vacant Buildable Area	801 acres
Net Vacant Buildable Area	**596 acres**

The Damascus Urban Reserve is comprised of two disconnected "sub-areas". The western sub-area is less than seven acres in size; it is located on the north side of Highway 224 and the east side of SE Tong Road, approximately a quarter mile east of current City of Happy Valley city limits. The northern portion of the western sub-area is relatively flat, while its southern portion near Highway 224 has slopes of 25 percent or greater. The UGB is the western sub-area's western boundary and the sub-area is otherwise entirely surrounded by rural reserve lands. The remaining 1,232 acres of the Damascus Urban Reserve is in its eastern sub-area, more than a mile east of the western sub-area and approximately half a mile from current City of Happy Valley city limits, roughly between Highways 212 and 224, west of Noyer Creek and east of SE Dolphin Road and SE Walgren Road. SE 232nd Drive and SE Royer Road both bisect the eastern sub-area. The UGB forms the northern boundary of the eastern sub-area and a small segment of its western boundary; the eastern sub-area is otherwise entirely surrounded by rural reserve lands, except for a 500-foot-long section in the area of Noyer Creek and a 330-foot-long section near to Highway 212 where it borders undesignated rural lands. The eastern sub-area is characterized by a mixture of flat agricultural lands, rural residences on its smaller tax lots, some rolling hills, and steeper slopes along Noyer Creek and nearer to Highway 224.

GOAL 14 BOUNDARY LOCATION FACTORS

Factor 1: Efficient accommodation of identified land needs

As noted above, the combined area of all of the Damascus Urban Reserve's tax lots is approximately 1,208 acres, though the reserve has only about 801 of gross vacant buildable acres and 596 net vacant buildable acres.

While the reserve has two disconnected "sub-areas", the 6.4-acre western sub-area accessed by SE Tong Road is comprised of just one tax lot, which has one dwelling, accessory uses, and a stand of trees on the steep slope above Highway 224 to the south. The tax lot's improvements are assessed at $660,000. Other properties neighboring this tax lot are of a similar or smaller size and are also generally developed with rural residential uses. The Richardson Creek Natural Area and is just on the opposite side of the highway from the sub-area's tax lot. Werne A Duncan Elementary School and Adrienne C Nelson High School are about a mile and a half away. Commercial uses in Carver are roughly a mile to the west, and commercial uses in the unincorporated community of Damascus are nearly two miles to the northeast. With its smaller size, existing and surrounding residential development, sloping terrain, and distance from commercial areas, the western sub-area is considered able to accommodate only a very small residential land need and no employment land need.

The eastern sub-area, however, has 215 contiguous tax lots fully within the Damascus Urban Reserve. Approximately 44 percent of these tax lots are smaller than two acres each and approximately 70 percent are smaller than five acres each. Slightly more than 10 percent are larger than 10 acres each, including four that are larger than 40 acres each. The eastern sub-area is characterized by agriculture lands, particularly near Highway 212, as well as rural residences and forested areas closer to Highway 224 and Noyer Creek. St. Paul Damascus Lutheran Church owns a nearly eight-acre tax lot in the eastern sub-area. More than 80 percent of the eastern sub-area's tax lots have assessed improvements, with the median assessed value of those tax lots' improvements being nearly $400,000.

The eastern sub-area is adjacent to Highway 212 and includes a portion of Highway 224. TriMet Route 30 has a stop on Highway 224 in the southeastern end of the eastern sub-area at the intersection with SE Royer Road. The eastern sub-area is served by a number of existing through- and dead-ending streets, and SE Ceielo Court in the UGB stubs to the edge of sub-area.

The Deep Creek – Damascus K-8 School occupies a 20-acre tax lot in the north end of the reserve's eastern sub-area. Lewis & Clark Montessori Charter School is outside of the reserve, but less than 1,000 feet from the north end of the eastern sub-area, on the opposite side of Highway 212. The Gresham-Barlow School District also owns more than 50 acres of undeveloped land outside of but adjacent to the reserve along SE 232nd Drive, across from the Deep Creek – Damascus K-8 School. The Barton Natural Area is less than 500 feet from the southeastern end of the eastern sub-area, and Barton Park is approximately 1.5 miles away. Existing commercial retail uses of unincorporated Damascus at the intersection of Highway 212, SE Sunnyside Road, and SE Foster Road are about 1.5 miles west of the northern end of the eastern sub-area via Highway 212.

The larger tax lots, vacant lands, and areas already cleared and in agricultural use, generally near to Highway 212, provide the opportunity for efficient urbanization, while the smaller-acreage rural residential pockets on steeper terrain closer to Highway 224 lend themselves to a less efficient level of urbanization. The areas near Highway 212, which are also closer to existing schools, vacant land near to school-district-owned property, and the Damascus commercial area provide an opportunity for employment or residential use. Employment uses in this area would also have better access to Highway 26 through the community of Boring. Therefore, this sub-area is considered able to accommodate both residential and employment land needs.

Factor 2: Orderly and economic provision of public facilities and services

Water Services

With regard to water services, the Damascus Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Sunrise Water Authority currently serves portions of the UGB generally east of I-205 and north of the Clackamas River, including Happy Valley. They will also serve Pleasant

Valley and Carver as they are annexed into Happy Valley and developed with urban uses. Sunrise Water Authority uses two types of sources for drinking water: surface water drawn from the Clackamas River, which is treated at one of three treatment plants; and ground water extracted from wells. There are no known major water system deficiencies at this time. Sunrise Water Authority has a 20-year CIP that includes the necessary investments to serve the district's service area for the current planning horizon.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Sunrise Water Authority is planning on serving the future needs of the Damascus area. System improvements, including pumping, treatment, storage, and transmission facility improvements, would be needed to serve urban development of the Damascus Urban Reserve. The full cost of these improvements is not currently known but could be significant.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

The pumping, treatment, storage, and transmission facility improvements noted above would be needed to avoid negatively impacting services to areas already inside the UGB.

d. Estimated water service-related costs for reserve development

Water piping, pumping, and storage costs	Cost
10-inch pipe	$8.31 million
12-inch pipe	$0
16-inch pipe	$0
Pumping	$0
Storage	$0.78 million
Total:	**$9.09 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$762**

Sanitary Sewer Services

With regard to sanitary sewer services, the Damascus Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

There is no existing public sanitary sewer service within the UGB near the Damascus Urban Reserve. Rather, this portion of the UGB is currently served by private septic systems. The nearest sanitary district is operated by Clackamas Water Environment Services (WES).

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

As noted above, there is no existing public sanitary sewer service within the UGB near the Damascus Urban Reserve. WES is the logical future provider, due to proximity, topography, and location within Clackamas County; however, WES does not have settled plans to extend service to Damascus and there may be limitations on adding significant new flows to the Clackamas River Basin. If services come from WES, it is likely that new trunk lines and pipe upsizing would be needed.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Because there is no existing public sanitary sewer service within the UGB near the Damascus Urban Reserve, there are no existing facilities necessarily to be impacted. However, if WES is to eventually serve the area, upsizing of existing WES pipes may be necessary to avoid adverse impacts.

d. Estimated sanitary sewer service-related costs for reserve development

Sanitary sewer piping and pumping costs	Cost
10-inch pipe	$8.31 million
12-inch pipe	$0
15-inch pipe	$0
Pump station	$7.02 million
Force mains	$2.88 million
Total:	**$18.44 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$1,546**

Stormwater Management Services

a. Capacity of existing facilities to serve areas already inside the UGB

No public stormwater management facilities exist to serve the adjacent area already inside the UGB.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

No public stormwater management facilities exist.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Because there is no existing public stormwater service within the UGB near the Damascus Urban Reserve, there are no existing facilities necessarily to be impacted. Stormwater conveyance, water quality, and detention for roadways would be developed

during construction and would likely be used to handle the public sector runoff. Private property runoff would likely need to be treated onsite.

d. Estimated stormwater service-related costs for reserve development

Stormwater piping and water quality/detention	Cost
18-inch pipe	$5.64 million
24-inch pipe	$1.19 million
30-inch pipe	$0
Water quality/dentition	$7.85 million
Total:	**$14.68 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$1,230**

Transportation Services

With regard to transportation services, the Damascus Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(e) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Figure 4.36 in Chapter 4 of the 2023 Regional Transportation Plan (RTP) displays 2020 home-based vehicle miles traveled (VMT) per capita by Metro transportation analysis zone, with average VMT per capita considered 11.32. According to Figure 4.36, areas in the UGB adjacent to the Damascus Urban Reserve had above average and significantly above average home-based VMT per capita in 2020.

Metro's adopted 2040 Growth Concept Map designates numerous walkable, higher-density, mixed-use centers of employment, housing, cultural and recreational activities, and transit service across the region in the UGB. Those centers are intended to grow the economy, provide affordable housing, and promote vibrant and distinctive communities that minimize transportation costs and allow people to meet their daily needs without having to utilize a private motor vehicle. The nearest 2040 Growth Concept center that has been planned for urban uses is the Happy Valley Town Center, approximately two miles of the reserve; residents of areas already within the UGB near the reserve therefore have to travel about this distance to reach a 2040 Growth Concept Center that has been planned for urban uses.

Nonetheless, there are major commercial uses, including a grocery store and banking services, as well as medical services in the area around the intersection of Highway 212 and SE Sunnyside Road, an area in the UGB that is envisaged in the 2040 Growth Concept as a future town center, but has not yet been planned for urban land uses. This area is closer to the reserve than the Happy Valley Town Center and can provide some

services to the surrounding residents in the UGB. There are also some commercial uses, including restaurants, in the Carver area of the UGB, approximately one mile from the small western sub-area.

There are no dedicated bike facilities or sidewalks within the UGB near to the reserve. There is limited bus service (i.e., every few hours) on the Sandy Area Metro (SAM) connecting the areas of the UGB near the eastern sub-area to the Damascus commercial area and Clackamas via Highway 212. TriMet Route 30 also provides bus service along Highway 224, connecting areas of the UGB near the western sub-area to Carver and Clackamas. Highway 212 does have fairly wide and shoulders, which can provide some space for bicyclists. There are a couple of painted pedestrian crossings of Highway 212 at SE 232nd Drive and SE 242nd Drive. There are also dedicated bike lanes, painted pedestrian crossings, and sidewalks along Highway 212 in the Damascus commercial area, as well as small sections of sidewalk and painted pedestrian crossings at the intersection of Highway 224 and Springwater Road in Carver.

Figure 4.14 in Chapter 4 of the 2023 RTP identifies several high injury corridors inside the UGB in the areas of Happy Valley, including sections of Highway 212. The figure also identifies the intersection of SE 242nd Avenue and SE Hoffmeister Road as a high injury intersection.

Highway 212 and Highway 224 are identified as throughways in Figure 4.7 in Chapter 4 of the 2023 RTP. Figure 4.8 of the chapter indicates that these routes currently meet travel speed reliability performance thresholds, with no more than four hours per day when travel speeds fall below the identified minimum speed. RTP models indicate the facilities' reliability will continue at least to the year 2045.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Highways 212 and 224 run adjacent to the eastern sub-area, and Highway 224 is adjacent to the western sub-area. As noted above, these throughways currently meet travel speed reliability performance thresholds.

There is currently dedicated bike facilities or sidewalks connecting the reserve to areas already inside the UGB. There are also no bike facilities or sidewalks within the reserve itself. As noted above, SAM provides occasional bus along Highway 212 to the Damascus commercial area and Clackamas, but there are currently no stops on the highway near to the reserve. TriMet Route 30 has stops in the southern end of the eastern sub-area on Highway 2025, providing limited service to Carver and Clackamas.

The eastern sub-area already contains a school use; if this portion of the reserve were to be urbanized with residential uses in close proximity, those residents could potentially access the school without significant private motor vehicle trips. However, there are very few other public services or commercial uses in and near the reserve today. Indeed, the areas of the UGB near to the reserve have not yet even been planned for urban land uses. Unless the reserve and surrounding areas were to be developed with a mixture of

residential uses and uses that could allow those future residents to meet their daily needs, residents will most likely be travelling by private motor vehicle to access them elsewhere (e.g., in the Damascus commercial area, Carver, Happy Valley, and Clackamas).

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Portions of Highway 212, Highway 224, SE 232nd Drive, 242nd Avenue, SE Sunnyside Road, and SE Tong Road already within the UGB would be expected to see additional private vehicle traffic from development of the reserve, in part due to the distance of the reserve from commercial areas, the limited transit service connections, and lack of bike and pedestrian facilities. However, if the reserve itself were to be developed with a mixture of uses, future residents could get more of their daily needs met locally without having to drive as much on roads already in the UGB. The existing school uses in the reserve will also help to limit driving by new residents on roads already in the UGB. Moreover, nearby residences in the current UGB could provide housing to employees of the reserve, and new employment uses in the reserve could provide jobs for nearby residents of the current UGB, further limiting new traffic impacts on roads already in the UGB.

With these considerations, development of the reserve may result in only moderate impacts to home-based VMT per capita in the future in nearby areas already inside the UGB and the performance of Highways 212 and 224 as throughways. Any additional motor vehicle traffic on Highway 212 resulting from development of the reserve, however, may exacerbate existing high-crash conditions.

d. Need for major transportation facility improvements and associated costs

To serve urban development, roughly 0.40 miles of SE 232nd Avenue that border the reserve north of SE Georgia Lee Lane will likely need to be improved to urban arterial standards. These lengths' improvements are considered half-street improvements for the purposes of this analysis, as the west side is already inside the UGB. An additional 1.15 miles of SE 232nd Avenue will likely need to be improved to full-street urban arterial standards, including acquisition of additional right-of-way. Approximately 1.43 miles of SE Royer Road could need to be improved to urban collector standards, with acquisition of additional right-of-way, and two new collectors with a combined length of 1.73 miles are expected to be needed in the eastern portion of the reserve. Given the topography, most of the new and improved roadway sections are expected to have normal per-mile costs.

Facilities	Cost
Arterials, existing/improved full street	$70.98 million
Arterials, existing/improved half street	$9.66 million
Arterials, new	$0
Collectors, existing/improved full street	$44.74 million
Collectors, existing/improved half street	$0
Collectors, new	$73.33 million
Total:	**$198.71 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$16,659**

e. Provision of public transit service

Much of the reserve was withdrawn from the TriMet service district; thus, no analysis of future/additional transit service was completed by TriMet. The reserve straddles the TriMet district boundary. As described above, both SAM and TriMet currently serve along the northern and southern borders of the reserve, respectively.

Prior to land being included in the UGB, a more detailed concept plan, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11, will be required. This concept plan process will develop more refined public facility and service needs and cost estimates.

Factor 3: Comparative environmental, social, energy, and economic consequences

Environmental consequences

Two segments of Noyer Creek flow south along the eastern edge of the Damascus Urban Reserve for a total length of approximately 2,200 feet. Two small tributaries also connect to Noyer Creek along the reserve's eastern edge and have a combined length of approximately 3,200 feet. All four stream lengths are located in wooded ravines that could help provide protection from future urbanization.

A third tributary to Noyer Creek flows northeasterly through the edge of the large tract of agricultural land near Highway 212 for approximately 3,125 feet. A portion of the stream in this location is redirected under a loading area for a nursery. This stream section is susceptible to impacts from urbanization given its location, already altered state, and lack of an existing vegetated riparian corridor. However, restoration of this degraded stream edge, including the altered section, would provide protection for the water body.

Two tributaries to Richardson Creek flow north through the western portion of the eastern sub-area of the reserve for approximately 4,450 feet. A little more than half of the tributaries' lengths flow through pastureland and the remaining portions flow through locations of sporadic trees and shrubs, with no continuous vegetated riparian corridor. However, there is some riparian and upland habitat identified along the stream corridors.

These two streams are susceptible to impacts of future urbanization and, given their location near SE Royer Road, impacts to the upland habitat would be likely.

A 2,100-foot segment of Deep Creek and a 450-foot segment of Noyer Creek form the southern boundary of the eastern sub-area near Highway 224. There is a riparian buffer between 50 and 100 feet along the creeks, with limited ability to develop additional land given their location at the edge of the reserve.

An unnamed stream flows south along SE 232nd Drive for approximately 3,000 feet before flowing into Noyer Creek near the confluence with Deep Creek. The stream is mostly located in steep sloped wooded areas of rural residential tax lots and would be less impacted by urbanization due to steep slope protection measures.

There are two National Wetland Inventory (NWI) wetlands identified in the reserve. The first wetland is a 6,000-square-foot pond located on a rural residential property that is isolated from any stream corridor and includes both tree and shrub buffer vegetation. The isolated nature of this wetland may or may not make it susceptible to impacts from urbanization, depending on the ultimate redevelopment of this residential pocket. The second wetland, about 0.6 acres in size, is located along one of the tributaries to Richardson Creek adjacent to a residence. The wetland does have some significant adjacent tree canopy that continues along the stream corridor, which is identified as riparian habitat. The location of this wetland along a stream corridor with riparian habitat may make the wetland less susceptible to impact given the required protection levels for stream, wetland, and habitat areas within the UGB. There is also a pond located near the intersection of Highway 224 and SE 232nd Drive that may require habitat protection in the future.

There are areas near SE Royer Road and SE 232nd Drive that may have upland wildlife habitat considerations. A significant portion of these areas also contain slopes greater than 25 percent that would limit the impacts of future development; however, impacts to some upland habitat areas would be likely.

Overall, urbanization of the reserve could occur with comparatively low to moderate impacts to the natural resources; most stream corridors and wetlands would be protected by existing naturally-occurring buffers in ravines and steep slopes, as well as by increased stream and wetland protection requirements on land added the UGB. The identified upland habitat areas will need to be evaluated for future protection levels.

Considering the comparative environmental consequences of urbanization, the Damascus Urban Reserve is given a “medium-high” score in Attachment 3 for this Goal 14 boundary location sub-factor.

Social, energy, and economic consequences

The very small western sub-area, which is constrained by slopes and existing development, will not be able to accommodate new development that will have a meaningful social impact on the surrounding area, which is already largely developed with residential uses. Its

urbanization will also not generate significant energy impacts or result in the loss of commercial farming activity on the site.

The large eastern sub-area is characterized by rural residential development on rolling hills at the south, and a significant tract of agricultural activity near Highway 212. It is expected that urbanization of this sub-area would, over time, result in new housing replacing some of the existing rural residences, which could contribute to a loss in sense of place for area residents. Areas along SE Forest Hill Drive, SE Weatherly Lane, and SE Cielo Court, as well as portions of SE Royer Road, would probably see more limited new development due to the existing levels of development, parcelization, topography, and habitat areas.

The portions of the eastern sub-area from SE Curtis Road to east of SE Royer Road, as well as south and east of the Deep Creek – Damascus K-8 School, have large tax lots with far fewer constraints on development. These areas could potentially accommodate wide-scale urban development that would have a significant impact on the overall character of the area and would likely contribute to a loss of sense of place and a degradation of rural lifestyle for existing area residents. However, urbanization could also could foster new civic, recreational, and social opportunities for the reserve's existing residents, particularly if it features a mixture of uses.

As detailed more fully in response to Factor 2, urbanization of the reserve may only generate moderate levels of VMT, if the reserve were to be developed as a complete community with a mixture of uses that allowed residents to meet more of their daily needs closer to home. This would help to limit adverse energy impacts from urbanization as well.

There is a significant amount of commercial agricultural activity occurring in the reserve and urbanization of the reserve's farmland could have considerable adverse economic consequences. However, these economic losses may be outweighed by economic benefits of urban residential development and new urban employment opportunities.

This analysis finds there would be comparatively moderate to high social, energy, and economic consequences from urbanization of this reserve. The Damascus Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Factor 4: Compatibility of the proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

The Damascus Urban Reserve is almost entirely surrounded by lands that have Goal 3 or 4 resource land zoning for agricultural and forest activities. Most of these lands adjoining the reserve but outside the UGB are zoned Timber (TBR) by Clackamas County, though some adjacent to the west end of the eastern sub-area are zoned Exclusive Farm Use (EFU) by the County and others adjacent to the east end of the eastern sub-area around Noyer Creek and its canyon are zoned Ag/Forest (AG/F) by the County.

There are two TBR-zoned tax lots adjacent to the western sub-area, each of which are smaller than five acres. While both largely forested, these trees are on steep slopes and one has residential uses. Given their small size, topography, and existing development, as well as their limited local road access, they are unlikely to be suitable for major commercial timber operations. Neither of these tax lots appears to have commercial agricultural activity. Therefore, urban development of the small western sub-area will not adversely impact agricultural or forest activities on these tax lots.

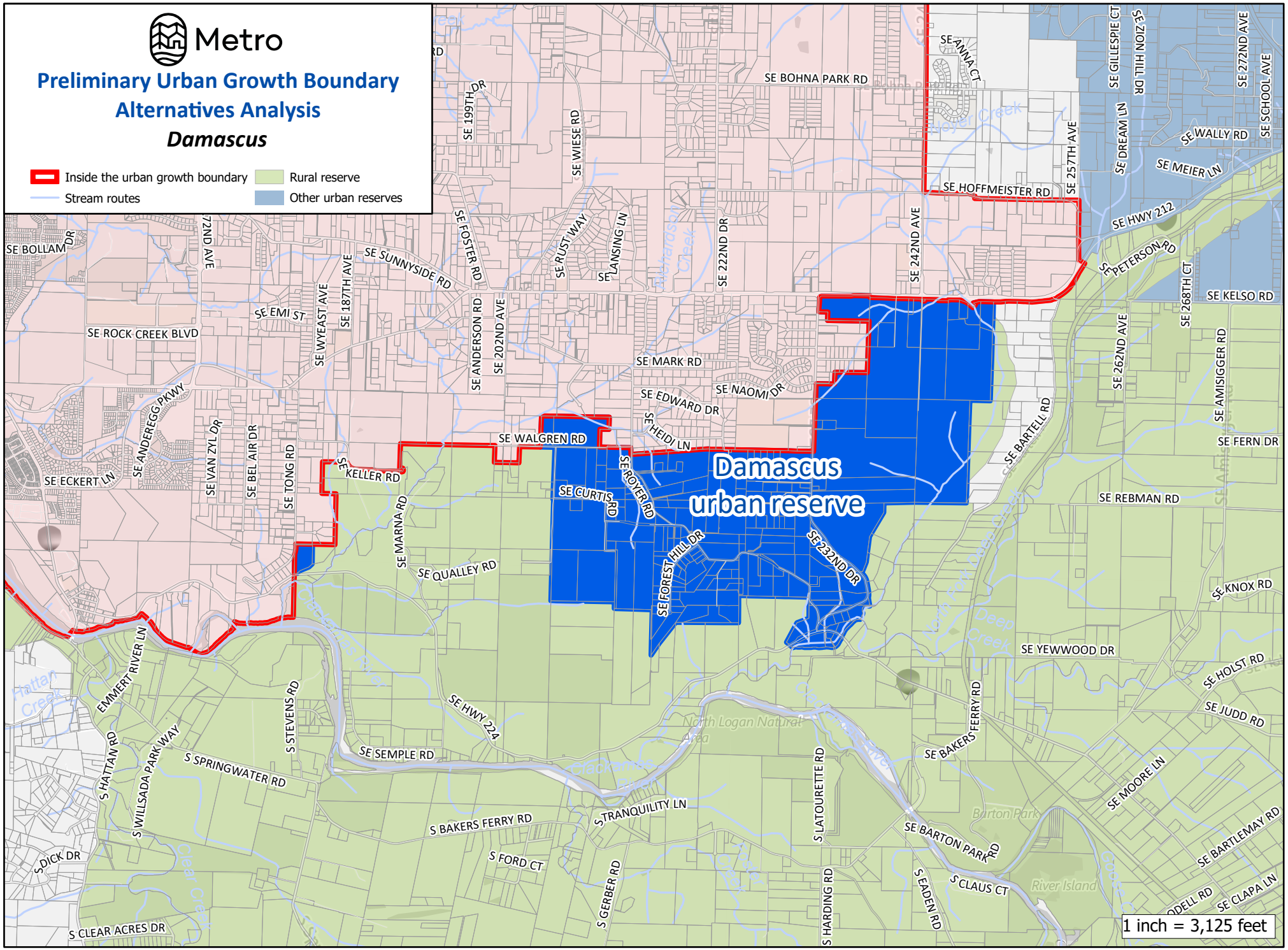
The EFU-zoned land adjacent to the west end of the eastern sub area, located south of SE Walgren Road and west of SE Dolphin Road, has agricultural activities, including productive fields and pasture lands, as well as stands of trees. Within the reserve and directly adjacent to one of the agricultural areas is the Alpha Broadcasting property that, if it stayed in its current use with broadcasting antennas, would provide a buffer between the agricultural activities and future urban development. SE Dolphin Road would not provide a satisfactory buffer between urban development and the agricultural and forested areas and conflicts related to safety, liability, and vandalism and complaints due to noise, odor, dust, and the use of pesticides and fertilizer could occur. Additional traffic along SE Dolphin Road may impact the movement of farm or forestry equipment, but since most of the future traffic would be expected to travel east towards SE 232nd Drive, the impact would likely be minimal.

The TBR-zoned land to adjoining to the south of the reserve's eastern sub-area is mostly forested, though there is some rural development on smaller tax lots. There is no apparent commercial agricultural activity in this area. While there could be commercial harvesting of trees, the topography slopes somewhat steeply down away from the reserve to Highway 224; timber harvesting here would be fairly isolated from development above in the reserve to the north. Moreover, one of the adjacent TBR-zoned properties, while forested, is owned by Metro and therefore not likely to be used for commercial timber harvesting.

Lands to the east of the reserve's eastern sub-area are zoned either TBR or AG/F. Those that are adjacent to the reserve in this area are generally forested, but they are along Noyer Creek and in the creek's canyon. Smaller adjoining tax lots have rural residences and limited apparent commercial agricultural activity. The canyon itself provides a very good buffer for the agricultural activities in this area. If urbanization occurred right up to the edge of the TBR-zoned land, it would not be compatible with any forestry activities that might occur, although restrictions on logging adjacent to Noyer Creek reduces the likelihood that the canyon area would be harvested.

Due to the limited nature of nearby agricultural and forest activities occurring on adjoining farm and forest land, the presence of the Noyer Creek, the functions of the creek's canyon as a buffer, Metro ownership of a large tax lot, and existing rural residential development, the proposed urban uses (i.e., urban development of the reserve) would be considered to have high compatibility with the nearby agricultural and forest activities occurring on farm and forest land.

The Damascus Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location factor.



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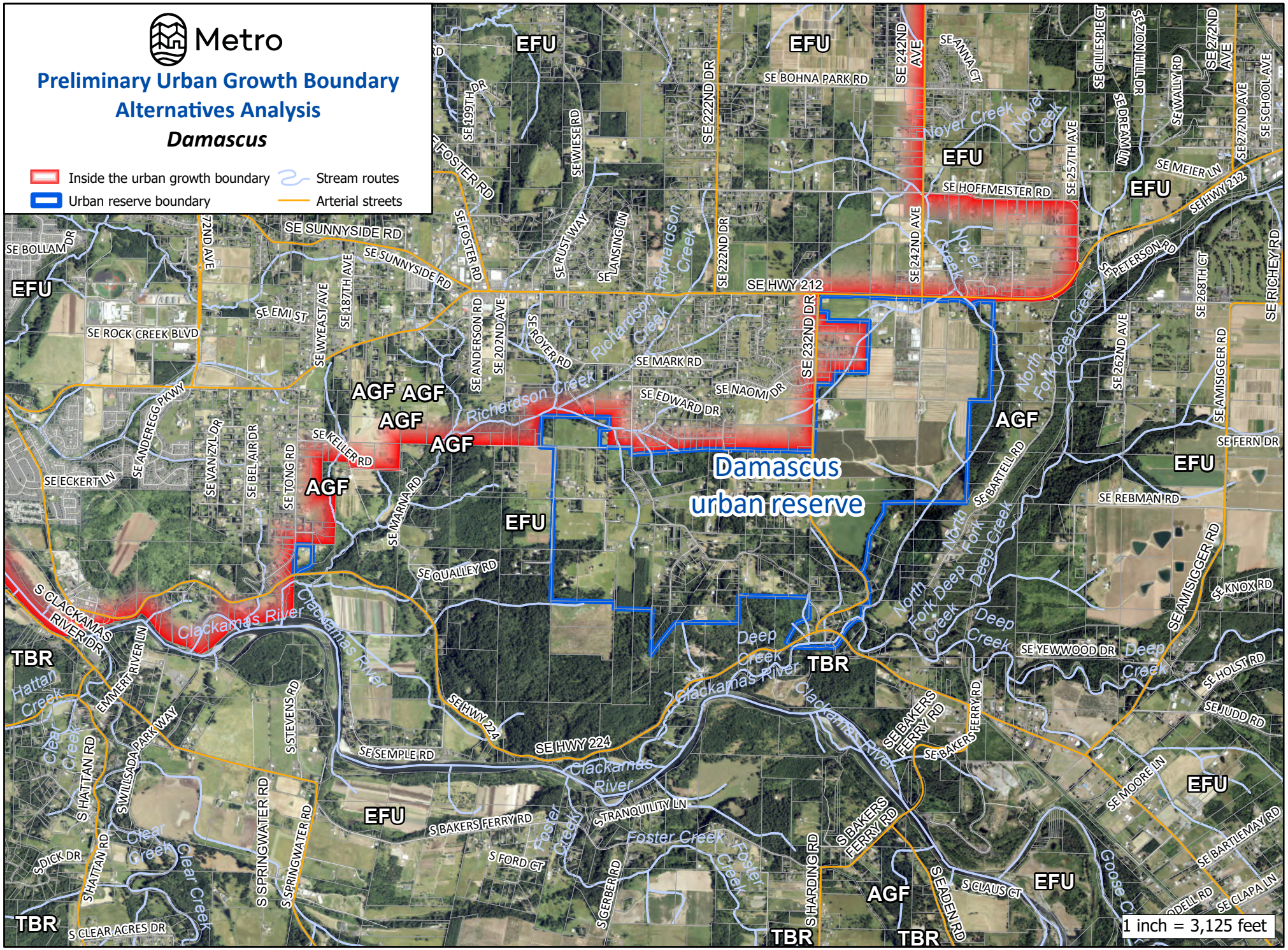

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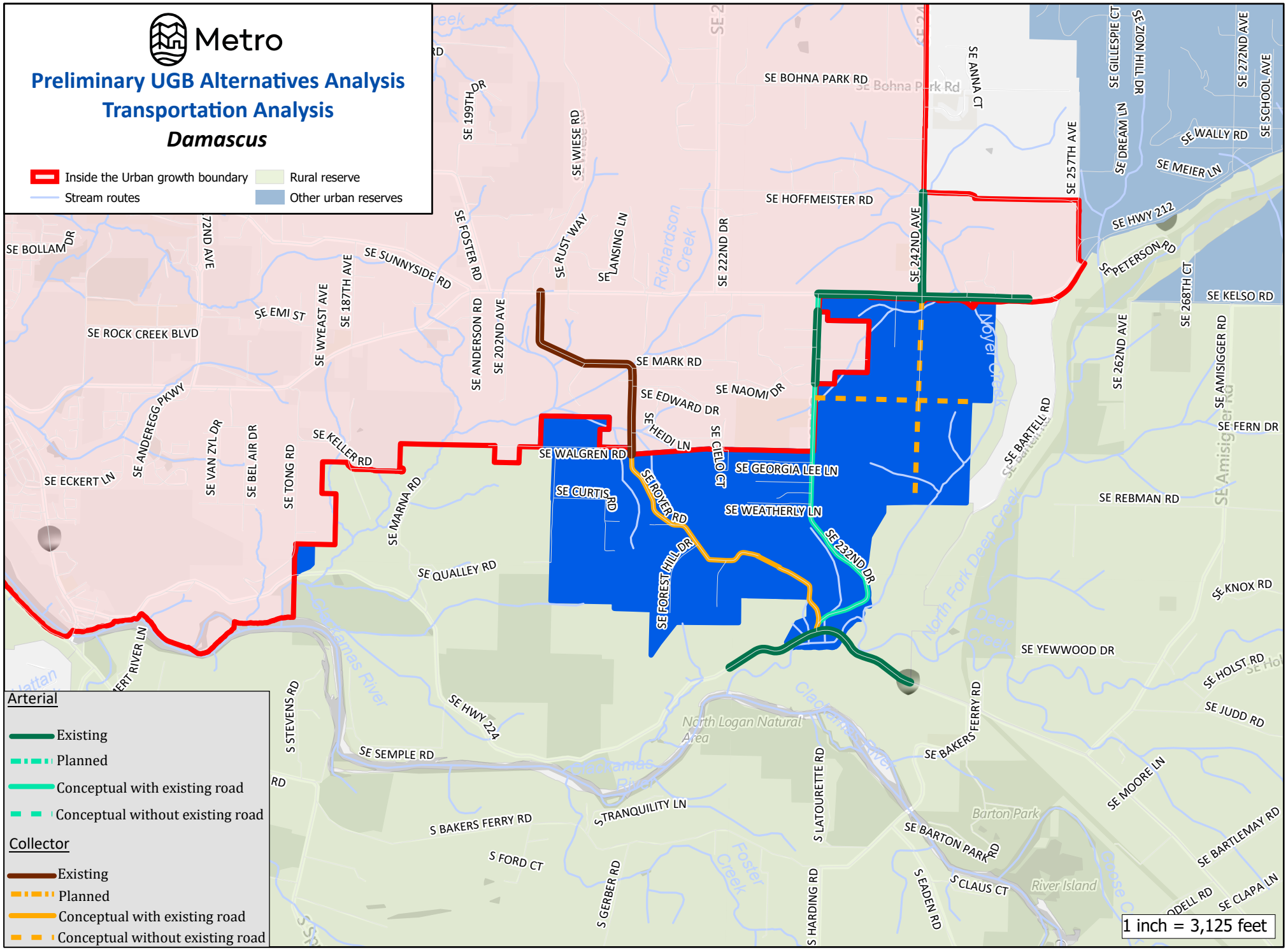

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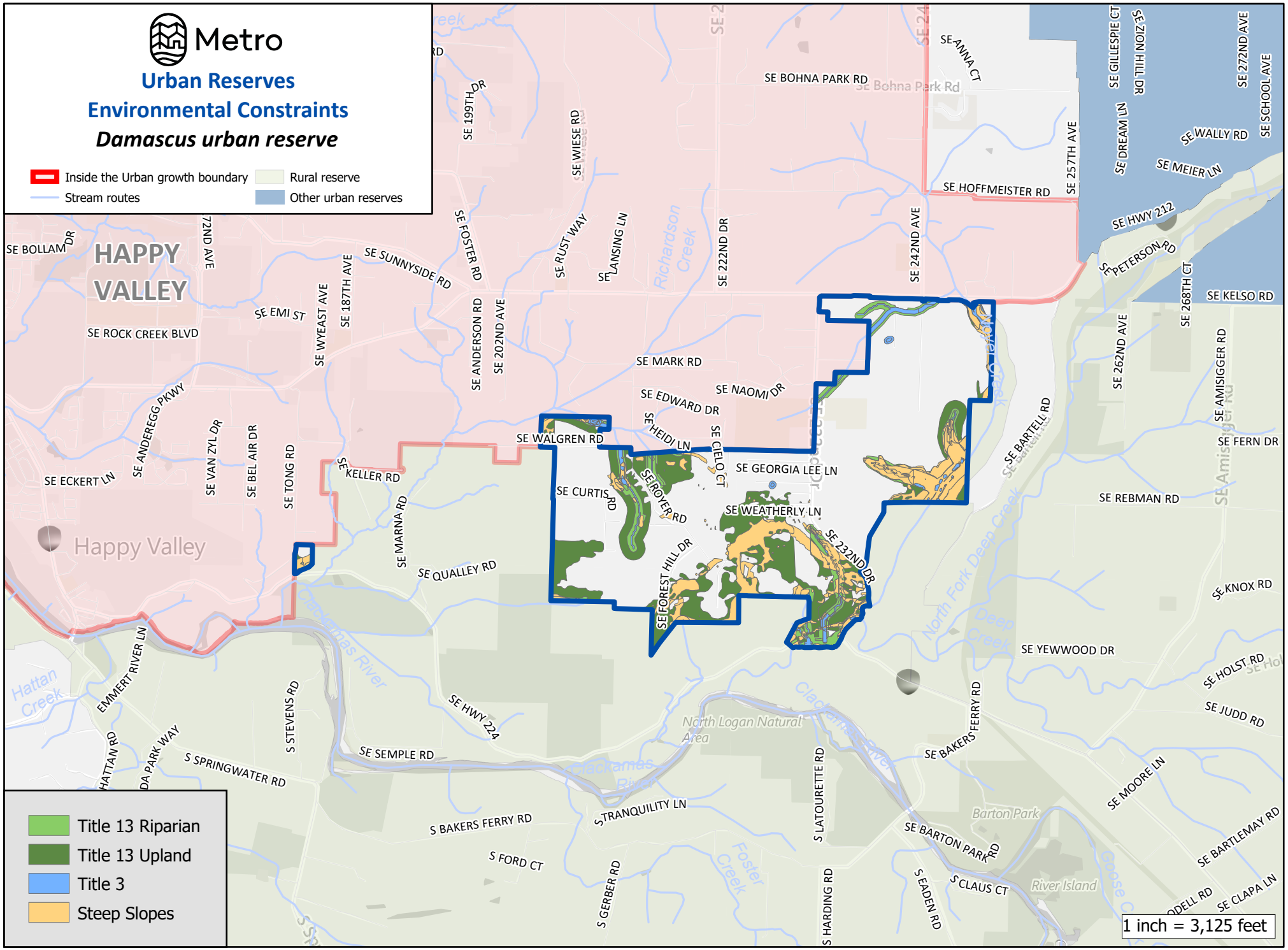

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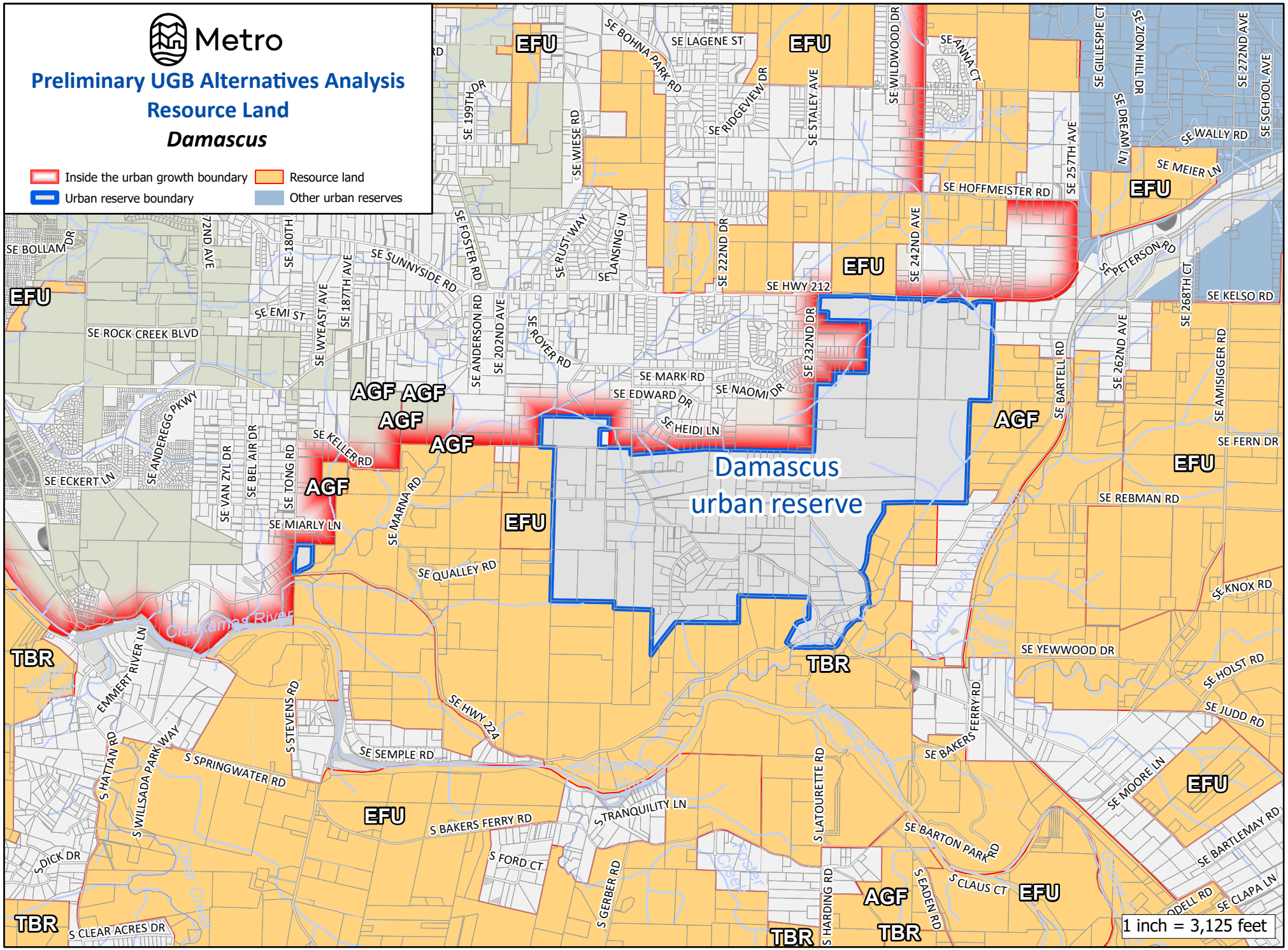

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DAVID HILL URBAN RESERVE

Total Reserve Area	320 acres
Total Tax Lot Area in Reserve (without Right-of-Way)	313 acres
Gross Vacant Buildable Area	172 acres
Net Vacant Buildable Area	**128 acres**

The David Hill Urban Reserve is an irregularly shaped area on the northwest edge of Forest Grove in the vicinity of NW David Hill Road. The UGB forms the reserve's eastern boundary and rural reserve land is to the west, north, and south. The high point of the reserve is near NW David Hill Road, with the land sloping down to the south towards NW Gales Creek Road and east towards NW Thatcher Road, dropping 440 and 360 feet, respectively. Access to the reserve is provided by NW David Hill Road, NW Gales Creek Road, and NW Thatcher Road.

GOAL 14 BOUNDARY LOCATION FACTORS

Factor 1: Efficient accommodation of identified land needs

The David Hill Urban Reserve is comprised of 23 tax lots, which have a combined area of approximately 313 acres within the reserve. Nearly half of the tax lots have area within the reserve larger than 10 acres and 70 percent have area within the reserve larger than five acres. As noted above, the entire reserve contains 172 gross vacant buildable acres and 128 net vacant buildable acres.

According to aerial imagery, the reserve contains rural residences, tree plantations and groves, and some field agriculture. A 0.88-acre tax lot is owned by the City of Forest Grove and used for a water service facility. Overall, 18 of the reserve's tax lots have improvements, with a median assessed value of those tax lots' improvements exceeding $345,000.

Thatcher Park is less than a mile away from the reserve via NW David Hill Road and Forest Glen Park is less than half a mile away via Gales Creek Road. Forest Gove High School is more than a mile away to the east. The nearest transit stop is more than two miles away; the nearest highway, Highway 26, is more than seven miles away.

Nearly all of the land in the reserve has slopes greater than 10 percent. There are also some locations with slopes greater than 25 percent. Given this topography and the distance of the reserve from a highway and transit, the reserve is not considered suitably able to accommodate an employment land need. It could, however, accommodate a residential land need.

Factor 2: Orderly and economic provision of public facilities and services

Water Services

With regard to water services, the David Hill Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Adjacent lands inside the UGB are served by the City of Forest Grove. The city's water is a combination of city-sourced supply and water from the Joint Water Commission (JWC). The water treatment plant is owned and operated by the city and provides finished water to a city-owned five million gallon reservoir. The city is generally considered to have sufficient supply and treatment capacity, and sufficient finished water transmission capacity, to serve lands already inside the UGB under current conditions. There is also some surplus storage and pumping capacity under current conditions. The city has previously indicated that most piping within the current UGB is adequate; however, some piping in undeveloped areas within the UGB may need upsizing to serve new development. If so, these improvements would likely be completed by the developers, as that development occurs.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Urban development in the reserve is expected to result in supply, storage, and pumping deficits if current sources and facilities are not improved/expanded. The City of Forest Grove Water System Master Plan (2022) proposes the addition of a 0.5 MG reservoir to serve the 710 pressure zone. The city's capital improvement plan has also identified several projects related to water supply and pumping that would be needed to development of the reserve. As noted above, some existing piping in undeveloped areas already within the UGB may need to be upsized.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

The supply, storage, pumping, and piping capacity improvements noted above would be needed to avoid development of the reserve negatively impacting services to areas already inside the UGB.

d. Estimated water service-related costs for reserve development

Water piping, pumping, and storage costs	Cost
10-inch pipe	$2.93 million
12-inch pipe	$0
16-inch pipe	$0
Pumping	$1.75 million
Storage	$0.16 million
Total:	**$4.84 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$1,887**

Sanitary Sewer Services

With regard to sanitary sewer services, the David Hill Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

The City of Forest Grove operates a local sanitary sewer utility that feeds into the regional sanitary sewer system operated by Clean Water Services (CWS). The city

facilities generally flow eastward through the city toward CWS trunk line running parallel to Council Creek. CWS provides wastewater treatment through the Rock Creek Wastewater Treatment Plant. The treatment plant is understood to have sufficient capacity to serve lands already inside the UGB; however, there are capacity concerns (e.g., potential surcharging) with some sewer main line infrastructure.

CWS is currently developing the West Basin Master Plan (WBMP), which is anticipated to be completed in early 2025. The WBMP will identify sanitary projects at two Water Resource Recovery Facilities (WRRFs) and in the conveyance system necessary to accommodate redevelopment of underdeveloped areas within the UGB and green-field development of large areas recently brought into the UGB that are undergoing community planning and/or development. Much of the conveyance infrastructure required for growing demands within the UGB is anticipated to be constructed privately during the development process and coordinated by CWS and local jurisdictions.

The CWS WBMP will identify trunk line projects and pump stations necessary to accommodate growth of these areas; these projects will be incorporated into the CWS long-range capital improvement plan (CIP) at strategic times necessary to meet expected capacity demands. The CWS CIP will be updated and adjusted annually to reflect the latest growth patterns and anticipated timing.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The topography of the reserve is expected to limit the density of new development, potentially placing a smaller burden on the existing system. Development in northern areas will contribute to existing sewer lines, which have been analyzed and have sufficient capacity; southern areas will contribute to a different existing trunk sewer system. Downstream trunk sewers have been sized to accommodate residential growth in this reserve. Both areas are tributary to the existing 36-inch diameter Council Creek Trunk Sewer, which has limited downstream capacity immediately upstream from the Hillsboro WRRF. Plans are underway to construct capacity relief. The existing downstream capacity limitations are expected to be resolved within approximately five years. Any existing main line surcharging would become more significant with development of the David Hill Urban Reserve if left unaddressed.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

As noted above, any existing main line surcharging would become more significant with development of the David Hill Urban Reserve if left unaddressed. The Council Creek Trunk Sewer, which is downstream of the David Hill Urban Reserve, has limited capacity and planning is currently underway to provide additional capacity that will be needed to serve the reserve without negative impacts to the existing system.

d. Estimated sanitary sewer service-related costs for reserve development

Sanitary sewer piping and pumping costs	Cost
10-inch pipe	$0
12-inch pipe	$7.09 million
15-inch pipe	$0
Pump station	$0
Force mains	$0
Total:	**$7.09 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$2,764**

Stormwater Management Services

With regard to stormwater management services, the David Hill Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

There is no indication of significant challenges with existing stormwater management facilities being able to serve existing development inside the UGB. However, additional development within the UGB under current zoning may require new facilities or facility improvements.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Stormwater related to new development in the David Hill Urban Reserve is expected to be conveyed, treated, and disposed of within the reserve itself and/or outfall directly to Gales Creek, rather than relying on existing facilities already in the UGB.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

As noted above, stormwater related to new development in the David Hill Urban Reserve is expected to be conveyed, treated, and disposed of within the reserve itself

and/or outfall directly to Gales Creek, rather than relying on existing facilities already in the UGB.

d. Estimated stormwater service-related costs for reserve development

Stormwater piping and water quality/detention	Cost
18-inch pipe	$4.40 million
24-inch pipe	$1.91 million
30-inch pipe	$0
Water quality/dentition	$3.69 million
Total:	**$10.00 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$3,901**

Transportation Services

With regard to transportation services, the David Hill Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(e) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Figure 4.36 in Chapter 4 of the 2023 Regional Transportation Plan (RTP) displays 2020 home-based vehicle miles traveled (VMT) per capita by Metro transportation analysis zone, with average VMT per capita considered 11.32. According to Figure 4.36 in Chapter 4, areas in the UGB adjacent to the David Hill Urban Reserve had a significantly above average home-based VMT per capita in 2020.

Metro's adopted 2040 Growth Concept Map designates a town center in the adjoining City of Forest Grove. Town centers are meant to: serve populations of tens of thousands of people; offer more locally-focused retail uses and public amenities; and be well served by transit. The Forest Grove Town Center aligns with this 2040 Growth Concept Map area. It encompasses the city's historic downtown, which itself includes transit-oriented mixed-use development, cultural amenities, retail commercial uses, civic buildings, and the main campus of Pacific University, but also some detached single-family dwellings, underdeveloped properties, and parking lots. TriMet Route 57 connects the town center to Cornelius, Hillsboro, and the MAX light rail line. GroveLink, a public transportation network for the Forest Grove community, also provides transit services in and around the town center and connects the town center with other parts of Forest Grove and to TriMet Route 57. WestLink is another public transportation service to the Town Center, connecting it with Hillsboro in the UGB, as well as to Banks and North Plains.

The town center's existing land uses and transit service, and some availability for new development in and near the town center, demonstrate that growth in the current UGB near the town center will not necessarily cause a significant increase in home-based VMT per capita in the future.

However, the town center is more than two miles away from the areas in the UGB adjacent to the reserve. Those areas in the UGB near the reserve are primarily zoned for low density residential development rather than for employment uses; they generally lack transit service and do not have services for meeting residents' daily needs, such as grocery stores, medical facilities, or banks. Under these conditions, growth in these areas will likely continue to rely significantly on private motor vehicle transportation.

Forest Grove has about 10 miles of dedicated bike lanes, four or more miles of established bikeways, and a handful of streets considered "bike friendly". Most of these facilities are either focused on the Town Center and Pacific University or provide routes along the edge of the city paralleling Highway 47, though there are also designated bike facilities on NW Gales Creek Road or Sunset Drive. Significant portions of the city do not have bike facilities, including its employment areas. Figure 4.5 in Chapter 4 of the 2023 RTP identifies some gaps in the planned on-street regional bike network, along NW Thatcher Road and NW Willamina Avenue.

Most of the residential neighborhoods in Forest Grove, including both older historic neighborhoods, more recent residential development projects, and areas near the reserve, have sidewalks. The Town Center is well served by sidewalks, though other employment areas are not. There are no sidewalks along stretches of NW Gales Creek Road in the west of the city, which Figure 4.4 in Chapter 4 of the 2023 RTP identifies as a gap in the planned regional pedestrian network. There are also no sidewalks along NW David Hill Road within the UGB near to the reserve. The Gales Creek Trail and the Highway 47 Trail connect the outer edges of Forest Grove with some nearby residential areas.

Figure 4.14 in Chapter of the 2023 RTP identifies Pacific Avenue east of Highway 47 as a high injury corridor, and an intersection of Highway 47 and Maple Street as a high injury intersection. However, Figure 4.14 does not identify any high injury corridors or high injury intersections in the UGB near the reserve.

The portion of Highway 47 within the UGB is identified as a throughway in Figure 4.7 in Chapter 4 of the 2023 RTP. Figure 4.8 of Chapter 4 indicates that it currently meets travel speed reliability performance thresholds, with no more than four hours per day below the identified minimum speed. RTP models indicate this reliability will continue at least to the year 2045.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The nearest RTP-designated throughway, Highway 47, is several miles from the reserve. As noted above, Highway 47 currently meets travel speed reliability performance

thresholds. Urban development of the reserve is unlikely to generate sufficient traffic on the highway to cause it to no longer meet those performance thresholds.

There is currently no transit service near to the reserve. The closest TriMet bus stop is well over two miles away at B Street and 19th Avenue. GroveLink stops approximately three-quarters of a mile from the reserve at Watercrest Road and Forest Gale Drive.

There are no dedicated bike facilities on the sections of NW Gales Creek Road or NW David Hill Road connecting to the reserve. However, the Emerald Necklace Trail, which can be accessed off Ridge Pointe Drive, runs through Forest Glen Park to NW Gales Creek Road, where it connects to a dedicated bike lane that runs almost the entire way to downtown. Still, the only way to access the trail from the reserve at this time is to follow local neighborhood streets for three-quarters of a mile due to steep slopes and the development pattern of the adjacent homes within the UGB.

The sidewalks within the nearby residential neighborhoods do not connect to the reserve and, given the existing development pattern, it would be difficult to connect to them in the future, with the exception of one location closer to NW David Hill Road. There are no sidewalks along NW Gales Creek Road. There are no sidewalks in the limited number of roadways in the reserve itself.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

NW Gales Creek Road, NW David Hill Road, NW Thatcher Road, and Forest Gale Drive would see additional private motor vehicle traffic as a result of urbanization of the reserve. Indeed, the reserve is some distance from the Forest Grove Town Center and other employment areas and currently lacks transit service, bike facilities, and complete pedestrian facilities to these areas were future residents of the reserve could shop, access services, or be employed. Therefore, future residents are likely to require private motor vehicle transportation on these and other roadways, potentially impacting home-based VMT per capita in the future.

However, traffic from urbanization of the reserve is unlikely to jeopardize the reliability of Highway 47 as a throughway, or to meaningfully contribute to an increase in injuries on the highway or Pacific Avenue, given these facilities' distance from the reserve and the relatively small net vacant buildable area.

The bike lane on NW Gales Creek Road is the only bike facility that may see observable additional use because of development of the reserve, especially if the bike lane is extended the 3,000 feet to the reserve itself. The existing sidewalks within the nearby residential neighborhoods, which are not connected to the reserve, would not be impacted.

d. Need for major transportation facility improvements and associated costs

A roughly 0.41-mile length of NW Gales Creek Road at the south end of the reserve will likely need to be improved to urban arterial standards, including with acquisition of

additional right-of-way. A nearly half-mile length of NW David Hill Road will also likely need to be improved to urban collector standards and four new collectors totaling approximately 1.87 miles are needed to provide access to the central portion of the area and additional connections to the east. Much of these facility improvement costs will be higher than normal on a per-mile basis due in part to topography.

Facilities	Cost
Arterials, existing/improved full street	$47.73 million
Arterials, existing/improved half street	$0
Arterials, new	$0
Collectors, existing/improved full street	$24.64 million
Collectors, existing/improved half street	$0
Collectors, new	$98.63 million
Total:	**$171 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$66,693**

e. Provision of public transit service

The David Hill Urban Reserve is outside the TriMet Service District. TriMet staff evaluated the reserve for providing transit service and determined that future service would be better provided by another entity, such as GroveLink. Actual service depends on the level of development in, and in the corridors leading to, the reserve.

Prior to land being included in the UGB, a more detailed concept plan, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11, is required. This concept plan process will develop more refined public facility and service needs and cost estimates.

Factor 3: Comparative environmental, social, energy, and economic consequences

Environmental consequences

Two different sections of a stream flow south along the eastern edge of the David Hill Urban Reserve for approximately 2,585 feet. All but 460 feet of the stream section is located within an area of slopes greater than 25 percent and is mostly wooded. There is riparian habitat associated with the stream sections along with a few small locations of identified upland habitat. There are no wetlands or floodplains identified in the reserve. The land east of the stream already inside the UGB is either owned by the City of Forest Grove and designated as open space or is developed with single family homes oriented away from the reserve with no likely potential for connection to the reserve. These conditions eliminate the ability or need for any east-west road connections that would impact the stream corridor.

Given the increased protection levels for streams, habitat areas, and steep slopes that are provided when lands area added to the UGB, and considering the adjacent land uses to the

east and already inside the UGB, urbanization of the reserve can occur with comparatively minimal impact to this stream corridor and habitat areas. Additional environmental consideration, specifically regarding avoidance of conflict between urban development and regionally significant fish and wildlife habitat, is provided in the Metro Code Factors Analysis (Appendix 7A).

Considering the comparative environmental consequences of urbanization, the David Hill Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Social, energy, and economic consequences

This relatively small reserve has a mixture of forested areas, rural residences, and agricultural activities on a hill that descends 400 feet from the high to the low point. Much of the land is on slopes greater than 25 percent that would result in a less dense development pattern. These conditions could reduce the overall impact of urbanization on the small number of existing residents in terms of loss of sense of place and degradation of rural lifestyle.

Directly to the east of the reserve is an urban low density residential area, but it is somewhat separated from the reserve by open space tracts and there are no direct local road connections between it and the reserve. Also adjacent to the reserve is a large area of land that, while is inside the UGB, is currently undeveloped. Therefore, current residents of the reserve are somewhat separated from urban areas and urban development of the reserve itself could be a more noticeable change.

As detailed more fully in response to Factor 2, future residents of this reserve are likely to be reliant on private motor vehicle transportation and VMT could have adverse energy consequences. However, given the relatively small developable area in the reserve, traffic impacts from urbanization are not expected to be particularly significant.

The reserve has some agricultural uses, as well as tree stands that may be intended for future commercial harvesting. The economic consequences of a loss in farming activity in the reserve may be outweighed by the economic benefits of residential development, and timber could be harvested as a part of urbanization, though not necessarily replanted. On a per-unit basis, the costs of protecting natural resource areas in the reserve from urbanization and establishing new/improved roadways to serve a residential development could be considerable.

This analysis finds that there would be comparatively moderate social, energy, and economic consequences from urbanization of this reserve. The David Hill Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Factor 4: Compatibility of the proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

Nearly all of the land outside of the UGB adjacent to the David Hill Urban Reserve has Goal 3 or 4 resource land zoning by Washington County for agricultural and forest activities, specifically with Agriculture and Forest (AF20) and Exclusive Farm Use (EFU) designations.

To the south of the reserve on the opposite side of NW Gales Creek Road is a large tract of EFU zoned land that extends into unincorporated areas for a number of miles. All the land that abuts the south side of NW Gales Creek Road is in field crop production. NW Gales Creek Road itself would not provide an adequate buffer between urban development and agricultural activity. Development of the reserve could lead to land use conflicts related to safety, liability, and vandalism and complaints due to noise, odor, dust, and the use of pesticides and fertilizer. In addition, the improvement of NW Gales Creek Road to urban standards, and associated street light illumination and bicycle and pedestrian movements, may further jeopardize the compatibility of the two uses, though the impacts of urban roadways on adjacent agricultural activity may be minimized through road design. Urbanization of the reserve would increase traffic on NW Gales Creek Road, which could impact the movement of both farm equipment and goods; however, the amount of additional traffic generated from urbanization is not expected to be significant given this reserve's limited buildable area. Nonetheless, the proposed urban uses would be considered generally incompatible with the extensive nearby agricultural activities occurring on the farmland to the south and impact mitigation measures would warranted.

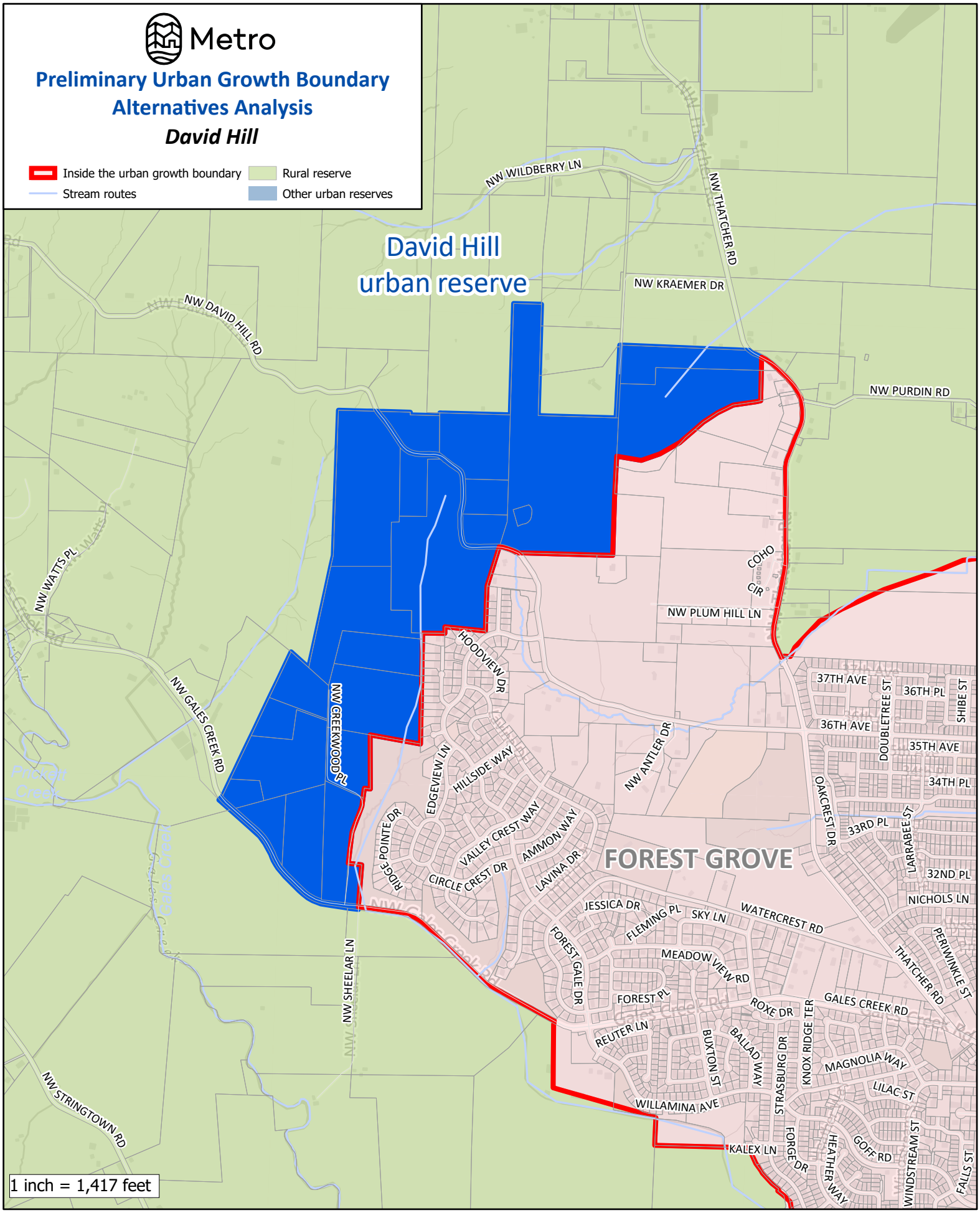
To the west of the reserve, between NW Gales Creek Road and NW David Hill Road, is another large tract of resource lands. These lands are zoned AF20 and are mostly forested, with some sporadic locations of agricultural activities including the David Hill Vineyards and Winery. An unnamed stream flows in a forested ravine along the western edge of the reserve, buffering the vineyard from the reserve to some degree. There does not appear to be any active commercial forestry activities occurring to the west. Considering the stream and ravine, the apparent lack of forestry activities on these adjacent lands, and the limited amount of development this relatively small reserve is expected to provided, the proposed urban uses would be considered compatible with nearby agricultural and forest activities in this location.

There is also small area of AF20-zoned land on the north side of the reserve in the vicinity of NW David Hill Road. There are some agricultural activities occurring in this area and it appears that some of this land has been logged in the past. In addition, directly north is land zoned Exclusive Forest and Conservation (EFC) that is owned by Stimson Lumber, with evidence of recent logging. While it is conceivable that the trees will be harvested here again in the future, it is not known what the timing would be given the long-term cycle of forest harvesting. Urbanization of the reserve would increase traffic on NW David Hill Road, which could impact the movement of farm and forestry equipment and goods. But again, the timing of future timber harvesting activities in this area is unknown. Thus, the proposed urban uses are considered moderately compatible with the nearby agricultural and forest activities occurring on the AF20 and EFC-zoned land in this location in the near-term, but conflicts may occur in the longer-term.

There is a tract of EFU-zoned land along NW Thatcher Road that extends for a number of miles to the north/northeast. The EFU-zoned land directly adjacent to the reserve in this area is in agricultural production and includes mainly nursery crops. Urbanization of the reserve could lead to land use conflicts related to safety, liability, and vandalism and complaints due to noise, odor, dust, and the use of pesticides and fertilizer. Impact mitigation measures on this short northern edge may be warranted. To the east of NW Thatcher Road is a significant tract of nursery and field crops that extend north to NW Kemper Road and east to Highway 47. This area of agricultural activity could be impacted by the increase in traffic on NW Thatcher Road, although, as noted above, the amount of increased traffic from this reserve is not expected to be significant. Much of the area east of the reserve that is already inside the UGB is still dedicated to rural land uses. Once this area urbanizes, overall impacts to the agricultural activities in this location will increase, especially as more traffic moves north to access Highway 47.

In summary, the proposed urban uses are considered moderately compatible with nearby agricultural and forest activities occurring on farm and forest land outside the UGB to the west and north of the reserve. As noted above, there may be compatibility issues with the forestry lands to the north at some point in the future if and when those lands are harvested and replanted. The proposed urban uses are not considered compatible with the agricultural activities occurring on the farmland to the south and impact mitigation measures on the urban land will likely be warranted.

The David Hill Urban Reserve is given a “medium” score in Attachment 3 for this Goal 14 boundary location factor.



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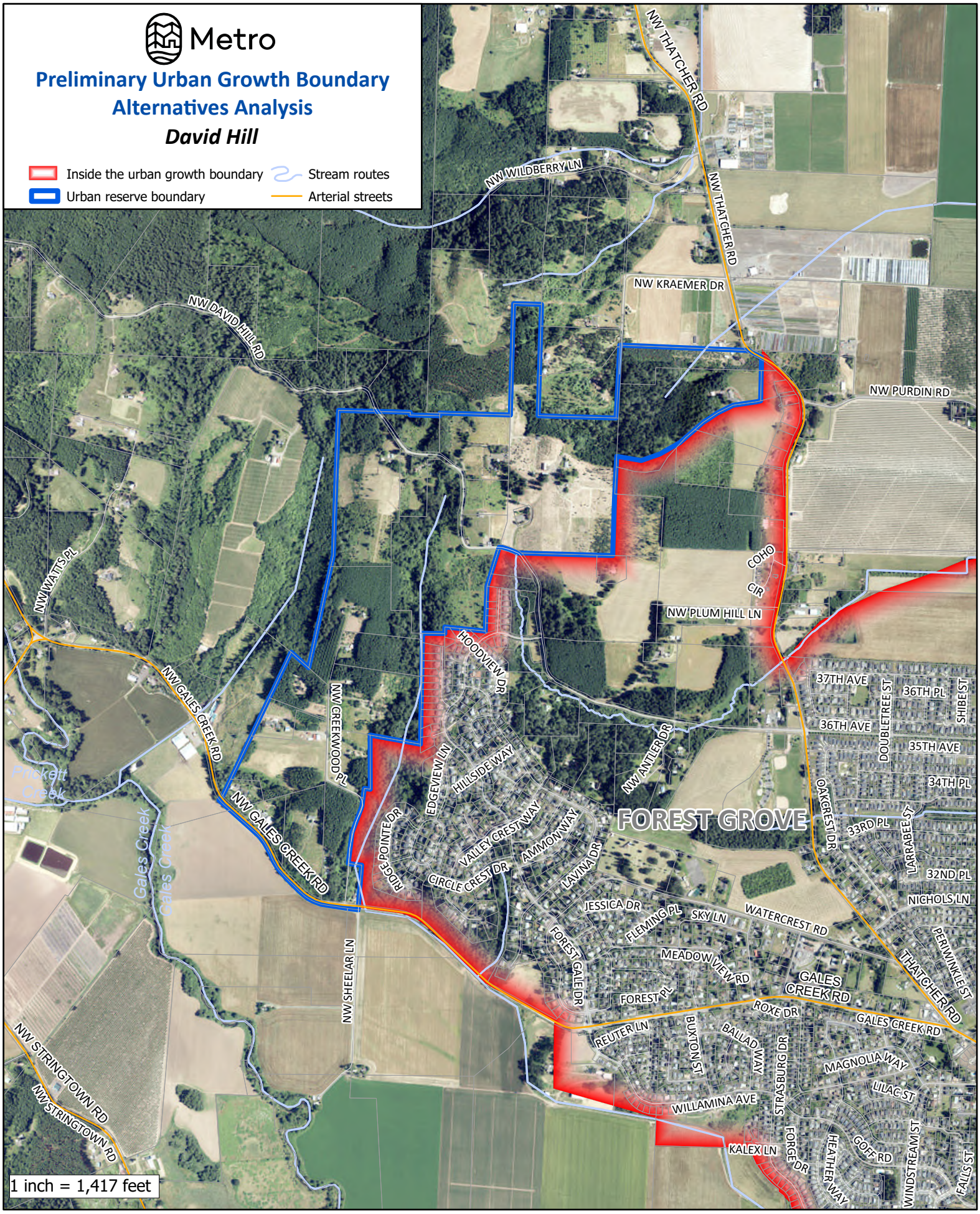
Metro

Preliminary Urban Growth Boundary Alternatives Analysis

David Hill

Inside the urban growth boundary
Urban reserve boundary
Stream routes
Arterial streets



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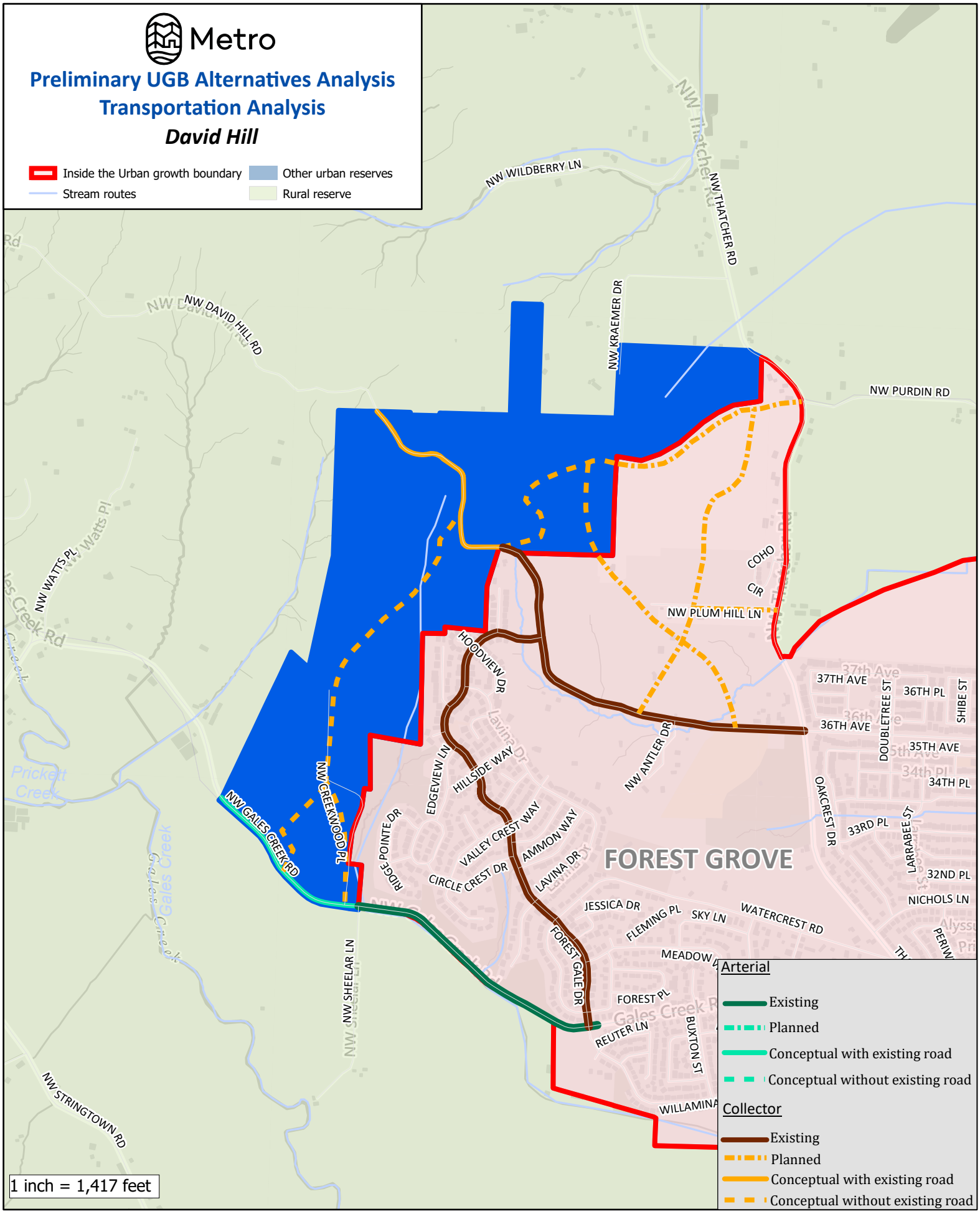

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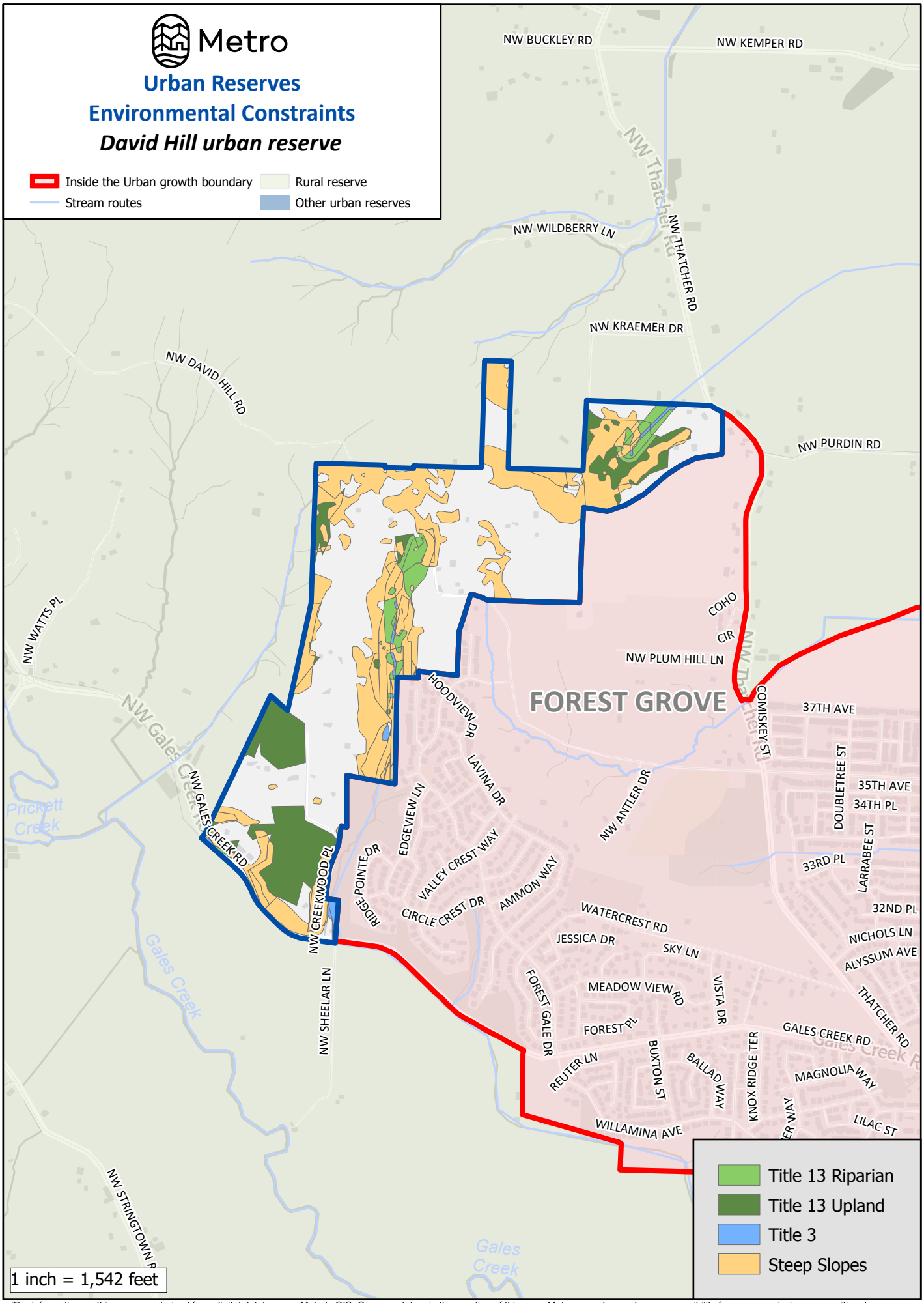

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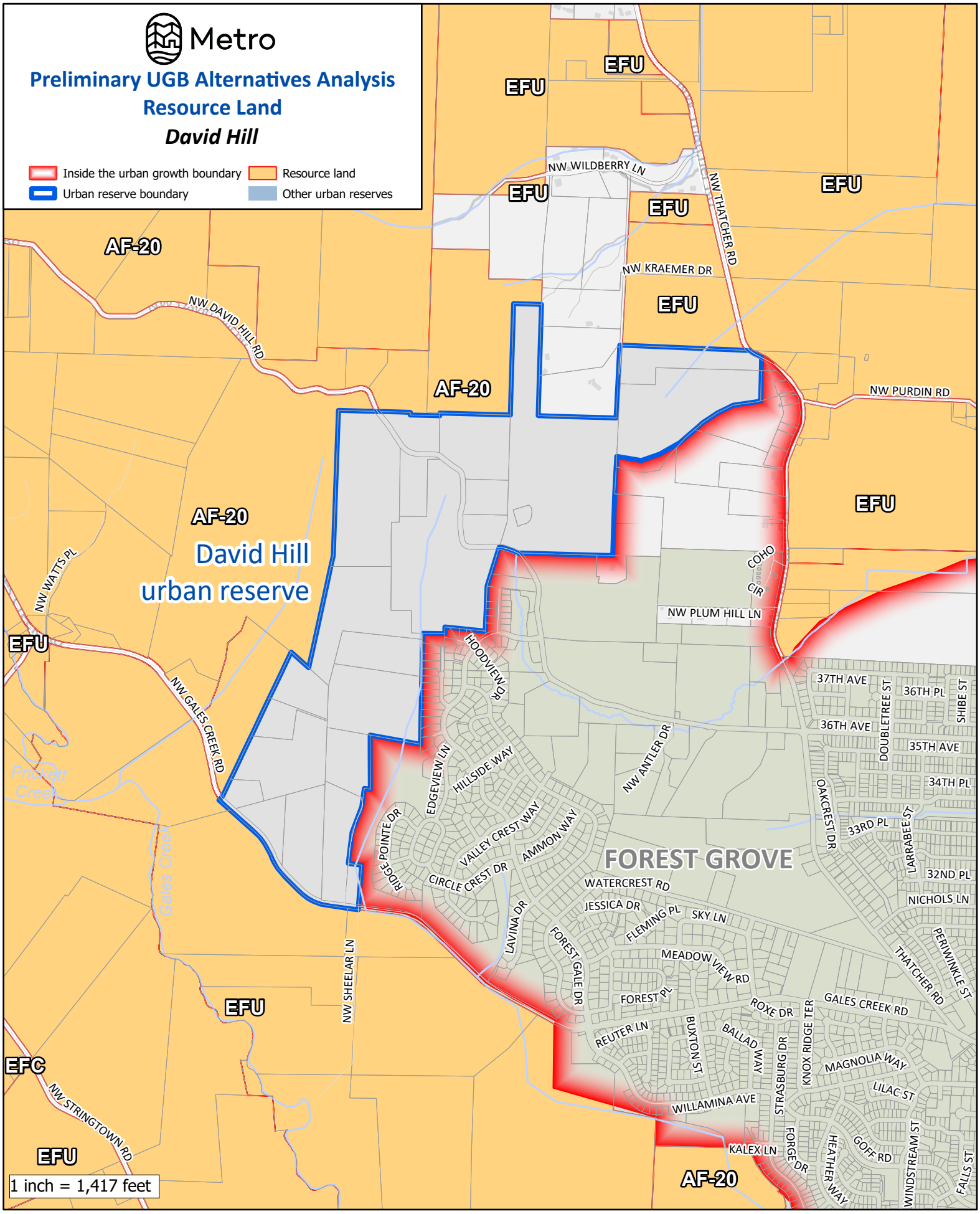

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ELLIGSEN ROAD NORTH URBAN RESERVE

Total Reserve Area	621 acres
Total Tax Lot Area in Reserve (without Right-of-Way)	588 acres
Gross Vacant Buildable Area	442 acres
Net Vacant Buildable Area	**329 acres**

The Elligsen Road North Urban Reserve is a somewhat rectangularly shaped area adjacent to both the City of Tualatin and the City of Wilsonville. It is located north of SW Elligson Road, west of SW 65th Avenue, and south of SW Frobase Road. The UGB is the western and southern boundary of the reserve, and it is otherwise entirely surrounded by other urban reserves. I-5 also parallels a portion of the western edge of the reserve. A tributary to Boeckman Creek flows south from the middle of the reserve and then along SW Elligsen Road before crossing underneath the road to the farmland further south. The reserve contains a series of moderately steep hills with some slopes greater than 10 percent through the middle of the area. Access to the reserve is provided by SW Elligsen Road, SW 65th Avenue, SW 82nd Avenue, and SW Frobase Road.

GOAL 14 BOUNDARY LOCATIONAL FACTORS

Factor 1: Efficient accommodation of identified land needs

The Elligsen Road North Urban Reserve is comprised of 58 contiguous tax lots, all of which are entirely within the reserve. The combined area of the reserve's tax lots is approximately 588 acres. Nearly half of the tax lots are five acres in size or larger. Nearly a quarter are larger than 10 acres and two are larger than 80 acres. As noted above, the entire reserve contains 442 gross vacant buildable acres and 329 net vacant buildable acres.

According to aerial imagery, there are rural residences and a 1.6-acre cemetery along SW 65th Avenue and the remainder of the reserve is generally in agricultural use. There are also some small stands of trees, as well as an RV park in the reserve's southwest corner on SW Elligsen Rd. Two water reservoirs are at the high point of the reserve, one for the City of Tualatin and another for the City of Wilsonville. Overall, 37 of the reserve's 58 tax lots have improvements, with a median assessed value of those tax lots' improvements exceeding $880,000.

Tualatin High School, Horizon Christian High School, and Edward Byrom Elementary School are within a mile of the reserve "as the crow flies", but on the opposite side of I-5. Meridian Creek Middle School and Wilsonville High School are on the same side of I-5 as the reserve, but slightly further away via SW 65th Avenue. Canyon Creek Park is approximately half a mile from the reserve. Employment uses, including commercial land uses, border to the southwest. The reserve includes a portion of I-5 and is essentially adjacent to its interchange with SW Elligsen Road. South Metro Area Regional Transit (SMART) operates a bus route along SW Elligsen Road and a medical shuttle route along SW 65th Avenue.

There is a significant amount of land in the middle and southern portions of the reserve with slopes greater than 10 percent that may limit employment uses; however, there is a roughly 100-acre section of land adjacent to SW Frobase Road that is generally flat that could be used for employment purposes benefiting from the easy access to I-5. Given the concentration of existing high-value homes along SW 65th Avenue, a residential use may be a more appropriate use for the reserve.

This reserve is considered able to accommodate both a residential and employment land needs.

Factor 2: Orderly and economic provision of public facilities and services

Water Services

With regard to water services, the Elligsen Road North Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary locational factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Adjacent lands inside the UGB are served by the City of Wilsonville. The city's primary supply comes from the Willamette River. There is a single water treatment plant, the Willamette River Water Treatment Plant, that serves the city and is in shared ownership with Tualatin Valley Water District. The treatment plant is understood to be capable of processing 15 MGD, and a planned improvement will bring capacity to 20 MGD in order to serve development in the existing UGB through the year 2036. There are currently no significant known storage, pumping, or distribution system deficiencies.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The ty is believed to have ample water rights for the long term, so water supply to urban development of the reserve is likely not an issue. The planned expansion of the treatment plant should provide sufficient capacity for development of the reserve. Existing storage tanks, however, do not have capacity to serve development outside of the existing UGB. A pump station will also be required to serve urban development of the reserve. The size of existing pipe trunks is adequate for future buildout.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Additional storage capacity, as well as a pump station, will be needed to avoid negative impacts to service in the UGB.

d. Estimated water service-related costs for reserve development

Water piping, pumping, and storage costs	Cost
10-inch pipe	$0
12-inch pipe	$10.22 million
16-inch pipe	$1.40 million
Pumping	$0.61 million
Storage	$0.44 million
Total:	**$12.67 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$1,925**

Sanitary Sewer Services

With regard to sanitary sewer services, the Elligsen Road North Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary locational factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Wastewater from adjacent lands in the City of Wilsonville is conveyed in a city-owned and operated collection system to the Wilsonville Wastewater Treatment Plant (WWTP), which was upgraded in 2014 to a capacity of 4.0 MGD, resulting in excess capacity. That excess capacity is believed to be able to accommodate growth in the Frog Pond areas recently added to the UGB. The city is planning to planning on necessary system upgrades to meet future needs. The existing system, including its piping and pump stations, is not known to have any hydraulic deficiencies.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Depending on the timing of additional development in the UGB, planned treatment plant upgrades may be needed sooner in order for the system to also serve new development in the Elligsen Road North Urban Reserve. Both the Canyon Creek and Memorial Park pump stations require capacity improvements to serve the reserve, and there are several trunk line extensions that would be needed as well.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

As noted above, pump station improvements, trunk line extensions, and, depending on timing of other growth, treatment plant facilities upgrades, are needed in order for Elligsen Road North Urban Reserve development to not negatively impact service to areas already inside the UGB.

d. Estimated sanitary sewer service-related costs for reserve development

Sanitary sewer piping and pumping costs	Cost
10-inch pipe	$0.74 million
12-inch pipe	$1.51 million
15-inch pipe	$0
Pump station	$3.96 million
Force mains	$0
Total:	**$6.21 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$943**

Stormwater Management Services

With regard to stormwater management services, the Elligsen Road North Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary locational factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

The City of Wilsonville Stormwater Master Plan (2012) identified "problem areas" (areas with flooding and evidence of significant erosion) based on observation during a 25-year storm event in 2009. The identified problem areas were isolated and there were no serious flooding issues identified under existing conditions.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The City of Wilsonville requires that stormwater management (water quality and flow control) be provided for all new impervious surfaces. Based on topography, portions of the reserve could outfall directly to a tributary of Boeckman Creek. However, the southwest quadrant flows southwest toward I-5; stormwater fromt his area would likely connect to existing city infrastructure near Elligsen Road and generally flow south and either outfall to Boeckman Creek or Coffee Lake Creek, before flowing south to the Willamette River. The city's assessment of problem areas does not appear to include any stormwater infrastructure between the reserve and either creek.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

The Master Plan does not indicate capacity issues in the stormwater infrastructure that the southwest portion of the reserve would connect to; however, this does not contemplate the addition of stormwater from a portion of the reserve. It is unclear whether existing pipes have the capacity to serve the reserve if it is added to the UGB.

d. Estimated stormwater service-related costs for reserve development

Stormwater piping and water quality/detention	Cost
18-inch pipe	$4.00 million
24-inch pipe	$2.64 million
30-inch pipe	$0
Water quality/dentition	$9.20 million
Total:	**$15.84 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$2,407**

Transportation Services

With regard to transportation services, the Elligsen Road North Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary locational factor, for the reasons detailed in (a)-(e) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Figure 4.36 in Chapter 4 of the 2023 Regional Transportation Plan (RTP) displays 2020 home-based vehicle miles traveled (VMT) per capita by Metro transportation analysis zone, with average VMT per capita considered 11.32. According to Figure 4.36, areas in the UGB adjacent to the Elligsen Road North Urban Reserve had an above average home-based VMT per capita in 2020.

Metro's adopted 2040 Growth Concept Map designates a town center in the adjoining City of Wilsonville. Town centers are meant to: serve populations of tens of thousands of people; offer more locally-focused retail uses and public amenities; and be well served by transit. The roughly 100-acre and centrally-located Wilsonville Town Center aligns with this 2040 Growth Concept Map area. The City of Wilsonville's Town Center Plan envisions it as vibrant, walkable destination that inspires people to come together and socialize, shop, live, and work. The town center, as well as nearby employment areas on the opposite (west) side of I-5, include grocery and drug stores, a library, medical and dental offices, banks, and restaurants. These areas also contain and are adjacent to residential uses, including higher-density residential uses. The town center is located a short distance from the terminus of the TriMet's Westside Express Service (WES) Commuter Rail line, which provides service up to Beaverton.

South Metro Area Regional Transit (SMART), the City of Wilsonville's bus service, provides transit services to the city through seven bus lines; Routes 2X, 4, and 6 provide service to the portions of Wilsonville east of I-5 and connect to the town center.

The town center's existing land uses and transit service, and some availability for new development in and near the town center, demonstrate that growth in the current UGB

near the town center will not necessarily cause a significant increase in home-based VMT per capita in the future, as residents will be able to access some daily needs through modes other than private motor vehicle transport. Growth in other areas of the city where residential uses surround schools and parks are is also unlikely to significantly impact home-based VMT per capita in the future.

The town center is about two miles away from areas in the UGB adjacent to the reserve. There are other commercial/employment areas that include grocery stores, other retail commercial uses, and industrial uses and that are closer to the residential uses, including apartments, in the UGB adjacent to the reserve. Growth in areas in the UGB near the reserve may continue to rely on private motor vehicle transportation, though existing transit service and bike and pedestrian infrastructure can provide alternatives and the relatively close proximity of a mixture of uses could keep vehicle trips for daily needs and employment relatively short.

In addition to routes described above, SMART also provides Wilsonville with medical transport services, a Villebois shopping shuttle, and connections to Keizer and Woodburn. The vast majority of the city's developed areas are within a quarter of a mile of a transit stop. Figure 4.3 in Chapter 4 of the 2023 RTP does, nonetheless, identify a gap in planned frequent transit service along SW Canyon Creek Road and other locations in the north of the city.

Wilsonville has a well-defined bike network of at least 19 miles of dedicated bike lanes and at least eight miles established bikeways that connect neighborhoods, schools, parks, community centers, business districts, and natural resource areas. Figure 4.5 in Chapter 4 of the 2023 RTP shows several existing bike facilities in Wilsonville as a part of the planned regional bike network, including facilities on SW Canyon Creek Road. There is identified gap in planned regional bike facilities on SW Elligsen Road and SW Stafford Road.

The city also has a fairly well-defined pedestrian network in its town center and residential neighborhoods, though with less pedestrian amenities in some industrial and employment areas. I-5 generally provides a barrier for east-west pedestrian connections, but there are sidewalks along both sides of SW Wilsonville Road as it crosses under I-5; there are no sidewalks on SW Boeckman Road over I-5 of SW Norwood Road over I-5. Figure 4.4 in Chapter 4 of the 2023 RTP shows a number of existing streets in Wilsonville as in the regional pedestrian network, including SW Canyon Creek Road. The figure identifies gaps in the future regional pedestrian network along SW Boeckman Road east of I-5, SW Elligsen Road, and SW Stafford Road.

Figure 4.6 in Chapter 4 of the 2023 RTP identifies a number of trails in the south and west of Wilsonville as in the planned regional trail network. There is a gap in the planned trail network along SW Stafford Road.

There are no high injury corridors or high injury intersections in Wilsonville's portion of the UGB identified on Figure 4.14 in Chapter 4 of the 2023 RTP.

The portion of I-5 bisecting Wilsonville is identified as a throughway in Figure 4.7 in Chapter 4 of the 2023 RTP. Figure 4.8 in Chapter 4 of the RTP indicates that it currently meets RTP travel speed reliability performance thresholds, with no more than four hours per day when travel speeds fall below the identified minimum speed. RTP models indicate this reliability of this section of I-5 will continue at least to the year 2045.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

An interchange with the nearest RTP-designated throughway, I-5, is practically adjacent to the reserve. As noted above, I-5 through Wilsonville currently meets travel speed reliability performance thresholds. Given the proximity of the town center and other commercial/employment areas to the reserve, and the reserve's size, urban development of the reserve is unlikely to generate sufficient traffic on the highway to cause it to no longer meet those performance thresholds.

Currently, there is no regular SMART service with stops directly at the reserve. Route 2X, however, runs adjacent to the southwest corner of the reserve on SW Elligsen Road and then on to SW Canyon Creek Road. Route 6 also runs along SW Canyon Creek Road.

There is a 825-foot length of SW Elligsen Road adjacent to the southwest corner of the reserve with dedicated bike lanes and sidewalks on both sides. SW Parkway Center Drive and SW Canyon Creek Road also have dedicated bike lanes and sidewalks. Another 225-foot-long section of SW Elligsen Road has sidewalks on its south side, opposite of the reserve. No other roads to or within the reserve currently have bike facilities or sidewalks. There are no established regional trails connected to the reserve.

The reserve is adjacent to Title 4 designated Industrial Area and Employment Area lands and commercial retail uses. Canyon Creek Park is approximately half a mile from the reserve. Future residents of the reserve could access these existing uses without lengthy travel by private motor vehicle; however school uses are more than a mile away. As noted in response to Factor 1, the reserve could potentially accommodate future employment uses, providing employment opportunities with a short commute for residents of adjacent multi-family housing on the opposite side of SW Elligsen Road.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

SW Canyon Creek Road, SW Elligsen Road, SW Parkway Center Drive, and SW Stafford Road would see additional private motor vehicle traffic as a result of urbanization of the reserve. However, given the proximity commercial/employment uses, and the potential for the reserve to include a mixture of uses, additional traffic is not likely to be significant. Nearby bike and pedestrian facilities on SW Canyon Creek Road, SW Elligsen Road, and SW Parkway Center Drive would see some amount of additional use.

Development of this reserve is unlikely to cause facilities in Wilsonville to become high injury corridors or intersections, jeopardize the throughway reliability of I-5, or cause significant increases in the area's home-based VMT per capita.

d. Need for major transportation facility improvements and associated costs

Urbanizing the reserve will likely require that the 0.59 miles of SW Elligsen Road and 0.83 miles of SW 65th Avenue that border the reserve be improved to urban arterial standards. Both roadway sections' improvements are mostly considered to be half-street improvements, as development of the adjacent Elligsen Road South Urban Reserve and the land inside the UGB would see to the improvement of the other halves. A new arterial extending from SW Elligsen Road to SW Day Road is also likely to be needed, and the 0.62-mile roadway's costs are included below. Furthermore, a 0.86-mile-long section SW Frobase Road would need to be improved to urban collector standards and three new collectors with a combined length of just over two miles are expected to be needed to provide access to the remainder of the reserve. Normal per-mile costs are expected for most of these new and improved roadways, though traversing some areas of steeper topography and some water bodies could lead to higher per-mile costs in specific locations.

Facilities	Cost
Arterials, existing/improved full street	$0
Arterials, existing/improved half street	$58.91 million
Arterials, new	$48.31 million
Collectors, existing/improved full street	$0
Collectors, existing/improved half street	$13.42 million
Collectors, new	$89.91 million
Total:	**$210.55 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$31,998**

e. Provision of public transit service

Though the Elligsen Road North Urban Reserve is in the TriMet Service District, SMART evaluated the reserve for providing transit service. SMART could potentially provide services to the reserve, although there is no guarantee of service. Actual service depends on the level of development in, and in the corridors leading to, the reserve. Service could be provided weekdays at 30-minute headways with one additional bus at a capital cost of $450,000 (recurs every eight – 12 years). Bus capital costs reflect the purchase of an electric Category C vehicle as SMART plans to provide services with a zero-emission fleet. Annual service cost of adding fixed-route and complementary paratransit service would be $70,000 in addition to services already being provided. This annual service cost would increase with the cost of inflation each year. Because the reserve is within the TriMet service boundary, SMART would need to negotiate with TriMet to provide bus service to the area.

Prior to land being included in the UGB, a more detailed concept plan, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11, is

required. This concept plan process will develop more refined public facility and service needs and cost estimates.

Factor 3: Comparative environmental, social, energy, and economic consequences

Environmental consequences

A 3,400-foot segment of a tributary to Boeckman Creek flows south through the middle of the Elligsen Road North Urban Reserve. The majority of the stream segment has been manipulated to flow along the edge of agriculture fields and then along SW Elligsen Road before crossing under the road to the south. Riparian habitat has been identified along the stream corridor along with some upland habitat in the steeper-sloped sections of the reserve. A 15,000-square-foot wetland identified on the National Wetland Inventory (NWI) is located in the northeastern portion of the reserve and a man-made pond, presumably used for irrigation purposes, is located on farmland in the center of the reserve. Given the increased protection levels for streams, wetlands, and habitat areas within the UGB, urbanization could occur with minimal to moderate impacts to the stream tributary, depending on east-west road connections.

This analysis finds that urbanization of the area could occur with comparatively low impacts to natural resources. Additional environmental consideration, specifically regarding avoidance of conflict between urban development and regionally significant fish and wildlife habitat, is provided in the Metro Code Factors Analysis (Appendix 7A).

Considering the comparative environmental consequences of urbanization, the Elligsen Road North Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary locational sub-factor.

Social, energy, and economic consequences

The Elligsen Road North Urban Reserve has some rural residential development, mostly along SW 65th Avenue, as well as well as an RV park on SW Elligsen Road. As noted in response to Factor 1, 37 of the reserve's 58 tax lots have improvements, with a median assessed value of those tax lots' improvements exceeding $880,000. These areas, with generally smaller parcel sizes, are unlikely to be part of a large-scale redevelopment, at least not in the near-term. However, there is also a considerable amount of cleared agricultural land that could accommodate larger-scale urban development. Such development could have more noticeable and more immediate impacts on reserve residents' sense of place and their rural lifestyle. Residents closer to existing urban employment areas adjacent to the reserve may experience less of a change, and preserved natural areas crossing the reserve may help to buffer existing rural residences from new urban development. Moreover, urbanization of the reserve could bring new social, educational, and recreational opportunities for existing residents.

As detailed more fully in response to Factor 2, urbanization of the reserve is not expected to result in significant increases in VMT, particularly if the reserve is developed with a mix of uses. Adverse energy impacts are therefore also not expected to be significant.

Aerial imagery suggests there may be about 200 acres of agricultural activity occurring in the reserve, largely field crops and pastureland and not row crops or nurseries. The reserve does include an equestrian center as well. There may also be some timber stands intended for future commercial harvesting. While there would be economic consequences from urbanization in terms of a loss in farming activity in the reserve, that loss may be outweighed by the economic benefits of residential and/or employment development. Timber could also be harvested a part of urbanization, though not necessarily replanted.

Overall, there would be comparatively moderate social, energy, and economic consequences from urbanization of this reserve. The Elligsen Road North Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary locational sub-factor.

Factor 4: Compatibility of the proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

Goal 3 agricultural lands, specifically lands zoned Exclusive Farm Use (EFU) by Washington County, border the Elligsen Road North Urban Reserve in areas outside the UGB to the north and south.

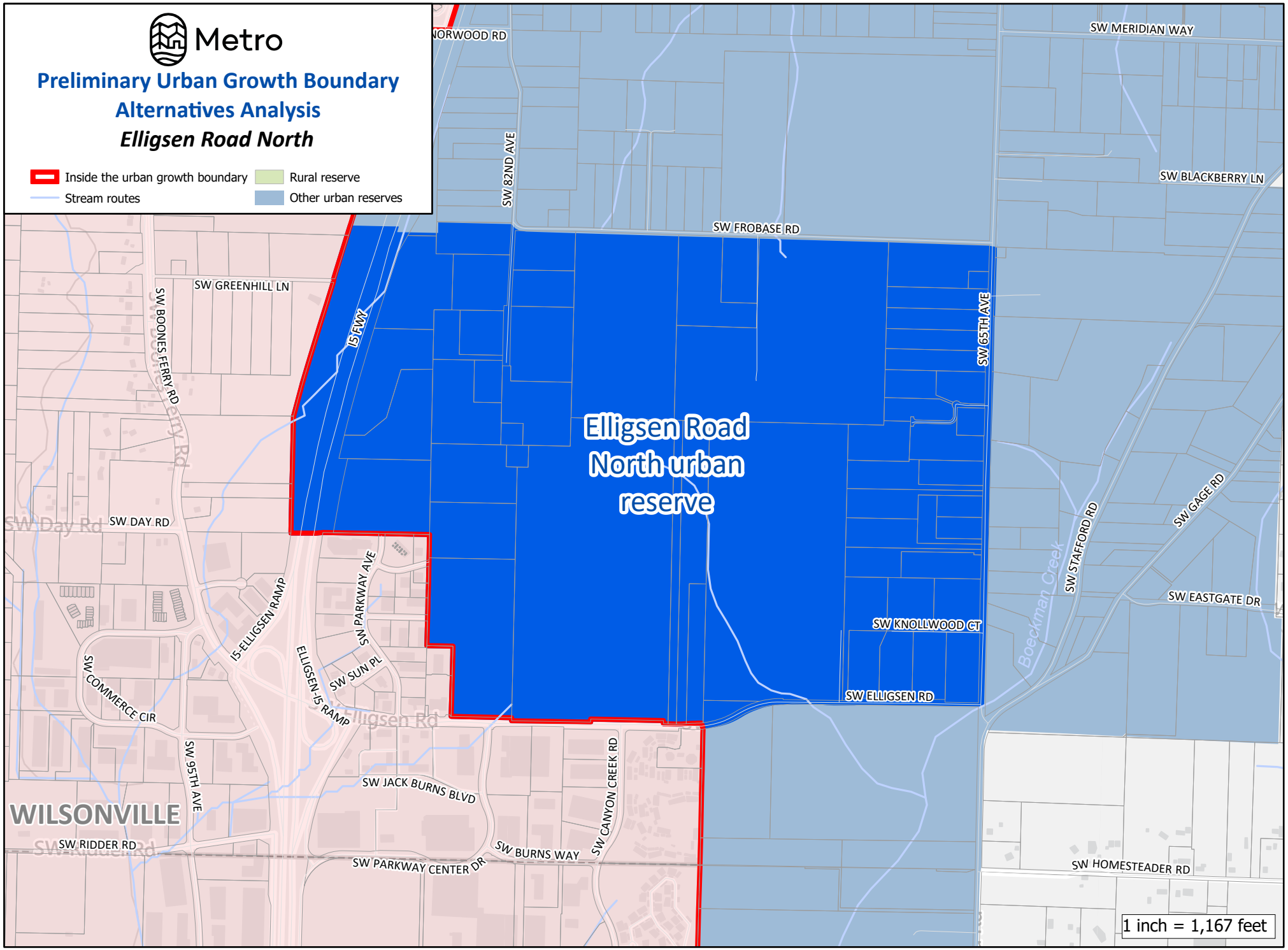
The more than 100 acres of EFU-zoned land to the north on the opposite side of SW Frobase Road is nearly entirely in agricultural production, mostly for field crops Christmas trees. The tract does have some small stands of trees as well, but they are generally along Saum Creek, which may inhibit harvesting for timber. There is a rural residence centered within the farm fields. SW Frobase Road separates the reserve from these EFU-zoned lands, but the road itself would not provide an adequate buffer between urban development and agricultural activity. Development of the reserve could lead to land use conflicts related to safety, liability, and vandalism and complaints due to noise, odor, dust, and the use of pesticides and fertilizer. The improvement of SW Frobase Road to urban standards, and associated street light illumination and bicycle and pedestrian movements, may further jeopardize the compatibility of the two uses, though the impacts of urban roadways on adjacent agricultural activity may be minimized through road design. Urbanization of the reserve would increase traffic on SW Frobase Road and SW 65th Avenue, which could impact the movement of both farm equipment and goods. Therefore, proposed urban uses are considered incompatible with the nearby agricultural activities occurring on the EFU-zoned land to the north.

The EFU-zoned land across SW Elligsen Road to the south also appears to have active farm uses, but also includes rural residential development. SW Elligsen Road would not provide an adequate buffer between urban development and agricultural activity. Development of the reserve could lead to land use conflicts related to safety, liability, and vandalism and complaints due to noise, odor, dust, and the use of pesticides and fertilizer. In addition, the improvement of SW Elligsen Road to would not provide an adequate buffer between urban development and agricultural activity. Development of the reserve could lead to land use conflicts related to safety, liability, and vandalism and complaints due to noise, odor, dust, and the use of pesticides and fertilizer. Urbanization would

increase traffic on SW Elligsen Road, which could impact the movement of both farm equipment and goods. The proposed urban uses are considered incompatible with the nearby agricultural activities occurring on farmland to the south.

This analysis finds that the proposed urban uses would not be compatible with nearby agricultural and forest activities occurring on farm and forest land outside the UGB to the north and the south. Land use conflict mitigation measures would be warranted.

The Elligsen Road North Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary locational factor.



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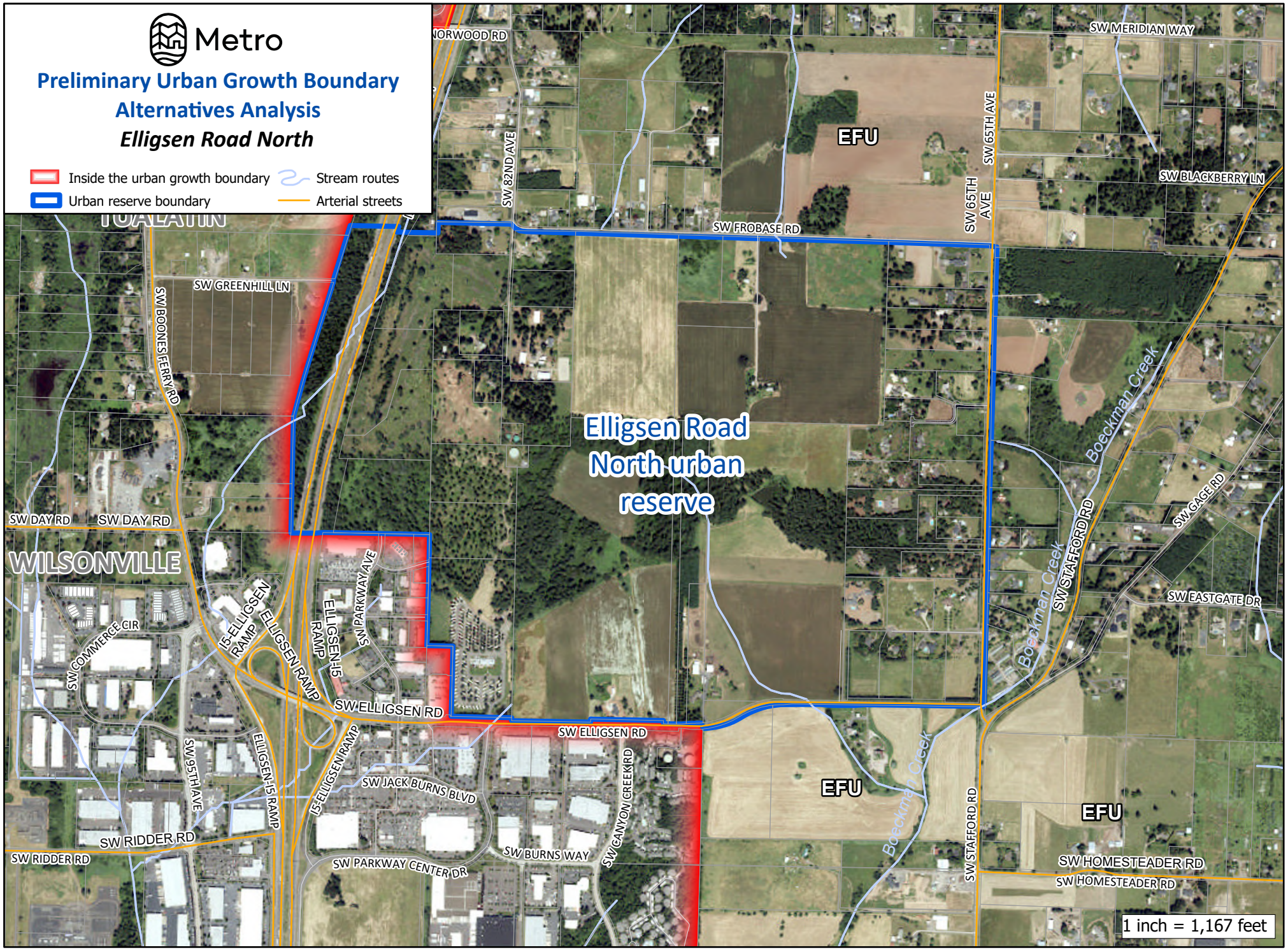
Metro

Preliminary Urban Growth Boundary Alternatives Analysis

Elligsen Road North

Inside the urban growth boundary
Urban reserve boundary
Stream routes
Arterial streets



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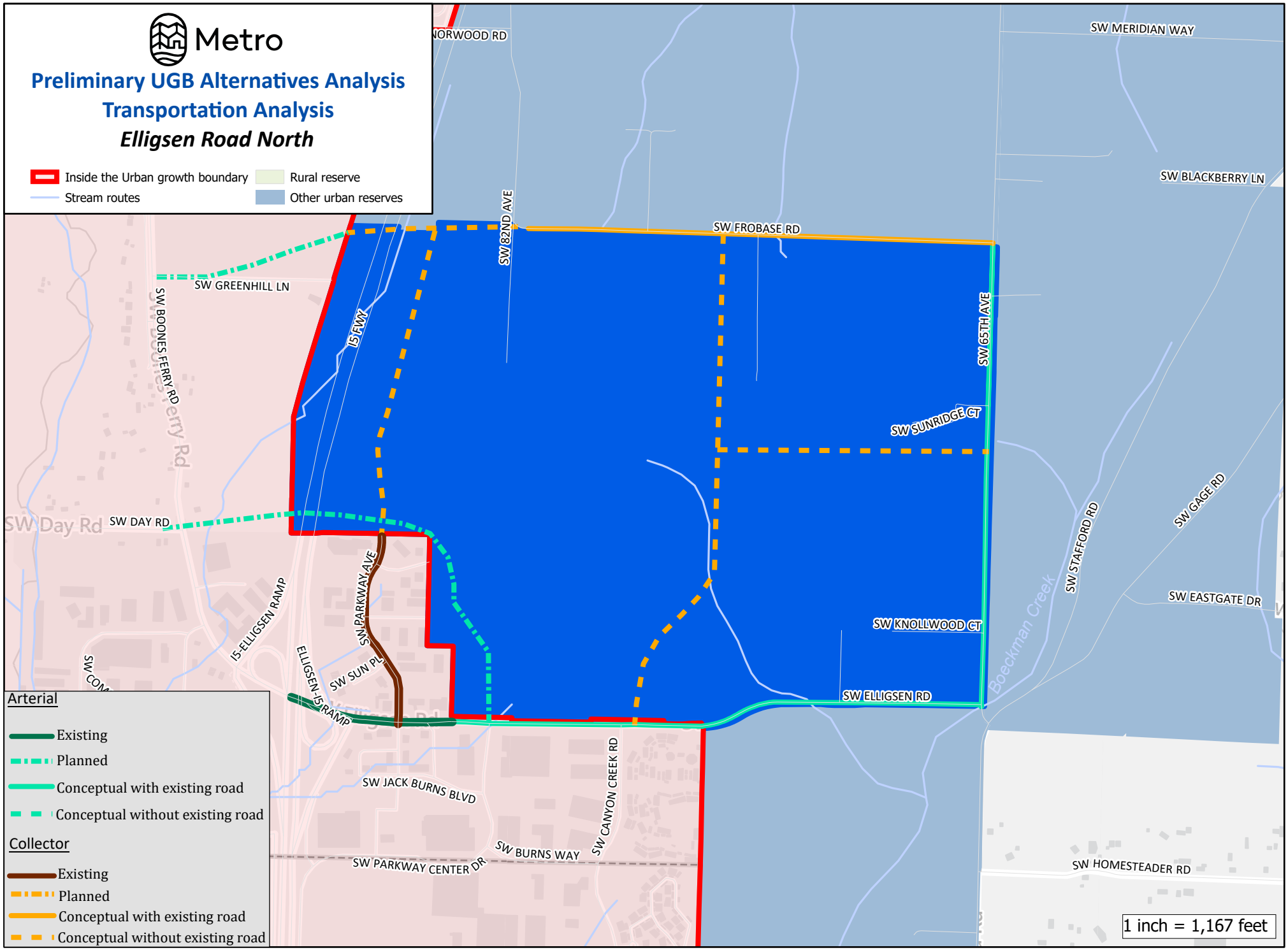

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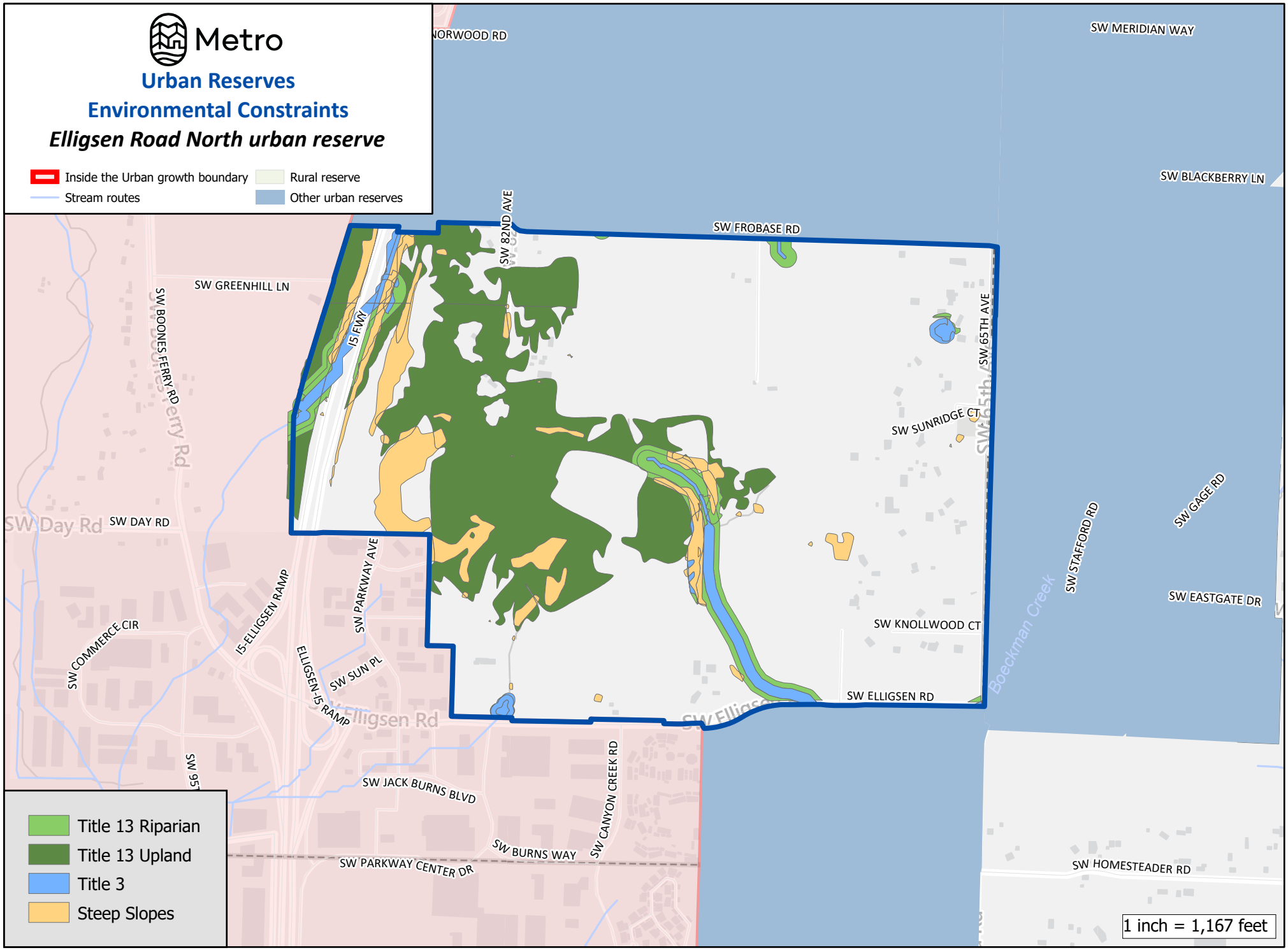

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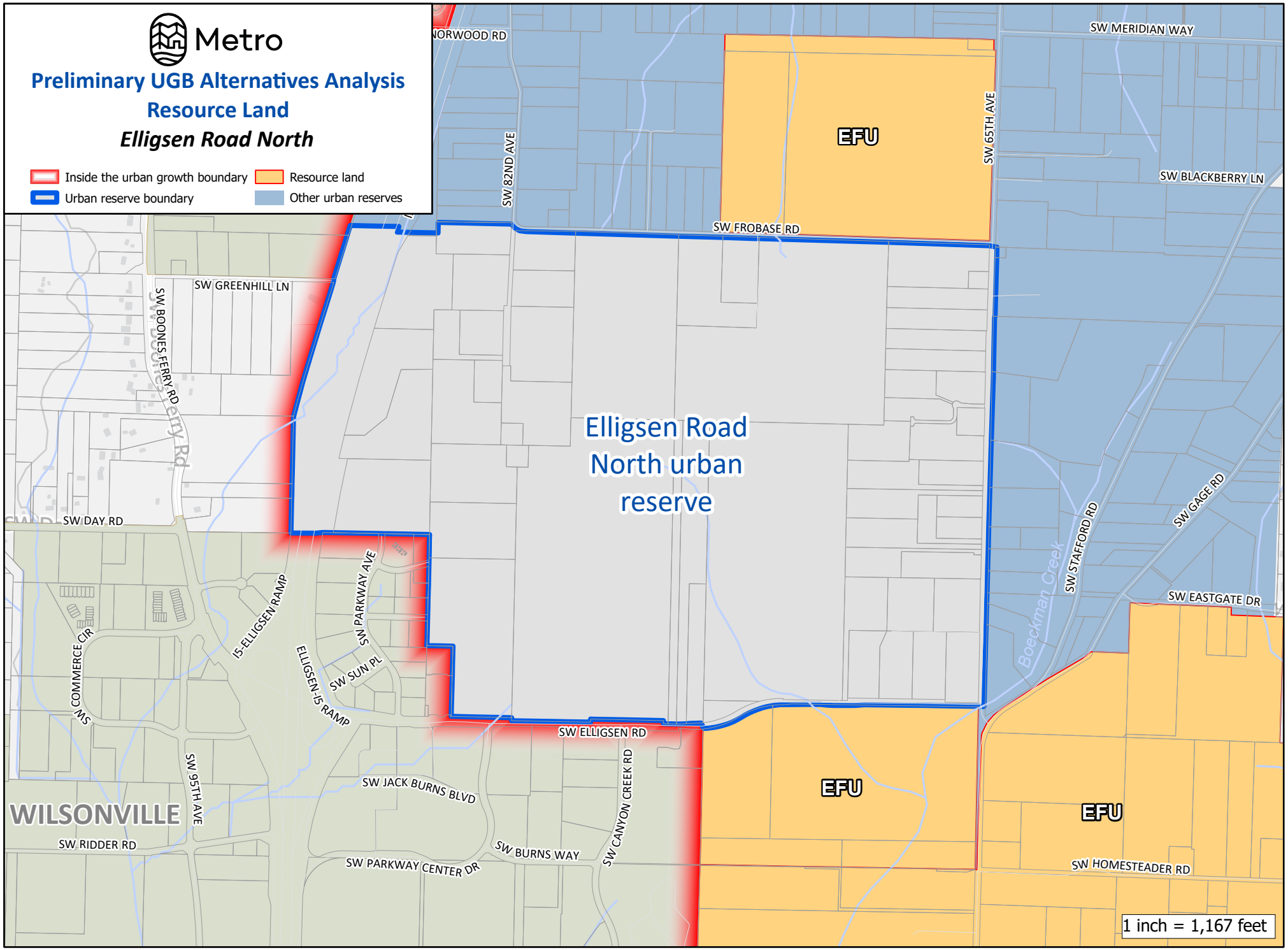

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ELLIGSEN ROAD SOUTH URBAN RESERVE

Total Reserve Area	254 acres
Total Tax Lot Area in Reserve (without Right-of-Way)	250 acres
Gross Vacant Buildable Area	213 acres
Net Vacant Buildable Area	**158 acres**

The Elligsen Road South Urban Reserve is a generally rectangular area south of SW Elligsen Road and west of SW Stafford Rd. The UGB and Wilsonville city limits are the reserve's western and southern boundaries. Boeckman Creek, which flows diagonally through the center of the urban reserve, splits the area into two roughly evenly sized sections. The land is mostly flat, except for some slopes greater than 10 percent along Boeckman Creek. Access to the area is provided by SW Elligsen Road, SW Elligsen Road, and SW Homesteader Road.

GOAL 14 BOUNDARY LOCATION FACTORS

Factor 1: Efficient accommodation of identified land needs

The Elligsen Road South Urban Reserve is comprised of 12 contiguous tax lots, all of which are entirely within the reserve. The combined area of the reserve's tax lots is approximately 250 acres. Half of the tax lots are each smaller than five acres, while the other half are each larger than 10 acres, with two that are larger than 50 acres. As noted above, the entire reserve contains 213 gross vacant buildable acres and 158 net vacant buildable acres.

According to aerial imagery, the reserve is predominantly comprised of agricultural uses and associated rural residences. Eight of the reserve's tax lots have assessed improvements, with a median assessed value of those tax lots' improvements exceeding $420,000. Powerline easements cross the northern and southern portions of the reserve.

In addition to fronting along SW Elligsen Road and SW Stafford Road, rights-of-way for new residential local streets already within the UGB stub to the south of the reserve and the reserve is less than a mile from an interchange with I-5. South Metro Area Regional Transit (SMART) operates a bus route along SW Elligsen Road and a medical shuttle route along SW Stafford Road.

The reserve is adjacent to Title 4 designated Employment Area lands, multifamily housing, and the new Frog Pond area residential development. It is approximately 1.5 miles away from a 2040 Growth Concept designated corridor along SW Parkway Avenue via SW Stafford Road and SW Boeckman Road, less than a mile from Meridian Creek Middle School and Frog Pond Primary School, and within a mile of several existing and planned parks.

This reserve is generally flat with some sloped land along Boeckman Creek that, in combination with the powerline easements mentioned above, divides the area into smaller potentially developable pockets. Some of the pockets are likely large and flat enough to accommodate employment uses and, given the powerlines that pass through the reserve, the proximity to I-5 and existing employment areas, employment uses here may be suitable as well. However, the proximity

of schools, parks, and existing residential development may support or be cohesive with residential development of the reserve. Therefore, this reserve is considered able to accommodate both a residential and employment land needs.

Factor 2: Orderly and economic provision of public facilities and services

Water Services

With regard to water services, the Elligsen Road South Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Adjacent lands inside the UGB are served by the City of Wilsonville. The city's primary supply comes from the Willamette River. There is a single water treatment plant, the Willamette River Water Treatment Plant, that serves the city and is in shared ownership with Tualatin Valley Water District. The treatment plant is understood to be capable of processing 15 MGD, and a planned improvement will bring capacity to 20 MGD in order to serve development in the existing UGB through the year 2036. There are currently no significant known storage, pumping, or distribution system deficiencies.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The city is believed to have ample water rights for the long term, so water supply to urban development of the reserve is likely not an issue. The planned expansion of the treatment plant should provide sufficient capacity for development of the reserve. Existing storage tanks, however, do not have capacity to serve development outside of the existing UGB. A pump station will also be required to serve urban development of the reserve. Future system infrastructure as shown in the City of Wilsonville Water System Master Plan is adequately sized for required fire flow and operating pressures.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Additional storage capacity, as well as a pump station, will be needed to avoid negative impacts to service in the UGB.

d. Estimated water service-related costs for reserve development

Water piping, pumping, and storage costs	Cost
10-inch pipe	$0.47 million
12-inch pipe	$3.91 million
16-inch pipe	$0
Pumping	$0
Storage	$0.20 million
Total:	**$4.58 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$1,444**

Sanitary Sewer Services

With regard to sanitary sewer services, the Elligsen Road South Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Wastewater from adjacent lands in the City of Wilsonville is conveyed in a city-owned and operated collection system to the Wilsonville Wastewater Treatment Plant (WWTP), which was upgraded in 2014 to a capacity of 4.0 MGD, resulting in excess capacity. That excess capacity is believed to be able to accommodate growth in the Frog Pond areas recently added to the UGB. The city is planning to planning on necessary system upgrades to meet future needs. The existing system, including its piping and pump stations, is not known to have any hydraulic deficiencies.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Depending on the timing of additional development in the UGB, planned treatment plant upgrades may be needed sooner in order for the system to also serve new development in the Elligsen Road South Urban Reserve. Both the Canyon Creek and Memorial Park pump stations require capacity improvements to serve the reserve, and there are several trunk line extensions that would be needed as well.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

As noted above, pump station improvements, trunk line extensions, and, depending on timing of other growth, treatment plant facilities upgrades, are needed in order for Elligsen Road South Urban Reserve development to not negatively impact service to areas already inside the UGB.

d. Estimated sanitary sewer service-related costs for reserve development

Sanitary sewer piping and pumping costs	Cost
10-inch pipe	$3.47 million
12-inch pipe	$0
15-inch pipe	$0
Pump station	$1.80 million
Force mains	$0
Total:	**$5.27 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$1,662**

Stormwater Management Services

With regard to stormwater management services, the Elligsen Road South Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

The City of Wilsonville Stormwater Master Plan (2012) identified "problem areas" (areas with flooding and evidence of significant erosion) based on observation during a 25-year storm event in 2009. The identified problem areas were isolated and there were no serious flooding issues identified under existing conditions.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The City of Wilsonville requires that stormwater management (water quality and flow control) be provided for all new impervious surfaces. Based on topography, it seems likely that stormwater management for the development of Elligsen Road South Urban Reserve would occur within the development area and outfall directly to Boeckman Creek, without connecting to an existing public stormwater system. The aforementioned master plan included several areas of observed erosion along Boeckman Creek, generally caused by incorrectly constructed or poorly maintained outfalls. While it would not necessarily be the responsibility of Elligsen Road South development to correct these outfalls, any new outfalls would need to be properly designed and constructed to avoid addition erosion.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

If stormwater outfalls directly to Boeckman Creek via private outfalls from development areas and public outfalls from roadways, and if such outfalls were properly designed

and constructed to avoid additional erosion, there would be no impacts to existing stormwater facilities.

d. Estimated stormwater service-related costs for reserve development

Stormwater piping and water quality/detention	Cost
18-inch pipe	$1.84 million
24-inch pipe	$0
30-inch pipe	$0
Water quality/dentition	$4.53 million
Total:	**$6.37 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$2,011**

Transportation Services

With regard to transportation services, the Elligsen Road South Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(e) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Figure 4.36 in Chapter 4 of the 2023 Regional Transportation Plan (RTP) displays 2020 home-based vehicle miles traveled (VMT) per capita by Metro transportation analysis zone, with average VMT per capita considered 11.32. According to Figure 4.36, areas in the UGB adjacent to the Elligsen Road South Urban Reserve had an above average home-based VMT per capita in 2020.

Metro's adopted 2040 Growth Concept Map designates a town center in the adjoining City of Wilsonville. Town centers are meant to: serve populations of tens of thousands of people; offer more locally-focused retail uses and public amenities; and be well served by transit. The roughly 100-acre and centrally-located Wilsonville Town Center aligns with this 2040 Growth Concept Map area. The City of Wilsonville's Town Center Plan envisions it as vibrant, walkable destination that inspires people to come together and socialize, shop, live, and work. The town center, as well as nearby employment areas on the opposite (west) side of I-5, include grocery and drug stores, a library, medical and dental offices, banks, and restaurants. These areas also contain and are adjacent to residential uses, including higher-density residential uses. The town center is located a short distance from the terminus of the TriMet's Westside Express Service (WES) Commuter Rail line, which provides service up to Beaverton.

South Metro Area Regional Transit (SMART), the City of Wilsonville's bus service, provides transit services to the city through seven bus lines; Routes 2X, 4, and 6 provide service to the portions of Wilsonville east of I-5 and connect to the town center.

The town center's existing land uses and transit service, and some availability for new development in and near the town center, demonstrate that growth in the current UGB near the town center will not necessarily cause a significant increase in home-based VMT per capita in the future, as residents will be able to access some daily needs through modes other than private motor vehicle transport. Growth in other areas of the city where residential uses surround schools and parks are is also unlikely to significantly impact home-based VMT per capita in the future.

The town center is about two miles away from areas in the UGB adjacent to the reserve. There are other commercial/employment areas that include grocery stores, other retail commercial uses, and industrial uses and that are closer to the residential uses, including apartments, in the UGB adjacent to the reserve. Growth in areas in the UGB near the reserve may continue to rely on private motor vehicle transportation, though existing transit service and bike and pedestrian infrastructure can provide alternatives and the relatively close proximity of a mixture of uses could keep vehicle trips for daily needs and employment relatively short.

In addition to routes described above, SMART also provides Wilsonville with medical transport services, a Villebois shopping shuttle, and connections to Keizer and Woodburn. The vast majority of the city's developed areas are within a quarter of a mile of a transit stop. Figure 4.3 in Chapter 4 of the 2023 RTP does, nonetheless, identify a gap in planned frequent transit service along SW Canyon Creek Road and other locations in the north of the city.

Wilsonville has a well-defined bike network of at least 19 miles of dedicated bike lanes and at least eight miles established bikeways that connect neighborhoods, schools, parks, community centers, business districts, and natural resource areas. Figure 4.5 in Chapter 4 of the 2023 RTP shows several existing bike facilities in Wilsonville as a part of the planned regional bike network, including facilities on SW Canyon Creek Road. There is identified gap in planned regional bike facilities on SW Elligsen Road and SW Stafford Road.

The city also has a fairly well-defined pedestrian network in its town center and residential neighborhoods, though with less pedestrian amenities in some industrial and employment areas. I-5 generally provides a barrier for east-west pedestrian connections, but there are sidewalks along both sides of SW Wilsonville Road as it crosses under I-5; there are no sidewalks on SW Boeckman Road over I-5. Figure 4.4 in Chapter 4 of the 2023 RTP shows a number of existing streets in Wilsonville as in the regional pedestrian network, including SW Canyon Creek Road. The figure identifies gaps in the future regional pedestrian network along SW Boeckman Road east of I-5, SW Elligsen Road, and SW Stafford Road.

Figure 4.6 in Chapter 4 of the 2023 RTP identifies a number of trails in the south and west of Wilsonville as in the planned regional trail network. There is a gap in the planned trail network along SW Stafford Road.

There are no high injury corridors or high injury intersections in Wilsonville's portion of the UGB identified on Figure 4.14 in Chapter 4 of the 2023 RTP.

The portion of I-5 bisecting Wilsonville is identified as a throughway in Figure 4.7 in Chapter 4 of the 2023 RTP. Figure 4.8 in Chapter 4 of the RTP indicates that it currently meets RTP travel speed reliability performance thresholds, with no more than four hours per day when travel speeds fall below the identified minimum speed. RTP models indicate this reliability of this section of I-5 will continue at least to the year 2045.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

An interchange with the nearest RTP-designated throughway, I-5, is less than a mile from the reserve. As noted above, I-5 through Wilsonville currently meets travel speed reliability performance thresholds. Given the proximity of the town center and other commercial/employment areas to the reserve, and the reserve's size, urban development of the reserve is unlikely to generate sufficient traffic on the highway to cause it to no longer meet those performance thresholds.

Currently, there is no regular SMART service all the way to the reserve. The closest existing bus routes, Routes 2X and 6 and 2X, are on SW Canyon Creek Road, which is 800 feet from the reserve. Route 4 on SW Wilsonville Road and SW Advance Road is one-half mile from the reserve. The WES Wilsonville station is more than two miles from the reserve.

There are no bike facilities adjacent to the reserve. The closest complete facility are dedicated bike lanes that runs north-south on SW Canyon Creek Road, which is approximately one-third of a mile from the center of the reserve along SW Elligsen Road. There is a small segment of bike lane on the south side of SW Elligsen Road that stops about 225 feet from the northwest corner of the reserve. There are no existing bike facilities in the reserve itself.

There are no sidewalks or trails connected to the reserve. There are sidewalks on both sides of SW Canyon Creek Road, and a sidewalk on the south side of SW Elligsen Road that that stops about 225 feet from the northwest corner of the reserve. A portion of SW Elligsen Road near SW parkway Center Drive has sidewalks on both sides of the street. There are no existing sidewalks in the reserve itself.

The reserve is adjacent to Title 4 designated Employment Area lands and less than a mile from school uses, commercial retail uses, and industrial uses. Future residents of the reserve could access these existing uses without lengthy travel by private motor vehicle. Moreover, as noted in response to Factor 1, the reserve could potentially accommodate future employment uses, providing employment opportunities with a short commute for residents of adjacent multi-family housing and the developing Frog Pond area.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

SW Canyon Creek Road, SW Elligsen Road, and SW Stafford Road would see additional private motor vehicle traffic as a result of urbanization of the reserve. However, given the proximity of schools and commercial/employment uses, and the potential for the reserve to include a mixture of uses, additional traffic is not likely to be significant. Nearby bike and pedestrian facilities would see some amount of additional use.

Development of this reserve is unlikely to cause facilities in Wilsonville to become high injury corridors or intersections, jeopardize the throughway reliability of I-5, or cause significant increases in the area's home-based VMT per capita.

d. Need for major transportation facility improvements and associated costs

The portions of SW Elligsen Road and SW Stafford Road that border the reserve and that have a combined length of approximately 1.31 miles will likely need to be improved to urban arterial standards. The SW Elligsen Road improvements are considered half-street improvements, as development of the separate Elligsen Road North Urban Reserve would include improvement of the roadway's northern half. Two new collectors with a combined length of approximately 1.33 miles are likely needed provide access to the middle of the reserve. Considering topography, normal per-mile costs are expected for most of these new and improved roadways, though there may be some higher per-mile costs in certain locations, including crossings of Boeckman Creek.

Facilities	Cost
Arterials, existing/improved full street	$44.75 million
Arterials, existing/improved half street	$12.70 million
Arterials, new	$0
Collectors, existing/improved full street	$0
Collectors, existing/improved half street	$0
Collectors, new	$58.80 million
Total:	**$116.25 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$36,707**

e. Provision of public transit service

The Elligsen Road South Urban Reserve is outside the TriMet Service District. SMART evaluated the reserve for providing transit service. SMART could potentially provide services to the reserve, although there is no guarantee of service. Actual service depends on the level of development in, and in the corridors leading to, the reserve. Service could be provided at 15-minute headways peak weekday and 30-minute headways off-peak weekday and Saturday, with one additional bus at a capital cost of $850,000 (recurs every 12-15 years). Bus capital costs reflect the purchase of a Category A/B electric vehicle as SMART plans to provide services with a zero-emission fleet. Annual service cost of adding fixed-route and complementary paratransit service

would be $330,000 in addition to services already being provided. This annual service cost would increase with the cost of inflation each year.

Prior to land being included in the UGB, a more detailed concept plan, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11, is required. This concept plan process will develop more refined public facility and service needs and cost estimates.

Factor 3: Comparative environmental, social, energy, and economic consequences

Environmental consequences

Boeckman Creek flows diagonally through the Elligsen Road South Urban Reserve in a northeast-to-southwest direction for just over a mile. The northern portion flows mostly through agricultural fields while the southern portion flows within a forested riparian corridor with some slopes greater than 25 percent. Riparian habitat has been identified along the stream corridor and most of the forested section is identified as wetland (5.8 acres of a larger 22-acre wetland) on the Wilsonville local inventory. In addition, there is an additional 0.2-acre wetland identified on the National Wetland Inventory (NWI) along the stream corridor. Given the increased protection levels for streams, wetlands, habitat areas, and steep slopes for areas added to the UGB, urbanization could occur without significant impacts to Boeckman Creek. However, the creek and powerlines divide the reserve into pockets of land, which could require street connections that impact natural habitat/features. Internal street connections would be more necessary if the reserve were to be developed with residential uses. All to say, some impacts to Boeckman Creek and habitat areas may occur through urbanization of the reserve depending on the design and level of street connectivity needs.

A tributary of Boeckman Creek flows south through the northern portion of the reserve for approximately 1,490 feet between agricultural land and a farmstead before joining Boeckman Creek. This stream also appears to drain into a couple of ponds, one of which, approximately 0.1 acres in area, has been identified as a NWI wetland. This stream also has riparian habitat identified along its corridor. Given the increased protection levels for streams, wetlands, and habitat areas within the UGB, urbanization could occur without significant impacts to this stream corridor. Nevertheless, this small stream corridor, along with Boeckman Creek, isolates a small land area from the remainder of the reserve, which could require stream-impacting street connections, especially for residential development. Therefore, some impacts to the stream and habitat area may occur through urbanization of the reserve, depending on the type of urban development and needs for new street connectivity.

A tributary flows southwest through the southern portion of the reserve, mostly through agricultural land, and appears to flow into a pond. The small stream section, which is within a forested patch, also is identified as a 0.25-acre wetland and includes riparian habitat. Given the required protection levels for streams, wetlands, and habitat areas within the

UGB, urbanization could occur without significant impacts to this stream corridor. Consistent with the other streams in the area, impacts related to street connectivity needs, especially serving new residential uses, could occur. Therefore, some impacts to the stream and habitat area may occur through urbanization of the area, again depending on types of future development and level of street connectivity needs.

Boeckman Creek and the southern tributary also flow within powerline easements in the reserve. These easements provide a level of protection for the water bodies, due to the inability to urbanize at a high level within the easements. However, if employment uses occurred in this area, the stream corridors could be susceptible to impacts from allowable parking facilities within the easement. Overall, urbanization of the area could occur with comparatively moderate to high impacts to the natural resources, depending on street connectivity needs and other site needs, such as parking or storage for to non-residential uses. Additional environmental consideration, specifically regarding avoidance of conflict between urban development and regionally significant fish and wildlife habitat, is provided in the Metro Code Factors Analysis (Appendix 7A).

Considering the comparative environmental consequences of urbanization, the Elligsen Road South Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Social, energy, and economic consequences

There are only a few rural residences in the Elligsen Road South Urban Reserve. The reserve is also already adjacent, or in relatively close proximity, to urban residential uses, employment uses, and major roadways. Therefore, urban development of the reserve is not expected to cause a significant change in sense of place or degradation of rural lifestyle for the existing residents of the reserve. The reserve's stream corridors and habitat areas that will require protection when added to the UGB can also help to reduce or at least slow the loss of sense of place and rural lifestyle. Urbanization of the reserve could also bring new social, educational, and recreational opportunities for existing residents.

As detailed more fully in response to Factor 2, and due in part to the reserve's proximity to a mix of existing urban uses and the opportunity to itself develop with a mix of new uses, urbanization of the reserve is not expected to cause significant increases in VMT. The energy impacts from urbanization of the reserve would also therefore be relatively minimal.

Aerial imagery suggests there may be more than 150 acres of commercial agriculture occurring in the reserve, but that appears to be largely pastureland and field crops and not row crops or nursery stock. While there would be economic consequences from urbanization in terms of a loss in farming activity in the reserve, that loss may be outweighed by the economic benefits of residential and/or employment development. Moreover, farmlands in the reserve are somewhat separated from each other by streams, natural areas, powerlines, and rural residential uses and urbanization of one area may not

necessarily impact agricultural activity that continues to occur on other farmlands until they too are ready to develop.

This analysis finds that there would be comparatively low social, energy, and economic consequences from urbanization of this reserve. The Elligsen Road South Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Factor 4: Compatibility of the proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

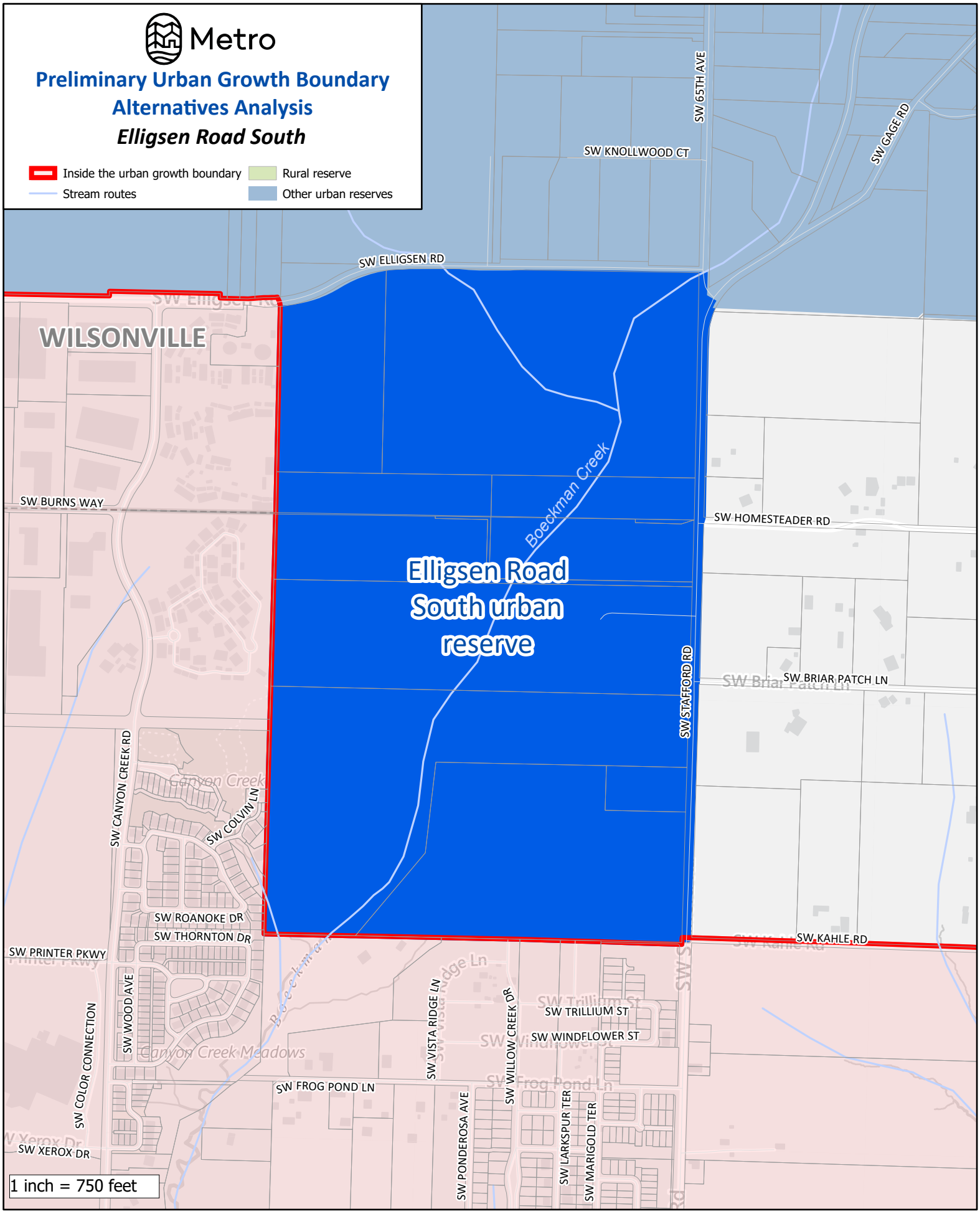
Goal 3 agricultural lands, specifically lands zoned Exclusive Farm Use (EFU) by Clackamas and Washington Counties, border the Elligsen Road South Urban Reserve in areas outside the UGB to the east and north, respectively.

Most of the EFU-zoned land to the east is in agricultural production and includes field crops and nursery and pastureland, with a few rural residences. SW Stafford Road separates the reserve from these EFU-zoned lands, but the road itself would not provide an adequate buffer between urban development and agricultural activity. Development of the reserve could lead to land use conflicts related to safety, liability, and vandalism and complaints due to noise, odor, dust, and the use of pesticides and fertilizer. The improvement of SW Stafford Road to urban standards, and associated street light illumination and bicycle and pedestrian movements, may further jeopardize the compatibility of the two uses, though the impacts of urban roadways on adjacent agricultural activity may be minimized through road design. Urbanization of the reserve would increase traffic on SW Stafford Road, which could impact the movement of both farm equipment and goods. Therefore, proposed urban uses are considered incompatible with the nearby agricultural activities occurring on the EFU-zoned land to the east.

The small section of EFU-zoned land adjacent to the north is being actively farmed with field crops and includes one residence. SW Elligsen Road separates the reserve from these farmlands, but the road itself would not provide an adequate buffer between urban development and agricultural activity. Conflicts related to safety, liability, and vandalism and complaints due to noise, odor, dust, and the use of pesticides and fertilizer could still occur. In addition, the improvement of SW Elligsen Road to urban standards, and associated street light illumination and bicycle and pedestrian movements, may further jeopardize the compatibility of the two uses, though the impacts of urban roadways on adjacent agricultural activity may be minimized through road design. The limited frontage between the reserve and the EFU-zoned lands to the north should help reduce potential conflicts. However, urbanization would increase traffic on SW Elligsen Road, which could impact the movement of both farm equipment and goods. The proposed urban uses are, therefore, considered generally incompatible with the nearby agricultural activities occurring on the small portion of farmland to the north.

Overall, the proposed urban uses would have low compatibility with nearby agricultural and forest activities occurring on farm and forest land outside the UGB to the east and to a lesser extent to the north. Land use conflict mitigation measures would be warranted on the urban side of the boundary.

The Elligsen Road South Urban Reserve is given a “low” score in Attachment 3 for this Goal 14 boundary location factor.



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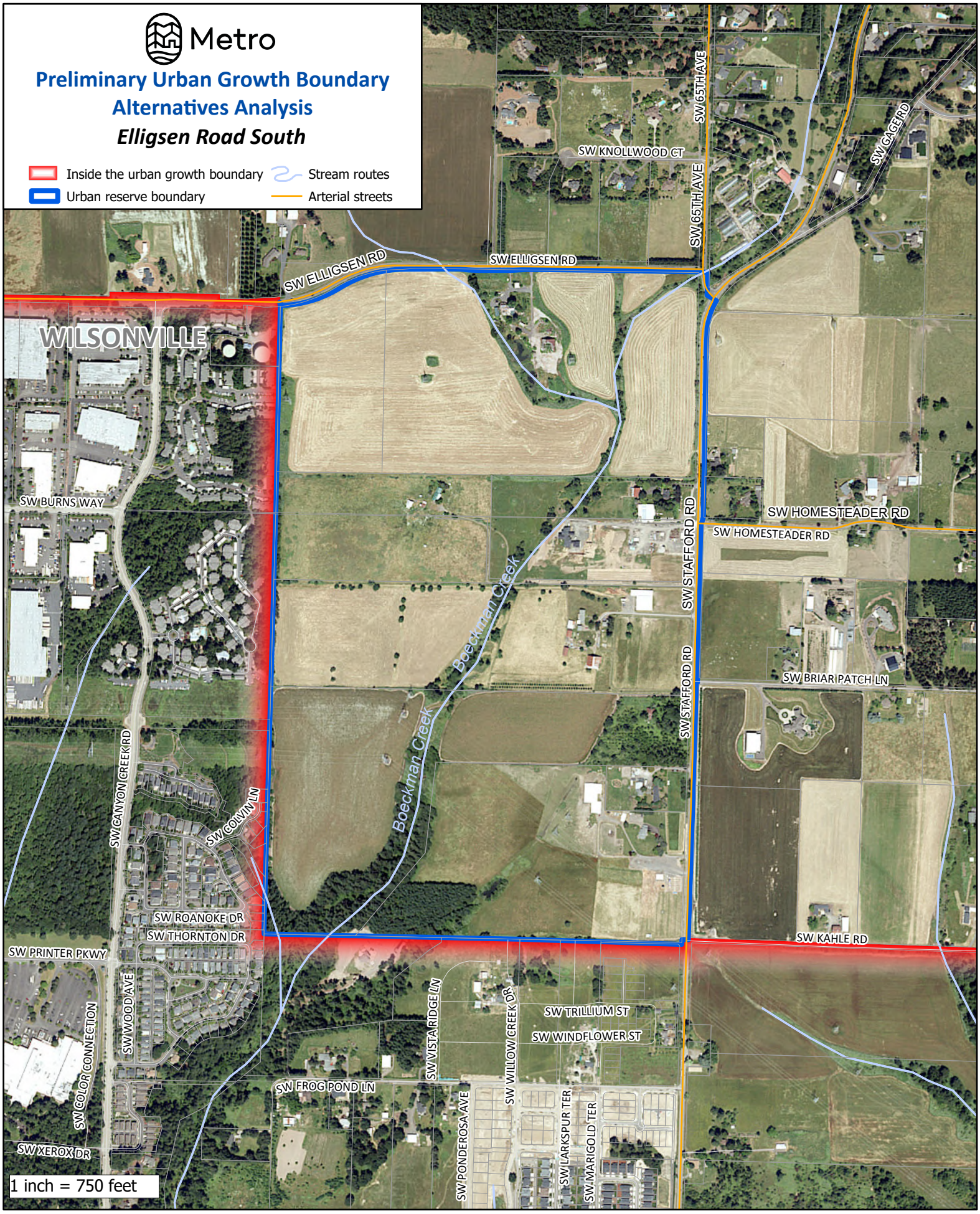

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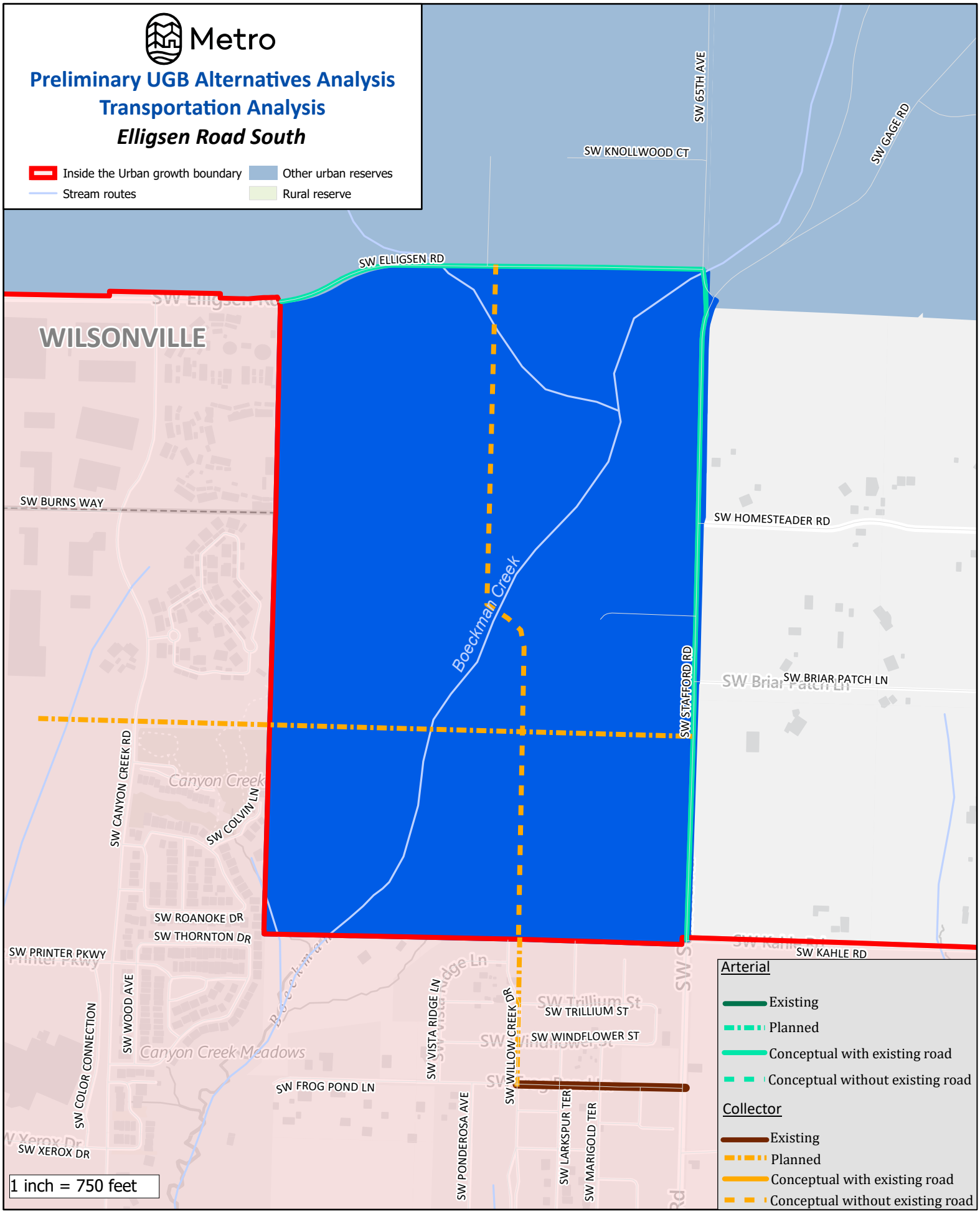

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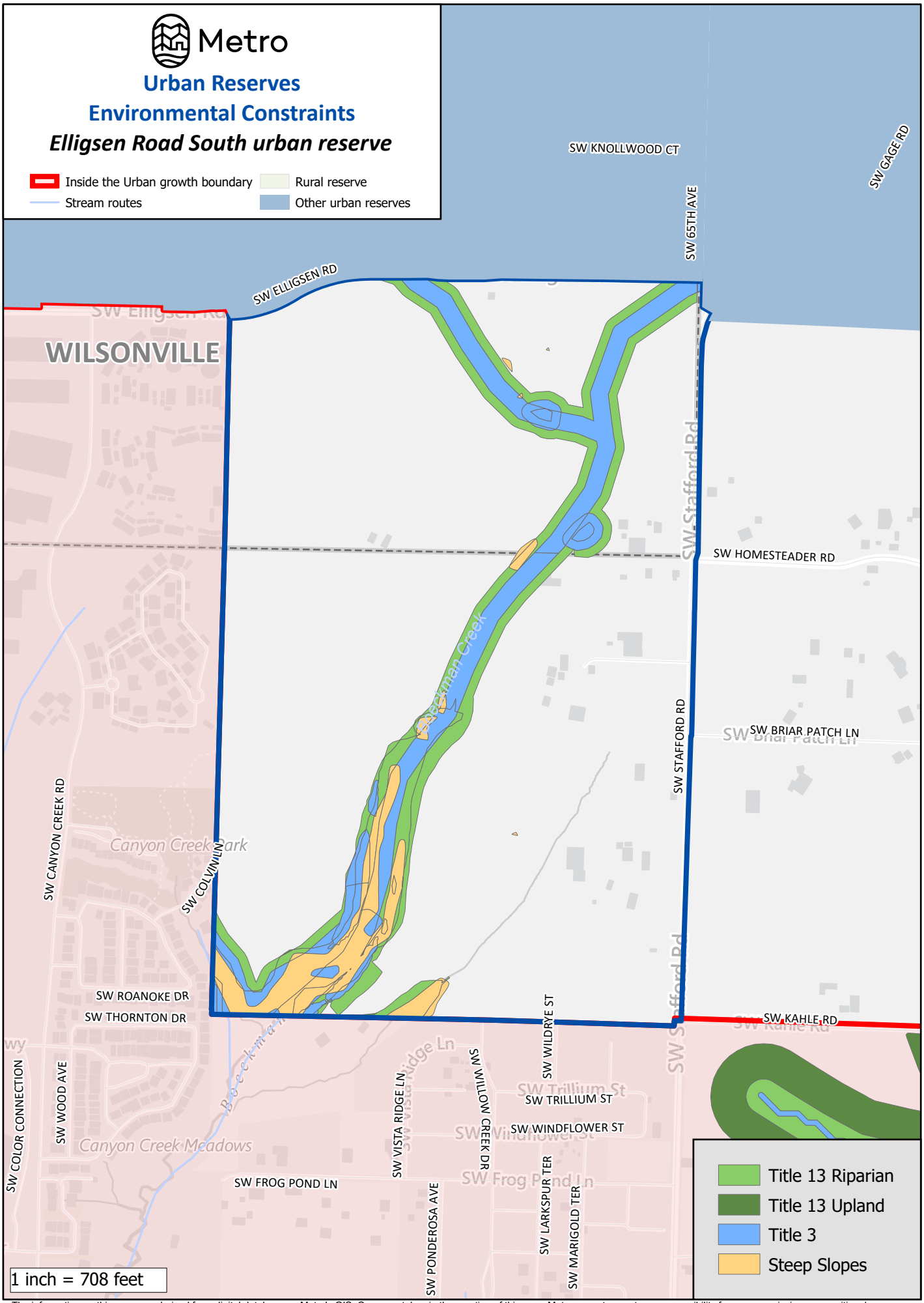

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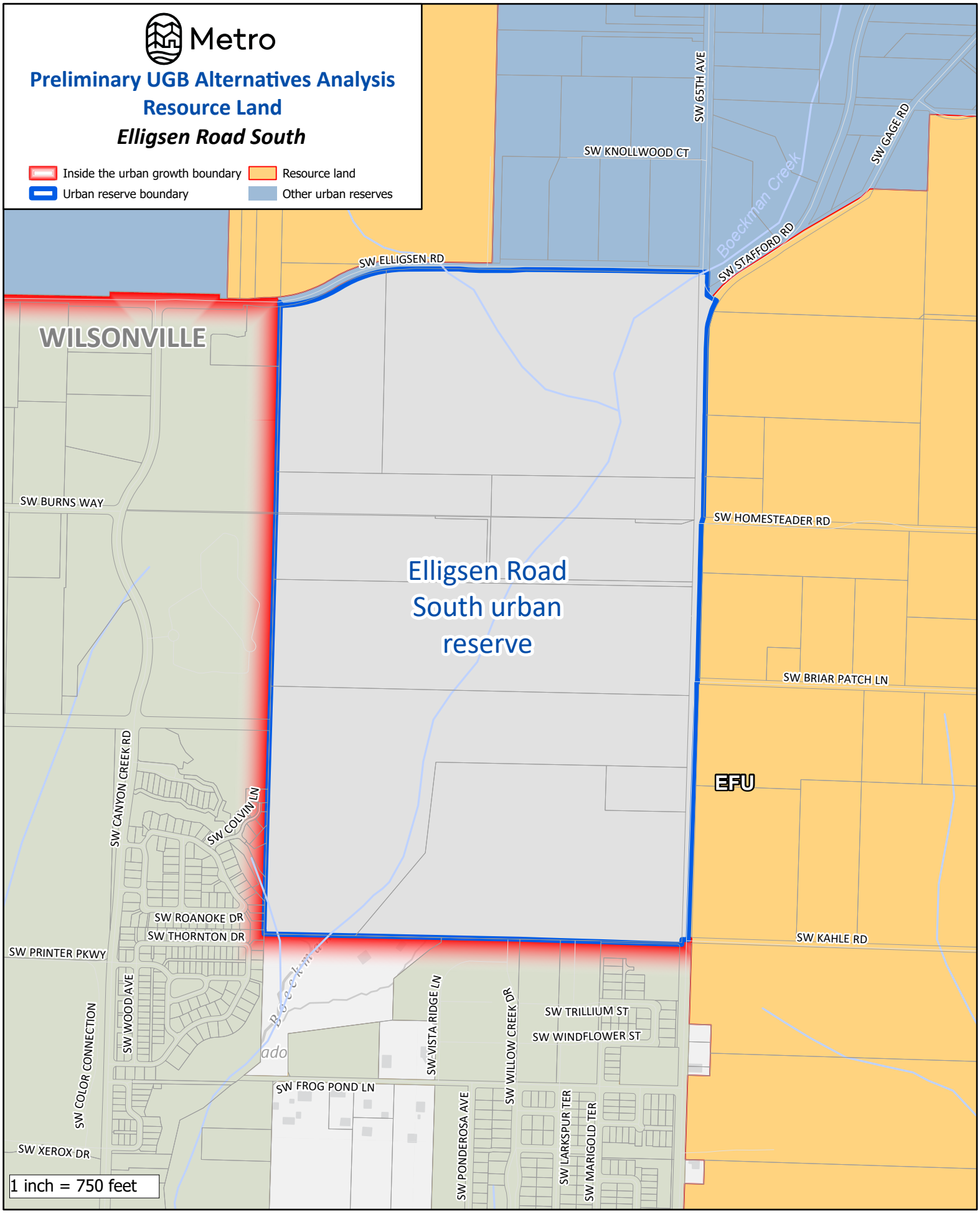

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GRAHAMS FERRY URBAN RESERVE

Total Reserve Area	203 acres
Total Tax Lot Area in Reserve (without Right-of-Way)	200 acres
Gross Vacant Buildable Area	92 acres
Net Vacant Buildable Area	**68 acres**

The Grahams Ferry Urban Reserve is a relatively compact area east of SW Grahams Ferry Road and north of SW Tooze Road. The UGB and Wilsonville city limits are the southern and eastern boundaries of the reserve, while rural reserve lands border to the north and northwest. The Metro-owned Coffee Lake Wetlands natural area is adjacent to the reserve's eastern side within the UGB.

GOAL 14 BOUNDARY LOCATION FACTORS

Factor 1: Efficient accommodation of identified land needs

The Grahams Ferry Urban Reserve is comprised of 24 contiguous tax lots, all of which are entirely within the reserve. The combined area of the reserve's tax lots is approximately 200 acres. More than 70 percent of the tax lots are smaller than five acres. Five tax lots are larger than 10 acres, with one being approximately 60 acres. As noted above, the entire reserve contains 92 gross vacant buildable acres and 68 net vacant buildable acres.

According to aerial imagery, the majority of the reserve is comprised of pastureland, groves of trees, small agricultural uses, some rural residential land uses. Twenty of the reserve's tax lots have improvements, with the median assessed value of those tax lots' improvements being more than $306,000; the aforementioned 60-acre tax lot has improvements assessed at more than $470,000 and a 2.7-acre tax lot has improvements assessed at more than $1.4 million.

The existing low density Villebois residential development is directly across SW Tooze Road from the reserve. Lowrie Primary School and Carinthia Park are approximately half a mile to the southeast, while Tracodero Park, Sparrow Creek Community Center, and a dog park are even closer. An interchange with I-5 is slightly more than two miles away via SW Grahams Ferry Road, SW Ridder Road, and SW Boones Ferry Road. A 2040 Growth Concept designated corridor along SW Parkway Avenue is approximately 1.5 miles via SW Tooze Road and Boeckman Road and on the opposite side of I-5. A Westisde Express (WES) rail stop is also about 1.5 miles away.

The reserve is relatively flat, but there are a couple of locations with slopes greater than 10 percent. The five largest tax lots are adjacent to each other and form a 155-acre contiguous area. However, there are some significant natural resources located on these tax lots that will direct development to the western portion of the reserve where tax lots are much smaller and where there is existing residential development, further away from the existing employment centers in Wilsonville. Moreover, Metro's ownership of the Coffee Lake Wetlands tract bordering the reserve to east effectively eliminates the opportunity for future new roadway connections between the reserve and industrial uses to the east within the UGB along SW 95th Avenue and SW Boones Ferry Road. With

these factors, and the proximity of parks, schools, and existing residential development, the area is considered suitable to accommodate a residential land need and not an employment land need.

Factor 2: Orderly and economic provision of public facilities and services

Water Services

With regard to water services, the Grahams Ferry Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Adjacent lands inside the UGB are served by the City of Wilsonville. The City's primary supply comes from the Willamette River. There is a single water treatment plant, the Willamette River Water Treatment Plant, that serves the city and is in shared ownership with Tualatin Valley Water District. The treatment plant is understood to be capable of processing 15 MGD, and a planned improvement will bring capacity to 20 MGD in order to serve development in the existing UGB through the year 2036. There are currently no significant known storage, pumping, or distribution system deficiencies.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The city is believed to have ample water rights for the long term, so water supply to urban development of the reserve is not a concern. The planned expansion of the treatment plant should provide sufficient capacity for development of the reserve. Existing storage tanks, however, do not have capacity to serve development outside of the existing UGB. Based on topography, the reserve could be served by gravity from the Elligsen Reservoirs (i.e., not require pumping). Future system infrastructure as shown in the City of Wilsonville Water System Master Plan is adequately sized for required fire flow and operating pressures.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Greater storage capacity may be needed to avoid negative impacts to service in the UGB.

d. Estimated water service-related costs for reserve development

Water piping, pumping, and storage costs	Cost
10-inch pipe	$0.99 million
12-inch pipe	$1.6 million
16-inch pipe	$0
Pumping	$0
Storage	$0.10 million
Total:	**$2.69 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$1,964**

Sanitary Sewer Services

With regard to sanitary sewer services, the Grahams Ferry Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Wastewater from adjacent lands in the City of Wilsonville is conveyed in a city-owned and operated collection system to the Wilsonville Wastewater Treatment Plant (WWTP), which was upgraded in 2014 to a capacity of 4.0 MGD, resulting in excess capacity. That excess capacity is believed to be able to accommodate growth in the Frog Pond areas recently added to the UGB. The city is planning to planning on necessary system upgrades to meet future needs. The existing system, including its piping and pump stations, is not known to have any hydraulic deficiencies.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Depending on the timing of additional development in the UGB, planned treatment plant upgrades may be needed sooner in order for the system to also serve new development in the Grahams Ferry Urban Reserve. No pumps are likely needed to serve development of the reserve. However, there are trunk line extensions that will be needed to serve the reserve.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

The above-mentioned trunk line extensions will be needed to serve the reserve and avoid negative impacts to existing services in the Villebois basin.

d. Estimated sanitary sewer service-related costs for reserve development

Sanitary sewer piping and pumping costs	Cost
10-inch pipe	$1.24 million
12-inch pipe	$0
15-inch pipe	$0
Pump station	$0
Force mains	$0
Total:	**$1.24 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$905**

Stormwater Management Services

With regard to stormwater management services, the Grahams Ferry Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

The City of Wilsonville Stormwater Master Plan (2012) identified "problem areas" (areas with flooding and evidence of significant erosion) based on observation during a 25-year storm event in 2009. The identified problem areas were isolated and there were no serious flooding issues identified under existing conditions.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The City of Wilsonville requires that stormwater management (water quality and flow control) be provided for all new impervious surfaces. Based on topography, it seems likely that stormwater management for the development of Grahams Ferry Urban Reserve would occur within the development area and outfall directly to Coffee Creek, without connecting to an existing public stormwater system. The aforementioned master plan does not indicate issues in Coffee Creek downstream of the reserve.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

If stormwater outfalls directly to Coffee Creek via private outfalls from development areas and public outfalls from roadways, there would be no impacts to existing storm facilities.

d. Estimated stormwater service-related costs for reserve development

Stormwater piping and water quality/detention	Cost
18-inch pipe	$0.32 million
24-inch pipe	$0
30-inch pipe	$0
Water quality/dentition	$2.76 million
Total:	**$3.08 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$2,251**

Transportation Services

With regard to transportation services, the Grahams Ferry Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(e) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Figure 4.36 in Chapter 4 of the 2023 Regional Transportation Plan (RTP) displays 2020 home-based vehicle miles traveled (VMT) per capita by Metro transportation analysis zone, with average VMT per capita considered 11.32. According to Figure 4.36, areas in the UGB adjacent to the Grahams Ferry Urban Reserve had an above average home-based VMT per capita in 2020.

Metro's adopted 2040 Growth Concept Map designates a town center in the adjoining City of Wilsonville. Town centers are meant to: serve populations of tens of thousands of people; offer more locally-focused retail uses and public amenities; and be well served by transit. The roughly 100-acre and centrally-located Wilsonville Town Center aligns with this 2040 Growth Concept Map area. The City of Wilsonville's Town Center Plan envisions it as vibrant, walkable destination that inspires people to come together and socialize, shop, live, and work. The town center, as well as nearby employment areas on the opposite (west) side of I-5, include grocery and drug stores, a library, medical and dental offices, banks, and restaurants. These areas also contain and are adjacent to residential uses, including higher-density residential uses. The town center is located a short distance from the terminus of the TriMet's Westside Express Service (WES) Commuter Rail line, which provides service up to Beaverton.

South Metro Area Regional Transit (SMART), the City of Wilsonville's bus service, provides transit services to the city through seven bus lines; Route 7 "Villebois Line" connects the town center to areas in the western portion of Wilsonville's UGB, including the Villebois neighborhood in the UGB adjacent to the reserve.

The town center's existing land uses and transit service, and some availability for new development in and near the town center, demonstrate that growth in the current UGB near the town center will not necessarily cause a significant increase in home-based VMT per capita in the future, as residents will be able to access some daily needs through modes other than private motor vehicle transport. Growth in other areas of the city where residential uses surround schools and parks are is also unlikely to significantly impact home-based VMT per capita in the future.

The town center is about a mile away from the areas in the UGB adjacent to the reserve, on the opposite side of I-5. There are closer employment areas, including industrial areas near the east of the reserve on the other side of the Coffee Lake Wetlands and commercial areas on the same side of I-5 as the reserve. The Villebois neighborhood, which includes medium-density residential uses, parks, and school uses, is across SW Tooze Road from the reserve. Growth in areas in the UGB near the reserve may continue to rely on private motor vehicle transportation, though existing transit service and bike and pedestrian infrastructure can provide alternatives and the relatively close proximity of a mixture of uses could keep vehicle trips relatively short.

Indeed, in addition to routes described above, SMART also provides medical transport services, a Villebois shopping shuttle, and connections to Keizer and Woodburn. The vast majority of the city's developed areas are within a quarter of a mile of a transit stop. Figure 4.3 in Chapter 4 of the 2023 RTP does, nonetheless, identify a gap in planned frequent transit service along SW Boones Ferry Road and other locations in the north of the city.

Wilsonville has a well-defined bike network of at least 19 miles of dedicated bike lanes and at least eight miles established bikeways that connect neighborhoods, schools, parks, community centers, business districts, and natural resource areas. Figure 4.5 in Chapter 4 of the 2023 RTP shows several existing bike facilities in Wilsonville as a part of the planned regional bike network, including facilities on SW Boekman Road and SW Wilsonville Road. There is identified gap in planned regional bike facilities on SW Stafford Road.

The city also has a fairly well-defined pedestrian network in its town center and residential neighborhoods, though with less pedestrian amenities in some industrial and employment areas. I-5 generally provides a barrier for east-west pedestrian connections, but there are sidewalks along both sides of SW Wilsonville Road as it crosses under I-5; there are no sidewalks on SW Boeckman Road over I-5. Figure 4.4 in Chapter 4 of the 2023 RTP shows a number of streets in Wilsonville as in the regional pedestrian network, including SW Wilsonville Road, SW Barber Street, and SW Boeckman Road west of I-5. The figure identifies gaps in the future regional pedestrian network along SW Boeckman Road east of I-5.

Figure 4.6 in Chapter 4 of the 2023 RTP identifies a number of trails in the south and west of Wilsonville as in the planned regional trail network.

There are no high injury corridors or high injury intersections in Wilsonville's portion of the UGB identified on Figure 4.14 in Chapter 4 of the 2023 RTP.

I-5, bisecting Wilsonville, is identified as a throughway in Figure 4.7 in Chapter 4 of the 2023 RTP. Figure 4.8 of the chapter indicates that it currently meets travel speed reliability performance thresholds, with no more than four hours per day when travel speeds fall below the identified minimum speed. RTP models indicate this reliability will continue at least to the year 2045.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

An interchange with the nearest RTP-designated throughway, I-5, is slightly more than two miles away from the reserve via SW Grahams Ferry Road, SW Ridder Road, and SW Boones Ferry Road. As noted above, I-5 currently meets travel speed reliability performance thresholds. Given its relatively small size, urban development of the reserve is unlikely to generate sufficient traffic on the highway to cause it to no longer meet those performance thresholds.

Currently, there is no regular SMART service all the way to the reserve. SMART's Route 7 has a stop about one-half mile from the reserve and provides limited connecting service to the SMART Central Station for WES trains. The Route 7 Villebois Shopper Shuttle provides connection the town center. The WES Wilsonville station is a little over one mile away from the reserve.

The majority of SW Tooze Road and SW Boeckman Road adjacent to the reserve have dedicated bike lanes. These facilities extend east across I-5, south to Villebois, and through employment areas around SW 95th Avenue. SW Grahams Ferry Road also has some dedicated bike lanes, but only a short 250-foot-long section of the road has bike facilities adjacent to the reserve. Significant natural areas border the east side of the reserve, which could limit more direct bike access from the reserve to SW Boeckman Road.

A majority of SW Tooze Road and SW Boeckman Road have a sidewalk on at least one side, and sidewalks are present in all of the developed portions of Villebois. There are no existing sidewalks within the reserve. The natural areas bordering the east side of the reserve could limit direct pedestrian access to SW Boeckman Road. Access to the nearby Ice Age Tonquin Trail is in Villebois, which extends south through Graham Oaks Nature Park to the Willamette River.

Lowrie Primary School and Carinthia Park are approximately half a mile to the southeast in Villebois, while Tracodero Park, Sparrow Creek Community Center, and a dog park are even closer. Future residents of the reserve could access these school and park uses in Villebois, as well as the SMART Route 7 stops, without travel by private motor vehicle. The bike and pedestrian facilities along SW Tooze Road and SW Boeckman Road could also help to support active transportation to nearby employment areas, the town center, and the WES station.

c. *Impacts to existing facilities that serve nearby areas already inside the UGB*

SW Boones Ferry Road, SW Grahams Ferry Road, and SW Tooze Road would see additional private motor vehicle traffic as a result of urbanization of the reserve. However, given the small size of the reserve, the proximity of schools, parks, the town center, and employment uses, and the availability of bike and pedestrian facilities, additional traffic is not likely to be significant. The nearby bike and pedestrian facilities and the Ice Age Tonquin Trail would see some amount of additional use.

Development of this reserve is unlikely to cause facilities in Wilsonville to become high injury corridors or intersections, jeopardize the throughway reliability of I-5, or cause significant increases in the area's home-based VMT per capita.

d. *Need for major transportation facility improvements and associated costs*

The roughly 0.61-mile-long portion of SW Grahams Ferry Road along the west of the reserve will likely need to be improved to urban arterial standards, including with acquisition of additional right-of-way. A slightly more than half-mile-long collector is also likely needed north of SW 110th Avenue through the middle of the reserve and connecting to SW Grahams Ferry Road. These facility improvements are assumed to have normal per-mile costs, given the relatively flat topography.

Facilities	Cost
Arterials, existing/improved full street	$31.30 million
Arterials, existing/improved half street	$0
Arterials, new	$0
Collectors, existing/improved full street	$0
Collectors, existing/improved half street	$0
Collectors, new	$21.15 million
Total:	**$52.45 million**
Per assumed unit:	**$38,341**

e. *Provision of public transit service*

The Grahams Ferry Urban Reserve is outside the TriMet Service District. SMART evaluated the reserve for providing transit service. SMART could potentially provide services to the reserve, although there is no guarantee of service. Actual service depends on the level of development in, and in the corridors leading to, the reserve. Service could be provided at 60-minute headways weekday, with one additional bus at a capital cost of $450,000 (recurs every eight – 12 years). Bus capital costs reflect the purchase of a Category C electric vehicle as SMART plans to provide services with a zero-emission fleet. Annual service cost of adding fixed-route and complementary paratransit service would be $45,000 in addition to services already being provided. This annual service cost would increase with the cost of inflation each year.

Prior to land being included in the UGB, a more detailed concept plan, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11, is required. This concept plan process will develop more refined public facility and service needs and cost estimates.

Factor 3: Comparative environmental, social, energy, and economic consequences

Environmental consequences

Coffee Lake Creek flows south along the northern edge of the Grahams Ferry Urban Reserve and then continues south through the eastern portion of the reserve for approximately 1,260 feet. A 44-acre portion of a much larger wetland system identified on the local Wilsonville inventory is located west of the portion of Coffee Lake Creek that flows through the area. The wetland appears to contain some irrigation ponds and an irrigation channel. This wetland extends south and east to connect with the wetland that is located on the Metro-owned open space within the UGB to the east, surrounding the very eastern portion of the reserve. A substantial amount of riparian habitat is identified along the wetland and stream, more or less encompassing the entire east side of the reserve. Given that all of the natural resources are located in the eastern portion of the reserve, urbanization of the western section could occur with no impacts to the stream and wetland areas.

Overall, urbanization of the area could occur with comparatively minimal impacts to the stream corridor and the wetland area, assuming future development is focused away from the wetland and stream complex. Additional environmental consideration, specifically regarding avoidance of conflict between urban development and regionally significant fish and wildlife habitat, is provided in the Metro Code Factors Analysis (Appendix 7A).

Considering the comparative environmental consequences of urbanization, Grahams Ferry Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Social, energy, and economic consequences

Natural resources and public ownership of lands will limit the amount of urban development the Grahams Ferry Urban Reserve can accommodate and will focus that development in certain locations, generally in the southwest corner of the reserve nearer to existing urban development already inside the UGB. There are already a number of rural residences in this location of the reserve; because of that existing development and its proximity to urban areas, development is not expected to cause a significant change in sense of place or degradation of rural lifestyle for the area's existing residents. That existing development and parcelization can also slow the speed of development and therefore the pace of noticeable change.

As detailed more fully in response to Factor 2, there may be additional vehicle traffic generated from urbanization of the reserve, but increased VMT and related energy impacts would be relatively small.

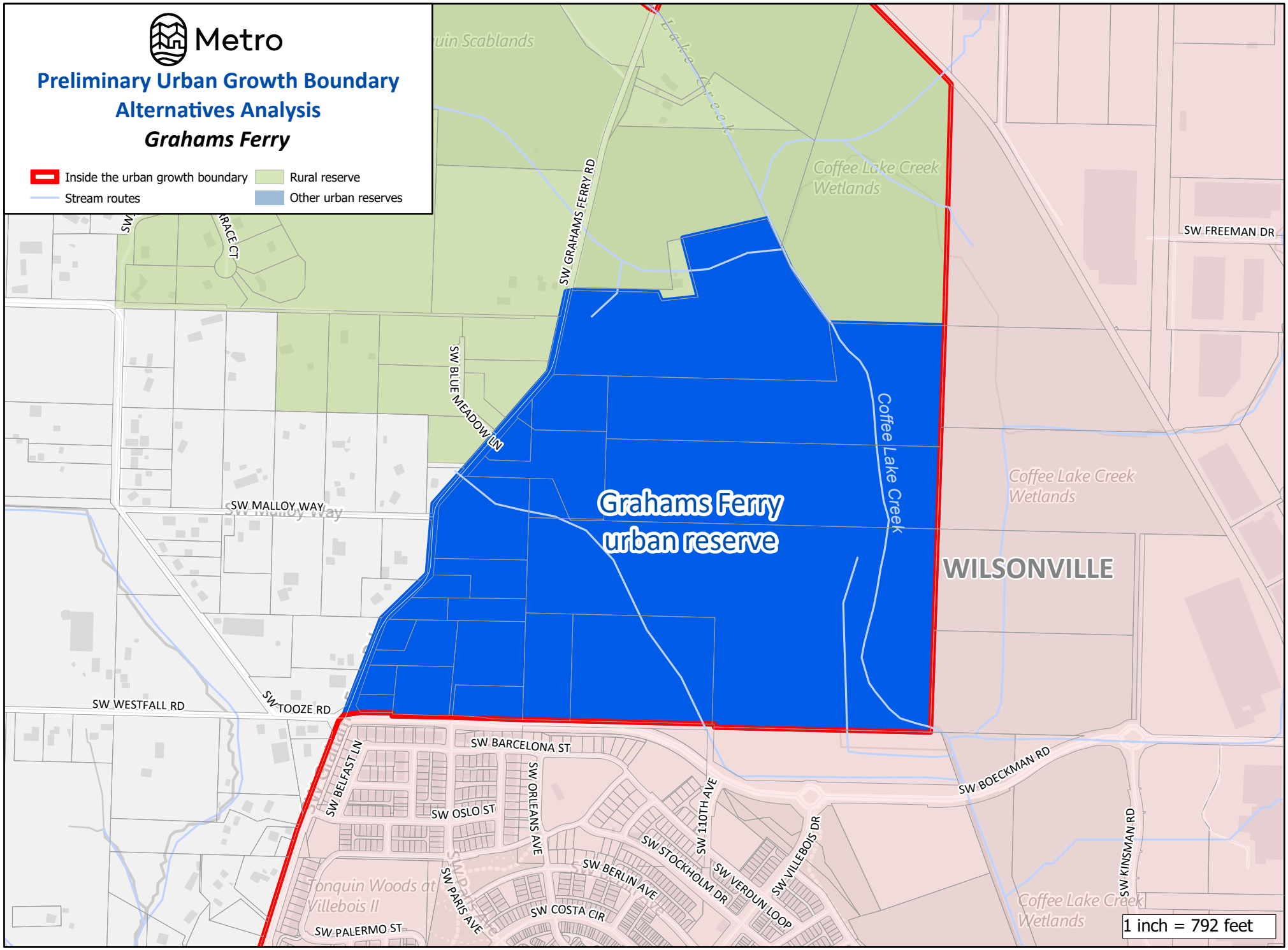
There are fewer than 30 acres of commercial agriculture occurring within the reserve and the economic consequences of a loss in farming activity in the reserve may be outweighed by the economic benefits of residential development.

This analysis finds that there would be comparatively low social, energy, and economic consequences from urbanization of this reserve. The Grahams Ferry Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Factor 4: Compatibility of the proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

Lands outside the UGB bordering the north side of the Grahams Ferry Urban Reserve have Goal 3 zoning, specifically Exclusive Farm Use (EFU) zoning by Clackamas County. These lands do not have agricultural activities and, while there are some forested areas, the lands are owned by Metro and therefore unlikely to be used for commercial forestry. The EFU zoning extends west of SW Grahams Ferry Road, but these areas don't have agricultural activities either and some of these areas tax lots are also owned by Metro. A nearby forested tax lot is a privately-owned open space tract of a homeowners association. Considering the lack of the agricultural activities occurring on the adjacent EFU zoned land and Metro and homeowners association ownership, the proposed urban uses would be considered to have high compatibility with nearby agricultural and forest activities occurring on farm and forest land outside the UGB.

The Grahams Ferry Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location factor.



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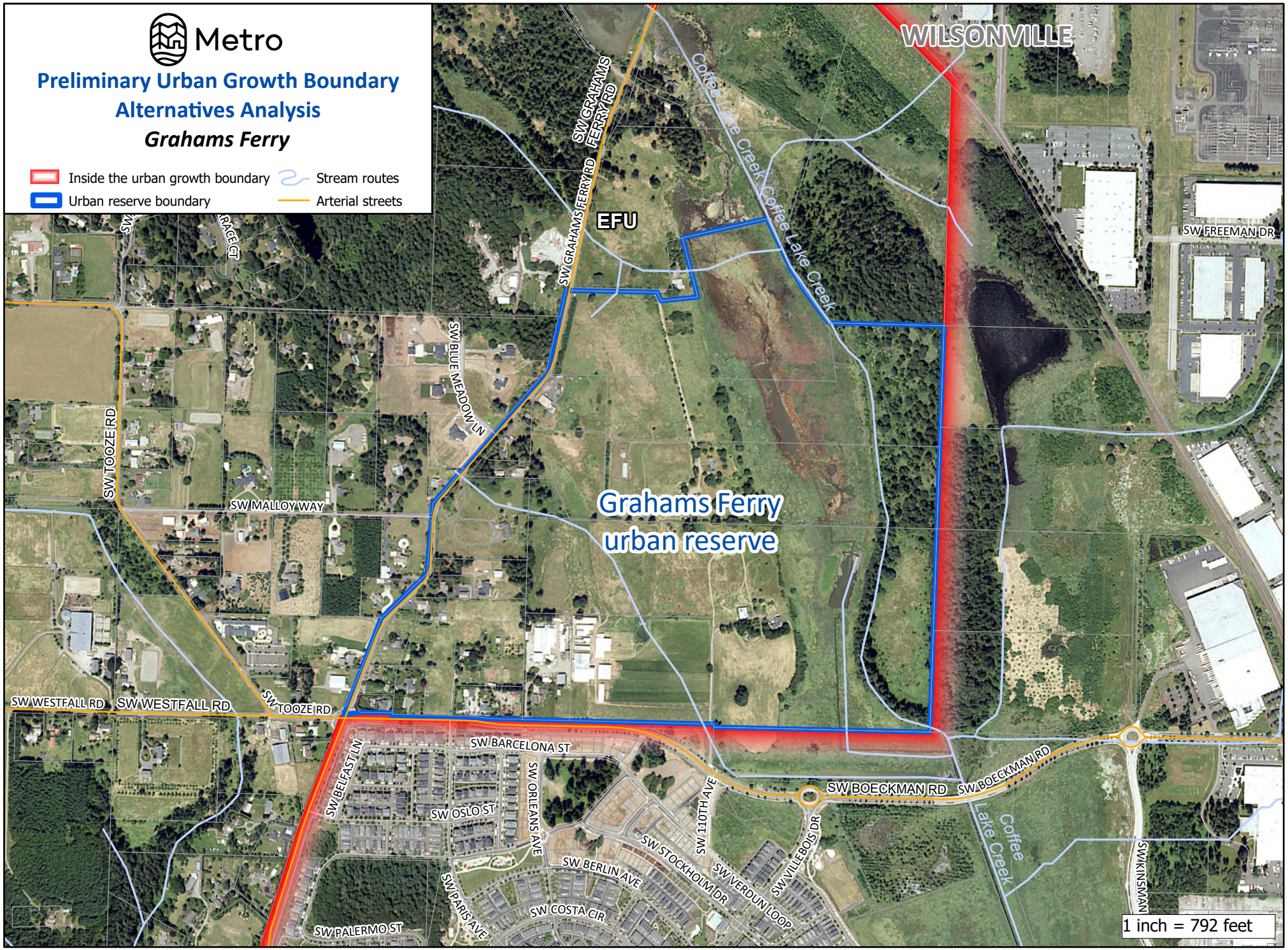
Metro

Preliminary Urban Growth Boundary Alternatives Analysis

Grahams Ferry

Inside the urban growth boundary
Urban reserve boundary
Stream routes
Arterial streets



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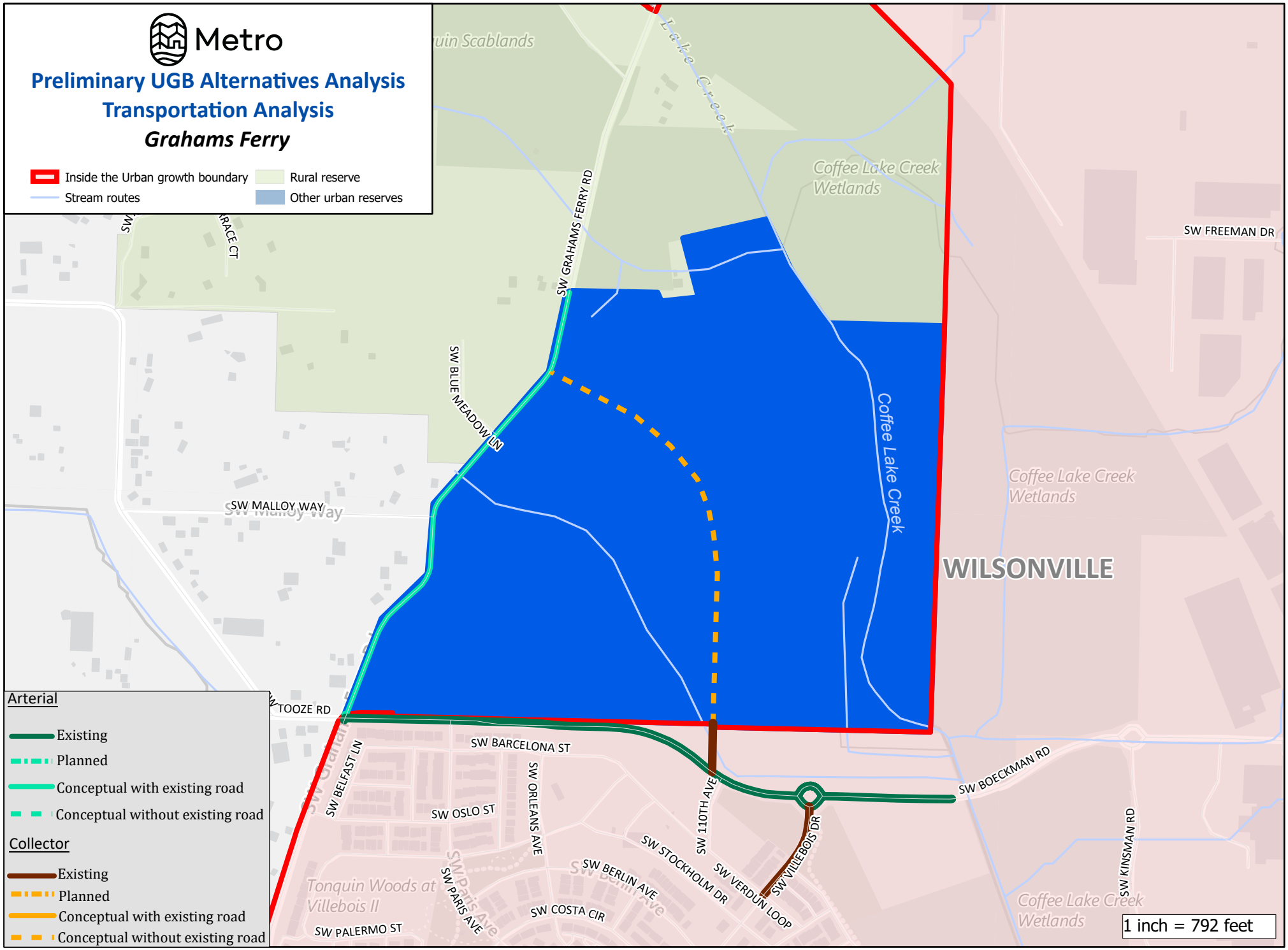

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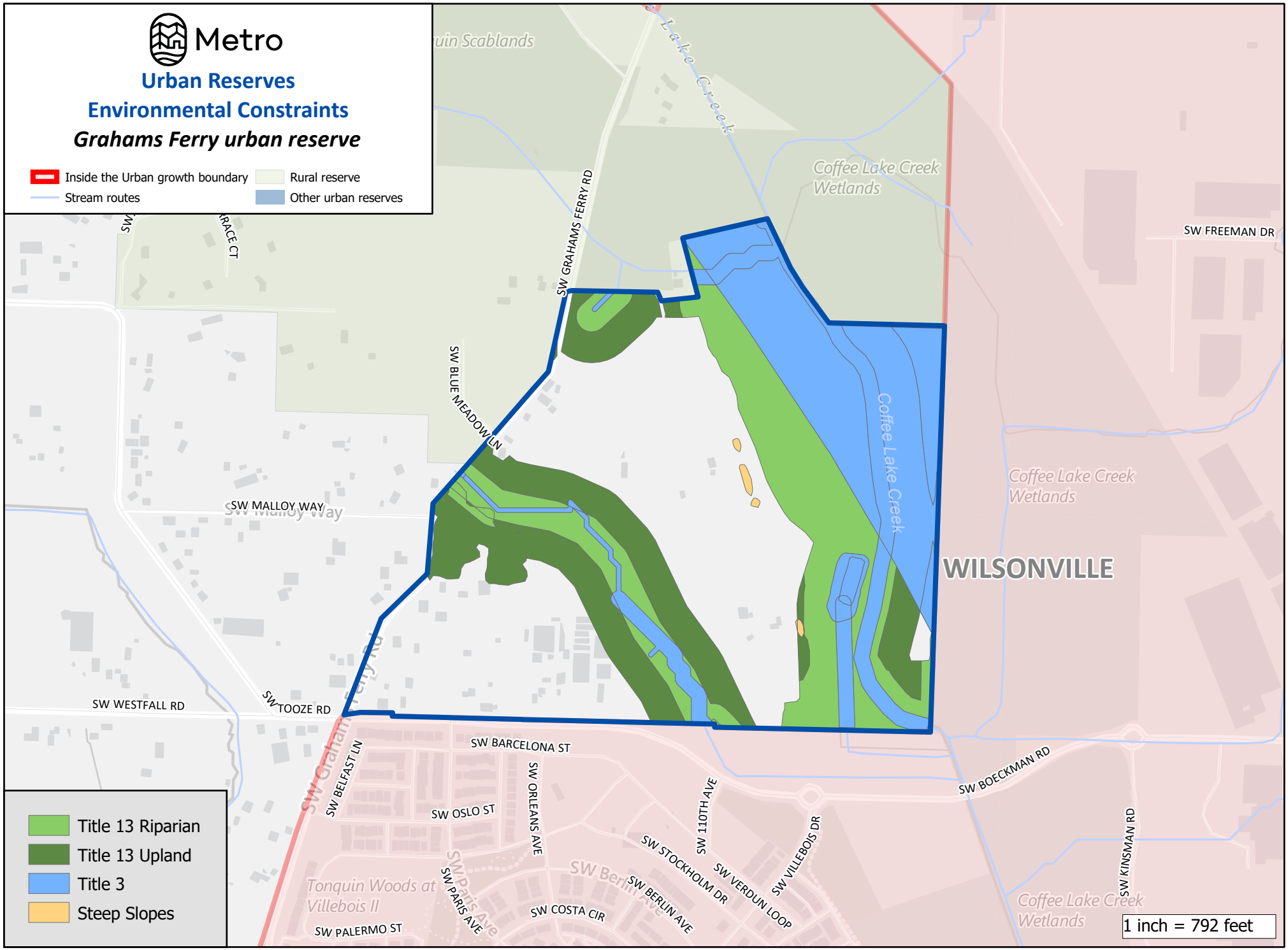

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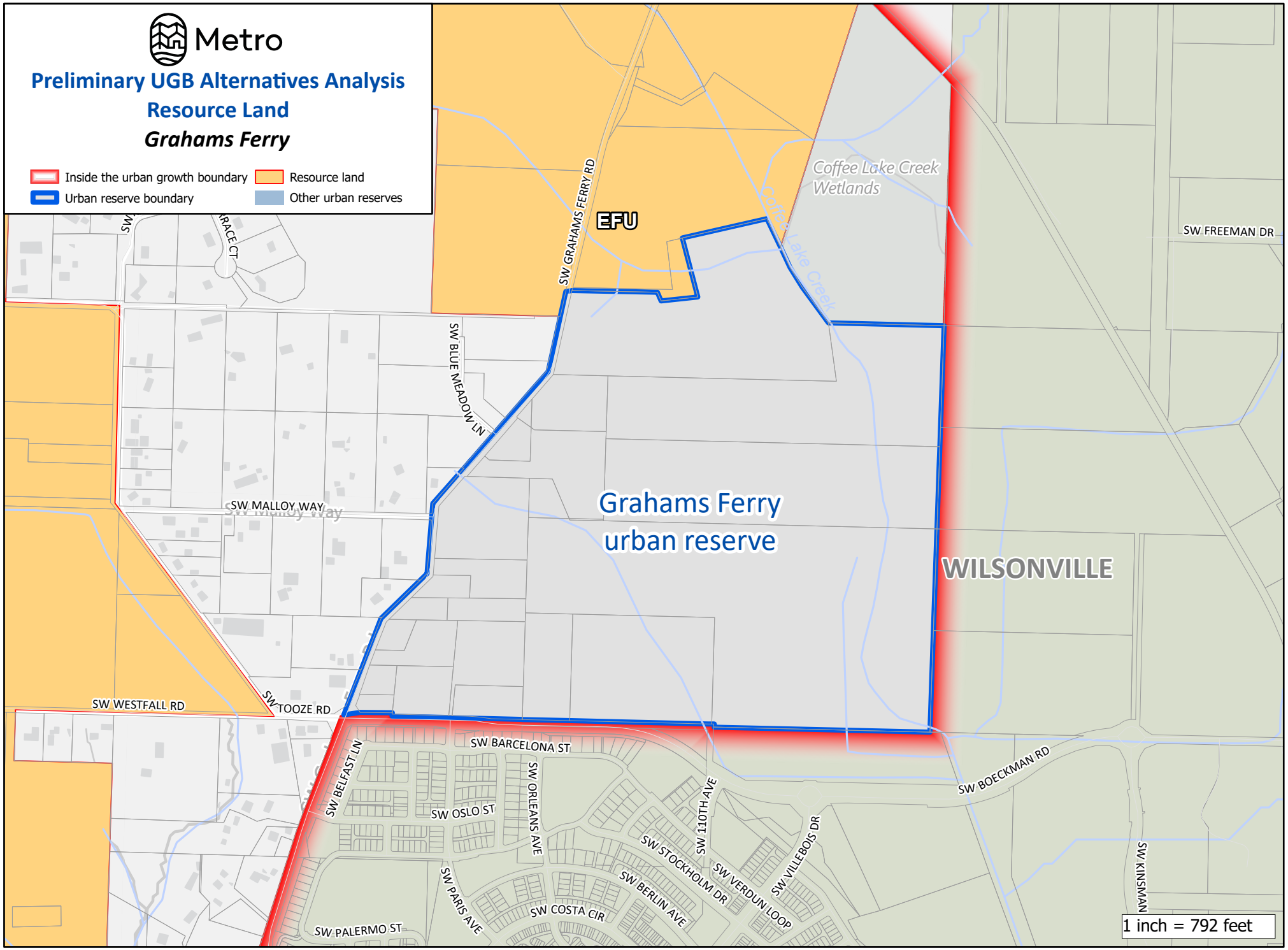

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GRESHAM EAST URBAN RESERVE

Total Reserve Area	857 acres
Total Tax Lot Area in Reserve (without Right-of-Way)	799 acres
Gross Vacant Buildable Area	630 acres
Net Vacant Buildable Area	**469 acres**

The Gresham East Urban Reserve is a boot-shaped area adjacent to the east side of Gresham. The reserve is bounded by SE Lusted Road to the north, SE 302nd Avenue to the east, and the riparian areas of Johnson Creek to the south. The UGB is the reserve's western boundary, while the remainder of the reserve is bordered by rural reserves. Gresham East Urban Reserve is bisected by SE Orient Drive, SE Dodge Park Boulevard, SE Powell Valley Road, and SE Chase Road. The reserve is primarily flat, with all slopes over 25 percent only located along three of the four drainages that flow generally westward through the area.

GOAL 14 BOUNDARY LOCATION FACTORS

Factor 1: Efficient accommodation of identified land needs

The Gresham East Urban Reserve is comprised of 230 contiguous tax lots, all of which are practically entirely within the reserve and have a combined area of approximately 799 acres. More than 80 percent of the tax lots are five acres or less in size; more than 60 percent are smaller than two acres and only three tax lots, including one owned by a school district and another by the East Multnomah Soil and Water Conservation District, are greater than 20 acres. As noted above, the entire reserve contains 630 gross vacant buildable acres and 469 net vacant buildable acres.

According to aerial imagery, the area is predominantly in agriculture use, but intermixed with some rural residential uses as well as commercial land uses primarily along SE Dodge Park, SE Powell Valley Road, and SE Orient Drive. About 61 acres of the reserve are owned/occupied by the Gresham-Barlow School District facilities, including Sam Barlow High School, West Orient Middle School, East Orient Elementary School, and associated uses (e.g., sports fields). A 0.85-acre tax lot is owned by the City of Gresham and is used for a water service facility. Overall, 201 (87 percent) of the reserve's tax lots have improvements, with a median assessed value of those tax lots' improvements exceeding $316,000, even when excluding those tax lots that are publicly owned.

Highway 26 is less than a mile away from the south end of the reserve via SE 282nd Avenue and SE Stone Road. "As the crow flies," the nearest interstate, I-84, is nearly five miles away, Oxbow Regional Park is nearly three miles away, and Southeast Community Park is about a third of a mile away. TriMet Route 84 already has a stop adjacent to the west side of the reserve at the intersection of S Orient Drive and SE 282nd Avenue.

Limited commercial or employment development may be appropriate in some areas of the reserve, such as in the vicinity of SE Powell Valley Road, SE Dodge Park Boulevard, and SE Orient Drive, given these areas' relatively flat topography, existing commercial uses, and proximity to Highway 26 and existing transit. More significant residential development, however, could occur on the

reserve's agricultural lands in relatively close proximity to existing schools and other urban residential development. Some of the agricultural lands could also provide employment capacity, especially those that are closer to Gresham's Springwater Corridor Industrial area. Therefore, this area is considered capable of efficiently accommodating residential and employment land needs.

Factor 2: Orderly and economic provision of public facilities and services

Water Services

With regard to water services, the Gresham East Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

The nearby lands in the UGB are also in the City of Gresham, which currently receives most of its water supply from Portland Water Bureau (PWB) Bull Run conduits. The remainder comes from groundwater through the Rockwood Water Public Utility District (RWPUD). The City of Gresham and RWPUD plan to transition away from purchasing water from PWB to local groundwater supply by the time their contract with the City of Portland expires in 2026. As a result, there are wells at various stages of planning and construction, with sufficient supply capacity to meet projected 2026 maximum daily demand (MDD) and two planned future wells to provide supply capacity to meet demands through 2050. Storage and pumping capacity are sufficient to meet current demands, but additional storage capacity will likely be needed to meet build-out to 2050 within the existing UGB. Pumping capacity and the piping network are considered adequate.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Lusted Water District currently services most of Gresham East Urban Reserve; however, the district does not have the capacity to serve the area at urban densities. Gresham also does not have existing supply and storage capacity to serve the reserve. Gresham's Powel and Barnes Pump Stations may have surplus capacity sufficient to serve urban development of the reserve. There are two planned mainline improvements in roadways near the reserve: a 16-inch diameter pipe in SE Orient Drive and a 12-inch diameter pipe in near the southern end of the URA boundary. Both of these service extensions are intended to serve the future Springwater service level, but it isn't clear whether they are sized adequately to provide service to the reserve as well; therefore, costs associated with upsizing this extension, if needed, are not included in the below figures.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

The supply and storage capacity improvements noted above would be needed to avoid negatively impacting services to areas already inside the UGB.

d. Estimated water service-related costs for reserve development

Water piping, pumping, and storage costs	Cost
10-inch pipe	$7.40 million
12-inch pipe	$0
16-inch pipe	$0
Pumping	$0
Storage	$0.62 million
Total:	**$8.02 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$854**

Sanitary Sewer Services

With regard to sanitary sewer services, the Gresham East Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Gresham's wastewater treatment facility, pipe network, and pump stations are generally considered appropriately sized to provide services to the area inside the UGB, including the Springwater area which is not yet annexed to the city. However, the City of Gresham 2019 Public Works Standards specify a rainfall derived infiltration and inflow (RDII) design rate of 1,000 gallons per net acre per day for new systems. The existing flow conditions for the five-year storm event is 4,070 gallons per net acre per day, indicating existing capacity deficiencies in the Upper Kelly Creek Basin Trunk.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Gresham's sanitary sewer master plan only covers full build-out within the current UGB and the wastewater treatment plant and pump stations have not been evaluated for their ability to serve areas outside the UGB. Nonetheless, if urban development of the Gresham East Urban Reserve were added to Kelly Creek Basin without appropriate improvements, there are presumed to be further capacity issues.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Full impacts to the existing facilities are unknown at this time. However, the capacity deficiencies in the Upper Kelly Creek Basin Trunk are not addressed, those deficiencies could be exacerbated by connecting urban development of the reserve and result in adverse impacts to existing facilities.

d. Estimated sanitary sewer service-related costs for reserve development

Sanitary sewer piping and pumping costs	Cost
10-inch pipe	$7.98 million
12-inch pipe	$0
15-inch pipe	$0
Pump station	$5.58 million
Force mains	$0.71 million
Total:	**$14.27 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$905**

Stormwater Management Services

With regard to stormwater management services, the Gresham East Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

There is no indication of capacity issues with existing stormwater facilities that serve the land inside the UGB.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Development/redevelopment of impervious surfaces in the City of Gresham requires on-site stormwater management (i.e., water quality and flow control). Gresham East Urban Reserve contains portions of Johnson Creek, Kelly Creek, and Beaver Creek tributary. Based on topography, stormwater could likely be managed and discharge to these waterways without needing connection to public infrastructure. Because flow control would be required by future development, the capacity of the waterways themselves to receive stormwater from the urban development in the reserve should be adequate.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

As noted above, stormwater is expected to be conveyed, treated, and disposed of within the reserve; therefore, no impacts to existing facilities in the UGB are anticipated.

d. Estimated stormwater service-related costs for reserve development

Stormwater piping and water quality/detention	Cost
18-inch pipe	$4.44 million
24-inch pipe	$2.47 million
30-inch pipe	$0
Water quality/dentition	$7.70 million
Total:	**$14.61 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$1,555**

Transportation Services

With regard to transportation services, the Gresham East Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(e) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Figure 4.36 in Chapter 4 of the 2023 Regional Transportation Plan (RTP) displays 2020 home-based vehicle miles traveled (VMT) per capita by Metro transportation analysis zone, with average VMT per capita considered 11.32. According to Figure 4.36 in Chapter 4, areas in the City of Gresham's portion of the UGB adjacent to the Gresham East Urban Reserve had above average and significantly above average home-based VMT per capita in 2020. Other areas of Gresham had average, below average, and significantly below average VMT per capita in 2020.

Metro's adopted 2040 Growth Concept Map designates a regional center and a separate town center in Gresham. Regional centers are generally meant to: serve populations of hundreds of thousands of people; surround high-quality transit service and multi-modal street networks; and offer larger commercial uses, healthcare facilities, local government services, and public amenities. Town centers are meant to: serve populations of tens of thousands of people; offer more locally-focused retail uses and public amenities; and be well served by transit. The Gresham Regional Center, comprised of Gresham's Historic Downtown and its Civic Neighborhood, and the Rockwood Town Center align with these Growth Concept intentions.

The city's "One Gresham" initiative aims to have these centers serve as foci for commerce, public services/events, healthcare, placemaking, entertainment, and denser, mixed-use, vertical development. These centers are already largely built out and include grocery stores, other retail commercial uses, banks, large office tenants, healthcare facilities, mixed-use housing, and other residential uses. The regional center includes the Gresham Central Transit Center at the eastern terminus of the MAX Light Rail Blue

Line; the Blue Line has other stops in Gresham as well, including at the town center, and continues on to Portland. Numerous TriMet bus routes, including frequent bus routes, connect the regional center to other parts of Gresham and the region. Two largely-developed 2040 Growth Concept centers connected to other areas of Gresham and the region via light rail and bus service, the city's priorities in its "One Gresham" initiative, and the availability of bike lanes and sidewalks as detailed below demonstrate that growth in the Gresham portion of the current UGB will not necessarily cause a significant increase in home-based VMT per capita in the future.

As noted above, the MAX Blue Line has multiple stops in the adjoining Gresham portion of the UGB, with stops in the regional and town centers and in other neighborhoods. Gresham is also served by nearly a dozen TriMet bus routes, including several routes that are classified as having frequent or regular service. TriMet Route 84 connects the regional center to the edge of the UGB at the intersection of SE 282nd Ave and SE Orient Drive. Nonetheless, Figure 4.3 in Chapter of the 2023 RTP indicates that there are gaps in planned frequent transit service along certain north-south streets, such as 162nd and 181st Avenues.

Gresham has a well-defined bike network in the UGB that consists of a variety of bike facilities. There are approximately 48 miles of dedicated bike lanes and 16 miles of bikeways, such as the Springwater Corridor and the Gresham to Fairview Trail. Still, Figure 4.5 in Chapter 4 shows that there are gaps in the planned regional bike network along Burnside Street, Division Street, Orient Drive, and other areas.

Gresham also has a fairly well-defined pedestrian network in its regional and town centers and residential areas, although there a few neighborhoods of post-war housing where there are no sidewalks. Some employment and butte areas have less of an established pedestrian network as well. Figure 4.4 in Chapter 4 of the RTP indicates there are gaps in the planned regional pedestrian network along Division Street and Orient Drive.

The Springwater Trail is an existing regional trail that connects Gresham to other areas currently inside and outside the UGB. There are other regional trail sections in Gresham identified in Figure 4.6 in Chapter 4 of the RTP.

Figure 4.14 in Chapter of the 2023 RTP identifies several high injury corridors in the area already inside the UGB in Gresham, including Burnside Road, Division Street, Orient Drive, Powell Boulevard, and Stark Street. The figure also identifies the intersection of Stark Street and 275th Avenue, as well as intersections along Burnside Street and Highway 26, as high injury intersections within the UGB and within about five miles of the reserve.

Burnside Street/Highway 26 is also already inside the UGB, running through the City of Gresham. The route is identified as a throughway Chapter 4, Figure 4.7 of the 2023 RTP. Figure 4.8 of that chapter indicates that it currently meets travel speed reliability

performance thresholds, with no more than four hours per day when travel speeds fall below the identified minimum speed. RTP models indicate this reliability will continue at least to the year 2045.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Highway 26, an RTP-designated throughway, is less than a mile away from the south end of the reserve via SE 282nd Avenue and SE Stone Road. As noted above, the portion of the highway near the reserve currently meets travel speed reliability performance thresholds.

There is currently no transit service into the reserve itself, though TriMet Route 84 connects Gresham's regional center to the western edge of the reserve at the intersection of SE 282nd Ave and SE Orient Drive.

While the Springwater Corridor Trail is just under a mile away from the reserve, but on the opposite side of Highway 26. There are also no bike facilities adjacent to or within the reserve itself. SE Chase, SE 302nd Avenue, and SE Short Road have been considered "helpful connections" and SE Lusted Road, SE Dodge Park Boulevard, and SE Orient Drive have been considered "bike with caution" routes.

Some residential subdivisions adjacent to the northwest of the reserve have sidewalks along their roads, including one, SE Teal Drive, that stubs directly to the reserve. Otherwise, there are no other sidewalks connecting to the reserve.

If the reserve were to be developed with employment uses, as considered possible in response to Factor 1, existing urban residential uses adjacent to the reserve could provide close-proximity housing to those uses' employees, helping somewhat to limit home-based VMT per capita. Having existing school facilities in and near the reserve could help to limit future residents' VMT as well. However, without additional transit connections, and unless the reserve is developed with employment and other service uses, the reserve's future residents will likely have to rely on private motor vehicles to access employment opportunities and their daily needs.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Portions of SE Lusted Road, SE Chase Road, SE Orient Drive, and SE 282nd Avenue within the UGB would be expected to see additional private vehicle traffic from development of the reserve. Indeed, the reserve is moderately distant from the regional center and currently lacks frequent transit service, bike, and pedestrian facilities to it, suggesting the need for private motor vehicle use on these roadways. However, as noted in response to Factor 1, the reserve is considered able to accommodate both residential and employment uses. If the reserve itself were to be developed with a mixture of uses, future residents could get more of their daily needs met locally without having to drive as much on roads already in the UGB. The existing school uses in the reserve will also help to limit driving by new residents on roads already in the UGB. Moreover, nearby

residences in the current UGB could provide housing to employees of the reserve, and new employment uses in the reserve could provide jobs for nearby residents of the current UGB, further limiting traffic impacts on roads already in the UGB.

With these considerations, development of the reserve may result in only moderate impacts to home-based VMT per capita in nearby areas already inside the UGB and the performance of Highway 26 as a throughway. Any additional motor vehicle traffic on Burnside Road, Division Street, Orient Drive, Powell Boulevard, and Stark Street resulting from development of the reserve, however, may exacerbate these roadways' high-crash conditions.

The dedicated bike lane on SE Powell Valley Road may see additional use if the portion of SE Lusted Road within the reserve is upgraded to urban standards with connecting bike facilities; however, there still will be a half-mile-long gap between SE Powell Valley Road and the improved SE Lusted Road, potentially limiting the existing bike lane's use.

The sidewalks in neighboring low density residential subdivisions in the UGB may see additional use with development of the reserve.

d. Need for major transportation facility improvements and associated costs

A roughly 0.88-mile-long portion of SE Lusted Road at the north of the reserve, as well as a 0.41-mile-long portion of and SE 282nd Avenue at the west of the reserve, will likely need to be improved to urban arterial standards, including with acquisition of some additional right-of-way. SE 282nd Avenue improvements are considered for the purposes of this preliminary analysis to be half-street improvements, as property on some of its west side is already within the UGB. A 1.04-mile-long portion of SE Orient Drive, which crosses through the southern half of the reserve, would also likely need to be improved to urban arterial standards. A 0.11-mile-long portion of SE Chase Road crossing through the northern half of the reserve, and a 1.4-mile-long portion of SE 302nd Avenue would be improved to urban collector standards. Because the terrain where much of these transportation facility improvements would be located is relatively flat, normal per-mile costs are mostly expected.

Facilities	Cost
Arterials, existing/improved full street	$86.59 million
Arterials, existing/improved half street	$11.37 million
Arterials, new	$0
Collectors, existing/improved full street	$60.05 million
Collectors, existing/improved half street	$0
Collectors, new	$0
Total:	**$158.02 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$16,829**

e. Provision of public transit service

TriMet evaluated the reserve for providing transit service. TriMet could provide services to the reserve, although there is no guarantee of service. Actual service depends on the level of development in, and in the corridors leading to, the reserve. Service could be provided at 30-minute headways through a route change to a conceptual service in TriMet's 2045 Network Vision with three additional buses at a capital cost of $3,000,000 – $4,500,000 (recurs every 12 years). The additional annual service cost is $1,254,240 and grows with inflation each year.

Prior to land being included in the UGB, a more detailed concept plan, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11, will be required. This concept plan process will develop more refined public facility and service needs and cost estimates.

Factor 3: Comparative environmental, social, energy, and economic consequences

Environmental consequences

There are four streams that flow west through the Gresham East Urban Reserve. In the north, two tributaries to Beaver Creek have forested riparian habitat along the majority of their stream corridors, as well as some upland habitat identified near the stream closest to Sam Barlow High School. Similarly, Kelley Creek, which flows through the middle of the reserve, is entirely within a forested riparian habitat corridor. The fourth small stream in the southern part of the reserve flows into Johnson Creek, which travels through Gresham and Portland to the Willamette River. This stream has less riparian habitat when compared to the other three streams. It also flows through some agricultural lands and appears to be piped in a few locations.

No "100-year" floodplains are identified within the reserve. There is one small National Wetland Inventory (NWI) wetland of approximately a quarter acre in size just south of SE Orient Drive along the Johnson Creek tributary.

The proximity of flat, developable land adjacent to all four streams within the reserve indicates meaningful potential impact from urbanization of reserve, especially if there are new north-south transportation connections. Addition to the UGB does bring enhanced protection for streams, wetlands, and habitat areas, and the presence of a significant existing vegetated riparian corridor along Kelley Creek and the northern tributaries may help reduce the potential impacts of urban development. Restoration of degraded stream edges could improve the environmental conditions for the portion of the southern stream that flows through active farmland.

This analysis finds, however, that urbanization of this reserve would have comparatively moderate to high impact on the stream corridors and habitat areas, depending on needed transportation connections. Additional environmental consideration, specifically regarding

avoidance of conflict between urban development and regionally significant fish and wildlife habitat, is provided in the Metro Code Factors Analysis (Appendix 7A).

Considering the comparative environmental consequences of urbanization, the Gresham East Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Social, energy, and economic consequences

While there are a number of rural residences in the Gresham East Urban Reserve, including those in a few small platted rural residential subdivisions, they are generally clustered in certain areas, such as near school and rural commercial land uses. There is adjacent urban residential development to the west of the reserve, but there are few connections to that development from the reserve itself. Urbanization, particularly larger-scale developments on the flatter agricultural lands of the reserve, could cause some change in sense of place for the reserve's existing residents and some degradation of a more rural lifestyle. However, existing development and smaller parcel sizes in some areas may slow that development in certain locations. Moreover, urbanization of the reserve could bring new social, educational, and recreational opportunities for existing residents.

Of the three schools located in the urban reserve, the elementary and middle schools generally serve the surrounding 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 if they are not sized to serve an urban population. At the same time, urbanization may provide the opportunity for these two smaller school facilities to be enhanced.

As detailed more fully in response to Factor 2, urbanization of the reserve may not necessarily cause significant increases in VMT, particularly if the reserve were to be developed with a mixture of uses that allows existing and future residents to access daily needs closer to home. Limiting VMT will also help to limit adverse energy consequences.

There is a substantial amount of agricultural activity occurring in the reserve, including large commercial nursery operations and field and row crops. The economic consequences from urbanization in terms of a loss in farming activity in the reserve could be considerable; however, that loss may be outweighed by the economic benefits of residential and/or employment development, which could also be considerable given the amount relatively flat and easily developable land.

Overall, there would be comparatively moderate social, energy, and economic consequences from urbanization of this reserve. The Gresham East Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location sub-factor.

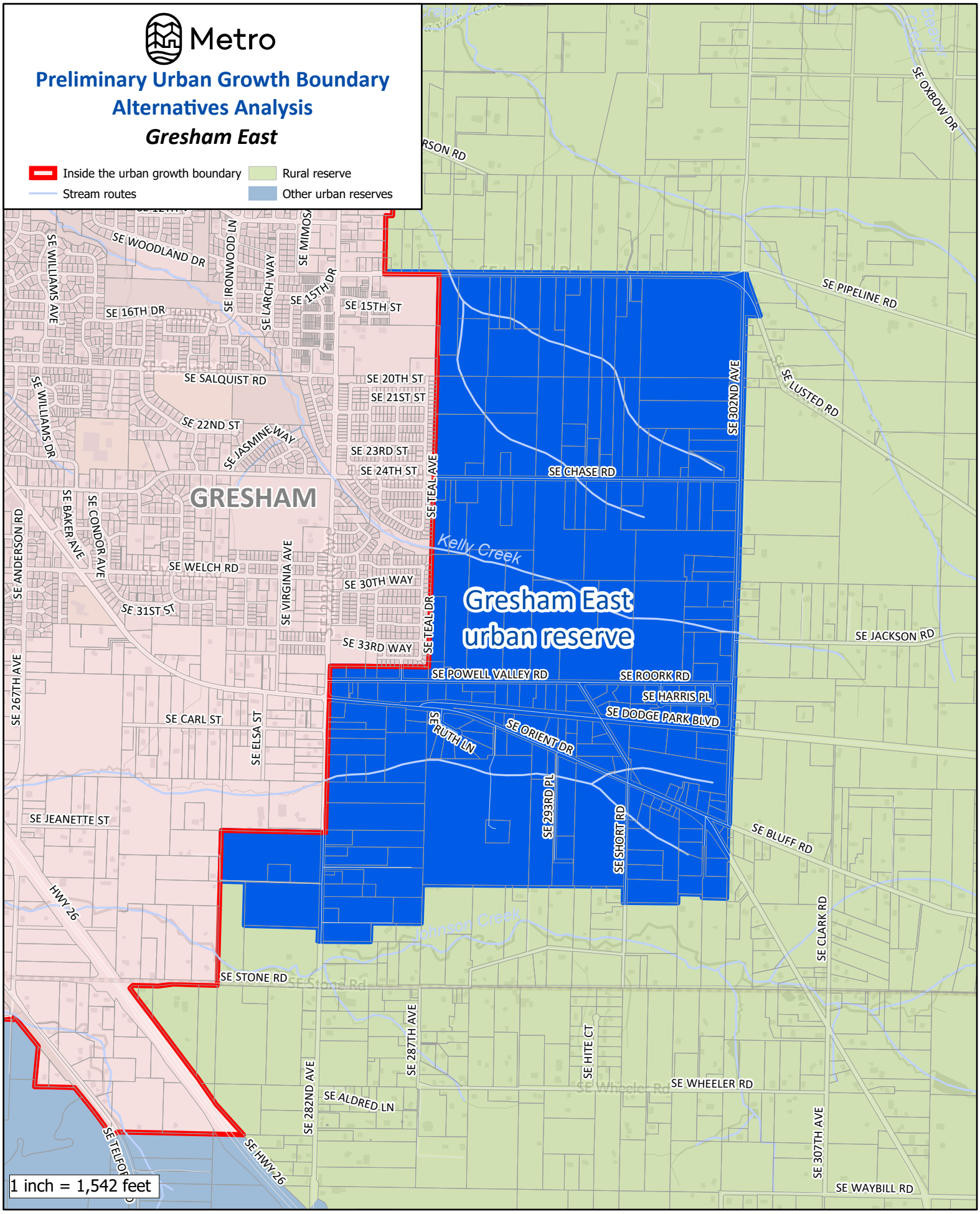
Factor 4: Compatibility of the proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

Goal 3 agricultural lands, specifically lands zoned Exclusive Farm Use (EFU) by Multnomah County, border the Gresham East Urban Reserve in three locations outside the UGB.

The first location is to the east of the reserve on the opposite side of SE 302nd Avenue, where EFU-zoned lands border the reserve for approximately 2,500 feet near the intersection with SE Chase Road. These EFU-zoned lands are nearly entirely in agricultural production for field crops and nursery stock, though there are a couple of rural residences. There are no significant stands of trees in this location. The proposed urban uses would not be compatible with these agricultural activities, in part because 302nd Avenue does not provide an adequate buffer between the two uses and conflicts related to safety, liability and vandalism and complaints due to noise, odor, dust, and the use of pesticides and fertilizer could occur. The improvement of SE 302nd Avenue to urban standards, and associated street light illumination and bicycle and pedestrian movements, may further jeopardize the compatibility of the two uses, though the impacts of urban roadways on adjacent agricultural activity may be minimized through road design. Urbanization of the reserve would increase traffic on SE 302nd Avenue and SE Chase Road, which could impact the movement of both farm equipment and goods. Therefore, proposed urban uses are considered incompatible with the nearby agricultural activities occurring on the EFU-zoned land to the east.

The second and third locations are at the south of the reserve where there are EFU-zoned lands along Johnson Creek. Here, there are two pockets, each smaller than 10 acres, of agricultural activities occurring on the land north of Johnson Creek. A portion of the western pocket west of SE 282nd Avenue is in the same ownership as agricultural land inside the reserve. It may not be economically viable for this small pocket to continue in agricultural production if the land under the same ownership to the north and in the reserve is urbanized. The majority of the agricultural activity in this area occurs south of Johnson Creek and north of Highway 26 and will not be directly impacted by urbanization of the reserve. However, increased traffic along SE Stone Road will probably have some adverse effects, as SE Stone Road provides access to Highway 26. The proposed urban uses are mostly compatible with the agricultural activities occurring on this farmland, with the exception of the one small pocket north of Johnson Creek that would warrant buffering from the urban uses.

This analysis finds that the proposed urban uses are considered to have low compatibility with the nearby agricultural and forest activities occurring on farm and forest land outside the UGB. The Gresham East Urban Reserve is given a “low” score in Attachment 3 for this Goal 14 boundary location factor.



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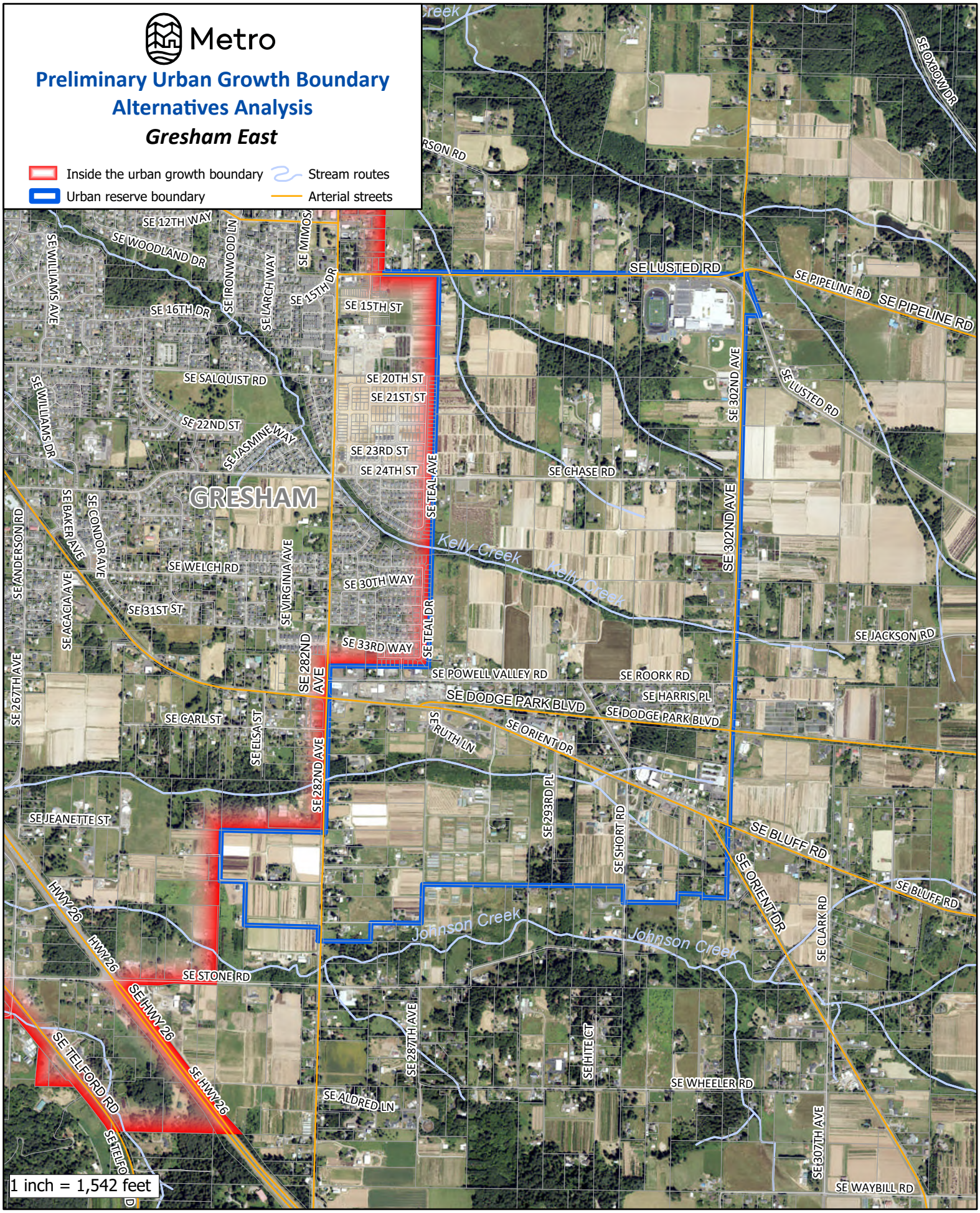
Metro

Preliminary Urban Growth Boundary Alternatives Analysis

Gresham East

Inside the urban growth boundary
Urban reserve boundary
Stream routes
Arterial streets



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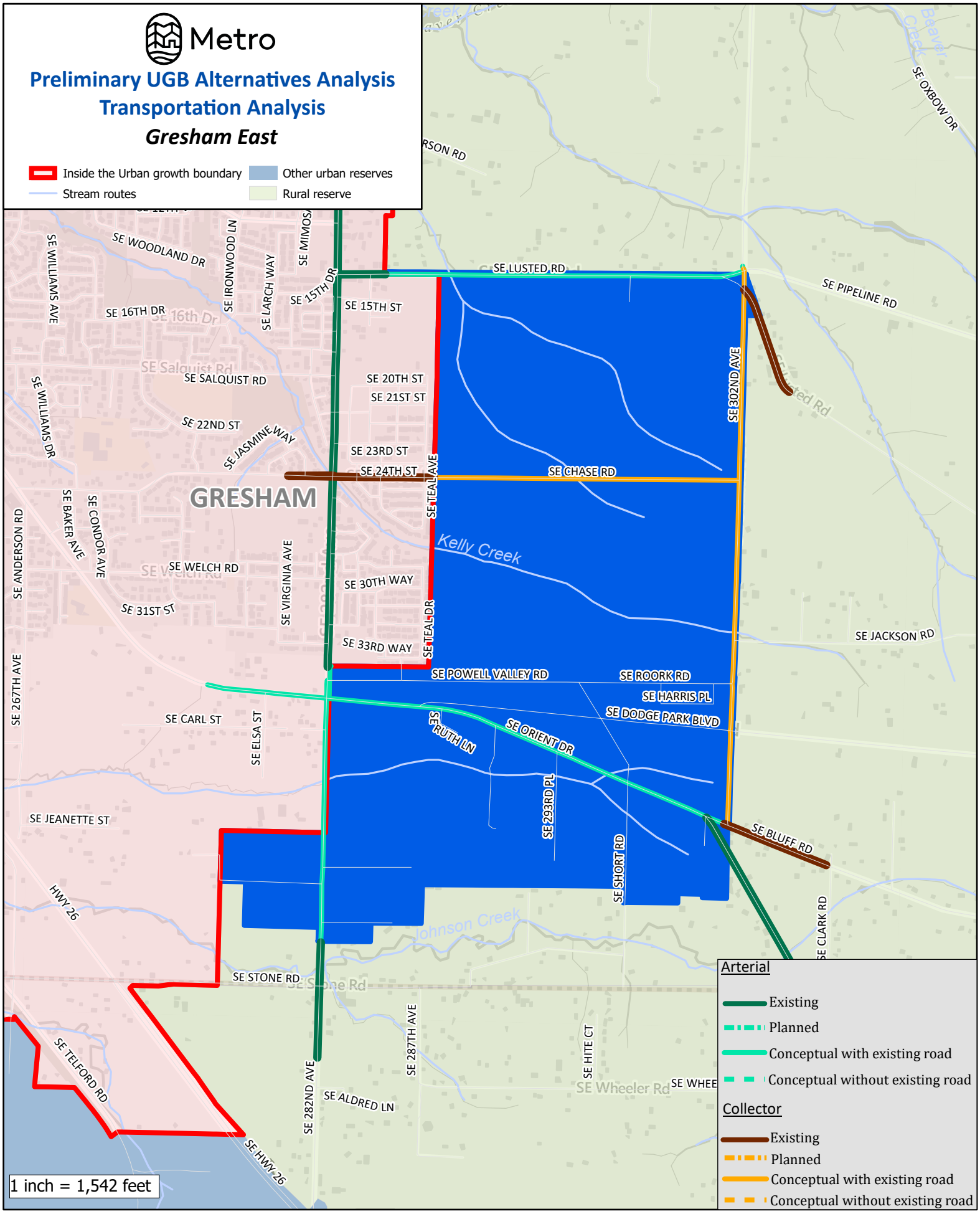

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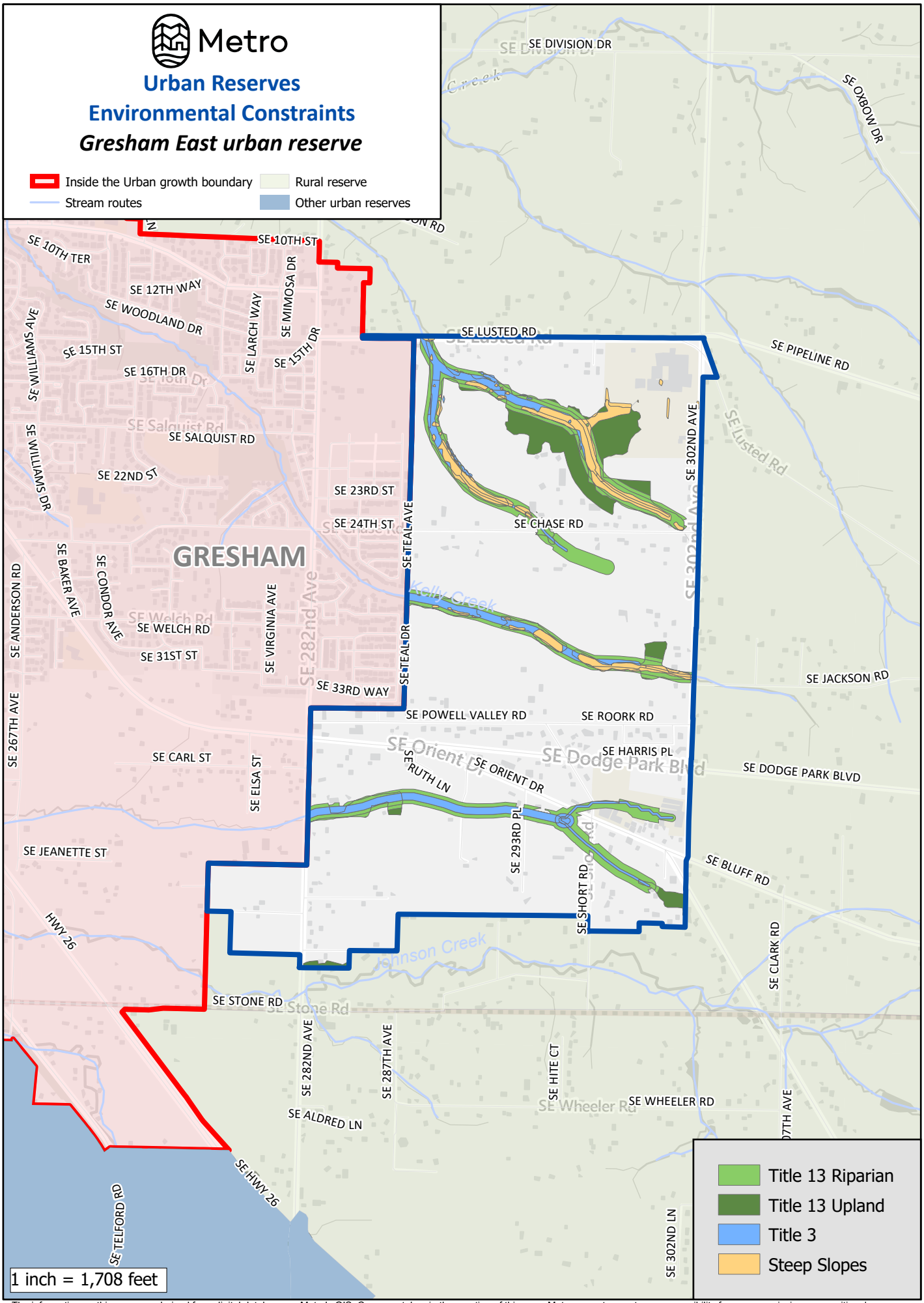

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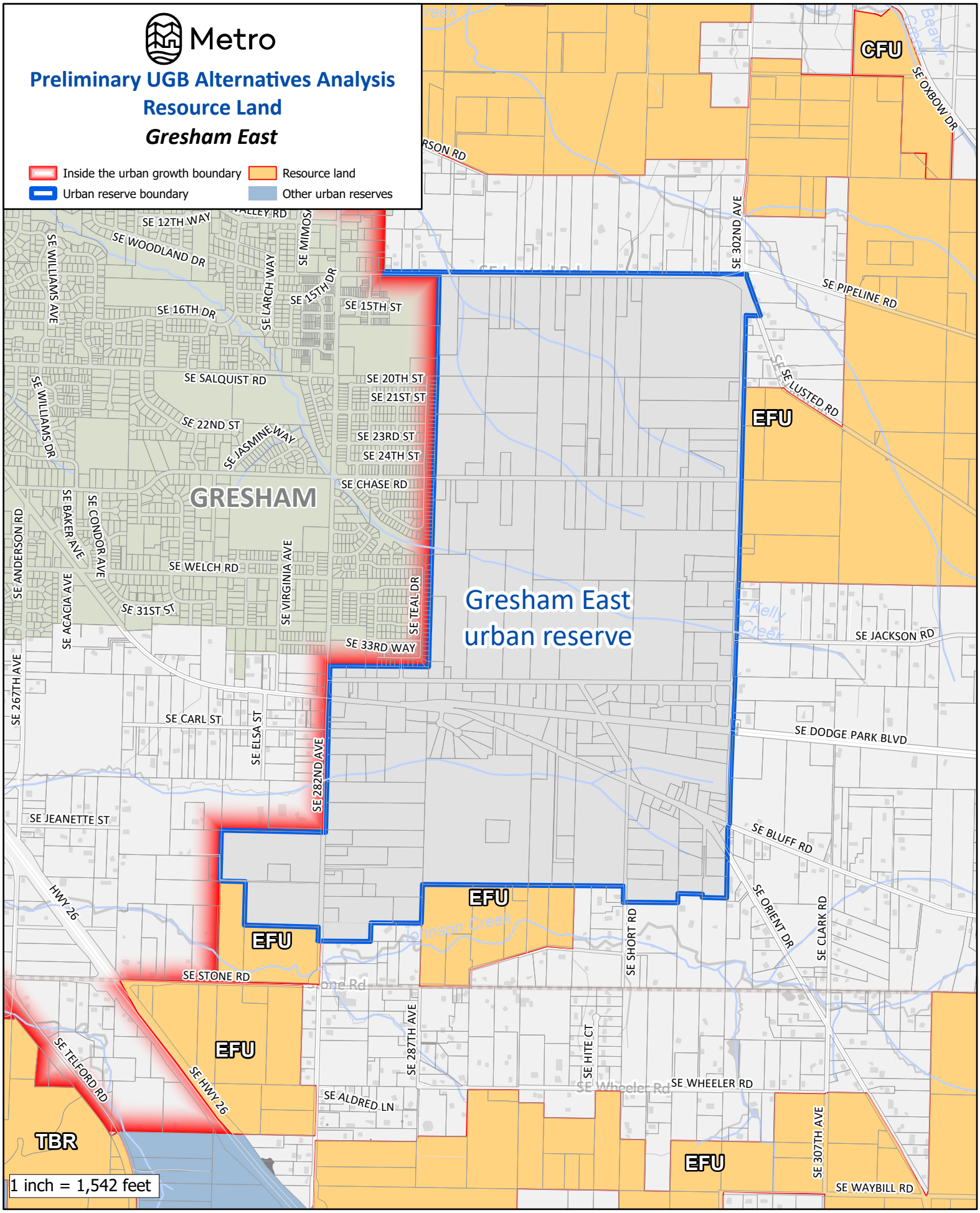

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HENRICI URBAN RESERVE

Total Reserve Area	422 acres
Total Tax Lot Area in Reserve (without Right-of-Way)	395 acres
Gross Vacant Buildable Area	301 acres
Net Vacant Buildable Area	**224 acres**

The Henrici Urban Reserve is a somewhat rectangularly shaped area adjacent to the southeast end of Oregon City. The reserve is bisected by S Henrici Road, S Beavercreek Road, and Highway 213, and its northern boundary is the UGB. The reserve is primarily flat, with the exception of its very western edge and its the northeast corner, areas which contain forested steep slopes above Beaver Creek and Thimble Creek, respectively.

GOAL 14 BOUNDARY LOCATION FACTORS

Factor 1: Efficient accommodation of identified land needs

The Henrici Urban Reserve is comprised of 354 tax lots, all of which are practically entirely within the reserve and have a combined area of approximately 395 acres. Roughly 75 percent of the reserve's tax lots are less than one acre in size; 14 are greater than five acres, and three are greater than 10 acres. As noted above, the entire reserve contains 301 gross vacant buildable acres and 224 net vacant buildable acres. The reserve is entirely contiguous, except for one 1.13-acre tax lot that is disconnected from the rest of the reserve and located west of Highway 213 near its intersection with Edgemont Drive.

According to aerial imagery, most of the reserve's tax lots are developed with rural residential land uses, though a few appear to have minor agricultural activities. There are also a few places of worship on tax lots totaling more than 20 acres, as well as water storage facilities owned by the City of Oregon City and Clackamas River Water (CRW) and, at the corner of S Henrici Road and Highway 213, a 0.81-acre tax lot owned by the State of Oregon. The Oregon City School District owns three tax lots totaling more than 16 acres in the vicinity of S Meadow Avenue and S Old Acres Lane. The Beavercreek Cooperative Telephone Company offices are located on a 2.5-acre tax lot along S Henrici Road and the El Paso Natural Gas Company owns a half-acre tax lot for one of its facilities at the corner of Highway 213 and S Henrici Road. Overall, 308 of the tax lots in the reserve have assessed improvements, with a median assessed value of those tax lots' improvements exceeding $279,000.

The reserve is served by Highway 213, but is approximately five miles from the nearest interstate, I-205. Clackamas Community College and Oregon City High School are less than a mile away, and the reserve is adjacent to the Oregon City Golf Club. The reserve is generally flat with only two locations of slopes greater than 25 percent located at the reserve's edges. While this topography might provide the opportunity for employment land uses, the large number of small parcels and existing residential and institutional development, as well as the reserve's distance from I-205, reduce the attractiveness of the area for new employment uses. The existing rural residential

development pattern and nearby school and recreational uses could be consistent with and support future residential development, and the school district's property within the reserve could provide a focal point for the neighborhood whenever developed with a new school use. Therefore, this area is able to accommodate a residential land need.

Factor 2: Orderly and economic provision of public facilities and services

Water Services

With regard to water services, the Henrici Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

The City of Oregon City serves lands within their corporate boundary, while lands within the jurisdiction of Clackamas County are served by Clackamas River Water (CRW). Both Oregon City and the CRW South System receive water from the South Fork Water Board (SFWB). SFWB's water treatment process includes flocculation, sedimentation, filtration, and chlorination of raw water from the Clackamas River to remove harmful bacteria. There are currently no known major treatment system deficiencies.

The city has annexed the Beavercreek UGB expansion area to the southwest. While the City is adequately served elsewhere, they may lack water storage necessary to fully serve urban development of these annexed areas. CRW is considered to have adequate capacity to serve lands still within the jurisdiction of Clackamas County in this vicinity and other customers; though the Beavercreek service area showed a storage deficiency of 0.31 MG in 2019 in the interim of building the new Beavercreek reservoir, it is anticipated to bring on sufficient storage. Under current conditions, there is a segment of distribution line identified with high head loss, indicating deficient pipe capacity. There are no known pumping deficiencies in the area.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

CRW has done planning for service to the area of the urban reserve, and the Henrici Urban Reserve is in CRW's service area. However, CRW will not likely be the service provider once the reserve is annexed to a city (i.e., Oregon City) and urbanized. Rather, when Oregon City annexes the reserve, the city will likely take ownership of any water related infrastructure within the area, except potentially for facilities that are needed to go beyond the annexed area, such as large-scale transmission lines. Accordingly, CRW, like many water service providers, may be cautious about investing in improvements for currently rural areas that may one day be annexed to cities. CRW is expected to build a new storage reservoir in the near future, which result in a storage surplus. Oregon City has plans to build reservoirs that could serve urban reserves, but no timeline is available at this time. While there is some surplus pumping capacity that could be

available to serve urban development of the reserve, once annexed to the city, that surplus may be insufficient and additional pumping facilities may be necessary. The distribution system may also continue to experience head loss challenges if not addressed.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

As noted above, new facilities for storage and pumping facilities will likely be needed to avoid system capacity deficits.

d. Estimated water service-related costs for reserve development

Water piping, pumping, and storage costs	Cost
10-inch pipe	$5.18 million
12-inch pipe	$0
16-inch pipe	$0
Pumping	$8.7 million
Storage	$0.3 million
Total:	**$14.18 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$3,162**

Sanitary Sewer Services

With regard to sanitary sewer services, the Henrici Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Oregon City provides sanitary sewer service to properties within its corporate limits, as well as to some properties that are already in the UGB but still in unincorporated Clackamas County. Wastewater flows to the Tri-City Sewer District (TCSD) trunks, interceptors, and, eventually, the Tri-City Water Resource Recovery Facility (WRRF), all of which are owned and operated by Water Environment Services (WES).

Some surcharging, ranging from minor to severe, exists throughout the existing City collection system. There are also known capacity deficiencies in several locations in the WES system. Two of the 12 existing pump stations (Settler's Point and Cook Street) have existing peak flows that exceed their firm capacity; however, there are no pump stations currently serving or needed to serve Pressure Zone B, which includes the area of the Henrici Urban Reserve.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Additional growth beyond the current UGB is going to challenge the existing sanitary sewer system due to the existing deficiencies and limited capacity of major treatment and conveyance facilities.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Development of the reserve is expected to contribute to further surcharging. Additional interceptor capacity could be required to serve urban development of the reserve in order to reduce potential adverse impacts to areas already inside the UGB.

d. Estimated sanitary sewer service-related costs for reserve development

Sanitary sewer piping and pumping costs	Cost
10-inch pipe	$5.12 million
12-inch pipe	$0
15-inch pipe	$0
Pump station	$0.54 million
Force mains	$0.21 million
Total:	**$5.87 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$1,308**

Stormwater Management Services

With regard to stormwater management services, the Henrici Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

While the City of Oregon City's 2019 Stormwater Master Plan identifies certain system issues related to flooding, infrastructure, maintenance, or natural channels, the Beaver Basin, which includes the area around the Henrici Urban Reserve, does not contain any existing stormwater infrastructure, as the topography allows for flows to go south away from city limits toward Beaver Creek, which then flows west and outfalls to the Willamette River. There are no known capacity deficiencies with this area's stormwater management system.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The system issues noted above could be exacerbated if future Henrici Urban Reserve development is connected to that system. However, capital improvement projects are planned for that existing system and stormwater from Henrici Urban Reserve

development would likely outfall directly to Beaver Creek and thus not impact that existing system infrastructure.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Stormwater will likely be detained and treated within the reserve and, based on topography, outfall directly to Beaver Creek; therefore, no impacts to the existing stormwater infrastructure in the UGB are anticipated.

d. Estimated stormwater service-related costs for reserve development

Stormwater piping and water quality/detention	Cost
18-inch pipe	$0.56 million
24-inch pipe	$0
30-inch pipe	$0
Water quality/dentition	$5.96 million
Total:	**$6.52 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$1,453**

Transportation Services

With regard to transportation services, the Henrici Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(e) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Figure 4.36 in Chapter 4 of the 2023 Regional Transportation Plan (RTP) displays 2020 home-based vehicle miles traveled (VMT) per capita by Metro transportation analysis zone, with average VMT per capita considered 11.32. According to Figure 4.36 in Chapter 4, areas in the UGB adjacent to the Henrici Urban Reserve had above average and significantly above average home-based VMT per capita in 2020.

Metro's adopted 2040 Growth Concept Map designates a regional center in the adjacent City of Oregon City. Regional centers are generally meant to: serve populations of hundreds of thousands of people; surround high-quality transit service and multi-modal street networks; and offer larger commercial uses, healthcare facilities, local government services, and public amenities. The Oregon City Regional Center aligns with the 2040 Growth Concept Map designation.

The City of Oregon City's plans for the Oregon City Regional Center include mixed-use development, enhancements to the main street, and the creation of new open spaces that will provide direct connections to the river. The regional center is also home to

Willamette Falls and the Willamette Falls Legacy Project, a public/private partnership working to connect the Falls to Downtown Oregon City through the development of housing, public spaces, habitat restoration, education, and employment opportunities. The regional center currently has a drug store, restaurants, and other retail commercial uses, banks, medical/dental facilities, community centers, government offices, and auto-oriented uses. Metro's 2017 State of the Centers Atlas showed less than 400 people living in the regional center, as well as a low population density (5.2 people per acre), low total employees, and low dwelling unit density compared with other regional centers; in fact, the average population of all regional centers in 2017 was more than 6,000 people and the average population density was 22.8 people per acre. The city's vision to attract more housing and employees to the regional center will elevate it to the activity spectrum levels comparable to other regional centers in the region.

There are also employment uses, including industrial uses, grocery stores, and other commercial uses, as well as education and medical facilities, government offices, and parks, closer to the reserve in the Red Soils area near the intersection of Beavercreek Road and Molalla Avenue and between Highway 213 and Beavercreek Road.

Growth in and near the regional center and other employment areas will not necessarily cause a significant increase in home-based VMT per capita in the future, as area residents will be able to access some daily needs and find employment opportunities with relatively short trips. The transit service and bike and pedestrian facilities that serve these areas, described further below, can also help to ensure that additional growth nearby does not adversely impact home-based VMT per capita.

Four TriMet bus lines serve Oregon City, all of which generally focus on the regional center and the central portion of the city along Molalla Avenue. Service is provided to Clackamas Community College and the employment areas near the intersection of Beavercreek Road and Molalla Avenue and between Highway 213 and Beavercreek Road; however, large portions of the city lack TriMet service. Figure 4.3 in Chapter of the 2023 RTP indicates that there are gaps in planned frequent regional transit service network along certain routes in the UGB near the reserve, including Beavercreek Road south of Glen Oak Road and S Meyers Road.

Oregon City has at least 29 miles of dedicated bike lanes and 3.5 miles of established bikeways, with most of them located in the "up-top" section (southern end) of the city. The Park Place neighborhood is also fairly well served and Highway 213 has dedicated bike lanes. Most of the downtown streets are classified as "bike with caution" streets and the South End neighborhood has minimal bike facilities. There are dedicated bike facilities along most of Beavercreek Road and Molalla Avenue, as well as on much of Glen Oak Road. Those existing bike facilities on Beavercreek Road, Molalla Avenue, S Meyers Road, South End Road, and others in the city are identified as part of the regional bike network on Figure 4.5 in Chapter 4 of the 2023 RTP. However, the figure also identifies a gap in the planned network along Glen Oak Road nearer to the reserve and areas closer to the regional center.

The regional center is well served by sidewalks, as are employment areas near the intersection of Beavercreek Road and Molalla Avenue and between Highway 213 and Beavercreek Road. Much of the residential areas in the UGB near to the reserve also have sidewalks, though some small adjacent pockets of residential development, such as along S Timbersky Way, do not currently have sidewalks. There some sections of Beavercreek Road in the UGB south of Meyers Road and north of Timbersky Way lack sidewalks. The gaps on Beavercreek Road are identified in Chapter 4, Figure 4.4 of the 2023 RTP as a gap in the planned regional pedestrian network. There are also gaps in the planned regional trail network in the UGB near the reserve, as indicated in Chapter 4, Figure 4.6 of the 2023 RTP.

Figure 4.14 in Chapter of the 2023 RTP identifies Molalla Avenue inside the UGB as a high injury corridor.

The sections of Highway 99E, Highway 213, and I-5 in Oregon City are identified as a throughways Chapter 4, Figure 4.7 of the 2023 RTP. Figure 4.8 of that chapter indicates that these highway sections currently meet travel speed reliability performance thresholds, with no more than four hours per day when travel speeds fall below the identified minimum speed. RTP models indicate this reliability will continue at least to the year 2045.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Highway 213, an RTP-designated throughway, crosses through the west end of the reserve. As noted above, the section of the highway in the city currently meets travel speed reliability performance thresholds and RTP models, which include the reserve, indicate this reliability will continue at least to the year 2045.

There is currently no TriMet bus service to the reserve. The nearest stop is for Route 32 on Glen Oak Road, roughly three-quarters of a mile north via Beavercreek Road from the reserve by Oregon City High School. Route 32 provides service to Clackamas Community College, as well as to near the intersection of Beavercreek Road and Molalla Avenue and between Highway 213 and Beavercreek Road.

Beavercreek Road and Highway 213 have dedicated bike lanes that extend to the reserve and connect to bike facilities on Glen Oak Road and to other areas of the city. There are no bike facilities on S Henrici Road.

As noted above, the residential areas already in the UGB adjacent to the reserve mostly have sidewalks. The sidewalks of these neighborhoods' local streets, such as those along Coquille Drive, Homesteader Drive, and Woodglen Way, generally stop at the edge of the UGB and do no extend into the reserve, even if the streets themselves extend into the reserve. Therefore, urban development of the reserve may warrant sidewalk installations, even along existing roadways. Beavercreek Road does not have sidewalks where it connects to the reserve; however, there are painted pedestrian crossings at the intersection of Beavercreek Road and Henrici Road. The portion of Highway 213 that is

closest to the reserve does have sidewalks, but there is a significant gap between Conway Drive and Meyers Road, where the trails at Clackamas Community College connect to Highway 213.

It was noted in response to Factor 1 that the reserve is not likely to be able to efficiently accommodate an employment land need, but could support a residential land need. With the reserve being moderately close to Oregon City High School, Clackamas Community College, and employment areas where future residents of the reserve could meet some of their daily needs and find employment opportunities, future residents' private motor vehicle trips may not be significant. Existing bike facilities connected to the reserve could also provide transportation alternatives.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Beavercreek Road, Henrici Road, Highway 213, and Homesteader Drive would be expected to see additional private vehicle traffic from development of the reserve. Existing bike and pedestrian facilities nearby would also be expected to see additional use.

With the lack of direct transit service and complete sidewalks connecting to the reserve, future residents will likely rely primarily on private motor vehicle transportation to access their daily needs and employment opportunities. However, the moderate proximity of educational and employment uses, including commercial uses, and the existing bike facilities connecting to the reserve could help to limit any major increase in home-based VMT per capita. Development of the reserve is also not expected to jeopardize this highway's throughway reliability. Any additional motor vehicle traffic on Molalla Avenue resulting from development of the reserve, however, may exacerbate its high-crash conditions.

d. Need for major transportation facility improvements and associated costs

A roughly quarter-mile-long portion of Highway 213, a one-third-mile-long portion of S Beavercreek Road, and a 1.56-mile-long portion of S Henrici Road, all of which pass through the reserve, will likely need to be improved to urban arterial standards, including with acquisition of additional right-of-way. A 0.13-mile-long portion of S Meadow Avenue at the southeast of the reserve will likely need to be improved to urban collector standards, and four new collector road sections, with a combined length of just over one mile will also likely be needed to provide necessary street connectivity to urban development of the reserve.

Facilities	Cost
Arterials, existing/improved full street	$113.45 million
Arterials, existing/improved half street	$0
Arterials, new	$0
Collectors, existing/improved full street	$3.78 million
Collectors, existing/improved half street	$0
Collectors, new	$37.29 million
Total:	**$154.52 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$34,468**

e. Provision of public transit service

TriMet evaluated the reserve for providing transit service. TriMet could provide services to the reserve, although there is no guarantee of service. Actual service depends on the level of development in the reserve and in the corridors leading to it. Service could be provided at 30-minute headways for all day service, seven days a week, by extending Route 31 with two additional zero-emission buses at a capital cost of $1,500,000 - $2,000,000 (recurs every 12 years). The additional annual service cost is $798,720 and grows with inflation each year.

Prior to land being included in the UGB, a more detailed concept plan, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11, will be required. This concept plan process will develop more refined public facility and service needs and cost estimates.

Factor 3: Comparative environmental, social, energy, and economic consequences

Environmental consequences

A 1,100-foot section of Thimble Creek flows north through the northeast corner of the Henrici Urban Reserve. This stream segment is located at the base of a forested slope, some 100 feet below the rural residential subdivision on S Danny Court. Due to development constraints related to steep slopes and the already developed nature of these narrow and deep subdivision lots, this section of Thimble Creek will not likely be impacted by new urban development of the reserve. Significant upland habitat has been identified on the forested hillsides that run down to Thimble Creek. The steep slopes in this area would limit the amount of the residential development that can occur, thereby providing some protections to the upland habitat.

A second stream flows west through some cleared land and the rural residential subdivision centered on S Wilshire Circle for approximately 2,600 feet, ultimately joining Beaver Creek outside of the reserve. The 750-foot section of the stream that meanders through the middle of cleared land west of the rural subdivision is susceptible to impacts from future development, depending on design and roadway connections. The stream segment that is

east of the rural subdivision is located on the Evangelical Lutheran Church property and is less susceptible to future impacts as the property is developed. The remaining portion of the stream flows through backyards of developed home sites and would most likely not be further impacted by urbanization of the reserve. In addition, portions of this segment have already been channelized or possibly piped. Riparian habitat is only identified along the western open land section and required restoration of the riparian corridor would occur as the result of urbanization.

A third stream segment is located in the western portion of the reserve, east and west of S Highway 213. The stream flows through a forested section of land on the north side of S Henrici Road for approximately 650 feet and appears to drain into the State-owned water retention facility that is located at the intersection of S Henrici Road and S Highway 213. The stream then resurfaces on the west side of S Highway 213 and flows 580 feet through cleared land to the end of the reserve boundary, ultimately joining Beaver Creek. Both of these stream segments have identified riparian and upland habitat and could be susceptible to limited impacts from urbanization, depending on the development pattern and new street connections. Increased natural resource protection that comes with inclusion in the UGB will help reduce the overall impacts, however. There are no inventoried wetlands within the reserve.

This analysis finds that urbanization of the reserve could occur with comparatively minimal impacts to the stream corridors and the riparian and upland habitat areas. Additional environmental consideration, specifically regarding avoidance of conflict between urban development and regionally significant fish and wildlife habitat, is provided in the Metro Code Factors Analysis (Appendix 7A).

Considering the comparative environmental consequences of urbanization, the Henrici Urban Reserve is given a “high” score in Attachment 3 for this Goal 14 boundary location sub-factor.

Social, energy, and economic consequences

The Henrici Urban Reserve already has numerous rural residences on smaller tax lots, as well as platted subdivisions, some of which are extensions of subdivisions in adjacent areas of the UGB. There are also larger places of worship, utility facilities, and major roadways in and near the reserve. Furthermore, the reserve is in relatively close proximity to urban employment areas. Therefore, urbanization of the reserve is not expected to cause a significant change in sense of place or degradation of rural lifestyle for existing residents of the reserve. Existing levels of development and parcelization could also slow the process of urbanization and mean that change comes to the area more gradually over time.

As detailed more fully in response to Factor 2, future residents of the reserve may be fairly reliant on private motor vehicle transportation. However, the proximity of a variety or urban land uses and modes of transportation could help limit significant increases in VMT and, therefore, related energy impacts from urbanization of this reserve.

There is minimal commercial agriculture occurring within the reserve and the economic consequences of a loss in farming activity in the reserve may be outweighed by the economic benefits of residential development.

Overall, there would be comparatively low social, energy, and economic consequences from urbanization of this reserve. The Henrici Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location sub-factor.

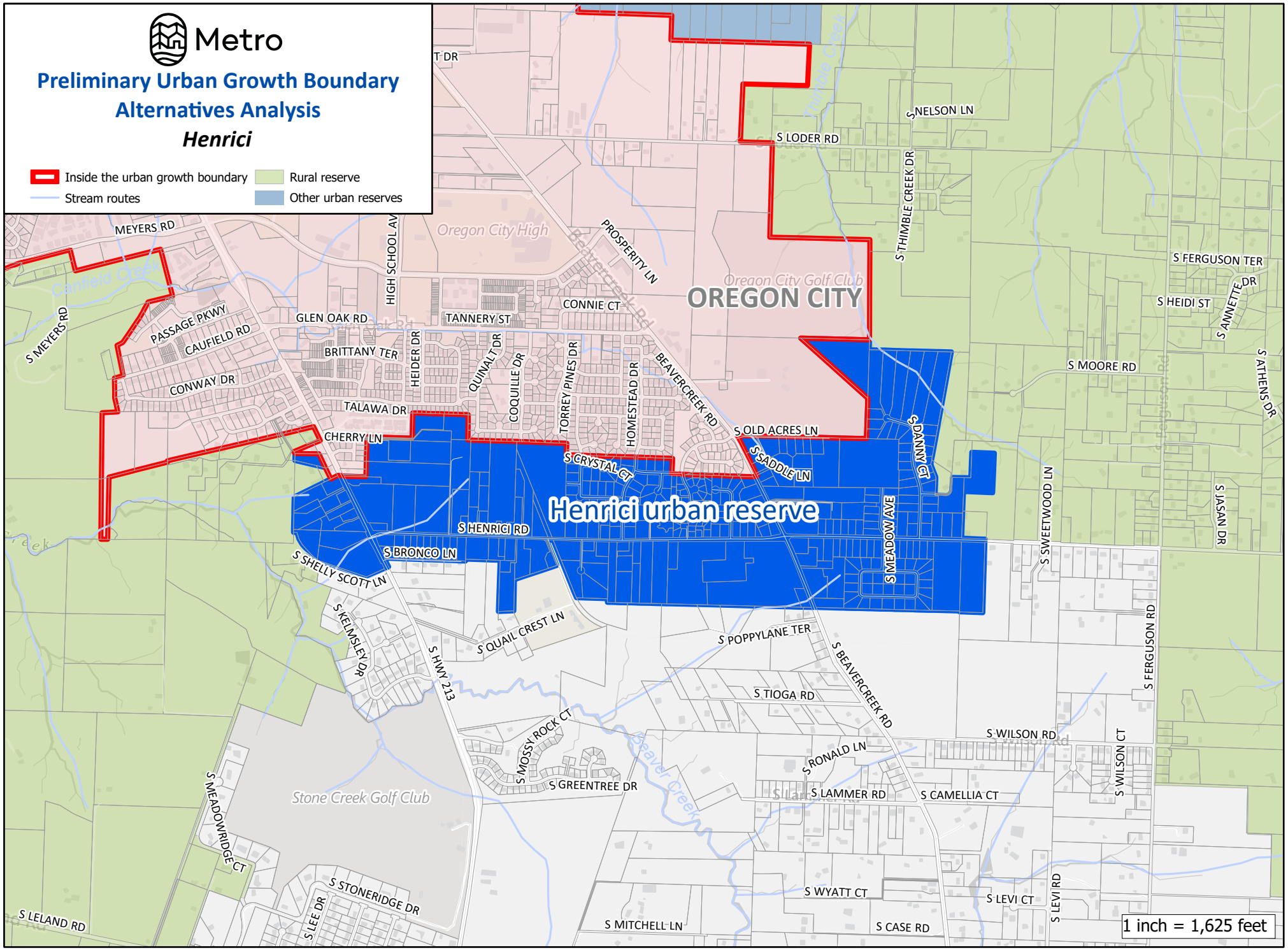
Factor 4: Compatibility of the proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

There are two locations where lands outside the UGB but contiguous to the Henrici Urban Reserve have Goal 3 or 4 resource land zoning for agricultural and forest activities.

The first location consists of one tax lot at the northeast corner of the reserve, north of S Danny Court. This 27-acre tax lot, zoned Timber (TBR) by Clackamas County, is on the opposite side of Thimble Creek from the reserve. It is forested, but does not have agricultural activities and is accessed via S Thimble Creek Drive, rather than via the reserve lands. It is also under the same ownership as an adjacent tax lot with residential uses. Contiguous tax lots inside the reserve are already developed with little to no additional development expected due to the steep slope that runs down to Thimble Creek. Therefore, the proposed urban use (i.e., urban development of the reserve) are not expected impact agricultural or forest activities that occur on this adjacent forest land outside the UGB to the northeast of the reserve.

The second location is along the western edge of the reserve, west of S Highway 213, where the reserve is adjacent to two tax lots that are also zoned TBR. While both have forested portions, neither appears to have agricultural uses. Both tax lots have residential uses and one has powerlines. Neither of the two tax lots are currently accessed by roads going through the reserve itself. The land in these reserves slopes downward away from the reserve toward Beaver Creek, so any future development of the reserve would be at the top of a hill, away from agricultural and timber activities below. The likelihood of timber harvesting on these tax lots is small, given the residences, streamside protection requirements along Beaver Creek, and powerlines. Therefore, the proposed urban uses (i.e., urban development of the reserve) would be considered compatible with nearby agricultural and forest activities in this location.

This analysis finds that the proposed urban uses (i.e., urban development of the reserve) would have high compatibility with the nearby agricultural and forest activities occurring on farm and forest land. The Henrici Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location factor.



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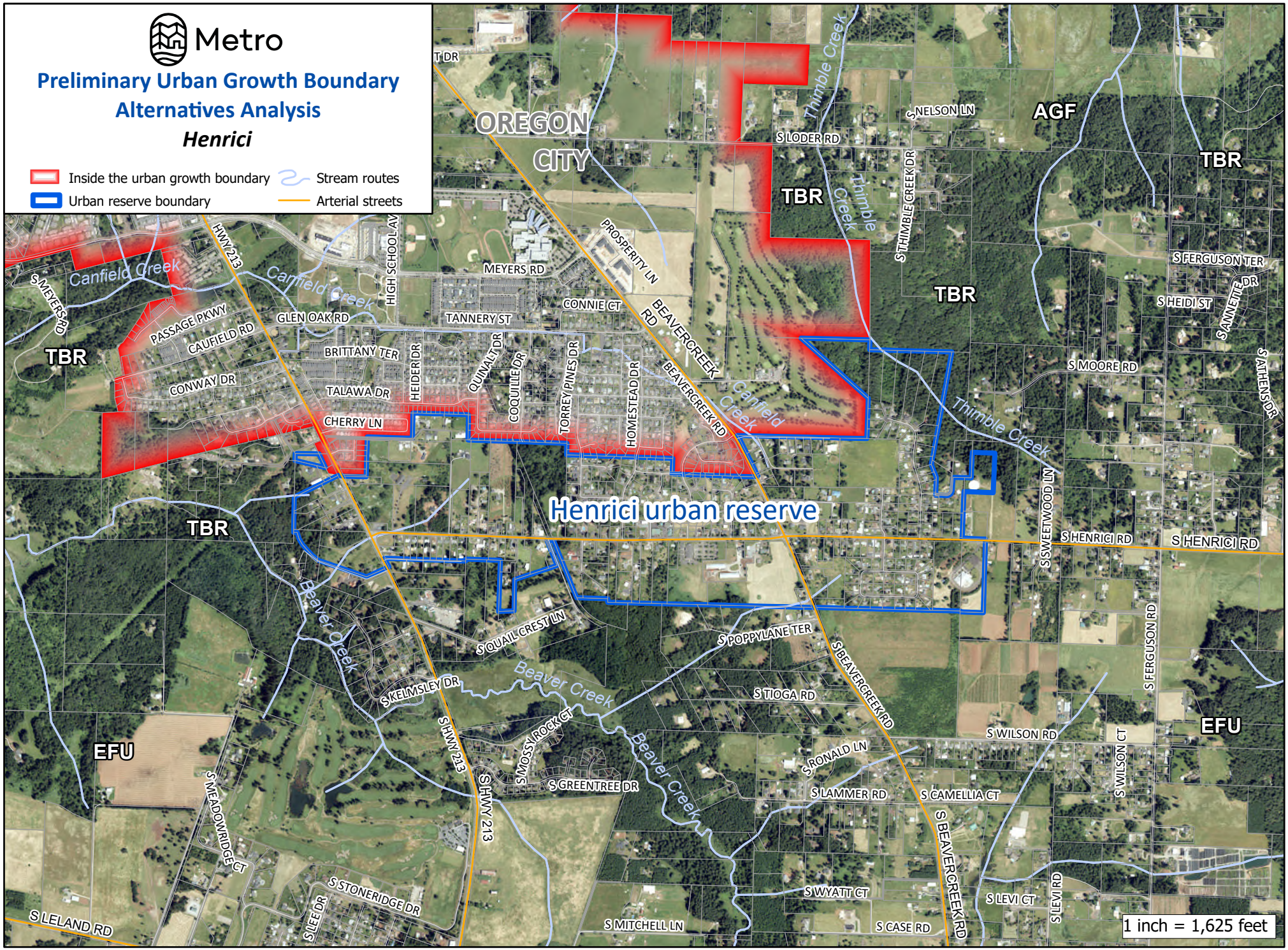

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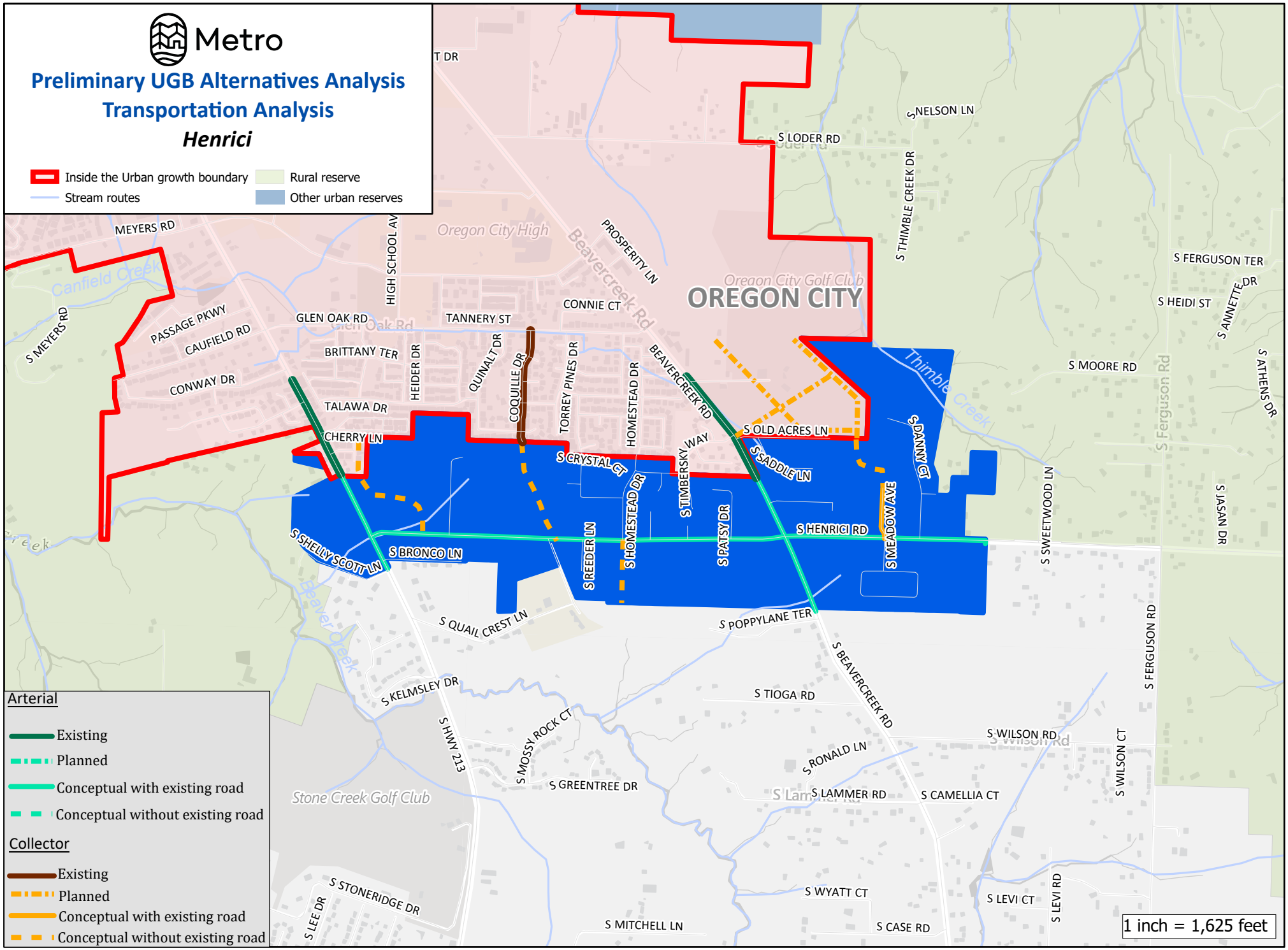

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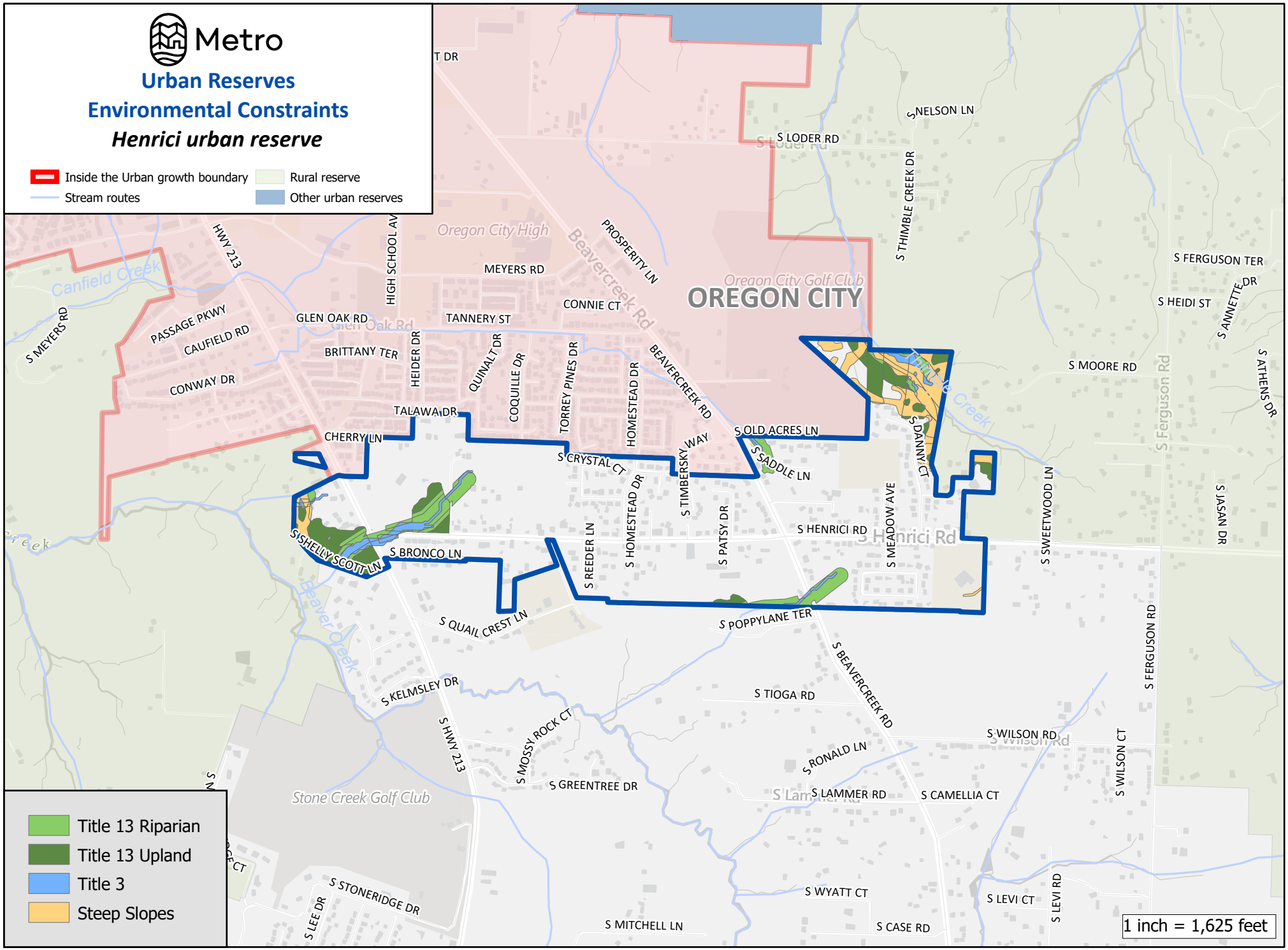

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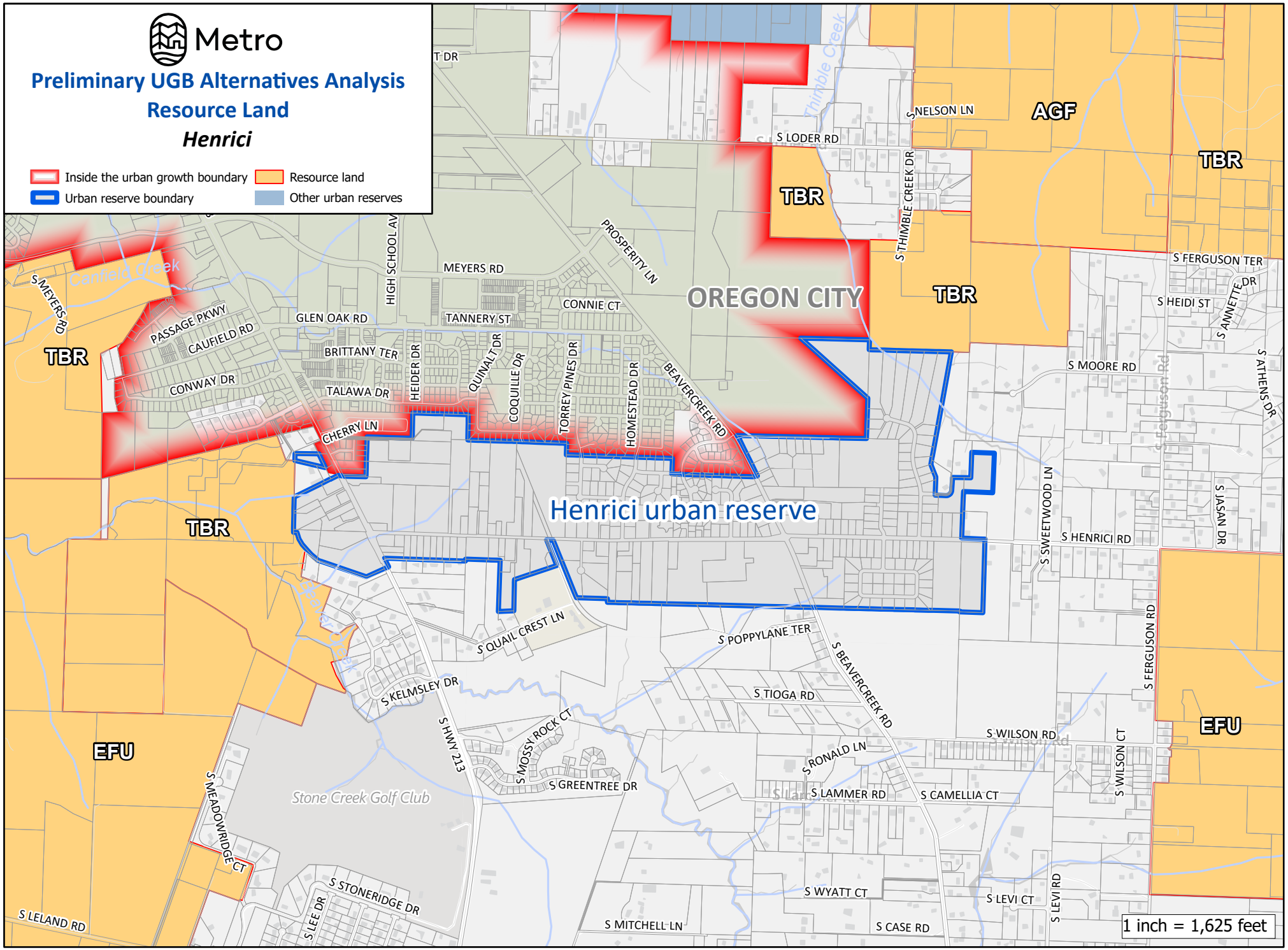

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HOLCOMB URBAN RESERVE

Total Reserve Area	321 acres
Total Tax Lot Area in Reserve (without Right-of-Way)	314 acres
Gross Vacant Buildable Area	215 acres
Net Vacant Buildable Area	**160 acres**

The Holcomb Urban Reserve is an irregularly shaped area adjacent to the east side of Oregon City. Its northern end is bisected by S Holcomb Boulevard. The northern end is also served by S Stoltz Road and S Hilltop Road, while its southern end is connected to S Kraeft Road. The reserve has a mix of forested tax lots, very minor agricultural activities, and rural residential development. The area north of S Holcomb Boulevard is generally flat and represents the high point, with the remainder dropping by about 350 feet in elevation from S Holcomb Boulevard down to the southern edge of the reserve. A tributary of Holcomb Creek flows south through the lower portion of the reserve, joining the creek south of S Redland Road.

GOAL 14 BOUNDARY LOCATION FACTORS

Factor 1: Efficient accommodation of identified land needs

The Holcomb Urban Reserve is comprised of 99 contiguous tax lots, which have a combined area of approximately 314 acres. All but four tax lots are entirely within the reserve. The portions of the reserves' tax lots that are in the reserve range in size from roughly a third of an acre to nearly 44 acres. Approximately 80 percent of the tax lots have area within the reserve equaling five acres or less in size; roughly half have portions in the reserve smaller than two acres and only two tax lots have portions in the reserve greater than 20 acres. As noted above, the entire reserve contains 215 gross vacant buildable acres and 160 net vacant buildable acres.

According to aerial imagery, the reserve is mainly composed of rural residential development and groves of trees, with some agricultural activity on the largest tax lots. Holcomb Outlook Water owns a nearly one-acre property with a water storage facility at the high point of the urban reserve, north of S Holcomb Boulevard. Clackamas County owns one 0.36-acre tax lot off of S Kraeft Road that may primarily serve as an access way for other adjacent developed properties. Overall, 91 of the 99 tax lots in the reserve have improvements, with a median assessed value of those tax lots' improvements exceeding $360,000.

The reserve is bisected by S Holcomb Boulevard. Several local roads within the UGB stub to the reserve, including S Barlow Drive, Jada Way, and S Wright Flyer Lane. The nearest interstate, I-205, is approximately two miles away. Upper Holcomb Creek Natural Area is only a third of a mile "as the crow flies" from the north end of the reserve, but not directly accessible to it. Holcomb Elementary School is less than a mile away via S Holcomb Boulevard. Tumwata Middle School is approximately 1.25 miles away via S Kraeft Road, S Redland Road, S Holy Lane, and S Donovan Road.

The portion of the reserve north of S Holcomb Boulevard contains the most flat and unconstrained land and is the high point of the area. This topography could accommodate both residential and employment uses; however, employment uses in this location would not be practical due to the somewhat isolated nature of the area up on the hill. There is also currently only one two-lane access point along S Holcomb Boulevard through an existing urban residential area and the reserve is relatively far from existing employment centers of Oregon City and I-205. A significant portion of the land south of S Holcomb Boulevard has slopes greater than 10 percent that would limit development opportunities for employment uses. Considering these conditions, the proximity of schools, and the fact that half of the tax lots are smaller than two acres, this area is best suited to accommodate residential land needs.

Factor 2: Orderly and economic provision of public facilities and services

Water Services

With regard to water services, the Holcomb Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

The City of Oregon City serves lands within their corporate boundary, while lands within the jurisdiction of Clackamas County are served by Clackamas River Water (CRW). Both Oregon City and the CRW South System receive water from the South Fork Water Board (SFWB). SFWB's water treatment process includes flocculation, sedimentation, filtration, and chlorination of raw water from the Clackamas River to remove harmful bacteria. There are currently no known major treatment system deficiencies.

The city has annexed the Beavercreek UGB expansion area to the southwest. While the city is adequately served elsewhere, they may lack water storage necessary to fully serve urban development of these annexed areas. CRW is considered to have adequate storage and pumping capacity to serve lands still within the jurisdiction of Clackamas County in the vicinity of Holcomb Urban Reserve and other customers.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

CRW has done planning for service to the area of the urban reserve, and the Holcomb Urban Reserve is in CRW's service area. However, CRW will not likely be the service provider once the reserve is annexed to a city (i.e., Oregon City) and urbanized. Rather, when Oregon City annexes the reserve, the city will likely take ownership of any water related infrastructure within the area, except potentially for facilities that are needed to go beyond the annexed area, such as large-scale transmission lines. Accordingly, CRW, like many water service providers, may be cautious about investing in improvements for currently rural areas that may one day be annexed to cities. Under CRW's future (2038) projections, there is a storage capacity surplus of 0.59 MG in their Redland

Service Area, and a slight storage capacity deficit of 0.02 MG in their Holcomb Service Area. CRW's 2038 projections show a pumping capacity surplus of 301 GPM in their Redland Service Area, and a pumping capacity deficit of 619 GPM in their Holcomb Service Area. Therefore, additional pumping capacity may be needed to accommodate future growth in the area of the Holcomb Urban Reserve. Oregon City has plans to build reservoirs that could serve urban reserves, but no timeline information is available at this time.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

As noted above, new facilities for storage and pumping may be needed to avoid system capacity deficits.

d. Estimated water service-related costs for reserve development

Water piping, pumping, and storage costs	Cost
10-inch pipe	$5.06 million
12-inch pipe	$0
15-inch pipe	$0
Pumping	$6.38 million
Storage	$0.22 million
Total:	**$11.66 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$3,640**

Sanitary Sewer Services

With regard to sanitary sewer services, the Holcomb Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Oregon City provides sanitary sewer service to properties within its corporate limits, as well as to some properties that are already in the UGB but still in unincorporated Clackamas County. Wastewater flows to the Tri-City Sewer District (TCSD) trunks, interceptors, and, eventually, the Tri-City Water Resource Recovery Facility (WRRF), all of which are owned and operated by Water Environment Services (WES). Both the Oregon City Master Plan and the WES Master Plan identify segments of the conveyance system that are predicted to surcharge or flood during the design storm event. The Country Village Interceptor in Redland Road, however, does not appear to have any predicted surcharging or flooding under existing conditions, which indicates it has sufficient capacity to serve areas already inside the UGB near the Holcomb Urban Reserve. Moreover, Oregon City's Infrastructure Master Plan includes planned

improvements and funding necessary to support expected growth within the existing UGB.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The Country Village Interceptor in Redland Road does not extend far enough to serve the Holcomb Urban Reserve, but the City of Oregon City Master Plan includes a capital improvement project to extend this interceptor east, far enough to serve the reserve. The area immediately west of Holcomb is currently undeveloped and identified in Oregon City Master Plan as the Park Place Concept Area; it is not clear whether the proposed Country Village Interceptor extension is sized with enough capacity to serve both the Park Place Concept Area and Holcomb Urban Reserve and increased capacity may be necessary. There are no pump stations required downstream of the reserve. Development in the reserve is nonetheless expected to require major infrastructure improvements and investments, in part due to topography.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Additional capacity of the Country Village Interceptor could be required in order to serve urban development of the Holcomb Urban Reserve while reducing impacts to areas already inside the UGB. System improvements could require major construction in landslide-prone areas.

d. Estimated sanitary sewer service-related costs for reserve development

Sanitary sewer piping and pumping costs	Cost
10-inch pipe	$2.97 million
12-inch pipe	$1.26 million
21-inch pipe	$1.62 million
Pump station	$0
Force mains	$0
Total:	**$5.85 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$1,825**

Stormwater Management Services

With regard to stormwater management services, the Holcomb Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

The Oregon City Stormwater Master Plan identifies capacity issues within the modeled basins. Two of the modeled basins were determined to contain the most problem areas:

the John Adams Basin is described as generally undersized, and the South End Basin was described as an inefficient system with flooding during the two-year storm event. Capital improvement projects to address capacity issues described above are presented in the Master Plan.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Stormwater will be conveyed, treated, and disposed of within the reserve (i.e., outfall to Holcomb Creek, which flows to Abernethy Creek); therefore, it is not anticipated that existing stormwater facilities would be utilized. Stormwater will nonetheless be complex, given this reserve's infrastructure would be at the upstream edge of the surrounding basins, but stormwater is expected to be manageable.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

As noted above, stormwater will likely be detained and treated within the reserve and, based on topography, outfall directly to Holcomb Creek; therefore, no impacts to the existing stormwater infrastructure in the UGB are anticipated.

d. Estimated stormwater service-related costs for reserve development

Stormwater piping and water quality/detention	Cost
18-inch pipe	$2.8 million
24-inch pipe	$1.7 million
30-inch pipe	$0
Water quality/dentition	$2.96 million
Total:	**$7.46 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$2,330**

Transportation Services

With regard to transportation services, the Holcomb Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(e) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Figure 4.36 in Chapter 4 of the 2023 Regional Transportation Plan (RTP) displays 2020 home-based vehicle miles traveled (VMT) per capita by Metro transportation analysis zone, with average VMT per capita considered 11.32. According to Figure 4.36 in Chapter 4, areas in the UGB adjacent to the Holcomb Urban Reserve had above average and significantly above average home-based VMT per capita in 2020.

Metro's adopted 2040 Growth Concept Map designates a regional center in the adjacent City of Oregon City. Regional centers are generally meant to: serve populations of hundreds of thousands of people; surround high-quality transit service and multi-modal street networks; and offer larger commercial uses, healthcare facilities, local government services, and public amenities. The Oregon City Regional Center aligns with the 2040 Growth Concept Map designation.

The City of Oregon City's plans for the Oregon City Regional Center include mixed-use development, enhancements to the main street, and the creation of new open spaces that will provide direct connections to the river. The regional center is also home to Willamette Falls and the Willamette Falls Legacy Project, a public/private partnership working to connect the Falls to Downtown Oregon City through the development of housing, public spaces, habitat restoration, education, and employment opportunities. The regional center currently has a drug store, restaurants, and other retail commercial uses, banks, medical/dental facilities, community centers, government offices, and auto-oriented uses. Metro's 2017 State of the Centers Atlas showed less than 400 people living in the regional center, as well as a low population density (5.2 people per acre), low total employees, and low dwelling unit density compared with other regional centers; in fact, the average population of all regional centers in 2017 was more than 6,000 people and the average population density was 22.8 people per acre. The city's vision to attract more housing and employees to the regional center will elevate it to the activity spectrum levels comparable to other regional centers in the region.

There are also employment uses, including industrial uses, grocery stores, and other commercial uses, as well as education and medical facilities, government offices, and parks in the Red Soils area near the intersection of Beavercreek Road and Molalla Avenue and between Highway 213 and Beavercreek Road.

Growth in and near the regional center and other employment areas will not necessarily cause a significant increase in home-based VMT per capita in the future, as area residents will be able to access some daily needs and find employment opportunities with relatively short trips. The transit service and bike and pedestrian facilities that serve these areas, described further below, can also help to ensure that additional growth nearby does not adversely impact home-based VMT per capita.

Four TriMet bus lines serve Oregon City, all of which generally focus on the regional center and the central portion of the city along Molalla Avenue. Service is provided to Clackamas Community College and the employment areas near the intersection of Beavercreek Road and Molalla Avenue and between Highway 213 and Beavercreek Road; however, large portions of the city lack TriMet service. Route 154 provides service along Abernethy Road and Holcomb Boulevard between the regional center and up to about S Longview Way. Some of this existing route is identified as part of the frequent regional transit network in Chapter 4, Figure 4.3 of the 2023 RTP, though there are also gaps in planned frequent transit service along certain routes in the UGB near the reserve and elsewhere in the city as well.

Oregon City has at least 29 miles of dedicated bike lanes and 3.5 miles of established bikeways, with most of them located in the "up-top" section (southern end) of the city. The Park Place neighborhood is also fairly well served, and Highway 213 has dedicated bike lanes. Most of the downtown streets are classified as "bike with caution" streets and the South End neighborhood has minimal bike facilities. There are dedicated bike facilities along most of Beavercreek Road and Molalla Avenue, as well as on much of Front Avenue, Holcomb Boulevard, S Redland Road, and Swan Avenue nearer to the reserve. Those existing bike facilities on Beavercreek Road, Holcomb Boulevard, Molalla Avenue, and S Redland Road are identified as part of the regional bike network on Figure 4.5 in Chapter 4 of the 2023 RTP. However, the figure also identifies a gap in the planned network along S Holly Lane nearer to the reserve and areas closer to the regional center.

The regional center is well served by sidewalks, as are employment areas near the intersection of Beavercreek Road and Molalla Avenue and between Highway 213 and Beavercreek Road. Much of the residential areas in the UGB adjacent to the reserve also have sidewalks. Holcomb Boulevard has sidewalks on at least one side most of the way from the inner edge of the UGB to the intersection of Abernethy Road and S Redland Road, though there are some sections without sidewalks. Chapter 4, Figure 4.4 of the 2023 RTP identifies gaps in the planned regional pedestrian network along Holcomb Boulevard and S Redland Road. There are also gaps in the planned regional trail network in the UGB near the reserve, as indicated in Chapter 4, Figure 4.6 of the 2023 RTP.

Figure 4.14 in Chapter of the 2023 RTP identifies Molalla Avenue inside the UGB as a high injury corridor.

The sections of Highway 99E, Highway 213, and I-5 in Oregon City are identified as a throughways Chapter 4, Figure 4.7 of the 2023 RTP. Figure 4.8 of that chapter indicates that these highway sections currently meet travel speed reliability performance thresholds, with no more than four hours per day when travel speeds fall below the identified minimum speed. RTP models indicate this reliability will continue at least to the year 2045.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Highway 213 is the nearest RTP-designated throughway to the reserve, but is nearly two miles away. As noted above, the section of the highway in the city currently meets travel speed reliability performance thresholds. Considering the distance of the reserve to this highway and RTP reliability forecasts, development of the reserve is not expected to jeopardize the throughway reliability of the highway.

There is currently no TriMet bus service all of the way to the reserve. The nearest stop is for Route 154 just off Holcomb Boulevard, roughly three-quarters of a mile west of the north end of the reserve. There is no transit service near the south end of the reserve.

The adjacent residential subdivisions within the city that are north of Holcomb Boulevard have sidewalks that stub to the northwest of the reserve. Portions of Holcomb Boulevard also have sidewalks, including S Barlow Drive, Jada Way, and S Wright Flyer Lane, but there are gaps along Holcomb Boulevard and the southern end of the reserve is not connected to existing sidewalks. Sidewalks are lacking in the reserve itself. There are no trails that serve or connect to the reserve, either.

It was noted in response to Factor 1 that the reserve is not likely to be able to efficiently accommodate an employment land need, but could support a residential land need. The regional center is approximately two miles from the reserve via S Holcomb Boulevard and, as noted above, not fully connected to the reserve by transit, bike facilities, or pedestrian facilities. The employment uses along Beavercreek Road, Highway 213, and Molalla Avenue are even further away. It is therefore likely that future residents of the reserve would be particularly reliant on private motor vehicle transportation.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Holcomb Boulevard, S Kraeft Road, and S Redland Road would be expected to see additional private vehicle traffic from development of the reserve. Existing bike and pedestrian facilities nearby would also be expected to see additional use.

With the lack of direct transit service and complete bike facilities and sidewalks connecting to the reserve, future residents will likely rely primarily on private motor vehicle transportation to access their daily needs and employment opportunities more than two miles away, potentially impacting home-based VMT per capita. Development of the reserve is, however, not expected to jeopardize Highway 213's throughway reliability or necessarily cause additional motor vehicle traffic on Molalla Avenue that exacerbates its high-crash conditions.

d. Need for major transportation facility improvements and associated costs

To accommodate urban development, a 0.4-mile section of S Holcomb Boulevard would likely need to be improved to urban arterial standards, including acquisition of additional right-of-way. S Edenwild Lane and S Kraeft Road, which currently are private streets, would also likely need to become public streets and improved to urban collector standards with a combined length of slightly more than half a mile. It is assumed that a 0.32-mile section of S Hilltop Road will need to be improved to urban collector standards, with acquisition of additional right-of-way, and three new collectors with a combined length of about 1.09 miles would be needed to provide necessary street connectivity. An approximately 0.07-mile section of one of the new collectors is expected to have higher per-mile costs because of a stream crossing.

Facilities	Cost
Arterials, existing/improved full street	$19.32 million
Arterials, existing/improved half street	$0
Arterials, new	$0
Collectors, existing/improved full street	$9.66 million
Collectors, existing/improved half street	$0
Collectors, new	$67.94 million
Total:	**$96.92 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$30,259**

e. Provision of public transit service

TriMet evaluated the reserve for providing transit service. TriMet could provide services to the reserve, although there is no guarantee of service. Actual service depends on the level of development in the reserve and in the corridors leading to it. Potential service could be provided at 30-minute headways for weekdays, and 60-minute headways on weekends, by extending an existing route after "Forward Together 2.0" improvements are implemented, with no additional cost.

Prior to land being included in the UGB, a more detailed concept plan, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11, will be required. This concept plan process will develop more refined public facility and service needs and cost estimates.

Factor 3: Comparative environmental, social, energy, and economic consequences

Environmental consequences

A tributary to Holcomb Creek flows south through the southern portion of the Holcomb Urban Reserve for just shy of half a mile, mostly through an intact riparian habitat corridor. The stream is located in a fairly steep portion of the reserve where most of the slopes are greater than 25 percent, limiting potential development near the stream. There are some significant locations of riparian and upland habitat identified in the southern portion of the reserve, although most of it is also located on slopes greater than 25 percent, which would limit the amount of urbanization that could occur and thereby limit adverse impacts of urbanization.

This analysis finds that urbanization of the reserve could occur with comparatively minimal impacts to the stream corridor and most of the upland habitat areas due to topography that limits development opportunities. Future east-west transportation connections in this southern area, however, could impact the natural resources, if extended across the stream corridor. Additional environmental consideration, specifically regarding avoidance of conflict between urban development and regionally significant fish and wildlife habitat, is provided in the Metro Code Factors Analysis (Appendix 7A).

Considering the comparative environmental consequences of urbanization, the Holcomb Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Social, energy, and economic consequences

The Holcomb Urban Reserve already has numerous rural residences on smaller tax lots in certain in certain areas, as well as platted subdivisions, some of which are extensions of subdivisions in adjacent areas outside of the reserve. The north end of the reserve is also adjacent to urban residential development with urban local streets that stub directly to the reserve. Therefore, urbanization of the reserve is not expected to cause a significant change in sense of place or degradation of rural lifestyle for existing residents of these locations of the reserve. However, the southern end of the reserve is less developed, not adjacent to urban levels of development, and characterized by more rural land uses; urbanization here could happen more quickly and be more noticeable and socially impactful to the area's residents.

Nonetheless, the steep slopes that divide the area south of S Holcomb Boulevard are generally forested and could provide separation between different areas of the reserve that develop at different times. The existing rural residences along S Kraeft Road are all high-value homes that are unlikely to be removed quickly upon urbanization. These factors can slow the pace of noticeable change.

As detailed more fully in response to Factor 2, future residents of the reserve will likely rely primarily on private motor vehicle transportation to access their daily needs and employment opportunities more than two miles away. The resulting VMT could have adverse energy impacts.

There is minimal commercial agriculture occurring within the reserve and the economic consequences of a loss in farming activity in the reserve may be outweighed by the economic benefits of residential development.

Overall, there would be comparatively low to moderate social, energy, and economic consequences from urbanization of this reserve. The Holcomb Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Factor 4: Compatibility of the proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

There are two locations where lands outside the UGB but contiguous to the Holcomb Urban Reserve have Goal 3 or 4 resource land zoning for agricultural and forest activities.

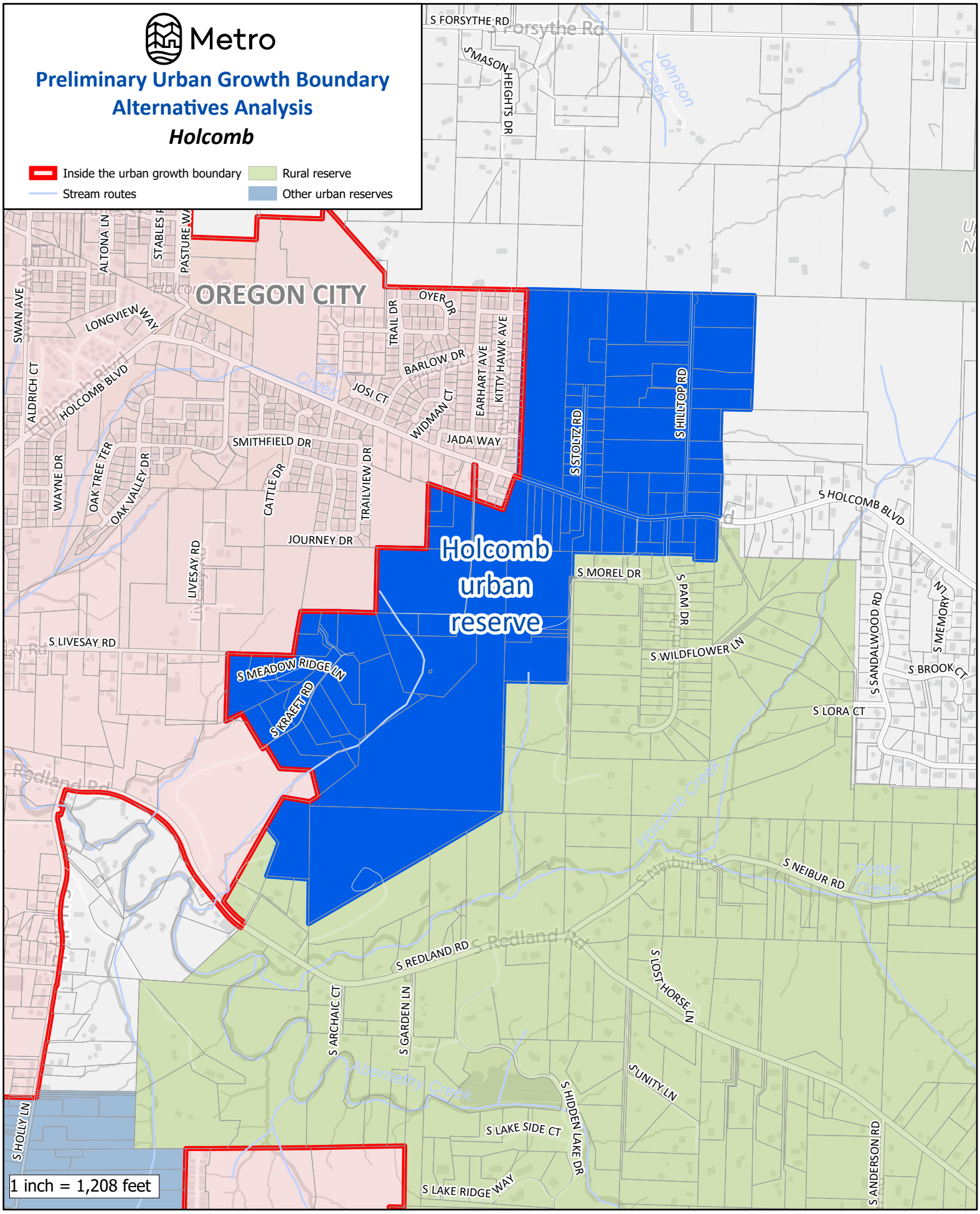
The first location is a small tract of land zoned Exclusive Farm Use (EFU) by Clackamas County at the northern edge of the reserve at the north end of S Hilltop Road. Aerial imagery indicates there are very minor agricultural activities occurring on one of these EFU-zoned tax lots, including pasture land and an orchard, but also a large residential use. This tax lot is accessed by S Hilltop

Road, which could see additional traffic if the reserve is urbanized, although the movement of farm equipment on S Hilltop Road from these limited agricultural activities would be minor and likely not impacted by such additional traffic. EFU-zoned tax lots adjoining the reserve in this location do have some trees, but there is no indication from aerial imagery that they are stands for commercial timber harvesting.

The second location is a small tract of land with three tax lots zoned Timber (TBR) by Clackamas County along the northeast corner of the reserve. Two of the tax lots contain fairly large homes surrounded by trees. Due to the location of the homes, the prospect of commercial forest activities occurring on them is small. The third TBR-zoned tax lot is 30 acres in size and slopes away from the reserve. It does not contain any structures, is divided by powerlines, and appears to have been cleared of trees somewhat recently, without evidence of re-planting. Urbanization of the reserve could generally be compatible with future forest activities occurring on this tax lot due to the change in elevation. However, access to this tax lot is by S Hilltop Road and urbanization of the reserve may make future access to the forest lands for machinery and trucks slightly more difficult, if trees were to be replanted and eventually harvested.

This analysis finds that the nearby agricultural and forest activities occurring on farm and forest land would not likely be significantly impacted by urbanization of the reserve. Therefore, the proposed urban uses (i.e., urban development of the reserve) is considered to have moderate to high compatibility with the nearby agricultural and forest activities occurring on farm and forest land.

The Holcomb Urban Reserve is given a “medium-high” score in Attachment 3 for this Goal 14 boundary location factor.



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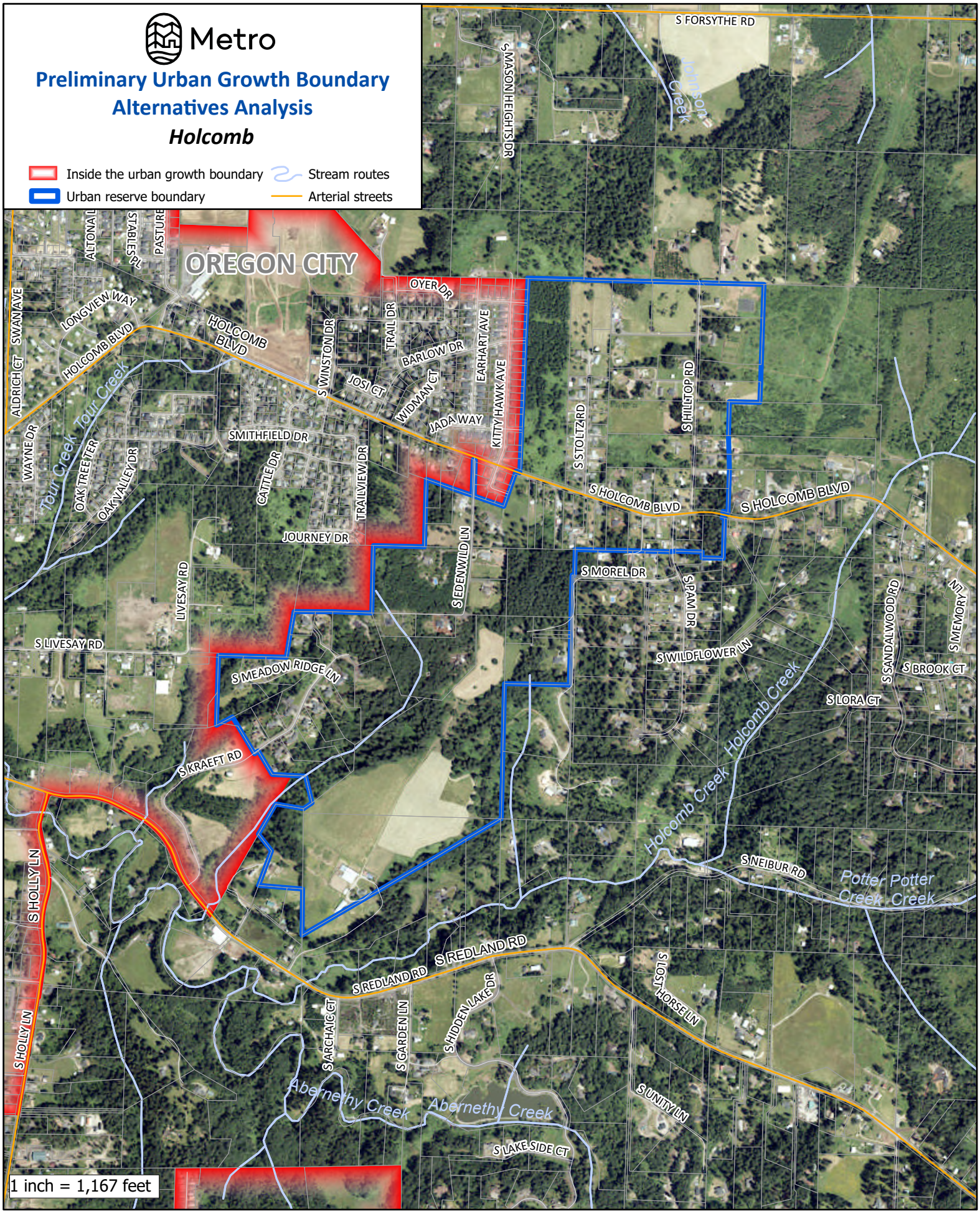
Metro

Preliminary Urban Growth Boundary Alternatives Analysis

Holcomb

Inside the urban growth boundary
Urban reserve boundary
Stream routes
Arterial streets



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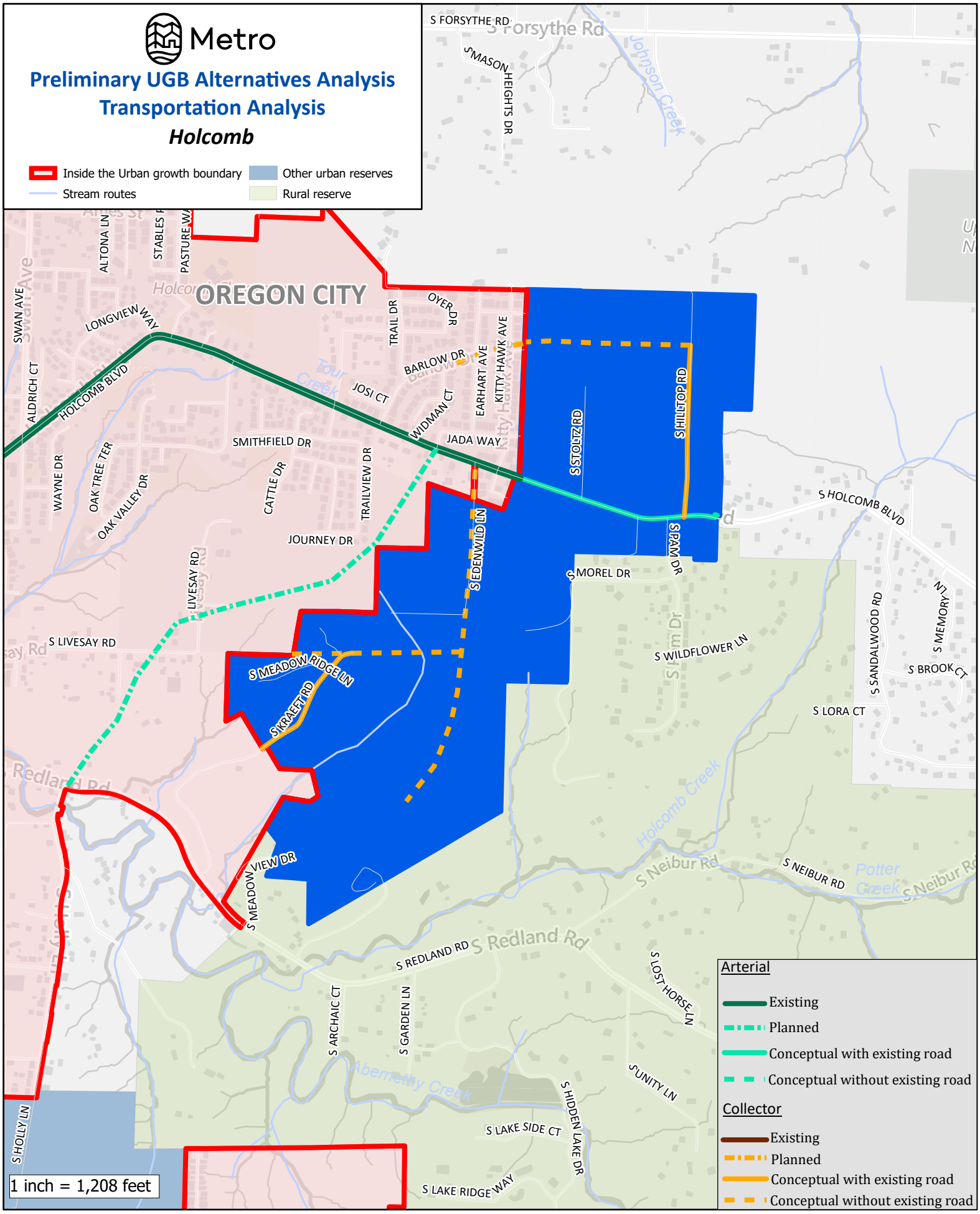

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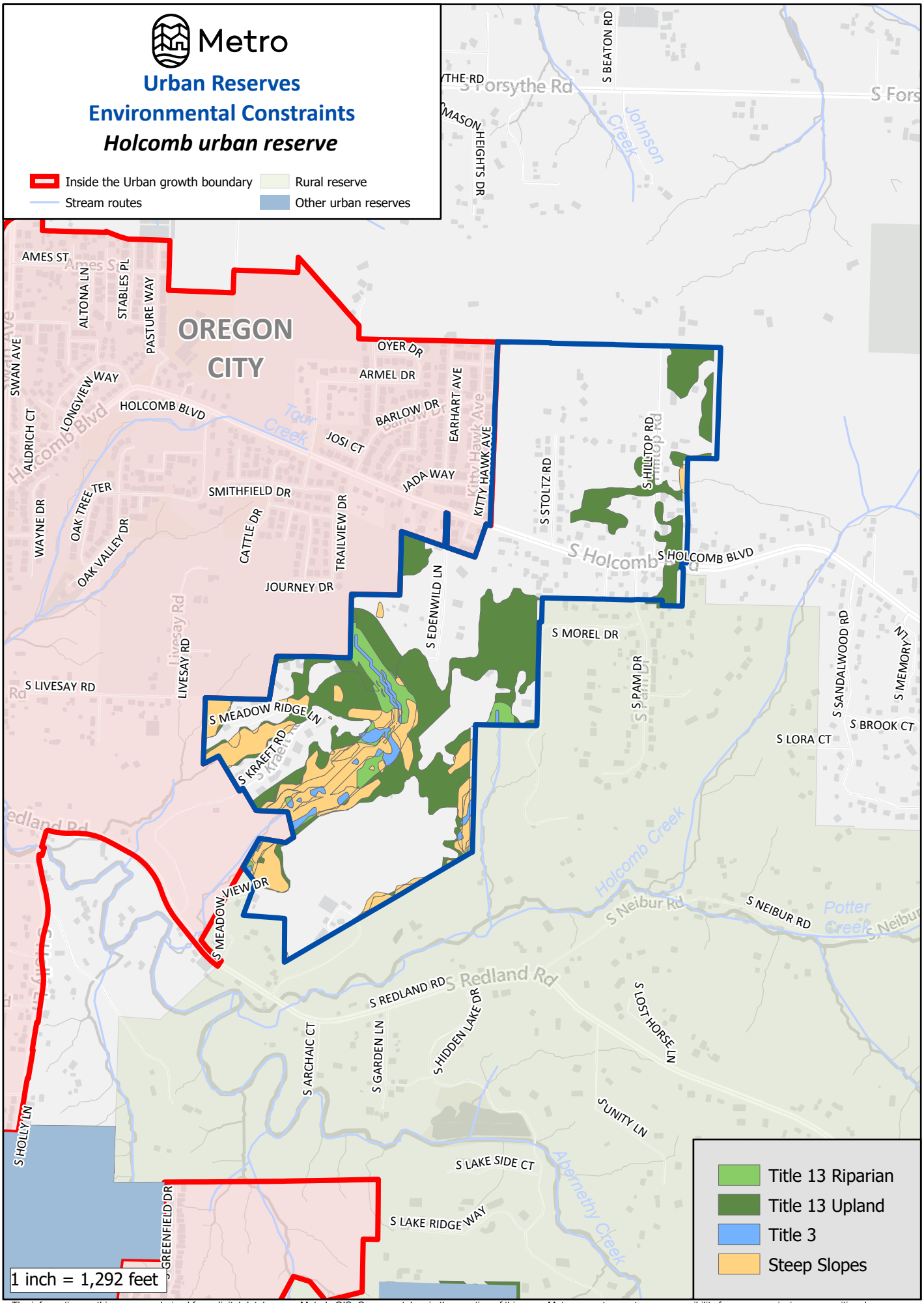

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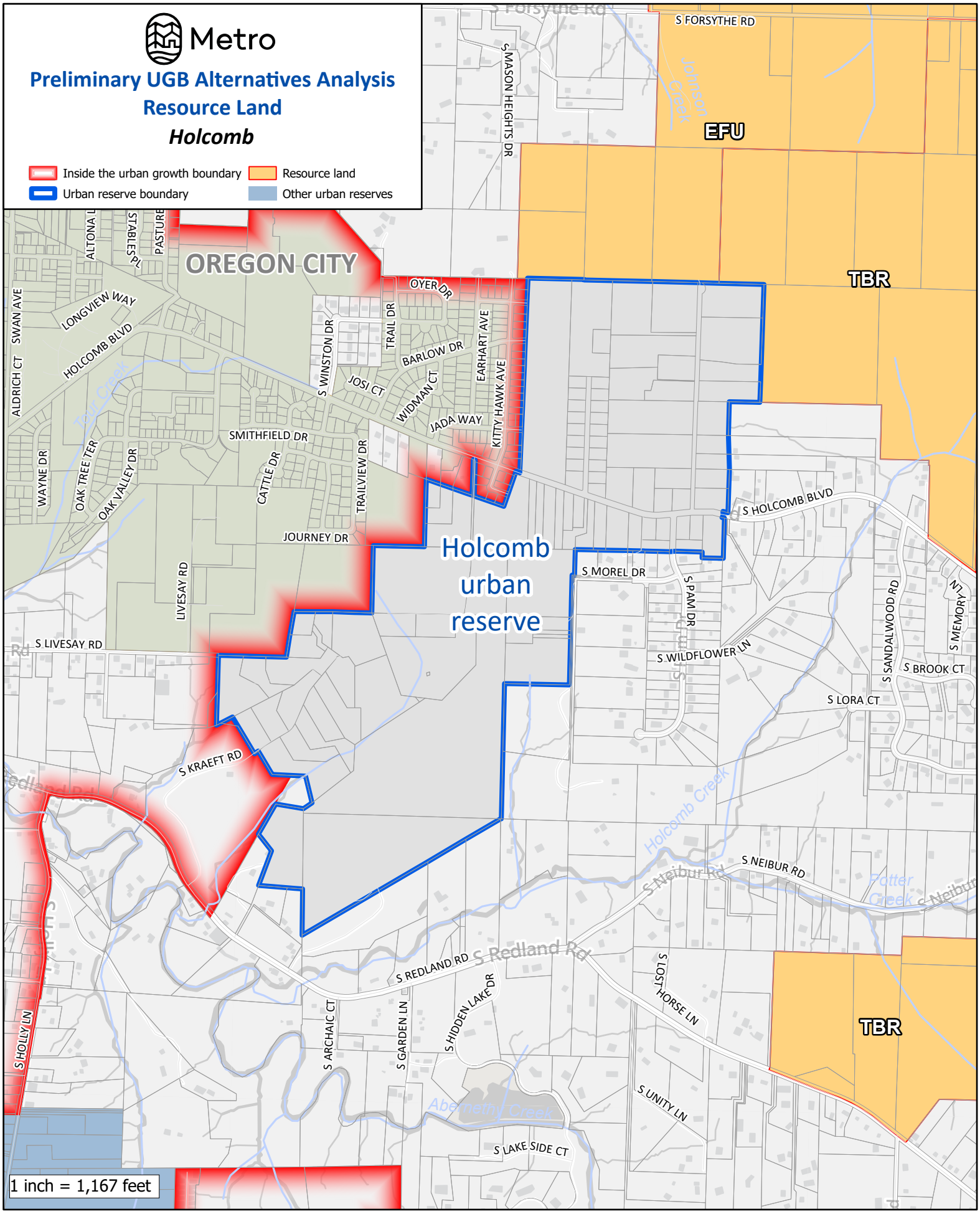

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HOLLY LANE – NEWELL CREEK CANYON URBAN RESERVE

Total Reserve Area	695 acres
Total Tax Lot Area in Reserve (without Right-of-Way)	591 acres
Gross Vacant Buildable Area	175 acres
Net Vacant Buildable Area	**131 acres**

The Holly Lane – Newell Creek Canyon Urban Reserve is an irregularly shaped area adjacent to the east side of Oregon City. The reserve straddles Highway 213 between S Redland Road to its north and S Maplelane Road to its south. The reserve's eastern side is also largely bisected by S Holly Lane; its western side is connected to S Davis Road, S Morton Road, and unimproved right-of-way leading to S Division Street. The reserve is almost entirely surrounded by land inside the UGB, with only an approximately 370-yard border with a rural reserve and a 330-yard border with rural exception lands in its northeast corner.

The reserve is largely a mix of publicly owned forested tax lots along Highway 213 and private rural residences along S Holly Lane. Newell Creek flows northward through the reserve on both sides of Highway 213, joining Abernethy Creek at the reserve's northern boundary.

GOAL 14 BOUNDARY LOCATION FACTORS

Factor 1: Efficient accommodation of identified land needs

The Holly Lane – Newell Creek Canyon Urban Reserve is comprised of 157 contiguous tax lots, which have a combined area of approximately 591 acres. All but two of these tax lots are entirely within the reserve. More than 80 percent of the tax lots have area within the reserve that are five acres or less in size; more than half have area within the reserve smaller than two acres and only five tax lots have area within the reserve greater than 20 acres. As noted above, the entire reserve contains 175 gross vacant buildable acres and 131 net vacant buildable acres.

A significant portion of the area, 203 acres, is land owned by Metro that is part of the larger 236-acre Newell Creek Canyon Nature Park that opened in 2021. The remainder of the area is composed of highway and road right-of-way, rural residential development with a few locations of very small-scale agricultural activity, and one 61-acre tax lot of forested land owned by Earthscapes of Oregon, LLC. Three power lines cross through the southern portion of the urban reserve. Overall, 101 of the 157 tax lots have improvements, with a median assessed value of those tax lots' improvements exceeding $229,000.

The reserve is adjacent to Tumwata Middle School and is less than a mile from the Oregon City School District Jackson Campus and Pioneer Memorial Stadium. Clackamas Community College is less than one mile away. The reserve is divided by Highway 213 and S Holly Lane, and its north end is approximately one mile from I-205.

With nearly all of the reserve has slopes greater than 10 percent, except for portions of some along S Holly Lane, the reserve's topography is generally not suitable for new employment uses. The

lands east of S Holly Lane and in the vicinity of S Alden Street on the west side of the reserve have slopes greater than 25 percent, which limit residential development opportunities in this location as well. Roughly one-third of the land area of the reserve is in public ownership. Therefore, this reserve is likely able to accommodate a small residential land need.

Factor 2: Orderly and economic provision of public facilities and services

Water Services

With regard to water services, the Holly Lane – Newell Creek Canyon Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

The City of Oregon City serves lands within their corporate boundary, while lands within the jurisdiction of Clackamas County are served by Clackamas River Water (CRW). Both Oregon City and the CRW South System receive water from the South Fork Water Board (SFWB). SFWB's water treatment process includes flocculation, sedimentation, filtration, and chlorination of raw water from the Clackamas River to remove harmful bacteria. There are currently no known major treatment system deficiencies.

The City has annexed the Beavercreek UGB expansion area to the southwest. While the City is adequately served elsewhere, they may lack water storage necessary to fully serve urban development of these annexed areas. CRW is considered to have adequate capacity to serve lands still within the jurisdiction of Clackamas County in this vicinity and other customers; though the Beavercreek service area showed a storage deficiency of 0.31 MG in 2019 in the interim of building the new Beavercreek reservoir, it is anticipated to bring on sufficient storage.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

CRW has done planning for service to the area of the urban reserve, and the Holly Lane – Newell Creek Canyon Urban Reserve is in CRW's service area. However, CRW will not likely be the service provider once the reserve is annexed to a city (i.e., Oregon City) and urbanized. Rather, when Oregon City annexes the reserve, the City will likely take ownership of any water related infrastructure within the area, except potentially for facilities that are needed to go beyond the annexed area, such as large-scale transmission lines. Accordingly, CRW, like many water service providers, may be cautious about investing in improvements for currently rural areas that may one day be annexed to cities. CRW is expected to build a new storage reservoir in the near future, which result in a storage surplus. Oregon City has plans to build reservoirs that could serve urban reserves, but no timeline is available at this time. While there is some projected surplus pumping and storage capacity that could be available to serve urban development of the reserve, once annexed to the City, those surpluses may be

insufficient and additional pumping and storage facilities may be necessary. The existing distribution system may also experience capacity challenges if it is determined to be undersized and not upgraded.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

As noted above, new facilities for storage and pumping will likely be needed to avoid system capacity deficits. The distribution system in the area may also need to be upgraded.

d. Estimated water service-related costs for reserve development

Water piping, pumping, and storage costs	Cost
10-inch pipe	$0
12-inch pipe	$0
15-inch pipe	$0
Pumping	$2.32 million
Storage	$0.08 million
Total:	**$2.4 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$919**

Sanitary Sewer Services

With regard to sanitary sewer services, the Holly Lane – Newell Creek Canyon Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Oregon City provides sanitary sewer service to properties within its corporate limits, as well as to some properties that are already in the UGB but still in unincorporated Clackamas County. Wastewater flows to the Tri-City Sewer District (TCSD) trunks, interceptors, and, eventually, the Tri-City Water Resource Recovery Facility (WRRF), all of which are owned and operated by Water Environment Services (WES). Both the Oregon City Master Plan and the WES Master Plan identify segments of the conveyance system that are predicted to surcharge or flood during the design storm event. The Newell Creek Interceptor south of Redland Road has predicted surcharging or flooding under existing conditions, which indicates it does not necessarily have fully sufficient capacity to serve the nearby areas already inside the UGB. Relevant master plans include a capital improvement project to upside a portion of the Newell Creek Interceptor south of Redland Road, but it is not clear how much additional capacity this will provide.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The Newell Creek Interceptor has capacity challenges and it is unknown whether a planned upsizing could accommodate urban development of the Holly Lane – Newell Creek Canyon Urban Reserve. However, no pump stations are likely needed downstream of the reserve to accommodate urban development.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Without sufficient upsizing of the Newell Creek Interceptor, urban development of the reserve could exacerbate existing capacity challenges.

d. Estimated sanitary sewer service-related costs for reserve development

Sanitary sewer piping and pumping costs	Cost
10-inch pipe	$2.89 million
12-inch pipe	$0
15-inch pipe	$0
Pump station	$0
Force mains	$0
Total:	**$2.89 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$1,105**

Stormwater Management Services

With regard to stormwater management services, the Holly Lane – Newell Creek Canyon Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

The Oregon City Stormwater Master Plan identifies capacity issues within the modeled basins. Two of the modeled basins were determined to contain the most problem areas: the John Adams Basin is described as generally undersized, and the South End Basin was described as an inefficient system with flooding during the two-year storm event. Capital improvement projects to address capacity issues described above are presented in the Master Plan.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Stormwater will be conveyed, treated, and disposed of within the reserve (i.e., outfall to Newell Creek); therefore, it is not anticipated that existing stormwater facilities would be utilized. Stormwater will nonetheless be complex, given this reserve's infrastructure would be at the upstream edge of the surrounding basins, but manageable.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

As noted above, stormwater will likely be detained and treated within the reserve and, based on topography, outfall directly to Newell Creek; therefore, no impacts to the existing stormwater infrastructure in the UGB are anticipated.

d. Estimated stormwater service-related costs for reserve development

Stormwater piping and water quality/detention	Cost
18-inch pipe	$0
24-inch pipe	$0
30-inch pipe	$0
Water quality/dentition	$2.91 million
Total:	**$2.91 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$1,114**

Transportation Services

With regard to transportation services, the Holly Lane – Newell Creek Canyon Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(e) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Figure 4.36 in Chapter 4 of the 2023 Regional Transportation Plan (RTP) displays 2020 household-based vehicle miles traveled (VMT) per capita by Metro transportation analysis zone, with average VMT per capita considered 11.32. According to Figure 4.36 in Chapter 4, areas in the UGB adjacent to the Holly Lane – Newell Creek Canyon Urban Reserve had average, above average, and significantly above average household-based VMT per capita in 2020.

Metro's adopted 2040 Growth Concept Map designates a regional center in the adjacent City of Oregon City. Regional centers are generally meant to: serve populations of hundreds of thousands of people; surround high-quality transit service and multi-modal street networks; and offer larger commercial uses, healthcare facilities, local government services, and public amenities. The Oregon City Regional Center aligns with the 2040 Growth Concept Map designation.

The City of Oregon City's plans for the Oregon City Regional Center include mixed-use development, enhancements to the main street, and the creation of new open spaces that will provide direct connections to the river. The regional center is also home to Willamette Falls and the Willamette Falls Legacy Project, a public/private partnership working to connect the Falls to Downtown Oregon City through the development of

housing, public spaces, habitat restoration, education, and employment opportunities. The regional center currently has a drug store, restaurants, and other retail commercial uses, banks, medical/dental facilities, community centers, government offices, and auto-oriented uses. Metro's 2017 State of the Centers Atlas showed less than 400 people living in the regional center, as well as a low population density (5.2 people per acre), low total employees, and low dwelling unit density compared with other regional centers; in fact, the average population of all regional centers in 2017 was more than 6,000 people and the average population density was 22.8 people per acre. The City's vision to attract more housing and employees to the regional center will elevate it to the activity spectrum levels comparable to other regional centers in the region.

There are also employment uses, including industrial uses, grocery stores, and other commercial uses, as well as education and medical facilities, government offices, and parks in the Red Soils area near the intersection of Beavercreek Road and Molalla Avenue and between Highway 213 and Beavercreek Road. Additionally, there are major medical facilities and an assisted living facility east of S Division Street between Davis Road and Gilman Drive and employment uses around the intersection of Abernethy Road and S Redland Road.

Growth in and near the regional center and other employment and medical center areas will not necessarily cause a significant increase in household-based VMT per capita in the future, as area residents will be able to access some daily needs and find employment opportunities with relatively short trips. The transit service and bike and pedestrian facilities that serve these areas, described further below, can also help to ensure that additional growth nearby does not adversely impact household-based VMT per capita.

Four TriMet bus lines serve Oregon City, all of which generally focus on the regional center and the central portion of the city along Molalla Avenue. Service is provided to Clackamas Community College and the employment areas near the intersection of Beavercreek Road and Molalla Avenue and between Highway 213 and Beavercreek Road; however, large portions of the City lack TriMet service. Route 154 provides service along Abernethy Road and Holcomb Boulevard between the regional center and up to about S Longview Way. Route 32 provides service along S Division Street and along Beavercreek Road, connecting the regional center with employment uses along Beavercreek Road, Oregon City High School, and Clackamas Community College. Some of these existing routes are identified as part of the frequent regional transit network in Chapter 4, Figure 4.3 of the 2023 RTP, though there are also gaps in planned frequent transit service along certain routes in the UGB near the reserve and elsewhere in the City as well.

Oregon City has at least 29 miles of dedicated bike lanes and 3.5 miles of established bikeways, with most of them located in the "up-top" section (southern end) of the City. The Park Place neighborhood is also fairly well served and Highway 213 has dedicated bike lanes. Most of the downtown streets are classified as "bike with caution" streets

and the South End neighborhood has minimal bike facilities. There are dedicated bike facilities along most of Beavercreek Road and Molalla Avenue, as well as on much of Front Avenue, Holcomb Boulevard, S Redland Road, and Swan Avenue nearer to the reserve. Portions of S Anchor Way and S Division Street have bike facilities. The existing bike facilities on Beavercreek Road, Holcomb Boulevard, Molalla Avenue, and S Redland Road are identified as part of the regional bike network on Figure 4.5 in Chapter 4 of the 2023 RTP. However, the figure also identifies a gap in the planned network along S Holly Lane and areas closer to the regional center.

The regional center is well served by sidewalks, as are employment areas near the intersection of Beavercreek Road and Molalla Avenue and between Highway 213 and Beavercreek Road. The medical center complex on S Division Street and much of the residential areas in the UGB adjacent to the reserve also have sidewalks. Holcomb Boulevard has sidewalks on at least one side most of the way from the inner edge of the UGB to the intersection of Abernethy Road and S Redland Road, though there are some sections without sidewalks. The portions of S Maplelane Road and S Thayer Road in the UGB lack sidewalks on both sides and have lengths with no sidewalks at all, though there are painted pedestrian crossings at the intersection of S Maplelane Road and S Beavercreek Road. Chapter 4, Figure 4.4 of the 2023 RTP identifies gaps in the planned regional pedestrian network along Holcomb Boulevard and S Redland Road. There are also gaps in the planned regional trail network in the UGB near the reserve, as indicated in Chapter 4, Figure 4.6 of the 2023 RTP.

Figure 4.14 in Chapter of the 2023 RTP identifies Molalla Avenue inside the UGB as a high injury corridor.

The sections of Highway 99E, Highway 213, and I-5 in Oregon City are identified as a throughways Chapter 4, Figure 4.7 of the 2023 RTP. Figure 4.8 of that chapter indicates that these highway sections currently meet travel speed reliability performance thresholds, with no more than four hours per day when travel speeds fall below the identified minimum speed. RTP models indicate this reliability will continue at least to the year 2045.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Highway 213 is the nearest RTP-designated throughway to the reserve. Indeed, the highway bisects the reserve, but does not include direct access to it; the closest accesses would be via S Redland Road, approximately half a mile from the north end of the reserve or via S Maplelane Road, approximately three-quarters of a mile from the south end of the reserve. As noted above, the section of the highway in the City currently meets travel speed reliability performance thresholds. Considering the relatively small buildable area of the reserve and RTP reliability forecasts, development of the reserve is not expected to jeopardize the throughway reliability of the highway.

TriMet Route 32 has stops on S Division Street, essentially adjacent to the northwest corner of the reserve. There are also Route 32 stops at the intersection of Beavercreek Road and Highway 213, approximately three-quarters of a mile from the southeast corner of the reserve. Route 32 provides access to the regional center, as well as to employment uses along Molalla Avenue and Beavercreek Road, as well as to Clackamas Community College and Oregon City High School. Route 154, which has stops at the intersection of Abernethy Road, Holcomb Boulevard, and S Redland Road, provides service between the City of West Linn and along Holcomb Boulevard, with stops in the regional center. There are no TriMet stops along S Holly Lane.

While there are no roads directly connecting to the reserve that have bike facilities, short sections of S Anchor Way and S Division Street near to the north of the reserve, as well as Abernethy Road and S Redland Road, have bike facilities. There are also bike facilities on S Maplelane Road, but they stop about 500 feet from the southeast corner of the reserve. There are no bike facilities along S Holly Lane.

The roads withing and along the residential neighborhoods and the medical facility complex adjacent to the northwest of the reserve mostly have sidewalks, as does much of the length of S Maplelane Rd adjacent to the south end of the reserve. There are no sidewalks along Morton Road or Willamette Street stubbing to the northwest of the reserve, along S Donovan Road between the reserve and Tumwata Middle School, or along S Holly Lane running through the reserve.

It was noted in response to Factor 1 that the reserve is not likely to be able to efficiently accommodate an employment land need, but could potentially support a small residential land need. The north and northwest of the reserve are relatively close and accessible to employment uses, school uses, medical facilities, and the regional center, has nearby transit service and bike and pedestrian facilities. Future residents of this portion of the reserve could access their daily needs and employment opportunities without significant travel by private motor vehicle. The east side of the reserve, however, is much further from employment, school uses, medical facilities, and the regional center, and is not as close to transit service, though the northeast of the reserve is adjacent to Tumwata Middle School. Future resents of the east side of the reserve will likely be more reliant on private motor vehicle transportation to access their daily needs and employment opportunities.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

S Anchor Way, Davis Road, S Division Street, Gilman Drive, S Holly Lane, S Maplelane Road, Morton Road, S Redland Road, and Willamette Street would be expected to see additional private vehicle traffic from development of the reserve. Existing bike and pedestrian facilities nearby would also be expected to see additional use.

As noted above, future residents of the north and northwest of the reserve could access their daily needs and employment opportunities without significant travel by private

motor vehicle and, therefore, would not likely increase the area's household-based VMT per capita. The small buildable area of this portion of the reserve would also mean that additional traffic impacts on existing streets would be minimal. The east side of the reserve, however, could support more residential development and is further away from areas where future residents could access their daily needs and employment opportunities. The east side is also generally less well served by transit and bike and pedestrian facilities. Future residents of these areas will likely drive more often and farther on average than future residents in the northwest of the reserve, with greater traffic impacts on nearby roadways.

Development of the reserve is, however, not expected to jeopardize Highway 213's throughway reliability or necessarily cause additional motor vehicle traffic on Molalla Avenue that exacerbates its high-crash conditions.

d. Need for major transportation facility improvements and associated costs

Urbanization of the reserve is expected to warrant improvement of a 1.22-mile-long portion of S Holly Lane crossing through the reserve to urban arterial standards, which will require acquisition of additional right-of-way.

Facilities	Cost
Arterials, existing/improved full street	$64.50 million
Arterials, existing/improved half street	$0
Arterials, new	$0
Collectors, existing/improved full street	$0
Collectors, existing/improved half street	$0
Collectors, new	$0
Total:	**$64.50 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$24,694**

e. Provision of public transit service

TriMet evaluated the reserve for providing transit service. TriMet could provide services to the reserve, although there is no guarantee of service. Actual service depends on the level of development in the reserve and in the corridors leading to it. Conceptual road layouts for the reserve do not provide enough roadway network to make service feasible. However, potential services described within TriMet's "2045 Network Vision" could be rerouted with future roadway development at no additional cost.

Prior to land being included in the UGB, a more detailed concept plan, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11, will be required. This concept plan process will develop more refined public facility and service needs and cost estimates.

Factor 3: Comparative environmental, social, energy, and economic consequences

Environmental consequences

Newell Creek flows north through the middle of the Holly Lane – Newell Creek Canyon Urban Reserve for approximately 1.9 miles. This stretch of the creek is on land owned by either Metro or Oregon Department of Transportation, and these lands are not likely to be urbanized.

Three tributaries of Newell Creek also flow through Metro-owned land for approximately 0.7 miles. Two of these tributaries first flow through undeveloped private land that contains numerous areas of steep slopes for approximately 0.6 miles. Urbanization of these steep slope areas will be difficult and likely minimal and therefore may not have significant impacts on these stream corridors.

A tributary to Abernethy Creek flows north in a ravine along the eastern edge of the reserve for approximately half a mile. The stream is about 100–200 feet below the main developable portions of the tax lots along S Holly Lane and, therefore, would not be impacted by future development occurring on the flatter portions of the area. A half-acre wetland identified on the National Wetland Inventory (NWI) is located in the southern portion of the area within the powerline easement. Limitations for residential development in powerline easements will provide their own protections on the wetlands from development.

There are some significant locations of upland habitat adjacent to both stream corridors and the tributaries. Again, due to the public ownership pattern and slopes greater than 25 percent that limit the amount of the residential development that can occur, urbanization of the area will have minimal impacts on the identified upland habitat.

Overall, urbanization of the area could occur with comparatively minimal impacts to the stream corridors, wetlands, and upland habitat due to topography and public ownership. Additional environmental consideration, specifically regarding avoidance of conflict between urban development and regionally significant fish and wildlife habitat, is provided in the Metro Code Factors Analysis (Appendix 7A).

Considering the comparative environmental consequences of urbanization, the Holly Lane – Newell Creek Canyon Urban Reserve is given a “high” score in Attachment 3 for this Goal 14 boundary location sub-factor.

Social, energy, and economic consequences

There is not a lot of developable land in the Holly Lane – Newell Creek Canyon Urban Reserve when considering the amount of vacant lands that are in public ownership or are constrained by topography or natural features. There are only a few rural residences west of Highway 213 and they are adjacent to and practically a part of the urban development of Oregon City, so urbanization of this area is unlikely to result in a significant change in sense of place or degradation of a more rural lifestyle for these residents. There are also already

numerous residences along S Holly Lane on the east side of Highway 213, and they are proximate to urban subdivisions, large manufactured home parks, commercial areas, and public school complexes; urbanization of this area is therefore also unlikely to result in a significant change in sense of place or degradation of a more rural lifestyle for these residents either.

As detailed more fully in response to Factor 2, the proximity of a variety or urban land uses and modes of transportation, as well as the relatively small amount of buildable area, could help limit significant increases in VMT and related energy impacts from urbanization of the north and northwest of the reserve. Urbanization of the east side of the reserve could have higher rates of VMT, but, given the amount of parcelization and existing development in this area, new development here would occur slowly. The larger and less developed tax lots in the southeast of the reserve may be developed sooner, and they are closer to existing urban services and other modes of transportation.

There is minimal commercial agriculture occurring within the reserve and the economic consequences of a loss in farming activity in the reserve may be outweighed by the economic benefits of residential development.

This analysis finds that there would be comparatively low social, energy, and economic consequences from urbanization of this reserve. The Holly Lane – Newell Creek Canyon Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Factor 4: Compatibility of the proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

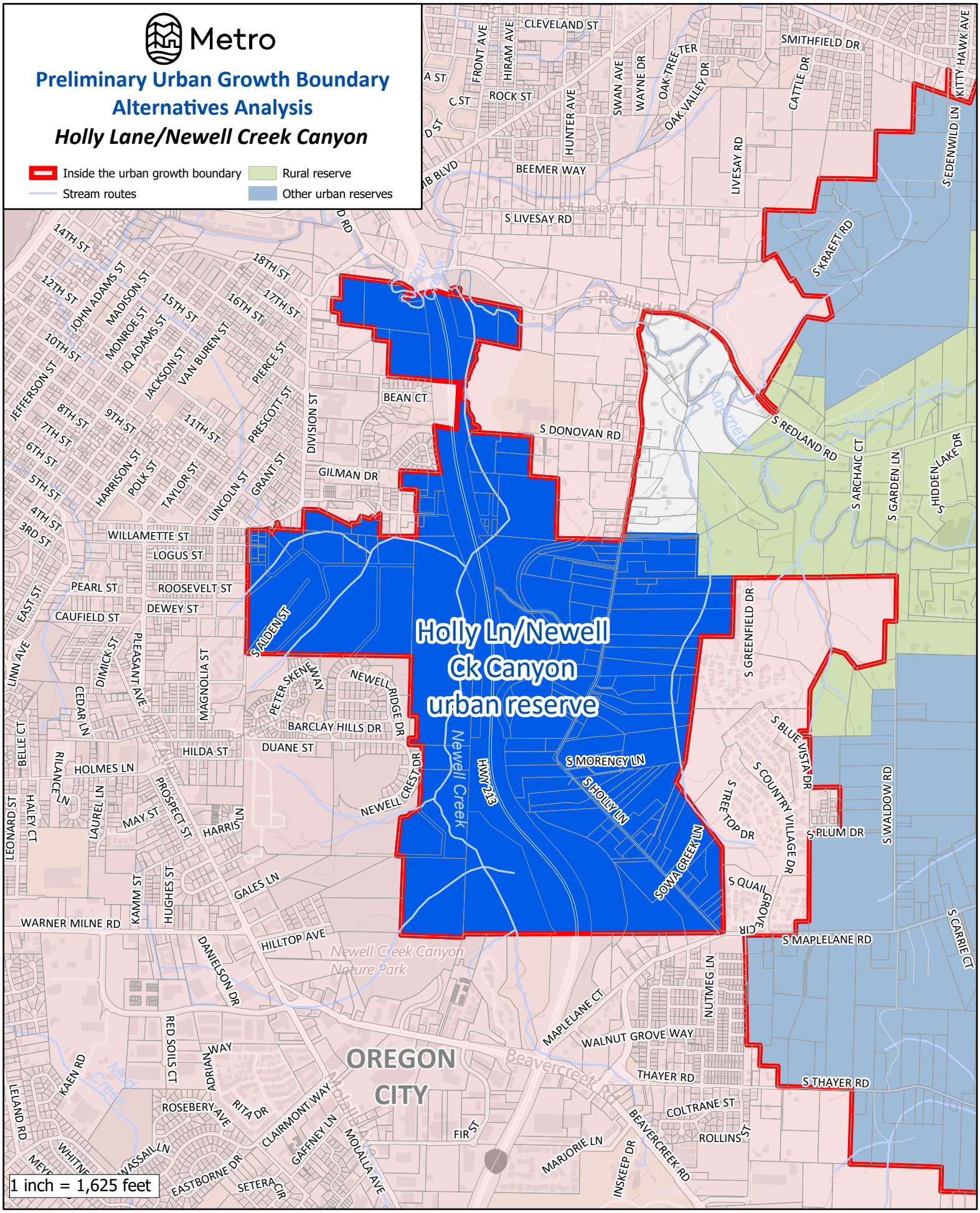
There are no locations where lands outside the UGB but contiguous with the Holly Lane – Newell Creek Canyon Urban Reserve have Goal 3 or 4 resource land zoning for agricultural or forest activities. Therefore, the proposed urban uses are considered to have high compatibility with the nearby agricultural and forest activities occurring on farm and forest land. The reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location factor.

Metro

Preliminary Urban Growth Boundary Alternatives Analysis

Holly Lane/Newell Creek Canyon

Inside the urban growth boundary
Stream routes
Rural reserve
Other urban reserves



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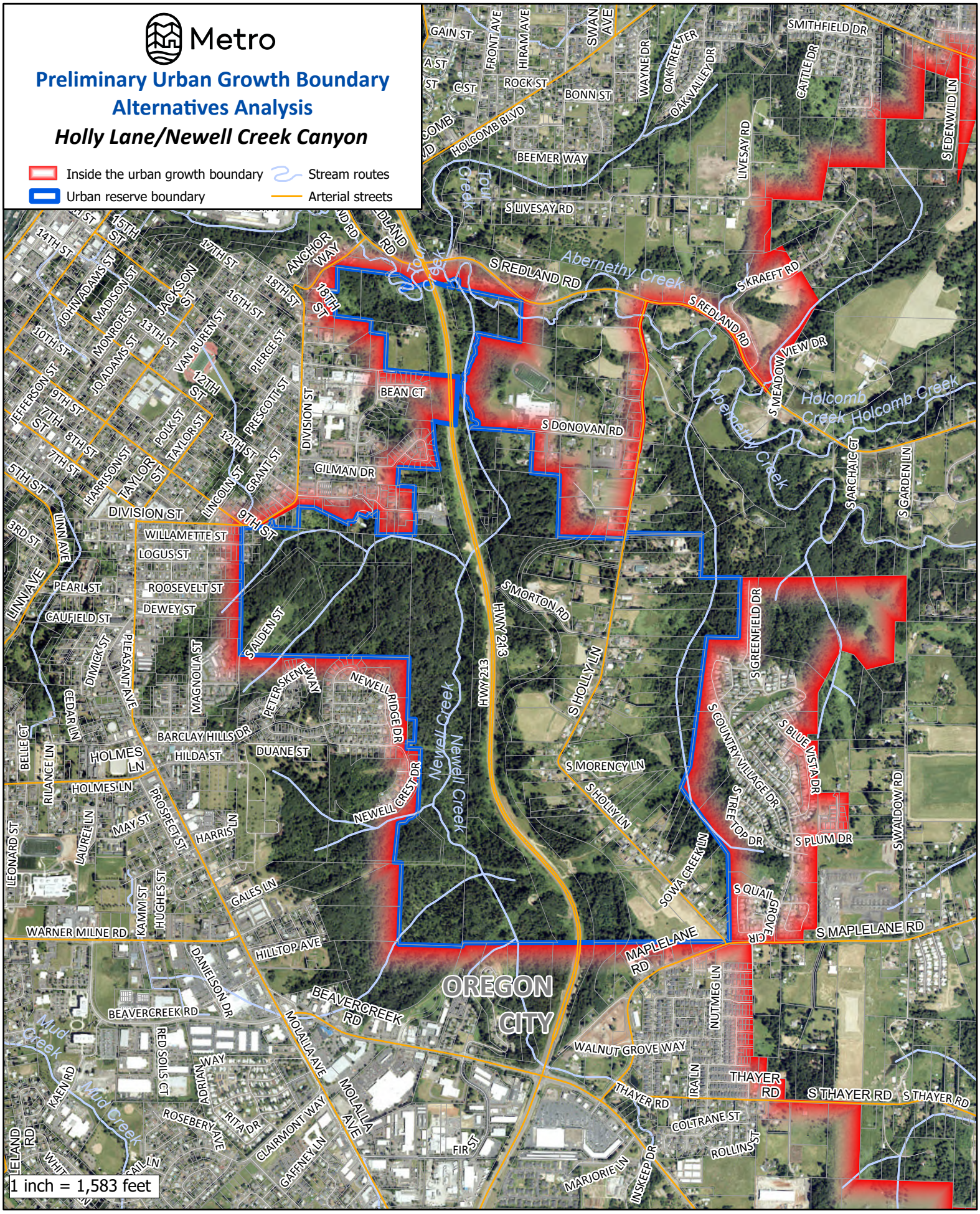
Metro

Preliminary Urban Growth Boundary Alternatives Analysis

Holly Lane/Newell Creek Canyon

Inside the urban growth boundary
Urban reserve boundary
Stream routes
Arterial streets



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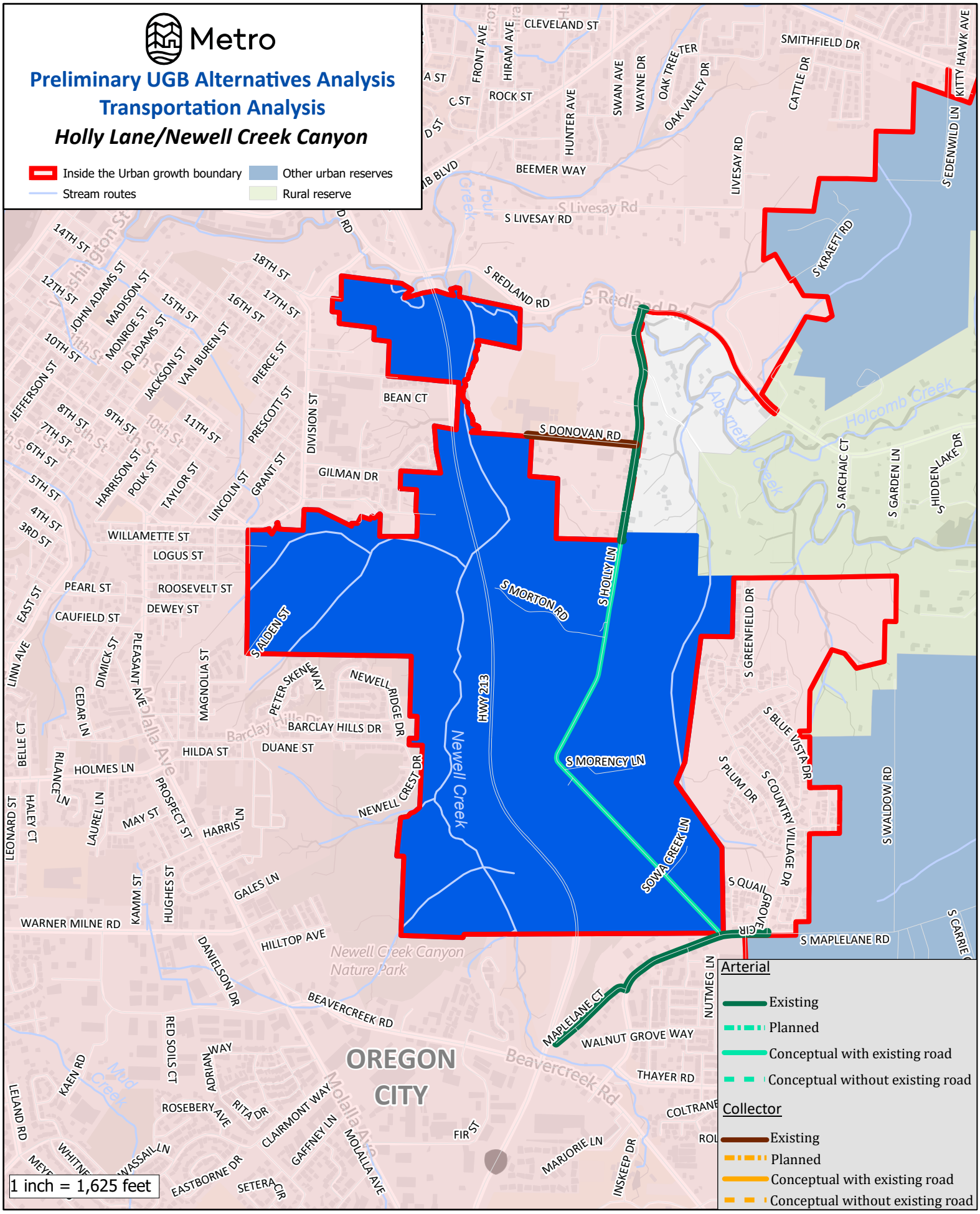

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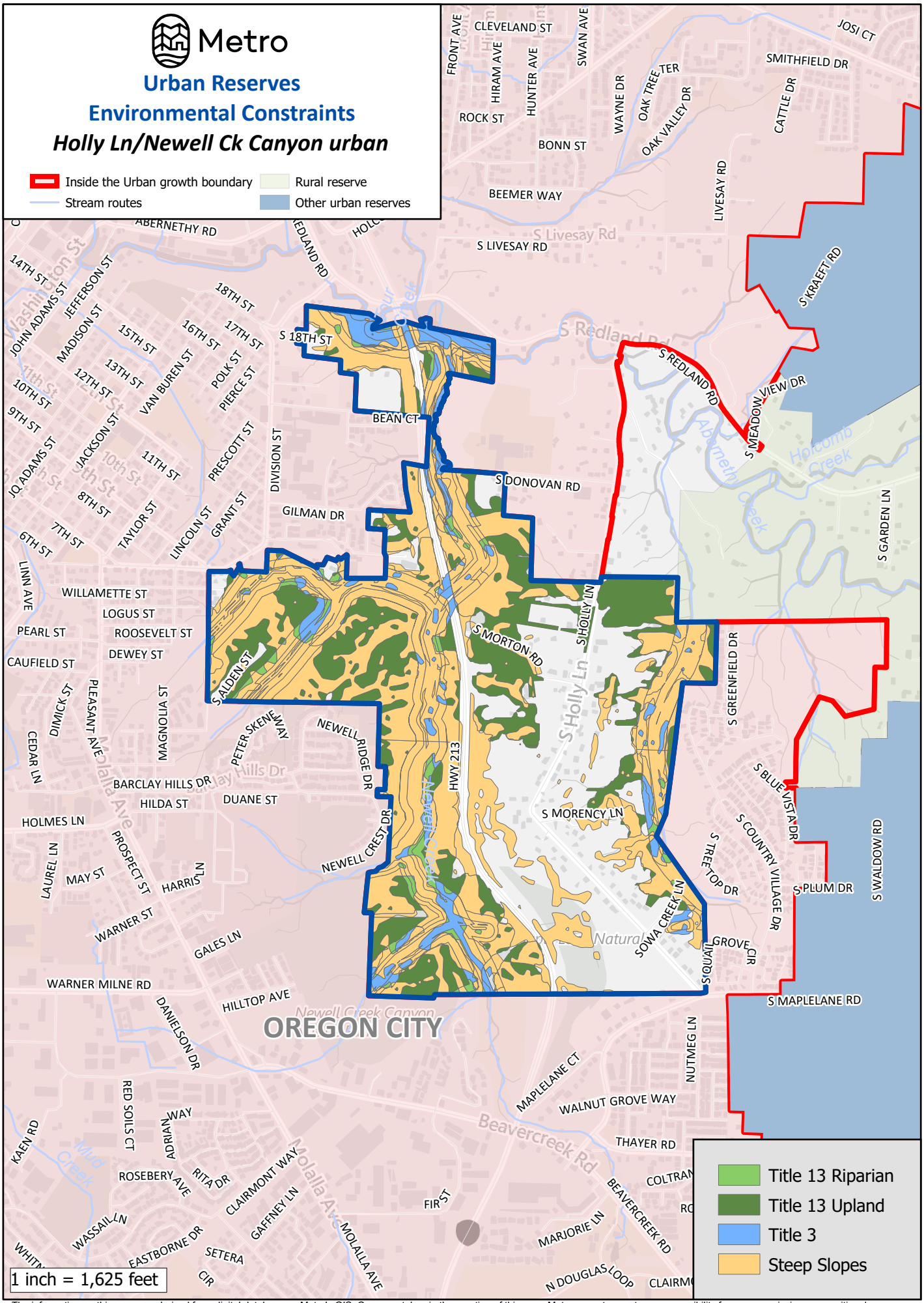

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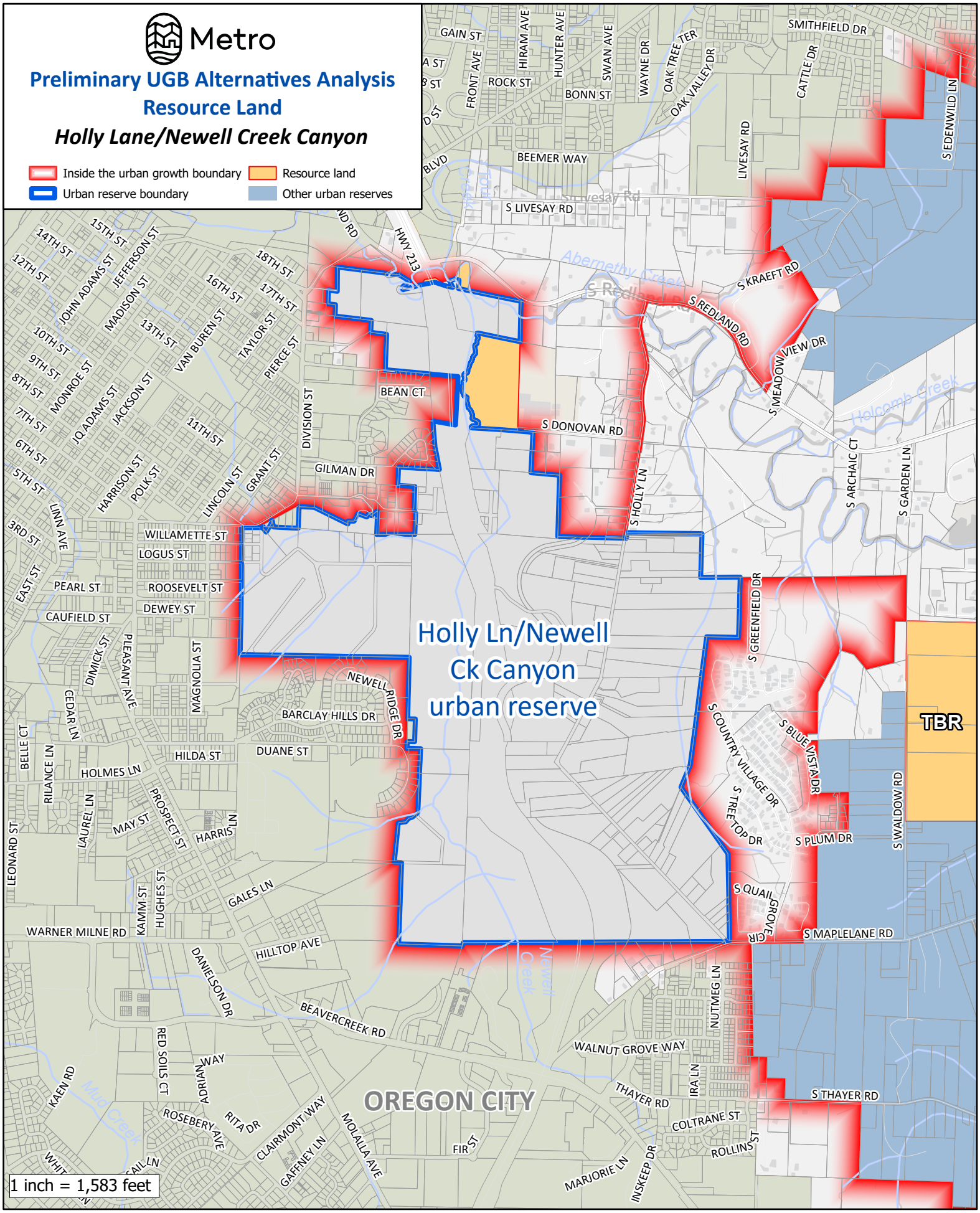

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I-5 EAST – WASHINGTON COUNTY URBAN RESERVE

Total Reserve Area	851 acres
Total Tax Lot Area in Reserve (without Right-of-Way)	740 acres
Gross Vacant Buildable Area	500 acres
Net Vacant Buildable Area	**372 acres**

The I-5 East – Washington County Urban Reserve is a somewhat rectangularly shaped area on the east side of I-5, south of I-205, north of SW Frobase Road, and west of SW 65th Avenue. The UGB, which more or less follows I-5 and I-205, forms the western and northern boundaries of the reserve, while the Norwood Urban Reserve and the Elligsen Road North Urban reserve bound it to the east and south, respectively. Saum Creek flows north through the center of the reserve and several tributaries join the creek prior to it crossing under I-205. The south end of the reserve is approximately 270 feet higher than its north end and there are numerous slopes greater than 10 percent throughout the reserve, primarily along Saum Creek and its tributaries. Access to the area is provided by SW Frobase Road, SW Norwood Road, SW 65th Avenue, and SW 82nd Avenue.

GOAL 14 BOUNDARY LOCATION FACTORS

Factor 1: Efficient accommodation of identified land needs

The I-5 East – Washington County Urban Reserve is comprised of 160 contiguous tax lots entirely within the reserve. The combined area of these tax lots is approximately 740 acres. More than 70 percent of the tax lots are smaller than five acres; five are larger than 10 acres, with two larger than 60 acres. As noted above, the entire reserve contains 500 gross vacant buildable acres and 372 net vacant buildable acres.

According to aerial imagery, the 160 tax lots are predominantly in agricultural and rural residential use and 142 have assessed improvements. The median assessed value of these tax lots' improvements is more than $330,000.

While the reserve is adjacent to – indeed, includes portions of – I-5 and I-205, the nearest interchanges to both highways are more than a mile away via existing roads. Tualatin High School and Horizon Christian High School are both within a mile of the reserve, and the nearest TriMet bus stop is approximately half a mile away, though these facilities are on the opposite side of I-5 from the developable portions of the reserve. The Chieftain/Dakota Greenway Trailhead is also on the opposite side of I-5. The nearest 2040 Growth Concept designated corridor is more than a mile away.

There are slopes greater than 10 percent dispersed throughout the middle of the reserve, mainly along the numerous stream corridors that divide the reserve into smaller potentially-developable sections. Given the considerable number of tax lots under five acres with existing residences, the natural features that divide the reserve into smaller sections, and the distance to highway interchanges, this area is not considered appropriate for employment land needs. However, it is able to accommodate a residential land need.

Factor 2: Orderly and economic provision of public facilities and services

Water Services

With regard to water services, the I-5 East – Washington County Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Adjacent lands inside the UGB are served by the City of Tualatin. The city's sole source of water is treated water purchased from Portland Water Bureau. Water is delivered through a 36-inch supply line from the Washington County Supply Line. There are two pressure zones that would likely serve the I-5 East – Washington County Urban Reserve, Pressure Zones B and C. According to the city's March 2023 Water System Master Plan, both zones have storage surpluses under current conditions, but may have storage deficits under UGB buildout conditions. Under normal pumping conditions, the Norwood Pump Station serving Zone C has surplus capacity, though the Martinazzi and Boones Ferry Pump Stations previously serving Zone B have reached the end of their usable lives and do not currently operate, so Zone B is now served by the Boones Ferry flow control valve/pressure reducing valve. There are existing industrial deficiencies in Zone B and residential deficiencies in Zone C. Existing transmission line capacity is deficient in both zones.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Assuming the I-5 East – Washington County Urban Reserve is added to the UGB after full buildout of the areas already within the UGB, and assuming storage facilities are not expanded, development of the reserve would cause a greater storage capacity deficit. Projected surpluses of the Norwood Pump Station could serve the reserve, but the Martinazzi and Boones Ferry Pump Stations both require upgrades to be operational. Transmission line improvements are identified in the Master Plan capital improvement projects. These improvements would provide resiliency to the existing water system as well as additional capacity to serve future growth in the reserve.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Additional storage capacity, as well as potentially pump station upgrades, will be needed to avoid negative impacts to service in the UGB.

d. Estimated water service-related costs for reserve development

Water piping, pumping, and storage costs	Cost
10-inch pipe	$6.76 million
12-inch pipe	$0 million
16-inch pipe	$0
Pumping	$14.5 million
Storage	$0.50 million
Total:	**$21.76 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$2,922**

Sanitary Sewer Services

With regard to sanitary sewer services, the I-5 East – Washington County Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Wastewater from adjacent lands in the City of Tualatin is treated at the Durham Advanced Wastewater Treatment Facility (AWWTF), which is owned and operated by Clean Water Services (CWS). CWS is also responsible for the system's gravity sewers over 24 inches in size, pump stations, and force mains. Eight of the nine CWS-owned pump stations have surplus capacity under existing conditions. While there may be some pipe capacity issues in the Teton and Tualatin Reservoir Basins, these capacity issues they may not be significant.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

It is unclear whether a capacity increase to the Saum Creek Pump Station proposed in the Master Plan would have the capacity to also serve the reserve. Current and planned piping is likely to be insufficient to serve development of the reserve. The treatment plant is a large facility with a broad service area; however, the cumulative addition of multiple urban reserves to the UGB could result in a need for some expansion in order to handle additional load.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Additional pumping and piping capacity are potentially needed to serve urban development of the reserve while avoiding negative impacts to service within the existing UGB. Additionally, and as noted above, cumulative addition of multiple urban reserves to the UGB could result in a need for some treatment plant expansion in order

to handle additional load while avoiding negative impacts to service within the existing UGB.

d. Estimated sanitary sewer service-related costs for reserve development

Sanitary sewer piping and pumping costs	Cost
10-inch pipe	$3.91 million
12-inch pipe	$4.20 million
15-inch pipe	$0
Pump station	$4.50 million
Force mains	$0
Total:	**$12.61 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$1,693**

Stormwater Management Services

With regard to stormwater management services, the I-5 East – Washington County Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

There is no indication of major capacity issues with existing stormwater facilities that serve the adjacent land inside the UGB. Based on topography, stormwater from development of the I-5 East – Washington County Urban Reserve would discharge directly to Saum Creek; the city's 2019 Stormwater Master Plan did not identify the Saum Creek Basin as currently facing capacity challenges.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Stormwater will be conveyed, treated, and disposed of within the reserve and discharge to Saum Creek, rather than connecting to existing facilities in the UGB. Saum Creek is believed to have sufficient capacity to serve development of the reserve.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

As noted above, stormwater will be conveyed, treated, and disposed of within the reserve and discharge to Saum Creek, rather than connecting to existing facilities in the UGB. Saum Creek is believed to have sufficient capacity. Therefore, no adverse impacts to existing facilities are anticipated.

d. Estimated stormwater service-related costs for reserve development

Stormwater piping and water quality/detention	Cost
18-inch pipe	$1.80 million
24-inch pipe	$0
30-inch pipe	$0
Water quality/dentition	$2.65 million
Total:	**$4.45 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$597**

Transportation Services

With regard to transportation services, the I-5 East – Washington County Urban Reserve is given a "low-medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(e) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Figure 4.36 in Chapter 4 of the 2023 Regional Transportation Plan (RTP) displays 2020 home-based vehicle miles traveled (VMT) per capita by Metro transportation analysis zone, with average VMT per capita considered 11.32. According to Figure 4.36, areas in the UGB adjacent to the I-5 East – Washington County Urban Reserve had below average, average, and above average home-based VMT per capita in 2020.

Metro's adopted 2040 Growth Concept Map designates a town center in the adjoining City of Tualatin. Town centers are meant to: serve populations of tens of thousands of people; offer more locally-focused retail uses and public amenities; and be well served by transit. The roughly 300-acre Tualatin Town Center aligns with this 2040 Growth Concept Map area. The city's Tualatin 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. Metro's 2017 State of the Centers Atlas shows that the Tualatin Town Center has a low number of dwelling units per acre and a much higher total number of employees compared with other town centers in the region. The town center has a very high "access to parks" score in the atlas, due in part to the numerous open space/natural areas and the Tualatin Community Park along the Tualatin River nearby. The town center also includes grocery stores and other retail commercial uses, medical/dental facilities, a post office, and multi-family housing, but also storage facilities, auto-oriented uses, and large parking lots. Within the UGB and adjoining the town center are Title 4 designated Industrial Area and Employment Area lands, as well as low- and medium-density residential uses.

Seven TriMet bus lines and the Westside Express Service (WES) Commuter Rail serve Tualatin. The routes are spread out along the major roadways including Highway 99W, SW Tualatin-Sherwood Road, and SW Boones Ferry Road, providing service to the town center and employment areas. WES connects the town center with Beaverton to the north and Wilsonville to the south. Figure 4.3 in Chapter 4 of the 2023 RTP does identify gaps in the planned regional transit network along SW Boones Ferry Road, SW Tualatin – Sherwood Road, and elsewhere in the city.

Nonetheless, the town center's existing land uses and transit service, and some availability for new development in and near the town center, demonstrate that growth in the current UGB near the town center will not necessarily cause a significant increase in home-based VMT per capita in the future, as residents will be able to access some daily needs through modes other than private motor vehicle transport. Growth in other areas of the city where residential uses surround schools and parks are is also unlikely to significantly impact home-based VMT per capita in the future.

The town center is less than half a mile away from areas in the UGB adjacent to the reserve, but these areas are on the opposite side of I-5 and I-205 from the reserve. I-5 also separates residential uses in the UGB to the north of the reserve from the town center to the west; there are just two overpasses that connect these residential uses to the town center, limiting connectivity. Residents of these areas, where there are also fewer bus routes, may be more reliant on private motor vehicle transportation to get to the town center and areas to the west.

Tualatin has a fairly well-established bike route system, with approximately 25 miles of dedicated bike lanes, seven miles of established bikeways, and local trails that connect the employment areas and town center to the residential areas. There are two bike lane connections across I-5 to provide access to the eastern portion of the city. Figure 4.5 in Chapter 4 of the 2023 RTP shows several existing bike facilities in Tualatin as a part of the planned regional bike network, including facilities on SW Boones Ferry Road, SW Nyberg Street, and SW Tualatin-Sherwood Road. There are identified gaps in planned regional bike facilities in the southwest and east of the city.

The town center has a well-established pedestrian network that also includes access to some trails. Most of the residential areas of Tualatin also have sidewalks, but there are fewer exiting pedestrian facilities in employment areas outside of the town center. The Tualatin River Greenway Trail connects the town center to parks in Durham and Tigard to the north, as well as to Browns Ferry Park along the Tualatin River on the east side of I-5. Figure 4.4 in Chapter 4 of the 2023 RTP shows a number of existing streets in Tualatin as in the regional pedestrian network, including sections of SW Boones Ferry Road, SW Borland Road, and SW Tualatin – Sherwood Road. The figure identifies gaps in the future regional pedestrian network, however, in the south and east of the city.

Figure 4.14 in Chapter 4 of the 2023 RTP identifies the SW Tualatin-Sherwood Road in the UGB as a high injury corridor. The intersection of SW Tualatin-Sherwood Road and

SW Boones Ferry Road, as well as the intersection of SW Martinazzi Avenue and SW Boones Ferry Road, are identified in Figure 4.14 as top five percent high injury intersections. There are no other high injury corridors or high injury intersections in Tualatin's portion of the UGB identified on Figure 4.14.

The portions of I-5 and I-205 that cross through Tualatin are identified as throughways in Figure 4.7 in Chapter 4 of the 2023 RTP. Figure 4.8 of the chapter indicates that these portions of both interstates currently meet travel speed reliability performance thresholds, with no more than four hours per day when travel speeds fall below the identified minimum speed. RTP models indicate this reliability will continue at least to the year 2045.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

While the reserve is adjacent to – indeed, includes portions of – I-5 and I-205, the nearest interchanges to both highways are more than a mile away via existing roads. As noted above, the portions of these highways in Tualatin currently meet travel speed reliability performance thresholds. Given the proximity of the town center and other commercial/employment areas to the reserve, the reserve's size, and the distance between highway interchanges and the reserve, urban development of the reserve is unlikely to generate sufficient traffic on either interstate to cause them to no longer meet those performance thresholds.

Currently, there is no transit service to the reserve. TriMet Route 76, which provides access to the town center, is approximately a third of a mile from the reserve via SW 65th Avenue, on the opposite side of I-205. TriMet Route 96, which also provides access to the town center, as well as to Portland and Wilsonville, is approximately two-thirds of a mile from the reserve via SW Norwood Road, on the opposite side of I-5.

There is a dedicated bike lane on SW 65th Avenue that is approximately one-tenth of a mile north of the reserve, on the opposite side of I-205. This bike lane connects to a bike lane on SW Sagert Street, which provides a connection to the west side of I-5, the town center, and employment areas. The small gap on SW 65th Avenue needs to be completed to connect to the reserve. There is an established bikeway and dedicated bike lane on SW Norwood Road that connects to the reserve and provides access to Horizon Christian School. This bikeway connects to another bikeway on SW Boones Ferry Road that extends south to the bike facility network in Wilsonville. It also connects to a bike lane that extends north on SW Boones Ferry Road to the bike facility network in Tualatin and Tualatin High School. There are no other existing bike facilities connected to or within the reserve.

The Saum Creek Greenway Trail is approximately 800 feet north of the reserve on the opposite side of I-205 via SW 65th Avenue; the trail connects to sidewalks on SW 65th Avenue and SW Sagert Street. The 800-foot gap needs to be completed in order to directly connect to reserve. The Norwood Trail is approximately 500 feet from the

reserve along SW Norwood Road. This trail connects to sidewalks in the residential area located just west of I-5 and extends quite some distance to the north through the residential neighborhoods and to Tualatin High School. The 500-foot gap needs to be completed to connect to the reserve. There are no sidewalks along SW 65th Avenue adjacent to the reserve, or on any existing streets within the reserve.

There are no urban residential or employment uses within a mile of the reserve and on the same side of I-5 or I-205 and, as noted above, there are only two nearby interstate crossings with gaps in bike and pedestrian facilities. There is also no existing transit service to the reserve. Therefore, without facility improvements and service extensions, and unless the reserve itself is developed with a mixture of uses, future residents of the reserve will likely be reliant on private motor vehicle transport to access their daily needs and employment, and employees of future employment uses in the reserve will need to commute by private motor vehicle from their homes located elsewhere. The analysis in Factor 1 indicated that the reserve would not be able to efficiently accommodate an employment land need.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

SW 65th Avenue and SW Norwood Road would see additional private motor vehicle traffic as a result of urbanization of the reserve. However, if the reserve were to be developed with a mix of residential and employment uses, if transit service were to be extended to the reserve, and if gaps in bike and pedestrian facility connections were to be completed, there would be less additional traffic on these roadways. Providing the bike and pedestrian facility connections would lead to more use of the existing facilities within the UGB.

Given the proximity of the town center and other employment areas to the reserve, and given the distance of highway interchanges, development of the reserve is unlikely to jeopardize the throughway reliability of I-5 or I-205. Any additional motor vehicle traffic on SW Tualatin-Sherwood Road resulting from development of the reserve, however, may exacerbate the road's high-crash conditions.

d. Need for major transportation facility improvements and associated costs

SW 65th Avenue would likely need to be improved to urban arterial standards, but its improvements are considered a half-street improvements in this analysis, as the eastern half would be attributable to the urban development of the Norwood Urban Reserve. SW Frobase Road, SW 82nd Avenue, and SW Norwood Road would likely need to be improved to urban collector standards. The improvements to SW Frobase Road are considered half-street improvements in this analysis, as the southern half would be attributable to the Elligsen Road North Urban Reserve. Additional right-of-way would be required to develop each of these roads to their respective urban standards. In most cases, per-mile costs are expected to be normal, given the topography of the reserve land the roadways cross.

Facilities	Cost
Arterials, existing/improved full street	$0
Arterials, existing/improved half street	$43.83 million
Arterials, new	$0
Collectors, existing/improved full street	$47.08 million
Collectors, existing/improved half street	$13.11 million
Collectors, new	$0
Total:	**$104.02 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$13,972**

e. Provision of public transit service

Though the I-5 East – Washington County Urban Reserve is within the TriMet Service District, when TriMet evaluated the reserve for providing transit service for this analysis, it determined service to the reserve is unlikely to occur.

Prior to land being included in the UGB, a more detailed concept plan, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11, is required. This concept plan process will develop more refined public facility and service needs and cost estimates.

Factor 3: Comparative environmental, social, energy, and economic consequences

Environmental consequences

Saum Creek flows north through the middle of the I-5 East – Washington County Urban Reserve for nearly two miles. Seven tributaries, with approximately three miles in combined length, join the creek. The vast majority of these water bodies are within established riparian buffers, some with adjacent steep slopes that would limit nearby future development. Five wetlands on the National Wetland Inventory (NWI) are located along the tributaries, ranging in size from 0.4 to 1.4 acres each, and with a total area of approximately 4.7 acres. Seven additional ponds not identified as wetlands on the inventory are located along the tributary stream corridors. There are significant areas of riparian and upland habitat identified along all the stream corridors. The stream corridors and habitat areas divide the reserve into numerous small sections of developable land. As a result, some of the land areas are isolated from one another and transportation connections between them could potentially have adverse impacts on the stream corridors and habitat areas. However, the increased protection levels on streams, wetlands, and habitat areas within the UGB will lessen the potential impacts.

Still, urbanization of the reserve could occur with comparatively moderate to significant impacts to the natural resources, depending on the level of transportation connectivity and general urban design factors. Additional environmental consideration, specifically

regarding avoidance of conflict between urban development and regionally significant fish and wildlife habitat, is provided in the Metro Code Factors Analysis (Appendix 7A).

Considering the comparative environmental consequences of urbanization, the I-5 East – Washington County Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Social, energy, and economic consequences

There are a number of rural residences throughout the I-5 East – Washington County Urban Reserve, but somewhat dispersed by stream corridors, habitat areas, and the agricultural uses described below. As noted in response to Factor 1, the vast majority of the reserve's tax lots have assessed improvements. Land uses in the reserve are somewhat separated from existing urban development by I-5, I-205, agricultural uses, stream corridors, and habitat areas, so urban development in the reserve may be more impactful on the current sense of place and rural lifestyle. However, existing development, parcelization, and the natural resources will likely slow urbanization and lead it to develop in more isolated sections, reducing the pace of change. Moreover, urbanization of the reserve could bring new social, educational, and recreational opportunities for existing residents.

As detailed more fully in response to Factor 2, future residents of the reserve are expected to be fairly reliant of private motor vehicle transportation, which could lead to VMT levels with adverse energy consequences. However, VMT could be limited under certain circumstances, including if the reserve were to be developed with a mix of land uses that allows future residents to access their daily needs closer by.

There is both small- and larger-scale agricultural activity occurring the reserve, including field and row crops, pastureland, and Christmas tree farms and Lee Farms, which hosts farm-related events and activities. While there would be economic consequences from urbanization in terms of a loss in farming activity in the reserve, that loss may be outweighed by the economic benefits of residential and/or employment development.

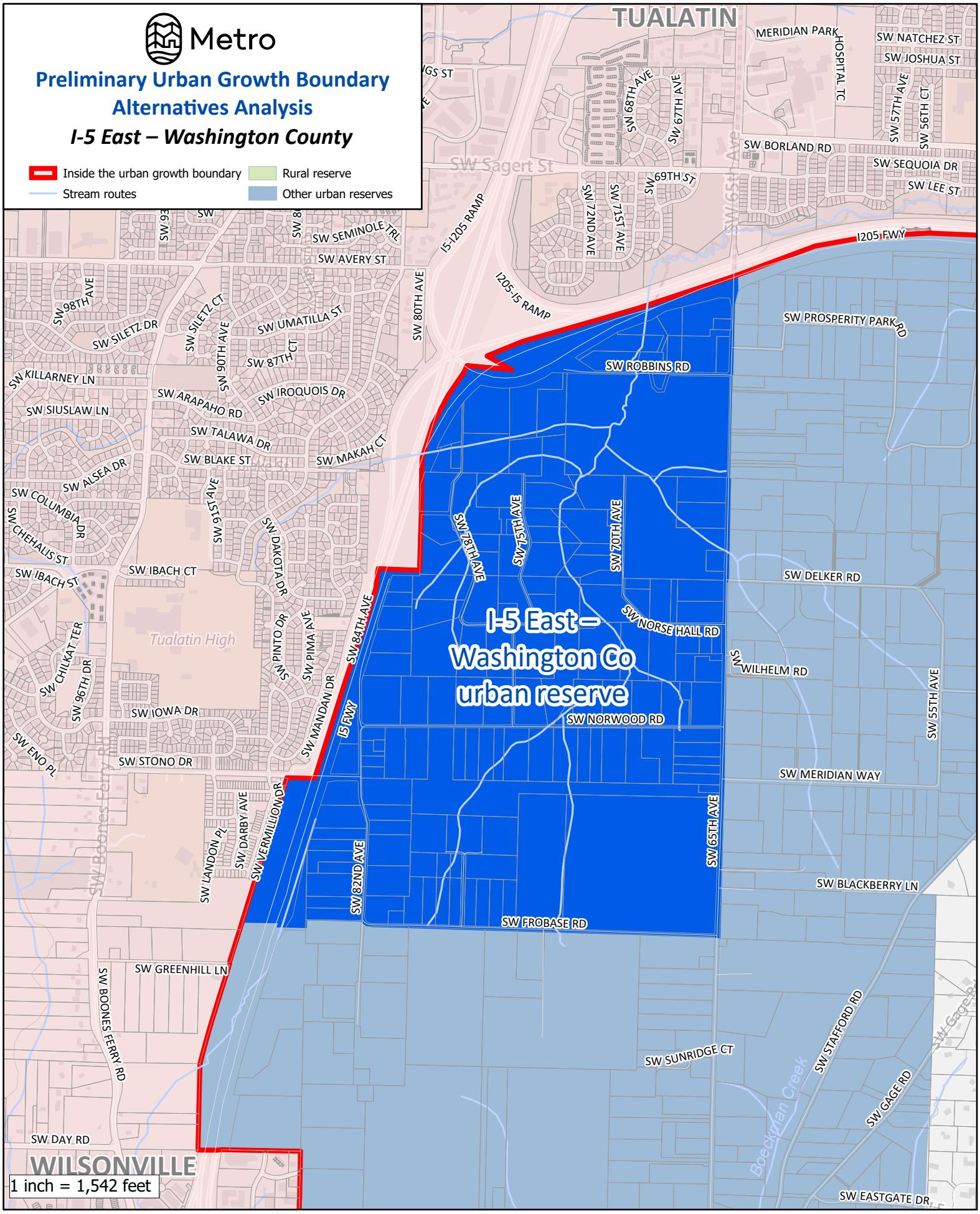
Overall, there would be comparatively moderate social, energy, and economic consequences from urbanization of this reserve. The I-5 East – Washington County Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Factor 4: Compatibility of the proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

Goal 3 agricultural lands, specifically lands zoned Exclusive Farm Use (EFU) by Washington County, border the I-5 East – Washington County Urban Reserve in areas outside the UGB to south, on the opposite side of SW Frobase Road. These EFU-zoned lands have agricultural activity, including field crops, Christmas tree farms, and pasture land. There are also patches of forest, but generally in stream riparian areas, which may limit harvesting potential. The EFU-zoned lands also contact some small amounts of rural residential development. SW Frobase Road separates the reserve from these EFU-zoned lands, but the road itself would not provide an adequate buffer between urban

development and agricultural activity. Development of the reserve could lead to land use conflicts related to safety, liability, and vandalism and complaints due to noise, odor, dust, and the use of pesticides and fertilizer. The improvement of SW Frobase Road to urban standards, and associated street light illumination and bicycle and pedestrian movements, may further jeopardize the compatibility of the two uses, though the impacts of urban roadways on adjacent agricultural activity may be minimized through road design. Urbanization of the reserve would increase traffic on SW Frobase Road and SW 65th Avenue, which could impact the movement of both farm equipment and goods. Therefore, proposed urban uses are considered incompatible with the nearby agricultural activities occurring on the EFU-zoned land to the south.

The proposed urban uses would not be compatible with nearby agricultural and forest activities occurring on farm and forest land outside the UGB to the south. Land use conflict mitigation measures would be warranted. The I-5 East – Washington County Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location factor.



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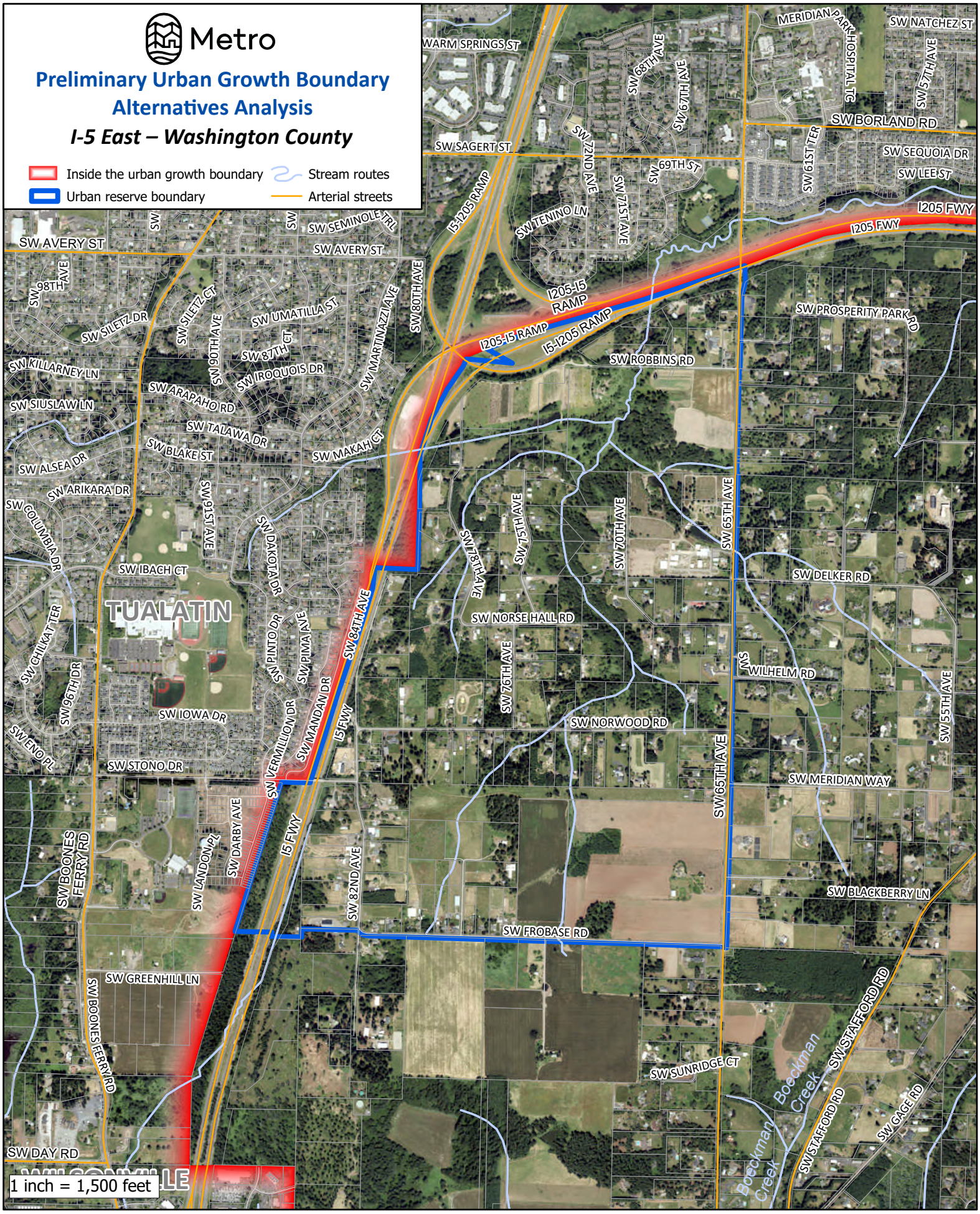

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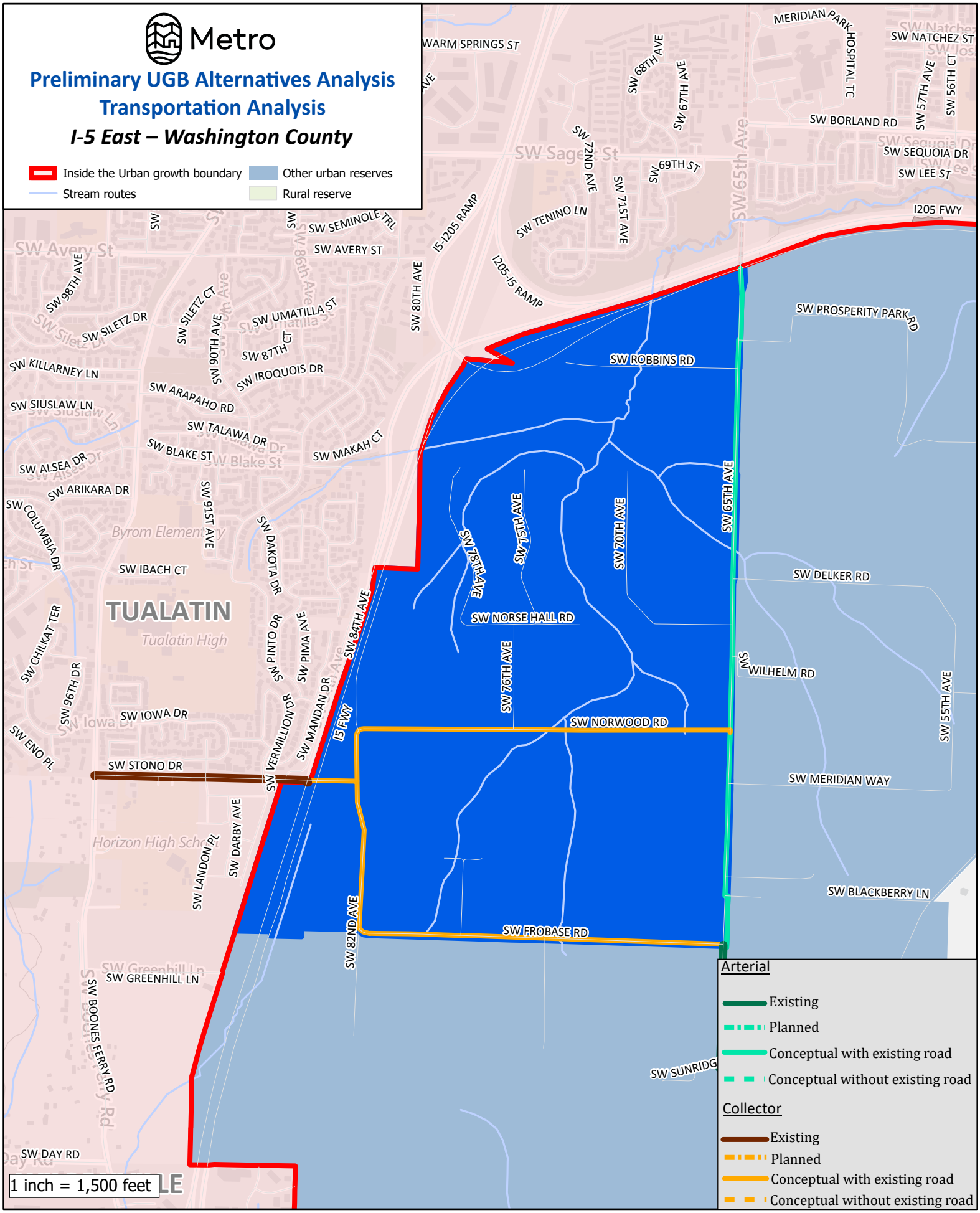

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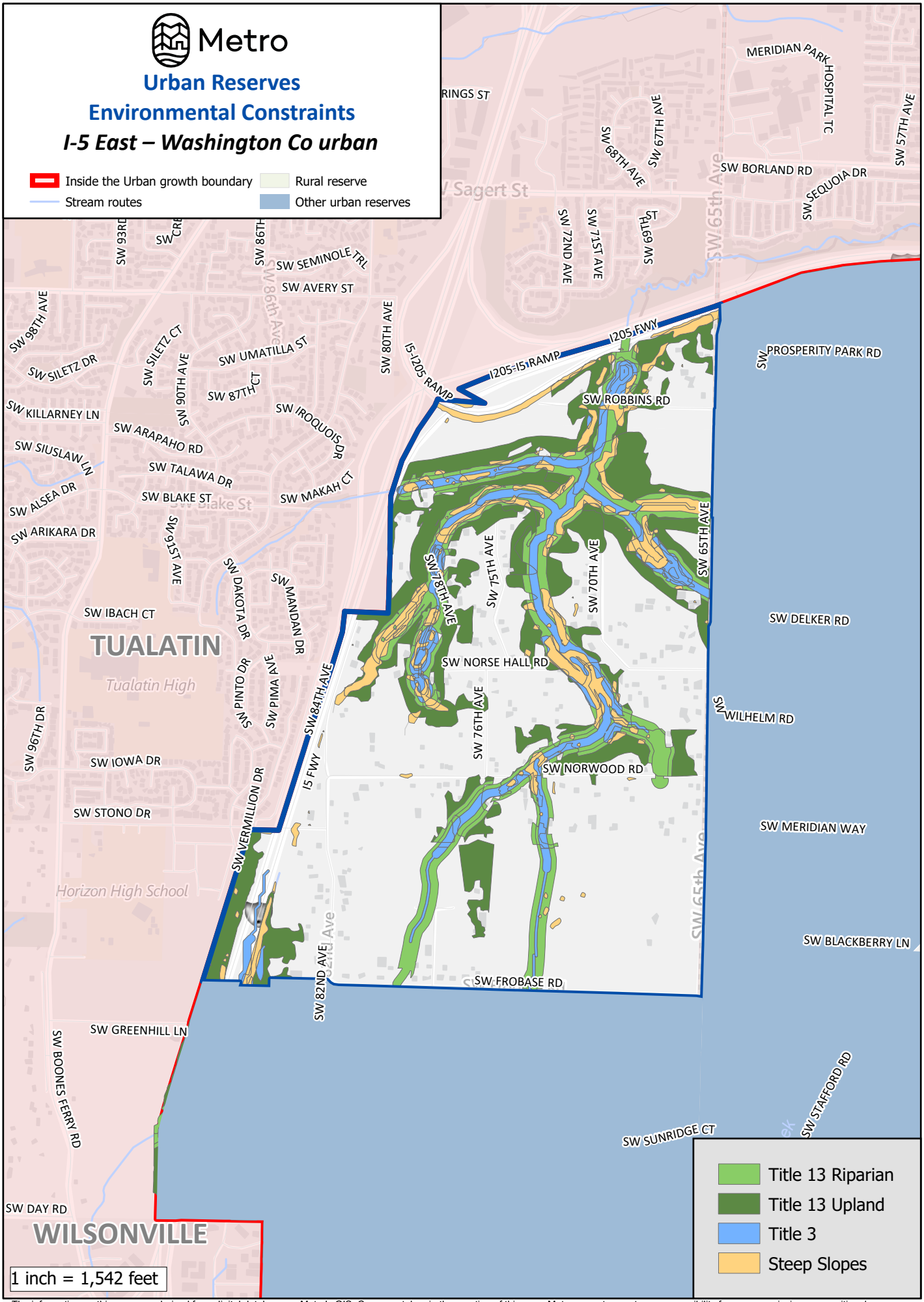

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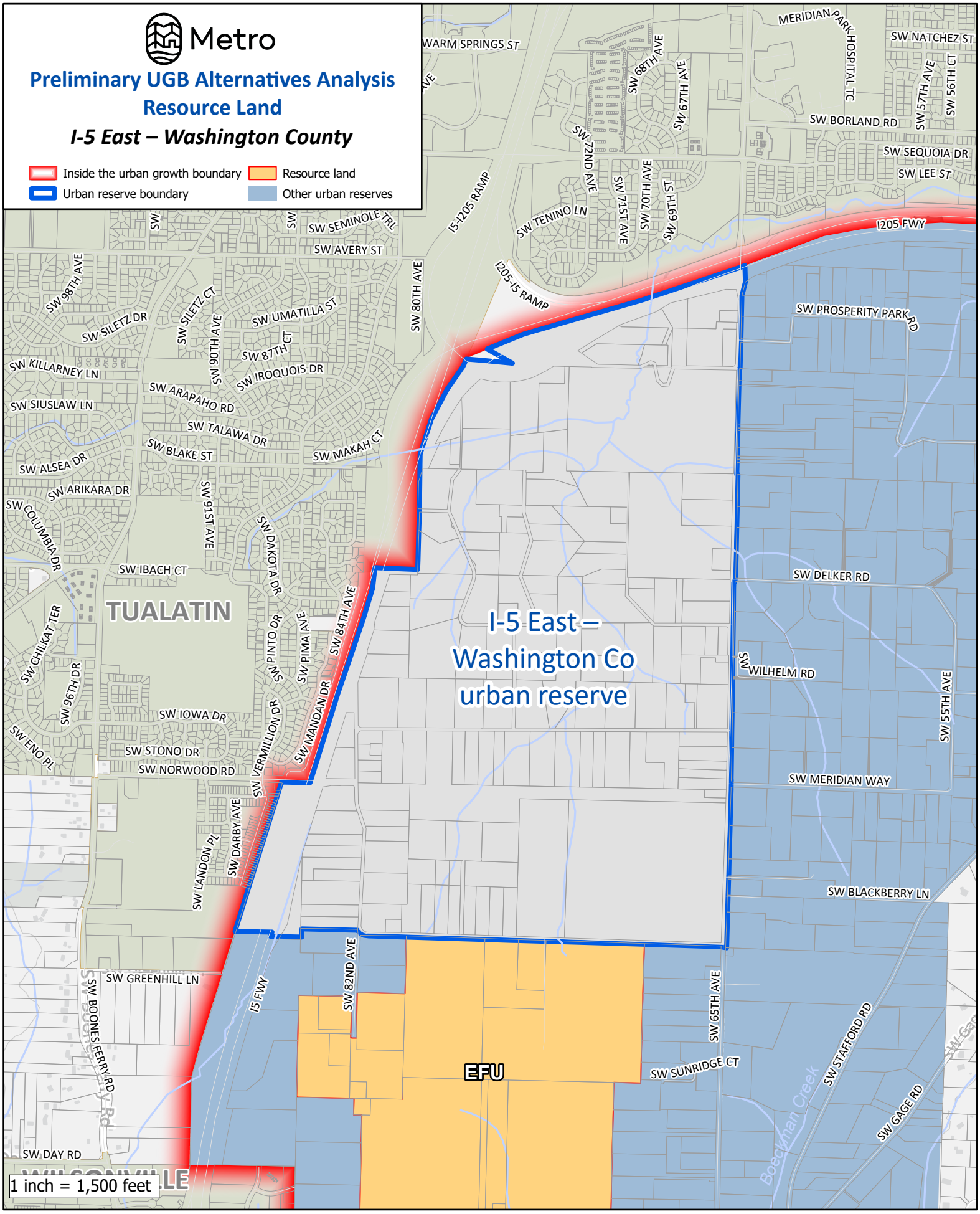

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MAPLELANE URBAN RESERVE

Total Reserve Area	569 acres
Total Tax Lot Area in Reserve (without Right-of-Way)	556 acres
Gross Vacant Buildable Area	341 acres
Net Vacant Buildable Area	**254 acres**

The Maplelane Urban Reserve is an irregularly shaped area adjacent to the east side of Oregon City. The reserve is roughly divided between north and south by S Maplelane Road. In addition to S Maplelane Road, the reserve is connected to S Waldow Road and S Thayer Road. The UGB forms the reserve's western and southern boundaries. The reserve is primarily flat, with the exception of some small areas of steep slopes along the stream corridors and within the forested northeastern corner of the reserve. Abernethy Creek flows northward, just outside of the reserve to the east. A tributary to Abernethy Creek flows eastward through the northern portion of the reserve, and three tributaries to Thimble Creek flow eastward through the southern portion.

GOAL 14 BOUNDARY LOCATION FACTORS

Factor 1: Efficient accommodation of identified land needs

The Maplelane Urban Reserve is comprised of 167 contiguous tax lots, which have a combined area of approximately 556 acres. All but one tax lot is entirely in the reserve. Of those tax lots that are entirely in the reserve, more than 40 percent are less than one acre in size, 80 percent are smaller than five acres, and only four are larger than 10 acres. As noted above, the entire reserve contains 341 gross vacant buildable acres and 254 net vacant buildable acres.

According to aerial imagery, most of the reserve's tax lots are developed with rural residential uses, though some larger tax lots appear to have agricultural uses and/or groves of trees. Oregon City School District owns a 57-acre tax lot in the northern portion of the reserve. Portland General Electric (PGE) and the federal government also together own about 50 acres of land in the reserve, including tax lots occupied by electrical substations and large powerlines. Overall, 148 of the reserve's tax lots have improvements, with a median assessed value of those tax lots' improvements exceeding $315,000.

S Maplelane Road and S Thayer Road run roughly east-west through the reserve. S Plumb Drive, a local residential street within the UGB, stubs to the west side of the north end of the reserve. The nearest bus stop is on S Beavercreek Road, approximately half a mile away via S Thayer Road. The nearest interstate, I-205, is more than two miles from the north end of the reserve. Clackamas Community College and Oregon City High School are about half a mile away from the south end of the reserve.

The reserve is generally flat with only a few locations, mainly at the edges of the reserve and along stream corridors, having slopes greater than 10 percent. While flatter topography would be easier for development of employment uses, the number of small parcels and the distance of the reserve from I-205 reduce the attractiveness for employment uses. In addition, there is an existing

employment and commercial node at Highway 213 and S Beavercreek Road, and additional vacant industrial-zoned land inside the UGB nearby, further reducing the need for additional employment land in this location. New residential development would be more cohesive with the existing rural residential development pattern and the school district's property could provide a focal point for residential neighborhoods once a school was built there. Therefore, this area is considered best able to accommodate a residential land need and not an employment land need.

Factor 2: Orderly and economic provision of public facilities and services

Water Services

With regard to water services, the Maplelane Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

The City of Oregon City serves lands within their corporate boundary, while lands within the jurisdiction of Clackamas County are served by Clackamas River Water (CRW). Both Oregon City and the CRW South System receive water from the South Fork Water Board (SFWB). SFWB's water treatment process includes flocculation, sedimentation, filtration, and chlorination of raw water from the Clackamas River to remove harmful bacteria. There are currently no known major treatment system deficiencies.

The city has annexed the Beavercreek UGB expansion area to the southwest. While the city is adequately served elsewhere, they may lack water storage necessary to fully serve urban development of these annexed areas. CRW is considered to have adequate capacity to serve lands still within the jurisdiction of Clackamas County in this vicinity and other customers; though the Beavercreek service area showed a storage deficiency of 0.31 MG in 2019 in the interim of building the new Beavercreek reservoir, it is anticipated to bring on sufficient storage. The Henrici reservoirs are understood to have capacity surpluses.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

CRW has done planning for service to the area of the urban reserve, and the Maplelane Urban Reserve is in CRW's service area. However, CRW will not likely be the service provider once the reserve is annexed to a city (i.e., Oregon City) and urbanized. Rather, when Oregon City annexes the reserve, the city will likely take ownership of any water related infrastructure within the area, except potentially for facilities that are needed to go beyond the annexed area, such as large-scale transmission lines. Accordingly, CRW, like many water service providers, may be cautious about investing in improvements for currently rural areas that may one day be annexed to cities. While there is some surplus storage capacity that could be available to serve urban development of the

reserve, once annexed to the city, that surplus may be insufficient for full urbanization of the reserve and addition storage facilities may be necessary.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

As noted above, new storage facilities will likely be needed to avoid system capacity deficits.

d. Estimated water service-related costs for reserve development

Water piping, pumping, and storage costs	Cost
10-inch pipe	$3.64 million
12-inch pipe	$0
15-inch pipe	$0
Pumping	$0
Storage	$0.34 million
Total:	**$3.98 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$784**

Sanitary Sewer Services

With regard to sanitary sewer services, the Maplelane Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Oregon City provides sanitary sewer service to properties within its corporate limits, as well as to some properties that are already in the UGB but still in unincorporated Clackamas County. Wastewater flows to the Tri-City Sewer District (TCSD) trunks, interceptors, and, eventually, the Tri-City Water Resource Recovery Facility (WRRF), all of which are owned and operated by Water Environment Services (WES). Surcharging, ranging from minor to severe, exists throughout the xity collection system. There are also capacity deficiencies in several locations in WES portions of the system. The Newell Creek Interceptor, which may need to serve the Maplelane Urban Reserve, has existing capacity issues. Relevant master plans include a capital improvement project to upside a portion of the Newell Creek Interceptor south of Redland Road, but it is not clear how much additional capacity this will provide.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The Newell Creek Interceptor has capacity challenges and it is unknown whether a planned upsizing could accommodate urban development of the Maplelane Urban Reserve.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Without sufficient upsizing of the Newell Creek Interceptor, urban development of the reserve could exacerbate existing capacity challenges.

d. Estimated sanitary sewer service-related costs for reserve development

Sanitary sewer piping and pumping costs	Cost
10-inch pipe	$0
12-inch pipe	$5.43 million
15-inch pipe	$0
Pump station	$3.06 million
Force mains	$2.64 million
Total:	**$11.13 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$2,190**

Stormwater Management Services

With regard to stormwater management services, the Maplelane Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

The Oregon City Stormwater Master Plan identifies capacity issues within the modeled basins. Two of the modeled basins were determined to contain the most problem areas: the John Adams Basin is described as generally undersized, and the South End Basin was described as an inefficient system with flooding during the two-year storm event. Capital improvement projects to address capacity issues described above are presented in the Master Plan.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Stormwater will be conveyed, treated, and disposed of within the reserve (i.e., outfall to Abernethy Creek); therefore, it is not anticipated that existing stormwater facilities would be utilized.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

As noted above, stormwater will likely be detained and treated within the reserve and, based on topography, outfall directly to Abernethy Creek; therefore, no impacts to the existing stormwater infrastructure in the UGB are anticipated.

d. Estimated stormwater service-related costs for reserve development

Stormwater piping and water quality/detention	Cost
18-inch pipe	$4.88 million
24-inch pipe	$0
30-inch pipe	$0
Water quality/dentition	$4.84 million
Total:	**$9.72 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$1,914**

Transportation Services

With regard to transportation services, the Maplelane Urban Reserve is given a "low-medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(e) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Figure 4.36 in Chapter 4 of the 2023 Regional Transportation Plan (RTP) displays 2020 home-based vehicle miles traveled (VMT) per capita by Metro transportation analysis zone, with average VMT per capita considered 11.32. According to Figure 4.36 in Chapter 4, areas in the UGB adjacent to the Maplelane Urban Reserve had an above average home-based VMT per capita in 2020.

Metro's adopted 2040 Growth Concept Map designates a regional center in the adjacent City of Oregon City. Regional centers are generally meant to: serve populations of hundreds of thousands of people; surround high-quality transit service and multi-modal street networks; and offer larger commercial uses, healthcare facilities, local government services, and public amenities. The Oregon City Regional Center aligns with the 2040 Growth Concept Map designation.

The City of Oregon City's plans for the Oregon City Regional Center include mixed-use development, enhancements to the main street, and the creation of new open spaces that will provide direct connections to the river. The regional center is also home to Willamette Falls and the Willamette Falls Legacy Project, a public/private partnership working to connect the Falls to Downtown Oregon City through the development of housing, public spaces, habitat restoration, education, and employment opportunities. The regional center currently has a drug store, restaurants, and other retail commercial uses, banks, medical/dental facilities, community centers, government offices, and auto-oriented uses. Metro's 2017 State of the Centers Atlas showed less than 400 people living in the regional center, as well as a low population density (5.2 people per acre), low total employees, and low dwelling unit density compared with other regional

centers; in fact, the average population of all regional centers in 2017 was more than 6,000 people and the average population density was 22.8 people per acre. The city's vision to attract more housing and employees to the regional center will elevate it to the activity spectrum levels comparable to other regional centers in the region.

There are also employment uses, including industrial uses, grocery stores, and other commercial uses, as well as education and medical facilities, government offices, and parks, in the Red Soils area near the intersection of Beavercreek Road and Molalla Avenue and between Highway 213 and Beavercreek Road.

Growth in and near the regional center and other employment areas will not necessarily cause a significant increase in home-based VMT per capita in the future, as area residents will be able to access some daily needs and find employment opportunities with relatively short trips. The transit service and bike and pedestrian facilities that serve these areas, described further below, can also help to ensure that additional growth nearby does not adversely impact home-based VMT per capita.

Four TriMet bus lines serve Oregon City, all of which generally focus on the regional center and the central portion of the city along Molalla Avenue. Service is provided to Clackamas Community College and the employment areas near the intersection of Beavercreek Road and Molalla Avenue and between Highway 213 and Beavercreek Road; however, large portions of the city lack TriMet service. Route 32 provides service along Beavercreek Road, connecting the regional center with employment uses along Beavercreek Road, Oregon City High School, and Clackamas Community College. Some of this existing route is identified as part of the frequent regional transit network in Chapter 4, Figure 4.3 of the 2023 RTP, though there are also gaps in planned frequent transit service along certain routes in the UGB near the reserve and elsewhere in the city as well.

Oregon City has at least 29 miles of dedicated bike lanes and 3.5 miles of established bikeways, with most of them located in the "up-top" section (southern end) of the city. The Park Place neighborhood is also fairly well served and Highway 213 has dedicated bike lanes. Most of the downtown streets are classified as "bike with caution" streets and the South End neighborhood has minimal bike facilities. There are dedicated bike facilities along most of Beavercreek Road and Molalla Avenue, as well as a roughly half-mile section of S Maplelane Road in the UGB extending from those on S Beavercreek Road. A painted shoulder serves as a bike facility on one side of S Country Village Drive, in the UGB across S Maplelane Road from the reserve. The existing bike facilities on S Beavercreek Road, S Maplelane Road, and Molalla Avenue are identified as part of the regional bike network on Figure 4.5 in Chapter 4 of the 2023 RTP. However, the figure also identifies a gap in the planned network along S Thayer Road in the UGB near to the reserve and along roadways closer to the regional center.

The regional center is well served by sidewalks, as are employment areas near the intersection of Beavercreek Road and Molalla Avenue and between Highway 213 and

Beavercreek Road. A residential area in the UGB adjacent to the reserve's west also has sidewalks, but not the Country Village Estates manufactured home park also adjacent to the reserve. The portions of S Maplelane Road and S Thayer Road in the UGB lack sidewalks on both sides and have lengths with no sidewalks at all, though there are painted pedestrian crossings at the intersection of S Maplelane Road and S Beavercreek Road. Chapter 4, Figure 4.4 of the 2023 RTP identifies gaps in the planned regional pedestrian network along S Beavercreek Road and S Maplelane Road. There are also gaps in the planned regional trail network in the UGB near the reserve, as indicated in Chapter 4, Figure 4.6 of the 2023 RTP.

Figure 4.14 in Chapter of the 2023 RTP identifies Molalla Avenue inside the UGB as a high injury corridor.

The sections of Highway 99E, Highway 213, and I-5 in Oregon City are identified as a throughways Chapter 4, Figure 4.7 of the 2023 RTP. Figure 4.8 of that chapter indicates that these highway sections currently meet travel speed reliability performance thresholds, with no more than four hours per day when travel speeds fall below the identified minimum speed. RTP models indicate this reliability will continue at least to the year 2045.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Highway 213 is the nearest RTP-designated throughway to the reserve, nearly one mile away via S Maplelane Road and S Beavercreek Road. As noted above, the section of the highway in the city currently meets travel speed reliability performance thresholds. Considering RTP reliability forecasts, development of the reserve is not expected to jeopardize the throughway reliability of the highway.

There is currently no TriMet bus service all of the way to the reserve. The nearest stop is for Route 32 on S Beavercreek Road, roughly two-thirds of a mile west of the reserve via S Maplelane Road or about half a mile away via S Thayer Road.

The bike facilities on S Maplelane Road stop about 1,000 feet from the west of the reserve and there are incomplete bike facilities on S Thayer Road.

The adjacent residential subdivision within the city between S Maplelane Road and S Thayer Road has nearly a dozen local streets with sidewalks that stub to west of the reserve, including at Blue Blossom Way, Sourwood Street, and Sugarpine Street, which lead out to S Maplelane Road and S Thayer Road. However, as noted above, S Maplelane Road and S Thayer Road lack sidewalks on both sides and have some gaps. Sidewalks are lacking in the reserve itself. There are no trails that serve or connect to the reserve, either.

It was noted in response to Factor 1 that the reserve is not likely to be able to efficiently accommodate an employment land need, but could support a residential land need. The regional center is approximately three miles from the reserve and, as noted above, not

fully connected to the reserve by transit, bike facilities, or pedestrian facilities. The employment uses along Beavercreek Road, Highway 213, and Molalla Avenue and Clackamas Community College, however, are roughly within a mile of the west side of the reserve, providing closer opportunities for future resents of the reserve to meet their daily needs and find employment opportunities. Nonetheless, without direct transit service and complete bike and pedestrian facilities linking these areas to the reserve, it is likely that future residents of the reserve would be reliant on private motor vehicle transportation.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

S Beavercreek Road, S Thayer Road, S Maplelane Road, and S Waldo Road would be expected to see additional private vehicle traffic from development of the reserve. Existing bike and pedestrian facilities nearby would also be expected to see additional use.

With the lack of direct transit service and complete bike facilities and sidewalks connecting to the reserve, future residents will likely rely primarily on private motor vehicle transportation to access their daily needs and employment opportunities. However, employment uses, including commercial uses, Clackamas Community College, are within about a mile of the reserve, potentially limiting any increase home-based VMT per capita. Development of the reserve is not expected to jeopardize Highway 213's throughway reliability. Any additional motor vehicle traffic on Molalla Avenue caused by development of the reserve could exacerbate the road's high-crash conditions.

d. Need for major transportation facility improvements and associated costs

To serve urban development of the reserve, more than a mile of S Maplelane Road would likely need to be improved to urban arterial standards, and the sections of S Waldow Road and S Thayer Road passing through the reserve (approximately 1.3 miles in combined length) would likely need to be improved to urban collector standards. Improvements to these roads would require acquisition of extra right-of-way. In addition, three new collectors totaling approximately 0.86 miles in length are likely needed to provide necessary street connectivity. Some lengths of the facility improvements could require higher than average per-mile costs due to topography and stream crossings.

Facilities	Cost
Arterials, existing/improved full street	$67.60 million
Arterials, existing/improved half street	$0
Arterials, new	$0
Collectors, existing/improved full street	$56.38 million
Collectors, existing/improved half street	$0
Collectors, new	$36.46 million
Total:	**$160.44 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$31,601**

e. Provision of public transit service

TriMet evaluated the reserve for providing transit service. TriMet could provide services to the reserve, although there is no guarantee of service. Actual service depends on the level of development in the reserve and in the corridors leading to it. Conceptual road layouts for the reserve do not provide enough roadway network to make service feasible. However, service could potentially be provided with adjusted layouts and by extending Route 79 after "Forward Together" improvements are completed, with three additional zero-emission buses at a capital cost of $3,000,000 – $4,500,000 (recurs every 12 years). Annual service cost is $668,824 and grows with inflation year.

Prior to land being included in the UGB, a more detailed concept plan, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11, will be required. This concept plan process will develop more refined public facility and service needs and cost estimates.

Factor 3: Comparative environmental, social, energy, and economic consequences

Environmental consequences

A tributary of Abernethy Creek flows east through the Maplelane Urban Reserve for approximately 0.6 miles on the north side of S Maplelane Road, east of S Waldow Road. Just over half of the stream length flows through cleared land and includes two National Wetland Inventory (NWI) wetlands, each measuring just less than an acre in area, and identified riparian habitat. The remaining length flows through a forested area with slopes greater than 25 percent. The length of the stream flowing through the cleared landscape is located in such a manner that could allow for the protection of the stream corridor, wetlands, and habitat areas consistent with urban protection levels, while allowing for future development opportunities on the remaining portion of the relevant tax lots. The forested section would also be impacted minimally from urbanization due to development constraints related to steep slopes. In addition, a significant portion of the upland habitat adjacent to the stream is located on school district property, which would not be impacted by the development of future school facilities given steep slope constraints.

Three tributaries to Thimble Creek flow generally east through the southern portion of the reserve on the south side of S Thayer Road. The main tributary flows in an arcing pattern from the southern edge of the reserve and then east for 0.6 miles before joining Thimble Creek just outside the reserve, ultimately draining into Abernethy Creek. About half of this stream lengths flows through semi-forested or forested land that provides a fairly healthy riparian corridor. The remaining portion of the stream is located adjacent to S Thayer Road, away from the developable portions of the relevant tax lots. While this allows for development of the tax lots without impacting the stream corridor, road improvements to bring S Thayer Road up to urban standards could impact the stream's riparian habitat in this location. There are some significant locations of upland habitat adjacent to the stream corridor that could also be impacted, as access to this portion of the reserve would need to come from S Thayer Road, unless access came from S Loder Road to the south that is already inside the UGB. The steep slopes along the stream corridors would limit the amount of the residential development that can occur to a degree, therefore protecting some portions of upland habitat. Natural resource protection requirements for land added to the UGB will help reduce the overall impacts; however, significant impacts would be expected given the stream's location near S Thayer Road, the need to access the parcels to the south, and other potential transportation connection needs.

A minor, 600-foot-long tributary joins the main tributary in the southwest corner of the reserve. About half of this stream length is located on land owned by the US government; this ownership, as well as some powerlines, will likely restrict urban development and thereby result in certain environmental protections from such development. The remaining length flows through an identified and intact riparian habitat. Impacts to the habitat areas could occur, depending on the design of the future development and new transportation connections.

The third tributary appears to originate from a pond not included in the NWI on the north side of S Thayer Road and flows for about a third of a mile before joining the main tributary south the roadway. This stream flows mostly through forested areas and a second pond, also not identified as a wetland on the NWI, is located along the stream route. There is both riparian and upland habitat identified along this stream segment. Impacts to the habitat areas could occur depending on the design of the future development and new transportation connections.

This analysis finds that urbanization of the reserve could occur with comparatively moderate to high impacts to the stream corridors, wetland, and the upland habitat areas. Additional environmental consideration, specifically regarding avoidance of conflict between urban development and regionally significant fish and wildlife habitat, is provided in the Metro Code Factors Analysis (Appendix 7A).

Considering the comparative environmental consequences of urbanization, the Maplelane Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Social, energy, and economic consequences

The Maplelane Urban Reserve already contains numerous rural residences, including a subdivision with more than 30 homes and a manufactured dwelling park, as well as a large electrical utility facility and powerlines. The reserve is also adjacent to urban residential development with a number of urban local streets already stubbing to the reserve and is close to some more major urban commercial retail areas. Therefore, urbanization of the reserve is not expected to cause a significant change in sense of place or degradation of rural lifestyle for residents of the reserve. Moreover, because the powerlines, as well as steep slopes, natural resources, and publicly owned lands, in some sense divide the reserve into sections of developable land, development of one section will not necessarily cause significant changes for other sections of the reserve.

As detailed more fully in response to Factor 2, the proximity of a variety or urban land uses and modes of transportation could help limit significant increases in VMT and, therefore, related energy impacts from urbanization of this reserve.

There is minimal commercial agriculture occurring within the reserve and the economic consequences of a loss in farming activity in the reserve may be outweighed by the economic benefits of residential development.

This analysis finds that there would be comparatively low social, energy, and economic consequences from urbanization of this reserve. The Maplelane Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Factor 4: Compatibility of the proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

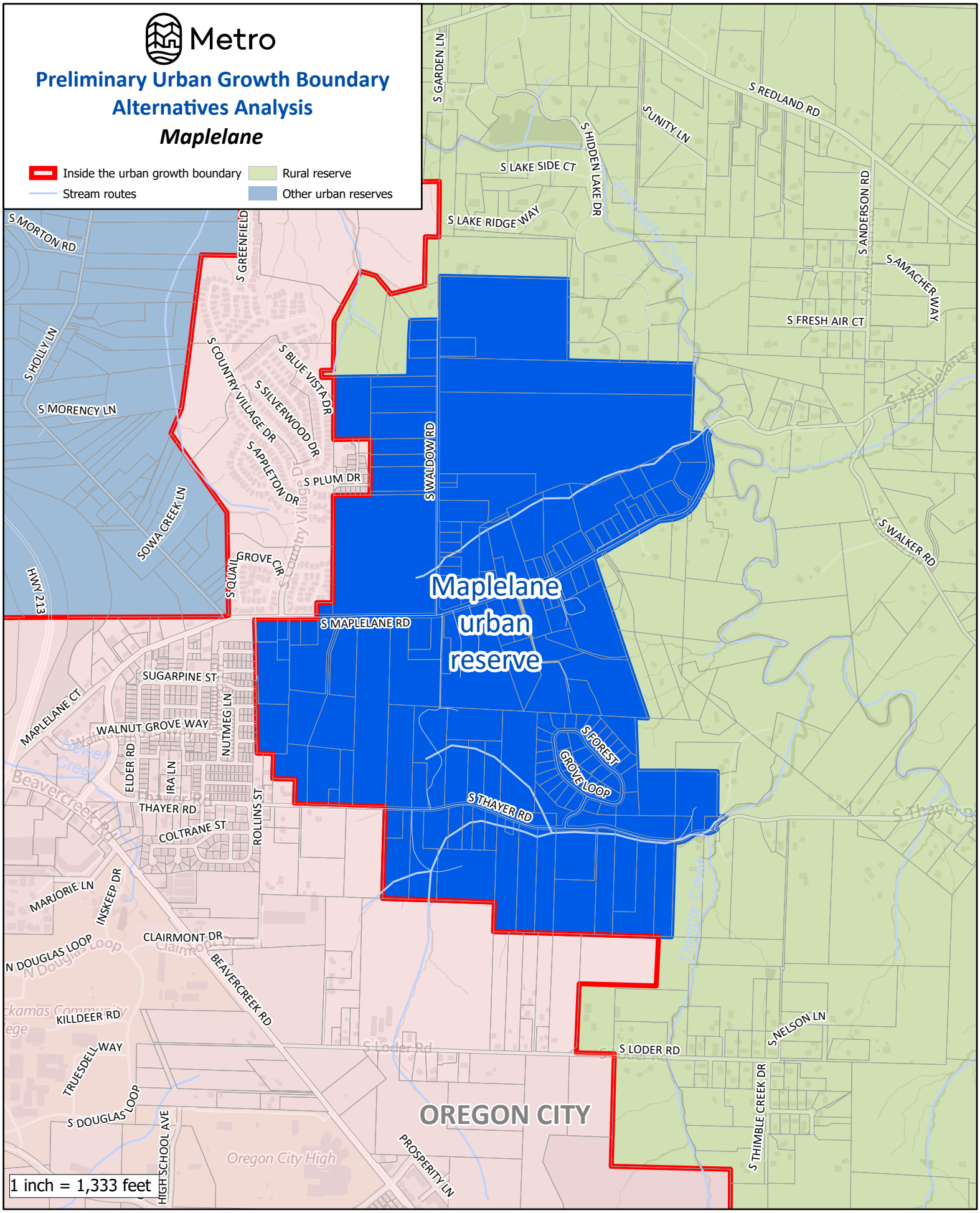
There are three locations where lands outside the UGB but contiguous to the Maplelane Urban Reserve have Goal 3 or 4 resource land zoning for agricultural and forest activities.

The first location is a single 15-acre tax lot zoned Timber (TBR) by Clackamas County at the north end of S Waldo Road with a single-family residence. This tax lot does not appear to be in active agricultural or forestry use. It is adjacent to rural residential development with some very large homes on one- to three-acre tax lots. Due to the current residential use of this and nearby properties, the likelihood of commercial agriculture or timber activities on this property is small; thus, the proposed urban uses of the adjacent reserve would be considered compatible with nearby agricultural or forest activities in this location.

The second location is a single eight-acre tax lot zoned TBR by Clackamas County that shares a 170-foot edge with the northeast corner of the reserve. This tax lot contains a portion of Abernethy Creek and, according to assessment records, is in the same ownership as an adjacent tax lot that is part of the rural residential subdivision with very large homes. Considering these conditions, the likelihood of commercial agricultural or timber activities on this property is small; thus, the urban development of the reserve would be considered compatible with agricultural and forest activities in this location.

The third location is near S Thayer Road, adjacent to the southeast corner of the reserve where three tax lots are zoned TBR by Clackamas County. The tax lots have residential uses and have very minimal amounts of trees available to commercial timber operations and no apparent commercial agricultural activities. Therefore, urban development of the reserve would be considered compatible with agricultural and forest activities occurring on these adjacent lands.

Overall, the proposed urban uses (i.e., urban development of the reserve) would be considered to have high compatibility with the nearby agricultural and forest activities occurring on farm and forest land. The Maplelane Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location factor.



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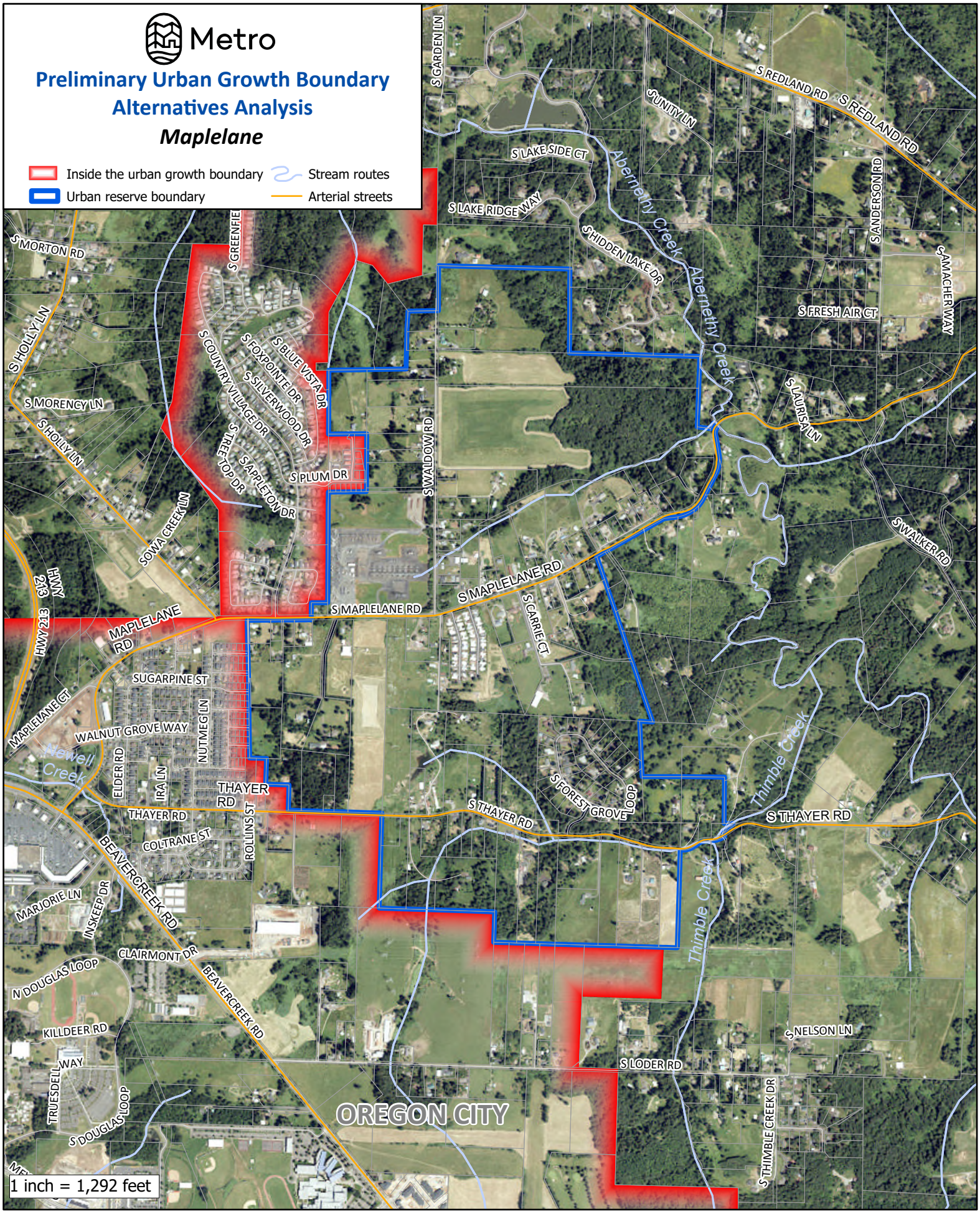

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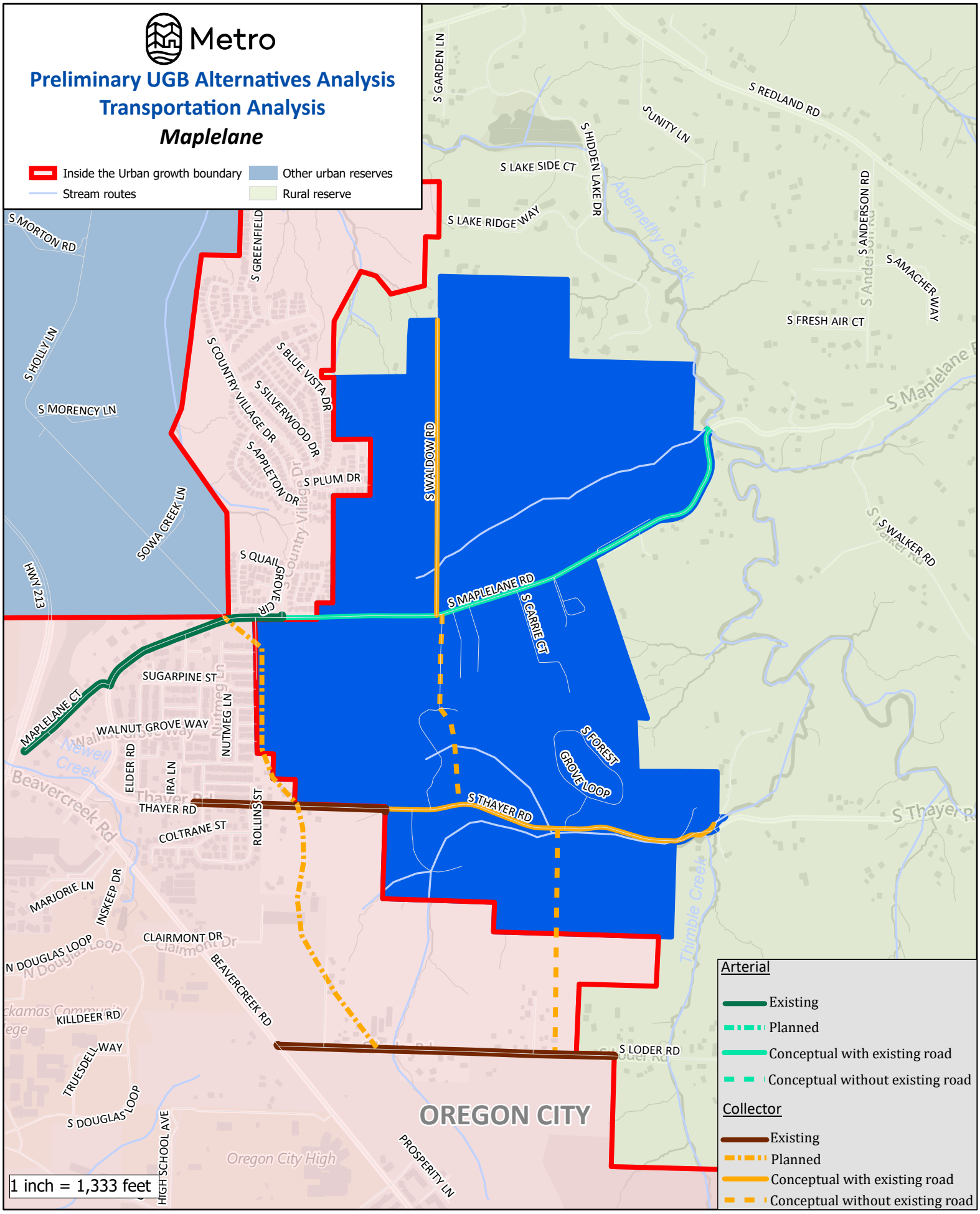

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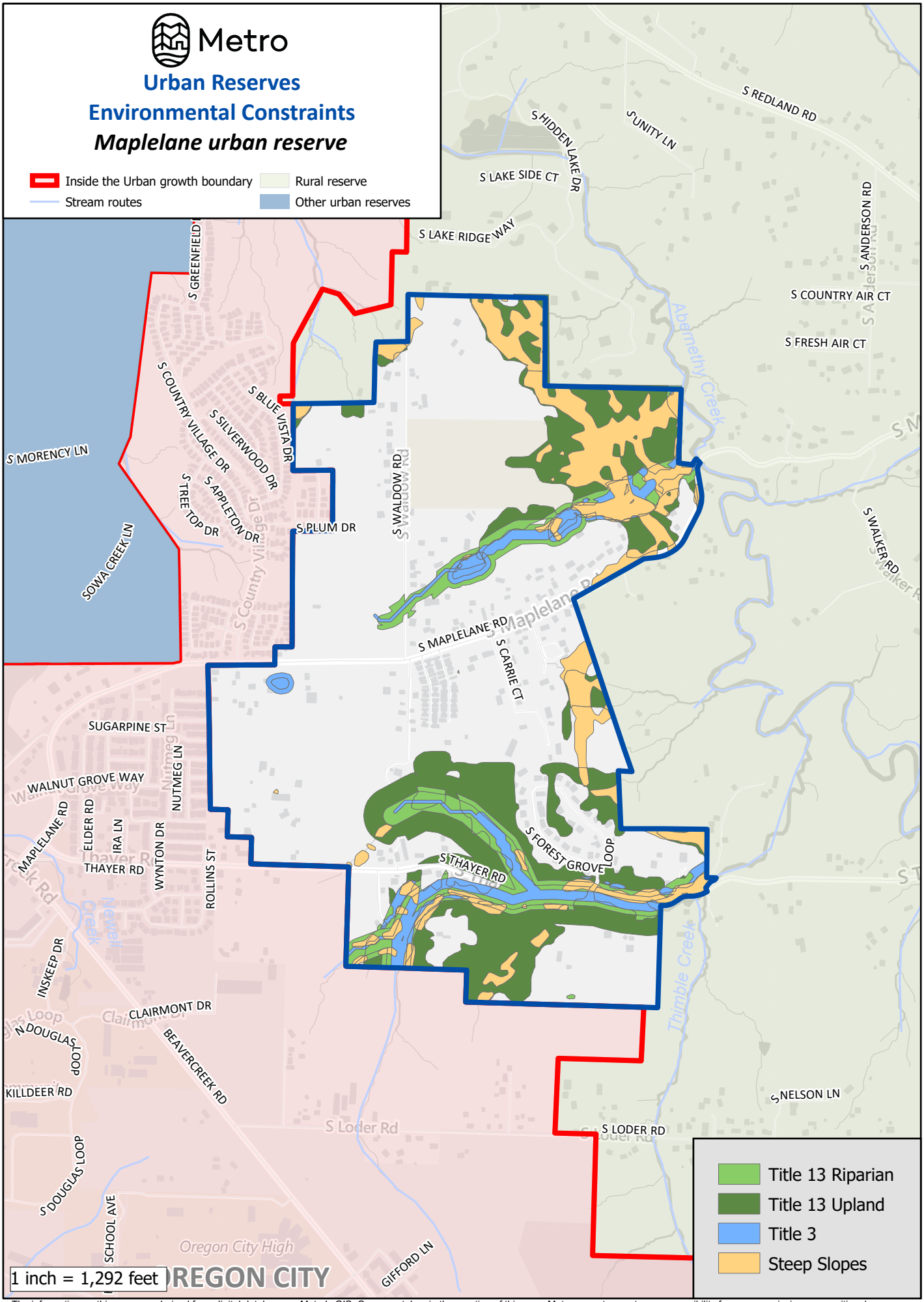
Metro

Urban Reserves
Environmental Constraints
Maplelane urban reserve

Inside the Urban growth boundary
Stream routes
Rural reserve
Other urban reserves



1 inch = 1,292 feet

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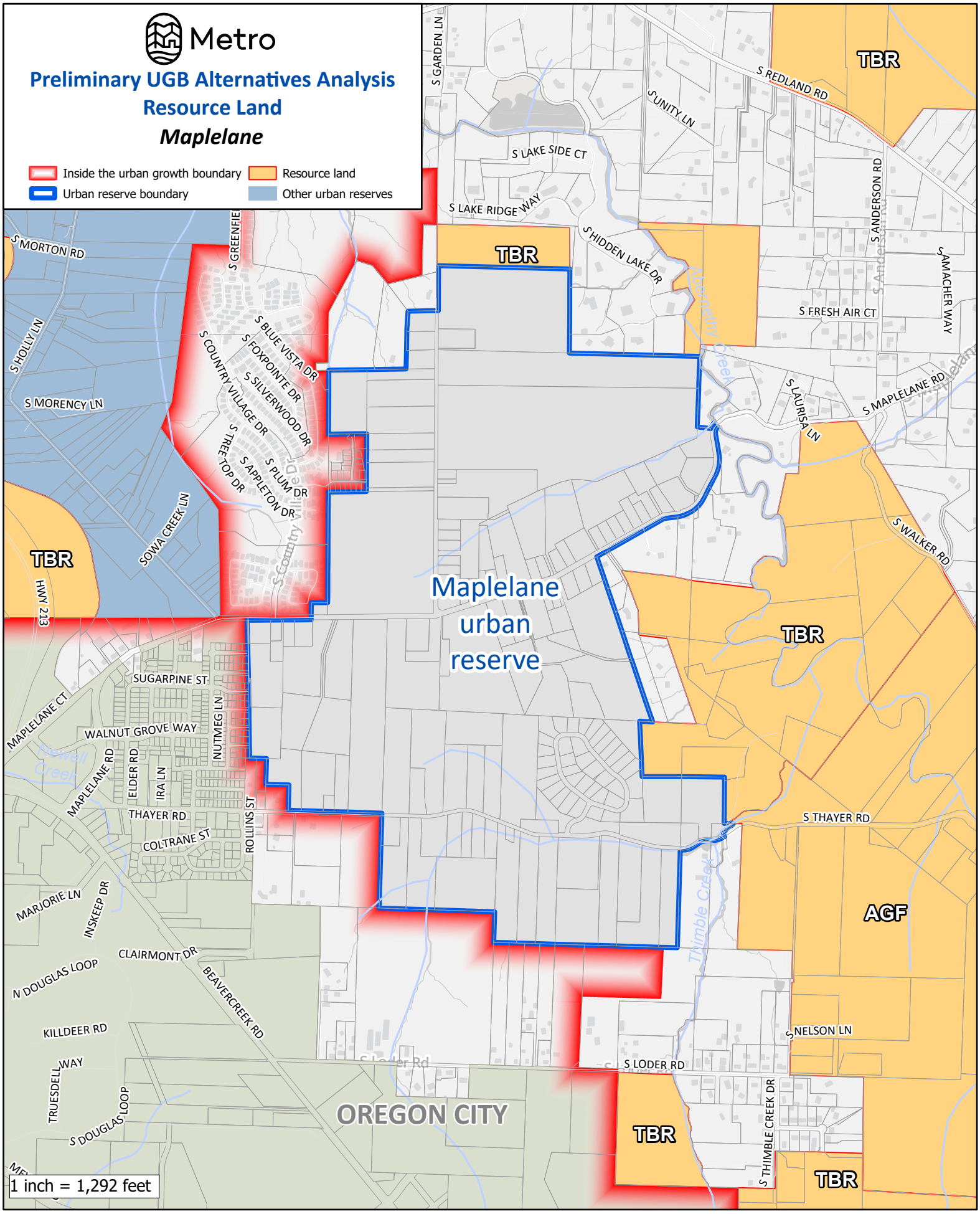

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NORWOOD URBAN RESERVE

Total Reserve Area	1,539 acres
Total Tax Lot Area in Reserve (without Right-of-Way)	1,451 acres
Gross Vacant Buildable Area	1,040 acres
Net Vacant Buildable Area	**775 acres**

The Norwood Urban Reserve is located in Clackamas County, east of SW 65th Avenue, south of I-205, and mostly west of SW Stafford Road, on the opposite side of I-205 from the east end of current Tualatin city limits. The UGB forms a portion of the reserve's northern boundary, with urban reserve land (the I-5 East – Washington County, Elligsen Road North, and Elligsen Road South Urban Reserves) to the west and additional urban reserve land (the "Borland" Urban Reserve) to the north. The reserve otherwise borders undesignated and rural reserve land to the east and south. Boeckman Creek and a small portion of a tributary to Newland Creek flow south, and tributaries to Saum Creek flow north, through the center of the reserve. Athey Creek also flows north through the northeastern corner of the reserve. Large portions of the reserve, particularly in its north and south, have slopes greater than 10 percent.

GOAL 14 BOUNDARY LOCATION FACTORS

Factor 1: Efficient accommodation of identified land needs

The Norwood Urban Reserve is a contiguous area that contains the entirety of 364 tax lots and a 14,000-square-foot piece of one more tax lot disconnected from the remainder of that tax lot by SW Stafford Road. Of the tax lots that are entirely in the reserve, slightly more than a quarter a smaller than two acres each, more than two-thirds are smaller than five acres each, and nine are larger than 10 acres, with the largest being about 36 acres. The State of Oregon owns four tax lots in the reserve totaling nearly 11 acres in area and Verizon Northwest owns two tax lots totaling just over one acre in area. As noted above, the entire reserve contains 1,040 gross vacant buildable acres and 775 net vacant buildable acres.

The reserve is largely characterized by rural residential and accessory uses, with some agricultural uses in its south and forested areas in its north. Nearly 90 percent of the reserve's tax lots have assessed improvements, with the median assessed value of those tax lots' improvements exceeding $660,000.

The reserve is largely surrounded by rural residential and agricultural uses. The Stafford Academy is adjacent to the reserve's northeast corner, while Bridgeport Elementary School and Athey Creek Middle School are within a mile of the northern end of the reserve but on the opposite side of I-205. Atfalati Park in Tualatin is also on the opposite side of I-205.

The SW Stafford Road interchange with I-205 is approximately a quarter mile from the northwest corner of the reserve, and a SW Elligsen Road interchange with I-5 is approximately 1.25 miles from the reserve's southern end. The nearest TriMet bus stop is on the opposite side of I-205 on SW 65th Avenue.

As noted above, the reserve has relatively steep topography in its north and south, as well as multiple streams.

Despite the reserve's proximity to interchanges with two highways, this steep topography, as well as its smaller tax lot sizes, large amount of higher-value existing residential development, and surrounding rural residential land uses, make it unsuitable for accommodating an employment land need. However, the reserve is considered able accommodate a residential land.

Factor 2: Orderly and economic provision of public facilities and services

Water Services

With regard to water services, the Norwood Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Lands to the north inside the UGB are served by the City of Tualatin. Tualatin's sole source of water is treated water purchased from Portland Water Bureau. Water is then delivered through a 36-inch supply line from the Washington County Supply Line. The reserve might be in Pressure Zone B. According to the city's March 2023 Water System Master Plan, the zone has a storage surplus under current conditions, but may have a storage deficit under UGB buildout conditions. The Martinazzi and Boones Ferry Pump Stations previously serving Zone B have reached the end of their usable lives and do not currently operate, and Zone B is now served by the Boones Ferry flow control valve/pressure reducing valve. There are also existing flow deficiencies in Zone B. Water service to the Norwood Urban Reserve could require another reserve (e.g., the I-5 East – Washington County Urban Reserve) to first be added to the UGB and developed.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Assuming the Norwood Urban Reserve is added to the UGB after full buildout of the areas already within the UGB, and assuming storage facilities are not expanded, development of the reserve would cause a greater storage capacity deficit. It is likely that existing pipes do not have the capacity to serve urban development of the reserve and would need to be upgraded. As noted above, service to the reserve could require prior development of another adjacent urban reserve.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Additional storage capacity will likely be needed to avoid negative impacts to service in the UGB. Without addressing undersized pipes, the number and severity of the existing flow deficiencies could increase if the reserve is added to the UGB and its development is connected.

d. Estimated water service-related costs for reserve development

Water piping, pumping, and storage costs	Cost
10-inch pipe	$13.51 million
12-inch pipe	$0 million
15-inch pipe	$0
Pumping	$0
Storage	$1.08 million
Total:	**$14.59 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$941**

Sanitary Sewer Services

With regard to sanitary sewer services, the Norwood Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Wastewater from nearby lands to the north in the City of Tualatin is treated at the Durham Advanced Wastewater Treatment Facility (AWWTF), which is owned and operated by Clean Water Services (CWS) and understood to have sufficient capacity to meet current needs. CWS is also responsible for the system's gravity sewers over 24 inches in size, pump stations, and force mains. The Boreland Pump Station has surplus capacity under existing conditions and there are no modeled pipe deficiencies in the Nyberg Basin under existing conditions.

The south end of the reserve is only about half a mile from the City of Wilsonville. Wastewater in Wilsonville is conveyed in a City of Wilsonville-owned and operated collection system to the Wilsonville Wastewater Treatment Plant (WWTP), which was upgraded in 2014 to a capacity of 4.0 MGD, resulting in excess capacity. That excess capacity is believed to be able to accommodate growth in the Frog Pond areas recently added to the UGB. Wilsonville is planning on necessary system upgrades to meet future needs. The existing system, including its piping and pump stations, is not known to have any hydraulic deficiencies.

The eastern portion of the reserve is about two miles from the City of West Linn, located on the opposite side of the Tualatin River. The downstream end of the West Linn system includes a Clackamas Water Environment Services (WES) owned pumps and force mains, which direct sewage to the Tri-City Water Resource Recovery Facility (WRRF) located on the east side of the Willamette River. West Linn's 2019 Sanitary Sewer System Master plan identified potential system capacity deficiencies for relevant

modeled pipes in both existing and buildout scenarios. The 2019 WES Master Plan identifies an expansion of the existing treatment plant within the 2020-2040 timeframe to increase its capacity.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Based on the varying topography throughout the reserve and the reserve's proximity to multiple jurisdictions, it's possible that its urban development is served by a combination of providers, such as CWS, the City of West Linn, and the City of Wilsonville.

The western portion of the site could, for example, be routed to the CWS system. While the treatment plant may have sufficient capacity now, wastewater treatment for development the relatively large Norwood Urban Reserve – and development of the I-5 East -Washington County Urban Reserve, which may preclude development of the Norwood Urban Reserve – could require plant improvements. It is unclear from either Tualatin's 2019 Sewer Master Plan or CWS's 2019 Master Plan whether relevant pumps have sufficient capacity to serve the Norwood Urban Reserve (and other urban reserves). The Nyberg Basin's pipes may not have sufficient capacity to serve the reserve(s) either. In order to connect to the CWS system, a new sewer line crossing I-205 could be required.

The eastern portion of the site may connect to an existing City of West Linn sewer located in Willamette Falls Drive. The city has previously indicated that the treatment plant would likely need some upgrades to accommodate additional flow. The available capacities of relevant pump stations and pipes to serve the Norwood Urban Reserve are unknown. The Borland Urban Reserve would likely need to be added to the UGB and developed before sanitary sewer service from West Linn can be connected to development in the Norwood Urban Reserve.

The southern portion of the site may most readily be served by the City of Wilsonville. In order to serve this portion of the reserve, the Elligsen North Urban Reserve would likely need to be urbanized first. Depending on the timing of additional development in Wilsonville, planned treatment plant upgrades may be needed sooner in order for the system to also serve new development in the Elligsen Road North Urban Reserve. Both the Canyon Creek and Memorial Park pump stations require capacity improvements to serve the Elligsen Road North Urban Reserve, and there are several trunk line extensions that would be needed as well.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Considering that other reserves may need to be urbanized before the Norwood Urban Reserve can be served with sanitary sewer services, treatment plant improvements and pumping and piping capacity improvements will likely be needed to avoid negative impacts to service within the existing UGB. Potential treatment plant improvement costs are not included in the below figures.

d. Estimated sanitary sewer service-related costs for reserve development

Sanitary sewer piping and pumping costs	Cost
10-inch pipe	$5.45 million
12-inch pipe	$3.78 million
15-inch pipe	$0
Pump station	$1.44 million
Force mains	$2.26 million
Total:	**$12.93 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$2,389**

Stormwater Management Services

With regard to stormwater management services, the Norwood Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

There is no indication of major capacity issues with existing stormwater facilities that serve the adjacent land inside the UGB. Based on topography, stormwater from development of the Norwood Urban Reserve would discharge directly to Saum Creek; the City of Tualatin's 2019 Stormwater Master Plan did not identify the Saum Creek Basin as currently facing capacity challenges.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Stormwater will be conveyed, treated, and disposed of within the reserve and discharge to Saum Creek, rather than connecting to existing facilities in the UGB. Saum Creek is believed to have sufficient capacity to serve development of the reserve.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

As noted above, stormwater will be conveyed, treated, and disposed of within the reserve and discharge to Saum Creek, rather than connecting to existing facilities in the UGB. Saum Creek is believed to have sufficient capacity. Therefore, no adverse impacts to existing facilities are anticipated.

d. Estimated stormwater service-related costs for reserve development

Stormwater piping and water quality/detention	Cost
18-inch pipe	$7.08 million
24-inch pipe	$6.38 million
30-inch pipe	$5.00 million
Water quality/dentition	$18.59 million
Total:	**$37.05 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$2,389**

Transportation Services

With regard to transportation services, the Norwood Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(e) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Figure 4.36 in Chapter 4 of the 2023 Regional Transportation Plan (RTP) displays 2020 home-based vehicle miles traveled (VMT) per capita by Metro transportation analysis zone, with average VMT per capita considered 11.32. According to Figure 4.36, areas in the UGB adjacent to and near the Norwood Urban Reserve had below average and average home-based VMT per capita in 2020.

Metro's adopted 2040 Growth Concept Map designates a town center in the adjoining City of Tualatin. Town centers are meant to: serve populations of tens of thousands of people; offer more locally-focused retail uses and public amenities; and be well served by transit. The roughly 300-acre Tualatin Town Center aligns with this 2040 Growth Concept Map area. The city's Tualatin 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. Metro's 2017 State of the Centers Atlas showed that the Tualatin Town Center had a low number of dwelling units per acre and a much higher total number of employees compared with other town centers in the region. The town center had a very high "access to parks" score in the atlas, due in part to the numerous open space/natural areas and the Tualatin Community Park along the Tualatin River nearby. The town center also includes grocery stores and other retail commercial uses, medical/dental facilities, a post office, and multi-family housing, but also storage facilities, auto-oriented uses, and large parking lots. Within the UGB and adjoining the town center are Title 4 designated Industrial Area and Employment Area lands, as well as low- and medium-density residential uses.

Seven TriMet bus lines and the Westside Express Service (WES) Commuter Rail serve Tualatin. The routes are spread out along the major roadways including Highway 99W, SW Tualatin-Sherwood Road, and SW Boones Ferry Road, providing service to the town center and employment areas. WES connects the town center with Beaverton to the north and Wilsonville to the south. Figure 4.3 in Chapter 4 of the 2023 RTP does identify gaps in the planned regional transit network along SW Boones Ferry Road, SW Tualatin – Sherwood Road, and elsewhere in the city.

Nonetheless, the town center's existing land uses and transit service, and some availability for new development in and near the town center, demonstrate that growth in the current UGB near the town center will not necessarily cause a significant increase in home-based VMT per capita in the future, as residents will be able to access some daily needs through modes other than private motor vehicle transport. Growth in other areas of the city where residential uses surround schools and parks are is also unlikely to significantly impact home-based VMT per capita in the future.

The town center is less than a mile away from areas in the UGB adjacent to the reserve, but these areas are on the opposite side of I-5 and I-205 from the reserve. I-5 also separates residential uses in the UGB to the north of the reserve from the town center to the west; there are just two overpasses that connect these residential uses to the town center, limiting connectivity. Residents of these areas, where there are also fewer bus routes, may be more reliant on private motor vehicle transportation to get to the town center and areas to the west.

Tualatin has a fairly well-established bike route system, with approximately 25 miles of dedicated bike lanes, seven miles of established bikeways, and local trails that connect the employment areas and town center to the residential areas. There are two bike lane connections across I-5 to provide access to the eastern portion of the city. Figure 4.5 in Chapter 4 of the 2023 RTP shows several existing bike facilities in Tualatin as a part of the planned regional bike network, including facilities on SW Boones Ferry Road, SW Nyberg Street, and SW Tualatin-Sherwood Road. There are identified gaps in planned regional bike facilities in the southwest and east of the city.

The town center has a well-established pedestrian network that also includes access to some trails. Most of the residential areas of Tualatin also have sidewalks, but there are fewer exiting pedestrian facilities in employment areas outside of the town center. The Tualatin River Greenway Trail connects the town center to parks in Durham and Tigard to the north, as well as to Browns Ferry Park along the Tualatin River on the east side of I-5. Figure 4.4 in Chapter 4 of the 2023 RTP shows a number of existing streets in Tualatin as in the regional pedestrian network, including sections of SW Boones Ferry Road, SW Borland Road, and SW Tualatin – Sherwood Road. The figure identifies gaps in the future regional pedestrian network, however, in the south and east of the city.

Figure 4.14 in Chapter 4 of the 2023 RTP identifies the SW Tualatin-Sherwood Road in the UGB as a high injury corridor. The intersection of SW Tualatin-Sherwood Road and

SW Boones Ferry Road, as well as the intersection of SW Martinazzi Avenue and SW Boones Ferry Road, are identified in Figure 4.14 as top five percent high injury intersections. There are no other high injury corridors or high injury intersections in Tualatin's portion of the UGB identified on Figure 4.14.

The portions of I-5 and I-205 that cross through Tualatin are identified as throughways in Figure 4.7 in Chapter 4 of the 2023 RTP. Figure 4.8 of the chapter indicates that these portions of both interstates currently meet travel speed reliability performance thresholds, with no more than four hours per day when travel speeds fall below the identified minimum speed. RTP models indicate this reliability will continue at least to the year 2045.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

While the reserve is adjacent to I-205, the nearest interchange, located at SW Stafford Road, is approximately a quarter mile from the northwest corner of the reserve. The SW Elligsen Road interchange with I-5 is approximately 1.25 miles from the reserve's southern end. As noted above, the portions of these highways in Tualatin currently meet travel speed reliability performance thresholds. Given the proximity of the town center and other commercial/employment areas to the reserve, including employment areas in Wilsonville on the same side of I-5 as the reserve, urban development of the reserve is unlikely to generate sufficient traffic on either I-5 or I-205 to cause them to no longer meet those performance thresholds. Future residents of the reserve, even if reliant on private motor vehicles for transportation, could use roadways other than these interstates to access employment opportunities and to meet their daily needs closer to home.

Currently, there is no transit service to the reserve. TriMet Route 76, which provides access to the Tualatin Town Center, is approximately one-third of a mile from the northwest corner of the reserve via SW 65th Avenue, on the opposite side of I-205. No other bus lines are close to the reserve.

There is a dedicated bike lane on SW 65th Avenue that is approximately one-tenth of a mile north of the northwest corner of the reserve, also on the opposite side of I-205. This bike lane connects to a bike lane on SW Sagert Street, which in turn provides a connection to the west side of I-5, the town center, and employment areas. The small gap on SW 65th Avenue needs to be completed in order to directly connect to the reserve. For the most part, there are no other dedicated bike facilities near to or within the reserve. However, portions of SW Stafford Road adjacent to the east side of the reserve have wide painted shoulders and there are designated bike lanes on a nearly half-mile section of SW Stafford Road beginning at the northeast corner of the reserve. This bike-lane section leads to others on the north side of I-205, but with some gaps.

The Saum Creek Greenway Trail is approximately 800 feet north of the reserve via SW 65th Avenue and connects to sidewalks on SW 65th Avenue and SW Sagert Street. The

sidewalks do not connect across I-5 and, therefore, provide only limited access to other parts of Tualatin. The 800-foot gap needs to be completed in order to directly connect to the reserve. Generally, there are no other sidewalks near to or within the reserve. There are painted crosswalks at the northeast corner of the reserve at the intersection of SW Stafford Road and SW Ek Road, both those sidewalks do not current connect to complete sidewalks.

There are no urban residential or employment uses within a mile of the reserve and on the same side of I-5 or I-205. The one adjacent interstate crossing of SW 65th Avenue has gaps in bike and pedestrian facilities. There is also no existing transit service to the reserve. Therefore, without facility improvements and service extensions, and unless the reserve itself is developed with a mixture of uses, which may not be practicable for reasons addressed in response to Factor 1, future residents of the reserve will likely be reliant on private motor vehicle transport to access their daily needs and employment, and employees of future employment uses in the reserve will need to commute by private motor vehicle from their homes located elsewhere. The analysis in Factor 1 indicated that the reserve would not be able to efficiently accommodate an employment land need.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

SW 65th Avenue, SW Elligsen Road, and SW Stafford Road would see additional private motor vehicle traffic as a result of urbanization of the reserve. However, if transit service were to be extended to the reserve and if gaps in bike and pedestrian facility connections were to be completed, there would be less additional traffic on these roadways. Providing the bike and pedestrian facility connections would lead to more use of the existing facilities within the UGB.

Given the proximity of the town center and other employment areas to the reserve. development of the reserve is unlikely to jeopardize the throughway reliability of I-5 or I-205. Any additional motor vehicle traffic on SW Tualatin-Sherwood Road resulting from development of the reserve, however, may exacerbate the road's high-crash conditions.

d. Need for major transportation facility improvements and associated costs

To serve urban development, a section of SW Stafford Road at the east and south of the reserve and a section of SW 65th Avenue at the west of the reserve, with a combined length of more than five miles, will likely need to be improved to urban arterial standards, including with acquisition of additional right-of-way. The SW 65th Avenue section is considered a half-street improvement, as the western side of the road would be developed as an arterial with the urbanization of the adjacent I-5 East – Washington County Urban Reserve. Sections of SW Prosperity Park Road, SW Delker Road, SW 55th Avenue, SW meridian Way, and SW Trail Road, with a combined length of more than three miles, will also likely need to be improved to urban collector standards, including with acquisition of additional right-of-way. Six new collectors with a combined length of

approximately 2.5 miles are assumed to be needed to provide sufficient connectivity throughout the reserve. Improved existing and new roadways would need to traverse some steeper topography and waterbodies, resulting in some expected higher per-mile costs.

Facilities	Cost
Arterials, existing/improved full street	$197.99 million
Arterials, existing/improved half street	$65.01 million
Arterials, new	$0
Collectors, existing/improved full street	$112.26 million
Collectors, existing/improved half street	$0
Collectors, new	$97.00 million
Total:	**$472.26 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$30,464**

e. Provision of public transit service

Though the Norwood Urban Reserve is within the TriMet Service District, when TriMet evaluated the reserve for providing transit service for this analysis, it determined service to the reserve is unlikely to occur.

Prior to land being included in the UGB, a more detailed concept plan, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11, is required. This concept plan process will develop more refined public facility and service needs and cost estimates.

Factor 3: Comparative environmental, social, energy, and economic consequences

Environmental consequences

Boeckman Creek and a small tributary flow south through the southwestern portion of the Norwood Urban Reserve for just over 0.8 miles. The streams flow through cleared fields and forested areas mostly adjacent to rural residences. Riparian habitat is identified along the stream corridors. It appears Boeckman Creek has been altered in certain locations as it flows through the residential area. There is one small wetland on the National Wetland Inventory (NWI) located near the tributary that is approximately 5,500 square feet in area. The location of Boeckman Creek between SW Stafford Road and SW 65th Avenue could lead to impacts related to future local street connections. The increased protection levels for streams, wetlands, and habitat areas added to the UGB will help lessen any potential impacts.

A very short segment of a tributary to Newland Creek flows south through the southeastern corner of the reserve for approximately 1,150 feet. This stream length is along a wooded area that forms the eastern edge of the reserve. There is riparian habitat identified along the

stream corridor that could receive regulatory protections once the land is added to the UGB. Indeed, considering the increased protection levels for streams and habitat areas that come with addition to the UGB, and considering the land to the east is in a rural reserve and therefore has limited development opportunities, this stream segment would not be impacted by future urbanization.

Athey Creek and a small tributary flow north through the northeastern corner of the reserve for approximately 2,900 feet. Athey Creek flows through private open space that is either wooded or a mixture of open field with scattered tree canopy. This portion of the stream would be protected from future urbanization. The tributary also flows through private open space with a very small section in open field and wooded portions of residential tax lots. Riparian habitat is identified along both stream segments. Increased protection levels for habitat areas inside the UGB will provide additional protection to the stream section that is not on the designated open space land; thus, urbanization would have minimal impact on these two streams.

There are two sets of tributaries to Saum Creek that flow north through the central and western portions of the reserve. Those in the western set, which is composed of two stream corridors, flow mainly through rural residential areas with a small section located in open fields that appear to be tilled. There is one roughly 14,600-square-foot wetland identified on the NWI located along one of the stream corridors. In numerous locations, the stream has been altered with manmade ponds. Riparian habitat has been identified along both stream corridors. The majority of the two stream segments flow along edges of developed rural residential properties and could be impacted by urbanization, depending on the density and design of the development.

The central tributary is also composed of a 1.5-mile-long main stem and a second, 2,820-foot-long stream that flow mainly through forested portions of rural residential tax lots, some open fields, and a forested private open space. There is one 6,289-square-foot wetland identified on the NWI located along the main stream corridor and another pond not identified on the inventory. There are several significant sections of steep slopes in the forested areas along both streams. Riparian habitat is identified along the two stream corridors with upland habitat identified in the forested areas. There are a couple of locations where the streams could be impacted by future urbanization; however, the majority of the two stream segments flow along edges of tax lots within canyons or gullies and the level of impact by urbanization of the area would depend on the design of the development and necessary road connections. An east-west connection between SW Prosperity Park Road and SW Trail Road could impact a significant amount of habitat.

This analysis finds that, given the location of the stream corridors adjacent to steep slopes, the increased protection levels for streams, wetlands, and habitat areas on land inside the UGB, and the existing pattern of the rural residential development, urbanization of the reserve could occur with comparatively minimal to moderate impact to the streams, wetlands, and habitat areas, depending on road connections and urban form.

Considering the comparative environmental consequences of urbanization, the Norwood Urban Reserve is given a "medium-high" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Social, energy, and economic consequences

The Norwood Urban Reserve has a significant amount of rural residences. As noted in response to Factor 1, Nearly 90 percent of the reserve's tax lots have assessed improvements, with the median assessed value of those tax lots' improvements exceeding $660,000. There are high-value homes in multiple platted subdivisions and on smaller-sized tax lots. The reserve is adjacent to I-205. Given the level of existing development and parcelization, as well as the stream and habitat corridors that divide up the area, rapid, large-scale redevelopment is not likely; urbanization of the reserve may cause some, but not necessarily significant, changes in residents' sense of place or in degradation of an existing rural lifestyle.

As detailed more fully in response to Factor 2, future residents of the reserve will likely be reliant on private motor vehicle transportation, which will have adverse energy consequences.

There is essentially no large-scale commercial agricultural activity in the reserve. What agricultural activity there is generally limited to maximum two-acre sites scattered throughout the reserve and generally associated with its rural residential development. The economic consequences of a loss in farming activity in the reserve would likely be outweighed by the economic benefits of urban residential development.

Overall, there would be comparatively low to moderate social, energy, and economic consequences from urbanization of this reserve. The Norwood Urban Reserve is given a "medium-high" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Factor 4: Compatibility of the proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

Goal 3 agricultural lands, specifically lands zoned Exclusive Farm Use (EFU) by Clackamas and Washington Counties, border the Norwood Urban Reserve in areas outside the UGB to the south, southeast, and west.

The EFU-zoned land to the south is part of a sizeable stretch of farmland that extends to the Willamette River. The EFU-zoned land directly adjacent to the reserve's south in the area north of SW Homesteader Road appears to be in agricultural use, including for field crops and pastureland, though there are some rural residential uses. There is no topographic or built (e.g., road right-of-way) separation between these farm uses and the reserve. Development of the reserve could, therefore, lead to land use conflicts related to safety, liability, and vandalism and complaints due to noise, odor, dust, and the use of pesticides and fertilizer. Urbanization of the reserve would increase traffic on SW Stafford Road, which could impact the movement of both farm equipment and goods.

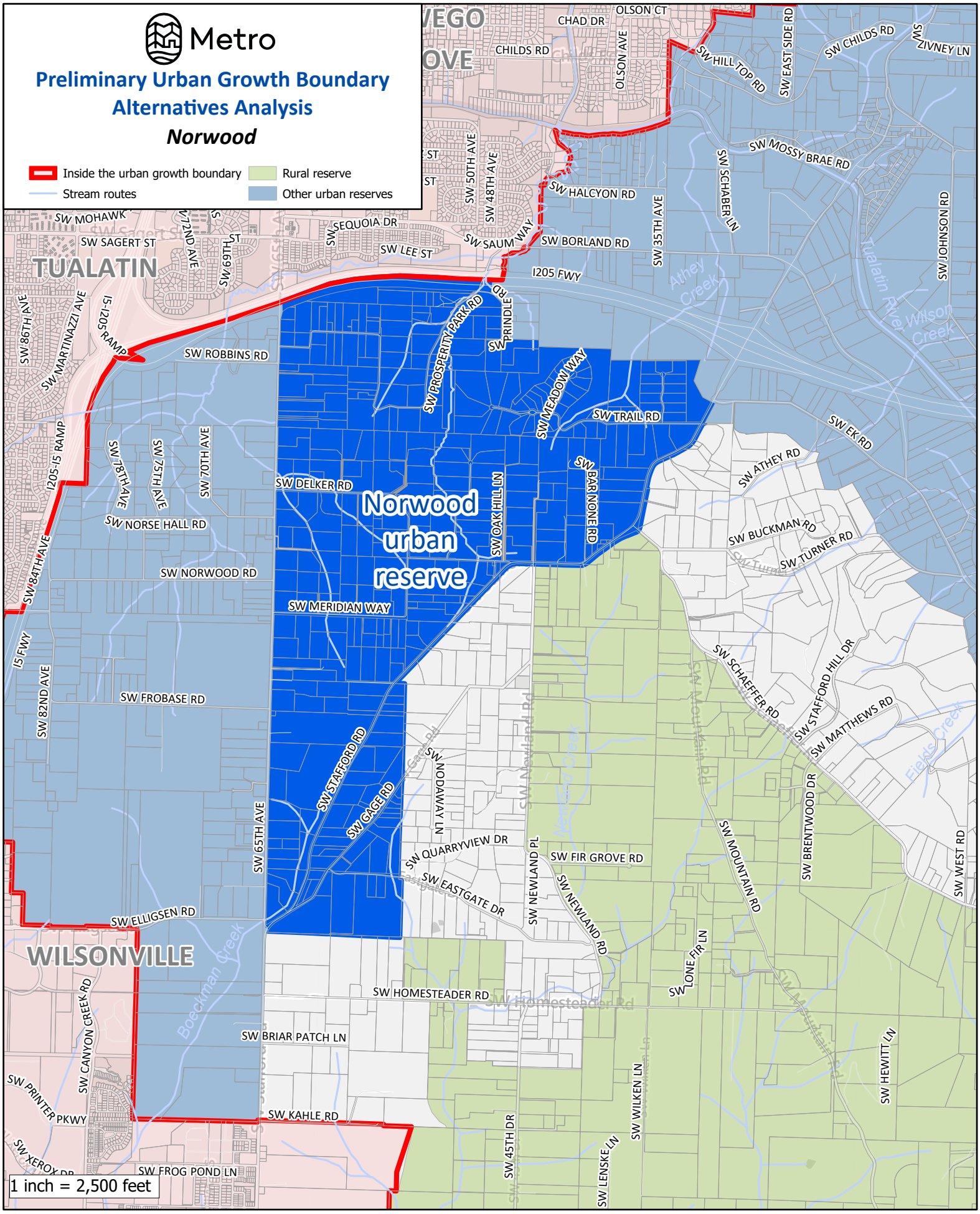
Therefore, proposed urban uses are considered incompatible with the nearby agricultural activities occurring on the EFU-zoned land to the south.

The EFU-zoned land to the southeast of the reserve, in the vicinity of SW Mountain Road, is part of a large tract of EFU land that extends over a mile to the south. Most of the EFU-zoned land directly adjacent to the reserve is in agricultural production, including field crops and pastureland, although the West Linn-Wilsonville School District Administrative office is also located on this farmland and there are some small tax lots with rural residential development. SW Stafford Road would not itself provide an adequate buffer between urban development and agricultural activity. Development of the reserve could lead to land use conflicts related to safety, liability, and vandalism and complaints due to noise, odor, dust, and the use of pesticides and fertilizer. The improvement of SW Stafford Road to urban standards, and associated street light illumination and bicycle and pedestrian movements, may further jeopardize the compatibility of the two uses, though the impacts of urban roadways on adjacent agricultural activity may be minimized through road design. Urbanization of the reserve would increase traffic on SW Stafford Road, which could impact the movement of both farm equipment and goods taking the most direct route to I-5 and I-205. Therefore, proposed urban uses are considered incompatible with the nearby agricultural activities occurring on the EFU-zoned land to the southeast.

There are two pockets of EFU-zoned land to the west of the reserve, on the opposite side of SW 65th Avenue. The first is a more than 100-acre tract on the north side of SW Frobase Road at the intersection with SW 65th Avenue. This area is nearly entirely in agricultural production, mostly for field crops Christmas trees. The tract does have some small stands of trees as well, but they are generally along Saum Creek, which may inhibit harvesting for timber. There is a rural residence centered within the farm fields. The second location is a roughly 100-acre tract of EFU-zoned land south of SW Robbins Road adjacent to SW 65th Avenue. This is the location of Lee Farms, which is a family-owned business that includes Christmas tree plantings, a pumpkin patch, berries, and a county store. Lee Farms hosts various farm-related events, as well. There are also field crops in the northern part of this section of EFU land, but presumably not associated with Lee Farms. The forested patches in these areas are generally around Saum Creek, which may limit their ability to be harvest for commercial timber.

SW 65th Avenue separates the reserve from these EFU-zoned lands to the west, but the road itself would not provide an adequate buffer between urban development and agricultural activity. Development of the reserve near here could lead to land use conflicts related to safety, liability, and vandalism and complaints due to noise, odor, dust, and the use of pesticides and fertilizer. The improvement of SW 65th Avenue to urban standards, and associated street light illumination and bicycle and pedestrian movements, may further jeopardize the compatibility of the two uses, though, as noted above, the impacts of urban roadways on adjacent agricultural activity may be minimized through road design.

This analysis finds that the proposed urban uses are considered to have low compatibility with nearby agricultural and forest activities occurring on farm and forest land outside the UGB. Land use conflict mitigation measures would be warranted. The Norwood Urban Reserve is given a “low” score in Attachment 3 for this Goal 14 boundary location factor.



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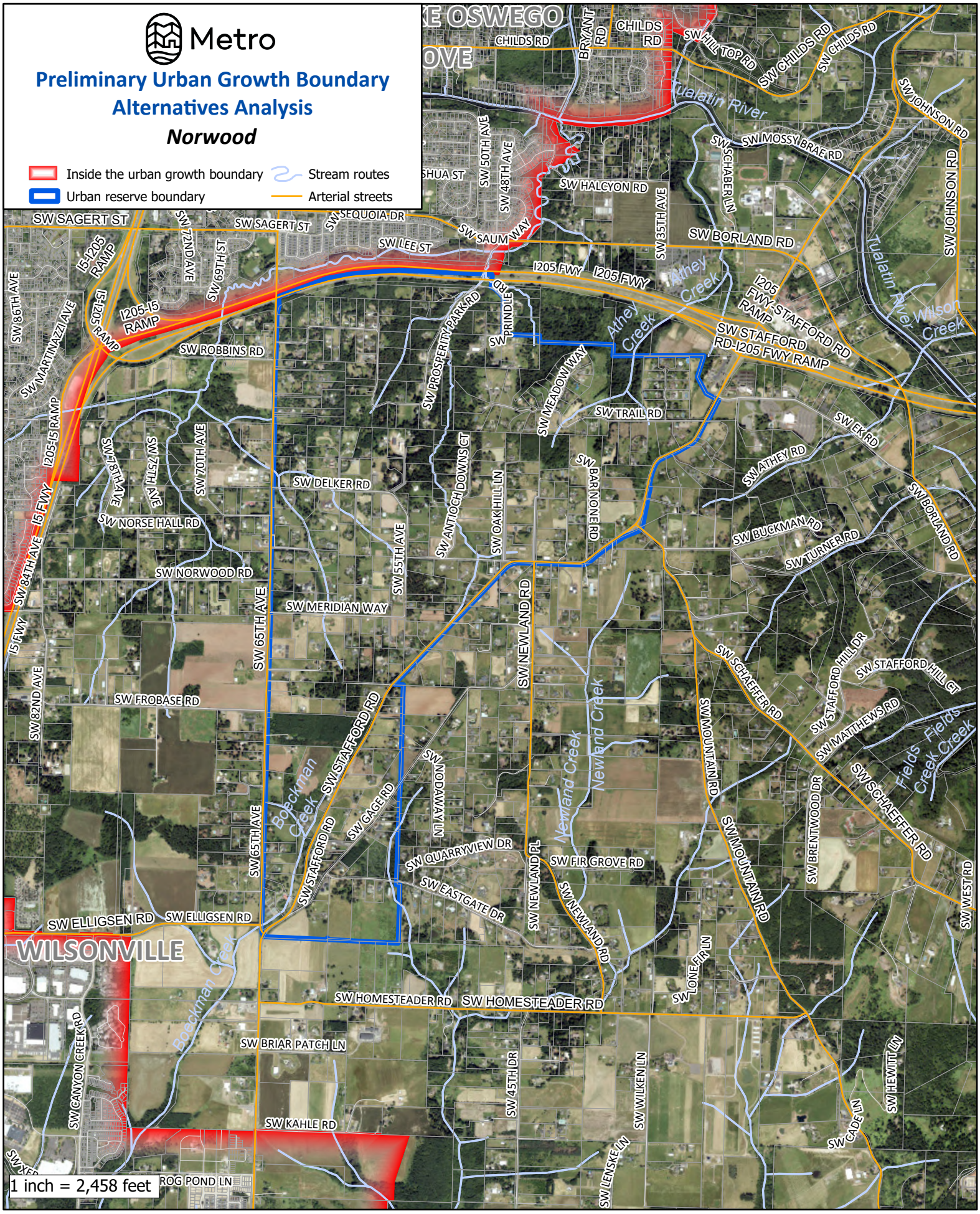
Metro

Preliminary Urban Growth Boundary Alternatives Analysis

Norwood

Inside the urban growth boundary
Urban reserve boundary
Stream routes
Arterial streets



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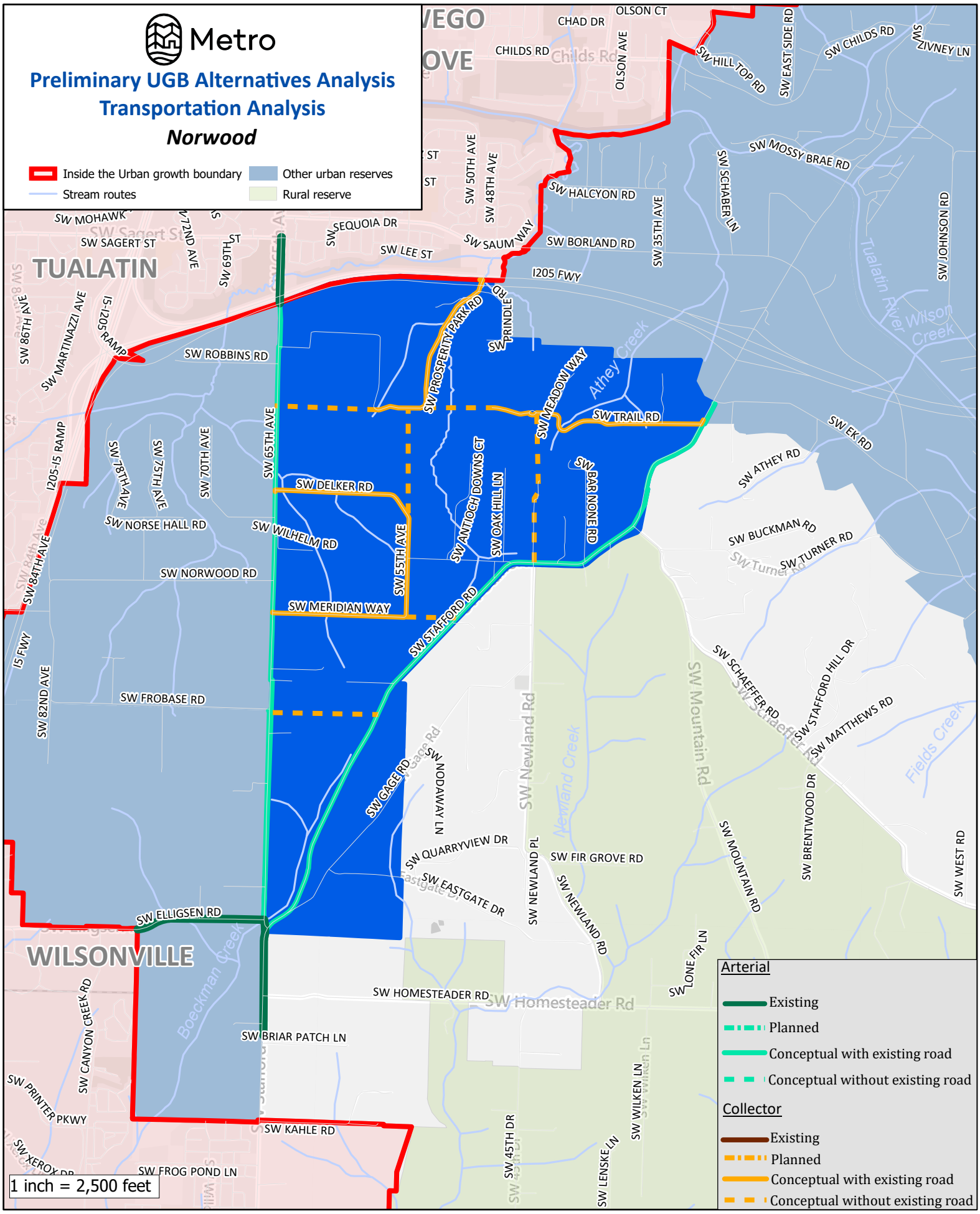

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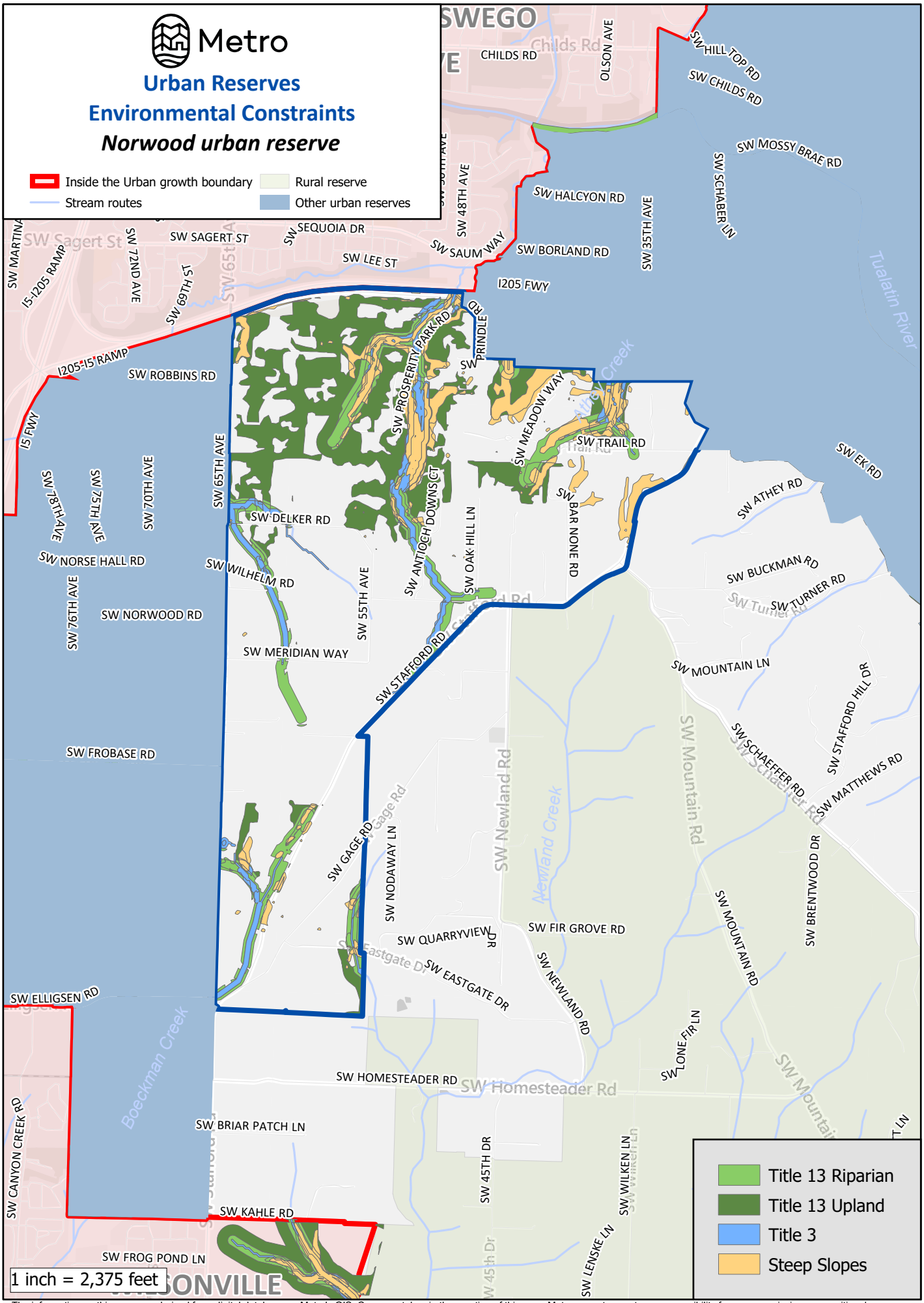

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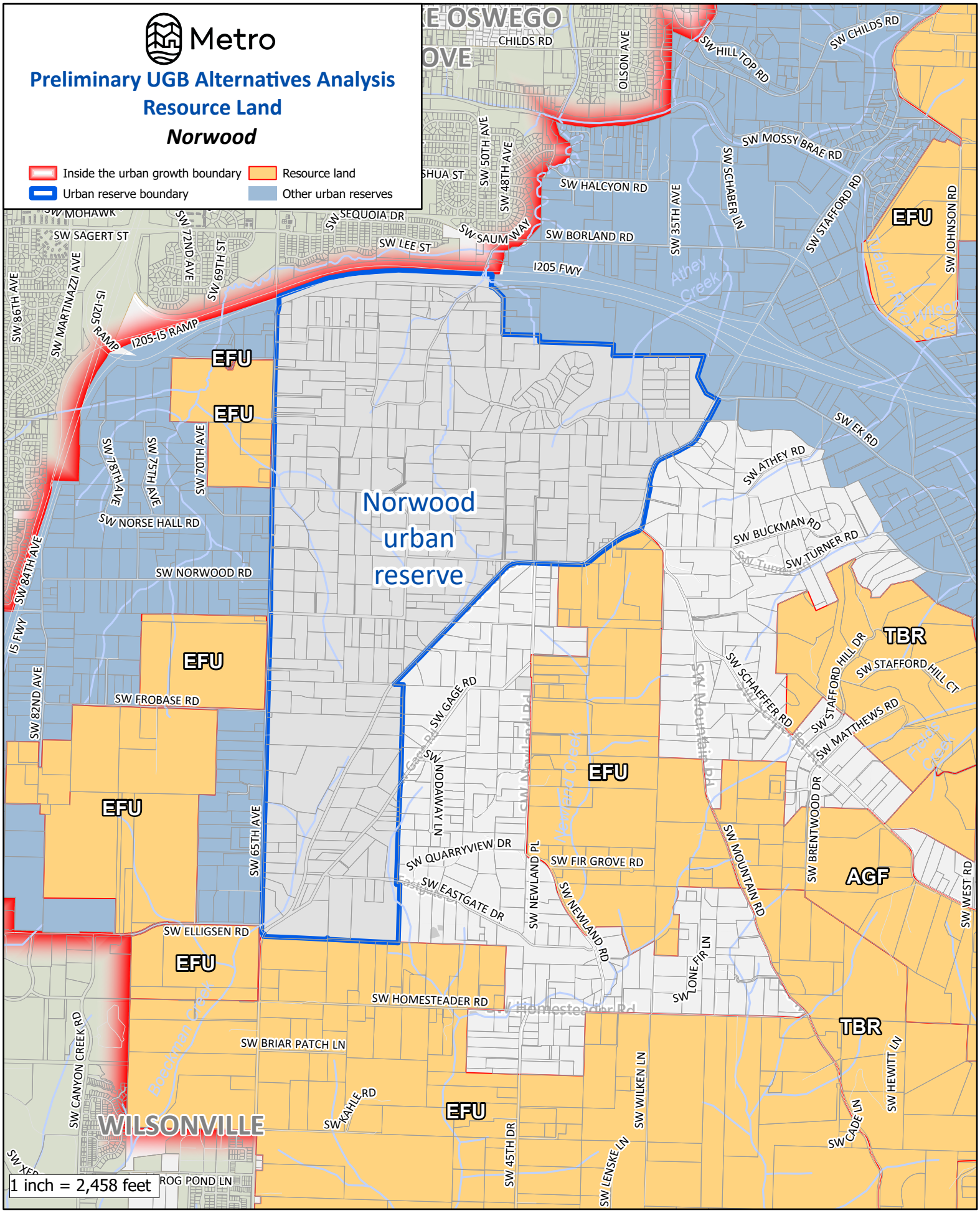

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ROSA URBAN RESERVE

Total Reserve Area	789 acres
Total Tax Lot Area in Reserve (without Right-of-Way)	769 acres
Gross Vacant Buildable Area	288 acres
Net Vacant Buildable Area	**210 acres**

The Rosa Urban Reserve, which is the remainder of the former "South Urban Reserve" after a portion was added to the UGB in 2018, is on the south side of Hillsboro, north of SW Rosedale Road between SW River Road and SW 229th Avenue. It is adjacent to the UGB on its east and north, while rural reserve land is to the south and west. The reserve is relatively flat with some minor slopes near its stream corridors. Access is provided by SW Rosedale Road, SW River Road, and SW 229th Avenue. SW Rosa Road bisects the southern portion of the reserve in an east-west direction.

GOAL 14 BOUNDARY LOCATION FACTORS

Factor 1: Efficient accommodation of identified land needs

The Rosa Urban Reserve is comprised of the entirety or portions of 97 contiguous tax lots. Of the 79 tax lots entirely in the reserve, roughly a third are smaller than two acres each, another third are between two and five acres each, and six are greater than 30 acres each, with one being 221 acres in area. The tax lots that are only partially within the reserve have portions in the reserve that are generally less than two acres, though a few have portions in the reserve between six and nine acres. The combined tax lot area within the reserve is approximately 769 acres. As noted above, the entire reserve contains 288 gross vacant buildable acres and 210 net vacant buildable acres.

Three tax lots, with a total area of 310 acres (approximately 40 percent of the reserve's area), are occupied by "The Reserve Vinyard and Golf Club", which feature golf courses and accessory commercial uses. The other tax lots are characterized by rural residential development, smaller-scale agricultural uses, and groves of trees. Of all the tax lots entirely or partially within the reserve, 77 (roughly 80 percent) have assessed improvements, with the median assessed value of those tax lots' improvements being nearly $310,000.

The only existing urban residential development directly adjacent to the reserve adjoins the golf course property, though residential and commercial development is planned for neighboring areas already inside the UGB. Rosedale Elementary School and South Meadows Middle School are both within one mile of the of the reserve. The planned Sohi Community Park is adjacent to the reserve's east, on the opposite side of SE Century Boulevard and the Meriwether National Golf Course is just to the west. The Tualatin Valley Highway is approximately two miles away via SW River Road and SE Witch Hazel Road, and Highway 26 is further away. The closest TriMet bus stops are on Tualatin Valley Highway.

This reserve is generally flat, with some minor slopes along the stream corridors that divide the area into two tracts. The northern tract contains the golf course, which is considered "developed land" in Metro's buildable lands inventory methodology. While there are a few sizeable and

relatively flat tax lots in the southern portion of the reserve, they are more than five miles from Highway 26. The proximity of educational and recreational uses, and existing and planned residential development, means the reserve is best suited to accommodating a residential land need.

Factor 2: Orderly and economic provision of public facilities and services

Water Services

With regard to water services, the Rosa Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Adjacent lands inside the UGB are served by the City of Hillsboro. The city owns and operates two municipal drinking water systems, the city's System, which is the primary system, and the Upper System, which is a secondary system. It utilizes wholesale water purchased from the Joint Water Commission (JWC). JWC, which is jointly owned by the Tualatin Valley Water District (TVWD) and the cities of Hillsboro, Beaverton, and Forest Grove, obtains water from Hagg Lake (Scoggins Reservoir) and the Barney Reservoir released into the upper portion of the Tualatin River. When flows are available, water from the Tualatin River is used. It is then withdrawn and filtered through the JWC water treatment plant. Chlorine and pH adjustments are added before leaving the plant, where chlorine and pH adjustments are added to the water. The city is working with TVWD on development of a new water supply system that will draw water from the Willamette River in order to, among other goals, better accommodate growth in the city and surrounding areas. The project is expected to be completed in 2026. There are also plans to an upgrade of the JWC Water Treatment Plant. In the meantime, it is assumed there is generally sufficient treatment, storage, and transmission capacity to meet existing demands, though additional storage may be needed for areas within the existing UGB during regional supply shortage events and to accommodate full buildout.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The City of Hillsboro has previously indicated there is or will be adequate water supply to serve the reserve as it develops, but capacity availability will ultimately depend on specific land uses in the reserve and the timing of any other urban development connected to the system. Additional supply capacity (e.g., from the WWSS project planned for completion in 2026) and pipe upsizing may be needed, and additional storage capacity is likely necessary.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Additional supply and storage capacity, as well as pipe upsizing, may be needed in order to avoid adversely impacting existing facilities in areas already inside the UGB.

d. Estimated water service-related costs for reserve development

Water piping, pumping, and storage costs	Cost
10-inch pipe	$0
12-inch pipe	$9.44 million
18-inch pipe	$0
Pumping	$0
Storage	$0.28 million
Total:	**$9.72 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$2,316**

Sanitary Sewer Services

With regard to sanitary sewer services, the Rosa Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

In adjacent areas already in the UGB, the City of Hillsboro provides sanitary sewer services that feed into the regional sanitary sewer system operated by Clean Water Services (CWS). CWS treats wastewater at the Rock Creek Wastewater Treatment Plant. Capacity is believed to be adequate to meet current demand, though CWS is in the process of developing the West Basin Master Plan (WBMP), which, when completed as early as 2025, will identify projects needed to accommodate redevelopment and new development in the UGB.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The forthcoming WBMP will help to identify projects needed to accommodate development in and beyond the existing UGB. Nonetheless, CWS has indicated that it is likely development of the Rosa Urban Reserve would require a new pump station that would pump sewage direct to the Rock Creek treatment plant.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

The WBMP will help to identify projects needed to accommodate development beyond the existing UGB while maintaining adequate service elsewhere. As noted above, CWS has indicated that it is likely development of the Rosa Urban Reserve would require a new pump station.

d. Estimated sanitary sewer service-related costs for reserve development

Sanitary sewer piping and pumping costs	Cost
10-inch pipe	$5.17
12-inch pipe	$0
15-inch pipe	$0
Pump station	$2.52
Force mains	$0
Total:	**$7.69**
Per dwelling unit at 20 units per net vacant buildable acre:	**$1,833**

Stormwater Management Services

With regard to stormwater management services, the Rosa Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

There is no indication of significant challenges with existing stormwater management facilities being able to serve existing development in adjacent areas inside the UGB.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Based on topography, stormwater related to new development in the Rosa Urban Reserve could potentially discharge to Butternut Creek or Gordon Creek via private and public outfalls, without connecting to other existing stormwater infrastructure.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

As noted above, stormwater related to new development in the Rosa Urban Reserve could potentially discharge to Butternut Creek or Gordon Creek via private and public outfalls, without connecting to other existing stormwater infrastructure. Therefore, no adverse impacts to existing facilities serving areas already inside the UGB are anticipated. It is also expected that stormwater will be treated and detained onsite, thereby limiting impacts to these creeks.

d. Estimated stormwater service-related costs for reserve development

Stormwater piping and water quality/detention	Cost
18-inch pipe	$3.00 million
24-inch pipe	$2.21 million
30-inch pipe	$0
Water quality/dentition	$9.38 million
Total:	**$14.59 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$3,476**

Transportation Services

With regard to transportation services, the Rosa Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(e) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Figure 4.36 in Chapter 4 of the 2023 Regional Transportation Plan (RTP) displays 2020 home-based vehicle miles traveled (VMT) per capita by Metro transportation analysis zone, with average VMT per capita considered 11.32. According to Figure 4.36 in Chapter 4, areas in the UGB adjacent to the Rosa Urban Reserve had above average home-based VMT per capita in 2020.

Metro's adopted 2040 Growth Concept Map designates two regional centers and separate town centers in the City of Hillsboro, as well as a town center in nearby unincorporated Washington County. Regional centers are generally meant to: serve populations of hundreds of thousands of people; surround high-quality transit service and multi-modal street networks; and offer larger commercial uses, healthcare facilities, local government services, and public amenities. Town centers are meant to: serve populations of tens of thousands of people; offer more locally-focused retail uses and public amenities; and be well served by transit. The Hillsboro Regional Center in Hillsboro and the Aloha Town Center in Washington County are the closest 2040 Growth Concept designated centers to the Rosa Urban Reserve.

The Hillsboro Regional Center includes historic downtown Hillsboro and a large surrounding area that encompasses a wide variety of residential, employment, institutional/public uses. The center includes grocery stores, restaurants, medical facilities, government offices, school uses, parks, and a variety of housing types. Metro's 2017 State of the Centers Atlas showed that this large regional center has an average population density and dwelling units per acre, and a slightly lower number of businesses per acre, when compared with the other regional centers in the region.

The Aloha Town Center is located along Tualatin Valley Highway in unincorporated Washington County. In 2017, Washington County completed the Aloha Tomorrow Plan for the town center area to integrate land use changes, transportation improvements, and policies that support affordable housing and economic development. The center includes grocery stores, other retail commercial uses, medical offices, a preschool, places of worship, and a variety of housing types. Metro's State of the Centers Atlas showed that the town center has a high total population and dwelling units per acre, but a very low number of total businesses and employees, when compared with other town centers in the region.

The South Hillsboro Community Plan area, which is in the UGB and adjacent to the reserve to the east, is expected to develop with a higher-density mixed-use town center ("Reed's Crossing") along Tualatin Valley Highway and a smaller-scale village center south of Butternut Creek. While these two centers are not formally designated 2040 Growth Concept centers, they are expected to have similar purposes and characteristics.

Growth in and near these 2040 Growth Concept centers, Reed's Crossing, and the village center will not necessarily cause a significant increase in home-based VMT per capita in the future, as area residents will be able to access some daily needs with relatively short trips. The transit service and bike and pedestrian facilities that serve these areas, described further below, can also help to ensure that additional growth nearby does not adversely impact home-based VMT per capita.

Six TriMet bus routes provide service to Hillsboro and/or nearby unincorporated Washington County, mainly along the arterial streets in the central portion of the city, focusing on the Hillsboro and Tanasbourne/Amber Glen Regional Centers, the Orenco Town Center, and employment areas. There is generally more minimal transit service to the southern and northern portions of the city. However, TriMet Route 57 provides service along Tualatin Valley Highway and connects the Hillsboro Regional Center with Aloha Town Center. The MAX Light Rail Blue Line stops at nine stations within Hillsboro, connecting the city to Beaverton and Portland. Figure 4.3 in Chapter of the 2023 RTP indicates that there are gaps in planned frequent transit service along certain routes in the UGB near the reserve, including along SE Cornelius Pass Road and SE Century Boulevard.

Hillsboro has over 54 miles of dedicated bike lanes, more than 24 miles of established bikeways, and numerous streets considered "bike friendly" that, together, create a fairly well-connected system that is focused mostly on the central portion of the city and its two regional centers, including the Hillsboro Regional Center. There are dedicated bike facilities on SE River Road, SE Davis Road west of SE Brookwood Avenue, and the roughly 1,000 feet of SE Davis Road leading up to SE Century Boulevard, in the area of the UGB near the reserve. There are also dedicated bike facilities along the developing SE Butternut Creek Parkway, which will serve that area's new development and its prospective village center. The existing bike facilities on Tualatin Valley Highway are identified as part of the regional bike network on Figure 4.5 in Chapter 4 of the 2023

RTP. However, the figure also identifies gaps in the planned network in other areas in the UGB near the reserve, including along SE Davis Road.

A large proportion of the residential neighborhoods in Hillsboro, including those in the UGB near the reserve, have sidewalks, although there are other residential areas of the city that do not have sidewalks. The Hillsboro Regional Center and Aloha Town Center have sidewalks, as does the developing South Hillsboro Community Plan area. Trails, such as the Butternut Creek Trail to the east of the reserve and the Rock Creek Trail, provide additional pedestrian opportunities. However, large sections of Tualatin Valley Highway lack sidewalks and sections of SE Brookwood Avenue and SE Davis Road in the UGB lack sidewalks on both sides. There are also no sidewalks along SE River Road south for most of the length south of SE Oakhurst Street. Chapter 4, Figure 4.4 of the 2023 RTP identifies the missing sidewalks on Tualatin Valley Highway, SE Brookwood Avenue, and SE River Road as gaps in the planned regional pedestrian network.

Figure 4.14 in Chapter of the 2023 RTP identifies a number of high injury corridors in the area already inside the UGB near the reserve and in Hillsboro, including Tualatin Valley Highway and SE River Road. The figure also identifies a number of intersections along Tualatin Valley Highway and SE River Road in the UGB near the reserve as high injury intersections.

Highway 26 within the UGB near Hillsboro is identified as a throughway Chapter 4, Figure 4.7 of the 2023 RTP. Figure 4.8 of that chapter indicates that this section of Highway 26 currently meets travel speed reliability performance thresholds, with no more than four hours per day when travel speeds fall below the identified minimum speed. RTP models indicate this reliability will continue at least to the year 2045.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Highway 26, an RTP-designated throughway, is more than four miles away from the reserve. As noted above, the section of the highway in the UGB near Hillsboro currently meets travel speed reliability performance thresholds.

There is currently no transit service into the reserve itself. TriMet Route 57, which travels on Tualatin Valley Highway between Forest Grove and the Beaverton Transit Center, is just shy of a mile from the eastern edge of the reserve along SE 67th Avenue and just over a half mile from the middle of the reserve along SE Brookwood Avenue.

There is a dedicated bike lane on north of the reserve on SE/SW River Road that connects to a bike lane on SE Davis Road 1,000 feet to the north that provides access to nearby South Meadows Middle School and Witch Hazel Elementary School. It appears the bike lane on SE Davis Road will be extended to the east as the area develops, given the fact that there are bike lanes on those portions of SE Davis with new homes. The bike lane on SE/SW River Road also extends south into the reserve to SW Rosedale Road. There are bike lanes and bikeways in South Hillsboro Community Plan area and it is expected that these facilities will continue to be built as development progresses.

There is one directly adjacent residential development that has sidewalks. However, this development is next to the golf course portion of the reserve and currently the sidewalks do not connect to the reserve itself. It is unclear as to whether they will be connected in the future.

As noted in response to Factor 1, the reserve may not be able to efficiently accommodate employment uses and instead would best accommodate residential uses, meaning future residents may have to travel outside of the reserves for daily services and employment opportunities. This Hillsboro Regional Center is located approximately 2.5 miles from the reserve via Tualatin Valley Highway or SE River Road. The Aloha Town Center is located about 3.5 miles to the east of the reserve along Tualatin Valley Highway. Without direct transit service, and without direct and complete bike and pedestrian facilities leading to transit on Tualatin Valley Highway, it is likely that future residents of the reserve will need to rely on private motor vehicle transportation to access their daily needs and employment opportunities in these centers. The "center-like" mixed use development in the nearby South Hillsboro Community Plan area could offer closer services.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

SE 67th Avenue, SE River Road, SE Brookwood Avenue, and Tualatin Valley Highway would be expected to see additional private vehicle traffic from development of the reserve. The few existing bike and pedestrian facilities nearby would also be expected to see additional use. Considering the distance between the reserve and the 2040 Growth Concept designated centers, the lack of direct transit service, the limited bike and pedestrian facilities, and the size of the reserve, the reserve could generate more private motor vehicle traffic on roadways already inside the UGB than other reserves. Any additional motor vehicle traffic on Tualatin Valley Highway or SE River Road may exacerbate their high-crash conditions. However, in part because Highway 26 is more than four miles from the reserve, development of the reserve is not expected to impact the performance of Highway 26 as a throughway.

d. Need for major transportation facility improvements and associated costs

Urbanizing the reserve will likely require an approximately 0.91-mile section of SW River Road in the west of the reserve to be improved to urban arterial standards, including acquisition of additional right-of-way. It is also likely that the following roadways would need to be improved to urban collector standards, with acquisition of additional right-of-way: a 0.92-mile section of SW Rosa Road; a 0.91-mile section of SW Rosedale Road; and a 1.05-mile section of SE Century Boulevard. The SW Rosedale Road improvements are considered half-street improvements for the purposes of this analysis, as the southern half of the roadway may be outside of the UGB. SE Century Boulevard improvements are also considered half-street improvements because the eastern half of the roadway would be inside the current UGB. Two new collectors with a combined length of approximately 1.27 miles are likely needed to serve central portions

of the reserve. Most of these new and improved roadways' per-mile costs are expected to be normal, though a few stream crossings could lead to higher-than-normal costs in specific locations.

Facilities	Cost
Arterials, existing/improved full street	$70.50 million
Arterials, existing/improved half street	$0
Arterials, new	$0
Collectors, existing/improved full street	$29.67 million
Collectors, existing/improved half street	$34.04 million
Collectors, new	$52.10 million
Total:	**$186.32 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$44,404**

c. Provision of public transit service

The Rose Urban Reserve is almost entirely within the TriMet District, but the area to the west of SW River Road is outside of the district. Conceptual road layouts for the reserve indicate that future transit service may not be feasible. However, TriMet nonetheless evaluated the reserve for providing transit service and determined they could reroute a potential new bus line proposed in TriMet's 2045 Network Vision that would operate along Roy Rogers Road. An analysis determined that the service would not create significant, additional costs. TriMet could potentially provide services to the reserve, although there is no guarantee of service. Actual service depends on the level of development in the reserve and in the corridors leading to it.

Prior to land being included in the UGB, a more detailed concept plan, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11, will be required. This concept plan process will develop more refined public facility and service needs and cost estimates.

Factor 3: Comparative environmental, social, energy, and economic consequences

Environmental consequences

Gordon Creek flows west through the golf course in the northern portion of the Rosa Urban Reserve for approximately 1,830 feet. Wetlands identified on the National Wetland Inventory (NWI) are associated with the entire stream length and total 5.8 acres. Riparian habitat is identified along the stream and wetlands. The golf course is considered developed land so no urbanization here is expected; therefore, the stream, wetland, and habitat areas on the golf course would not be impacted by future urbanization of the reserve.

Butternut Creek flows diagonally through the southern portion of the reserve for approximately 1.4 miles. The entire stream is within a floodplain and 26.5 acres of NWI

wetlands are identified along the entire length. There are a few locations with slopes greater than 25 percent near the western edge of the reserve.

Two small tributaries flow into Butternut Creek near the eastern edge of the reserve and combined total 2,400 feet. All three of the streams flow through forested riparian corridors. There is a significant amount of riparian and upland habitat identified along the corridors.

Butternut Creek bisects the southern portion of the reserve, and any north-south connection developed with urbanization would impact habitat areas, floodplain, and wetlands. However, given the increased protection levels for, streams, wetlands, steep slopes, and habitat areas on lands added to the UGB, urbanization of the area can occur without impacting this stream corridor and habitat areas, especially if a north-south road connection is not made.

Overall, urbanization of the reserve could occur with comparatively moderate impacts to the stream corridors and habitat areas, depending on north-south roadway connections and ultimate urban form. Additional environmental consideration, specifically regarding avoidance of conflict between urban development and regionally significant fish and wildlife habitat, is provided in the Metro Code Factors Analysis (Appendix 7A).

Considering the comparative environmental consequences of urbanization, the Rosa Urban Reserve is given a "medium-high" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Social, energy, and economic consequences

This Rosa Urban Reserve has three primary land uses: the Reserve Vineyards and Golf Course; rural residences on forested tax lots; and agricultural activities mostly occurring in the southern portion of the reserve. The golf course, which is not considered developable, mostly separates the developable portions of the reserve from areas from existing development already in the UGB, somewhat isolating the currently rural areas of the reserve. However, urban development on lands to the northwest and east of the reserve is likely in the near future and that development will impact the rural character of the wider area. The number of existing rural residences is relatively small and are generally clustered along SW River Rd on smaller tax lots. This existing development and parcelization, as well as nearby natural features, will limit opportunities for new development in this area of the reserve. Larger-scale urban development would instead likely occur first in the southeast corner of the reserve where lands are cleared and flatter, away from most existing residences. Butternut Creek and the tributary to the Tualatin River and their associated habitat and floodplain areas also divide the reserve into smaller sections that would result in a less dense urban development pattern and could help to buffer urban development for other areas of the reserve until they urbanize.

As detailed more fully in response to Factor 2, future residents of the reserve are likely to be reliant on private motor vehicle transportation, which will have some adverse energy impacts.

There is agricultural activity in the south of the reserve, primarily field crops and Christmas tree farming. The economic consequences of a loss in farming activity in the reserve may be outweighed by the economic benefits of residential development.

This analysis finds that there would be comparatively moderate social, energy, and economic consequences from urbanization of this reserve. The Rosa Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Factor 4: Compatibility of the proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

Goal 3 agricultural lands, specifically lands zoned Exclusive Farm Use (EFU) by Washington County, border the Rosa Urban Reserve to the south and west.

The EFU-zoned lands bordering to the south extend into unincorporated areas for a number of miles. Nearly all of the EFU-zoned land directly adjacent to the reserve on the south side of SW Rosedale Road is in agricultural production and include field crops, row crops, and orchards. There is also one roughly four-acre stand of trees near to some rural residential development. SW Rosedale Road itself would not provide an adequate buffer between urban development and agricultural activity. Development of the reserve could lead to land use conflicts related to safety, liability, and vandalism and complaints due to noise, odor, dust, and the use of pesticides and fertilizer. In addition, the improvement of SW Rosedale Road to urban standards, and associated street light illumination and bicycle and pedestrian movements, may further jeopardize the compatibility of the two uses, though the impacts of urban roadways on adjacent agricultural activity may be minimized through road design. Urbanization of the reserve would increase traffic on SW Rosedale Road, which could impact the movement of both farm equipment and goods, although the amount of traffic may be limited as Butternut Creek isolates the southern portion of the reserve and SW 229th Avenue and SW River Road provide more direct routes to the existing urban area. The proposed urban uses are considered mostly incompatible with the extensive nearby agricultural activities occurring on the farmland to the south and mitigation measures on the urban land will be necessary. While there is the aforementioned four-acre stand of trees on the adjacent EFU-zoned land in this area, the stand is not significant enough to attract large-scale timber operations that would be in conflict with urban development of the reserve.

The Tualatin River and its associated forested riparian corridor provide a buffer for the vast majority of the EFU land to the west. In addition, the some of the EFU-zoned land west of the river in this location is composed of the Meriwether National Golf Course and not actually in agricultural use. The tax lots at the southwest corner of the reserve are divided by the reserve boundary and the portions of these tax lots outside the reserve are zoned EFU. A very minor portion of this land, approximately two and a half acres in area, is currently in agricultural production along with the portion of the tax lot that is within the reserve. Given the location of this very small area between the Tualatin River and the reserve boundary, and the lack of an easy access point for farm equipment when urbanization occurs, the expectation is that, if the area urbanized, the agricultural activities on these remnants of land would not continue and the potential for land use conflicts

between urban development and agricultural activity would be further reduced. Therefore, the proposed urban uses would be considered compatible with nearby agricultural activities in this location.

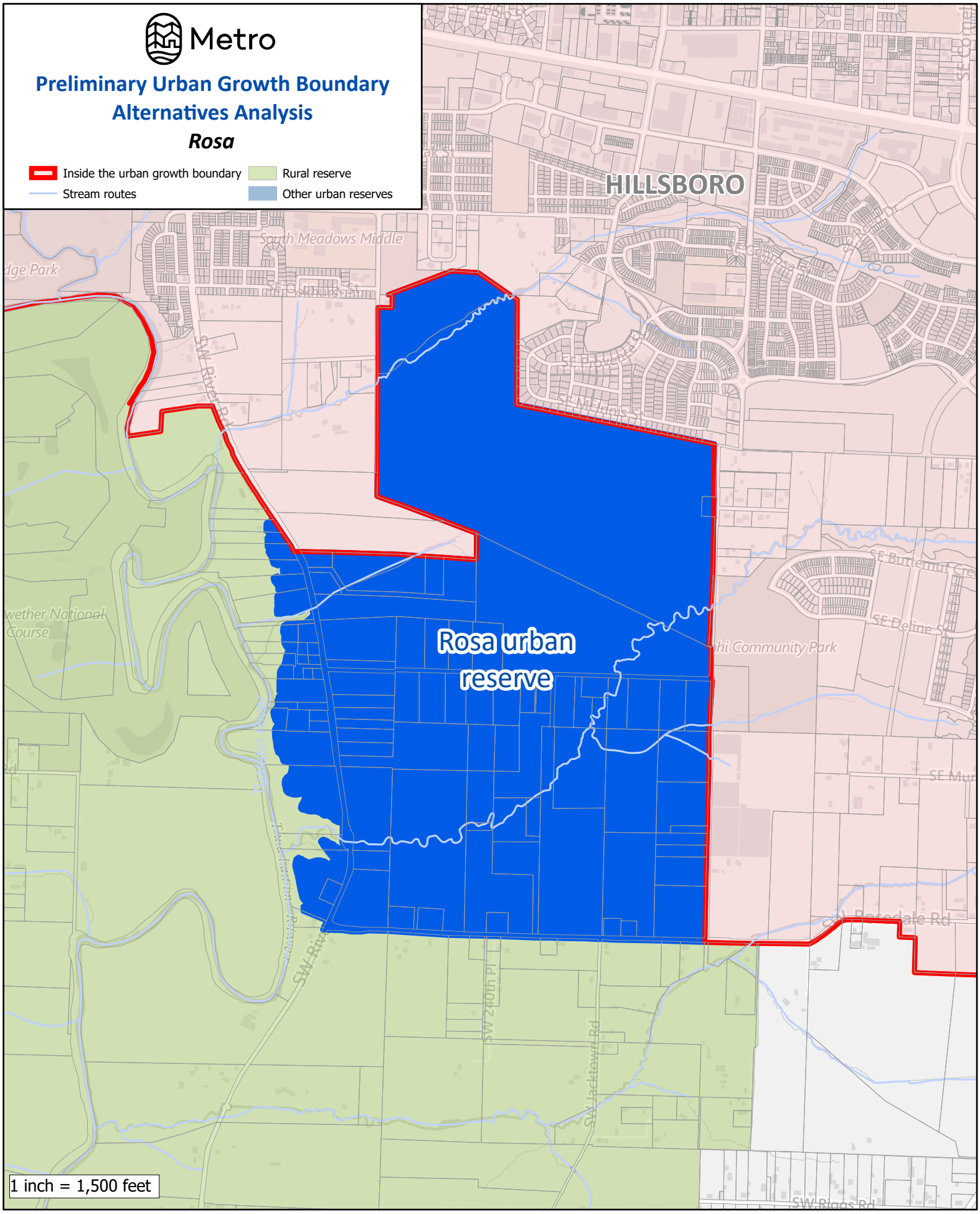
In summary, the proposed urban uses are generally compatible with nearby agricultural and forest activities occurring on farm and forest land outside the UGB to the west, but not compatible with the agricultural activities occurring on the farmland to the south where mitigation measures on the urban land could be warranted. Overall, the proposed urban uses have moderate compatibility with the nearby agricultural and forest activities occurring on farm and forest land outside the UGB. The Rosa Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location factor.

Metro

Preliminary Urban Growth Boundary Alternatives Analysis

Rosa

Inside the urban growth boundary
Rural reserve
Stream routes
Other urban reserves



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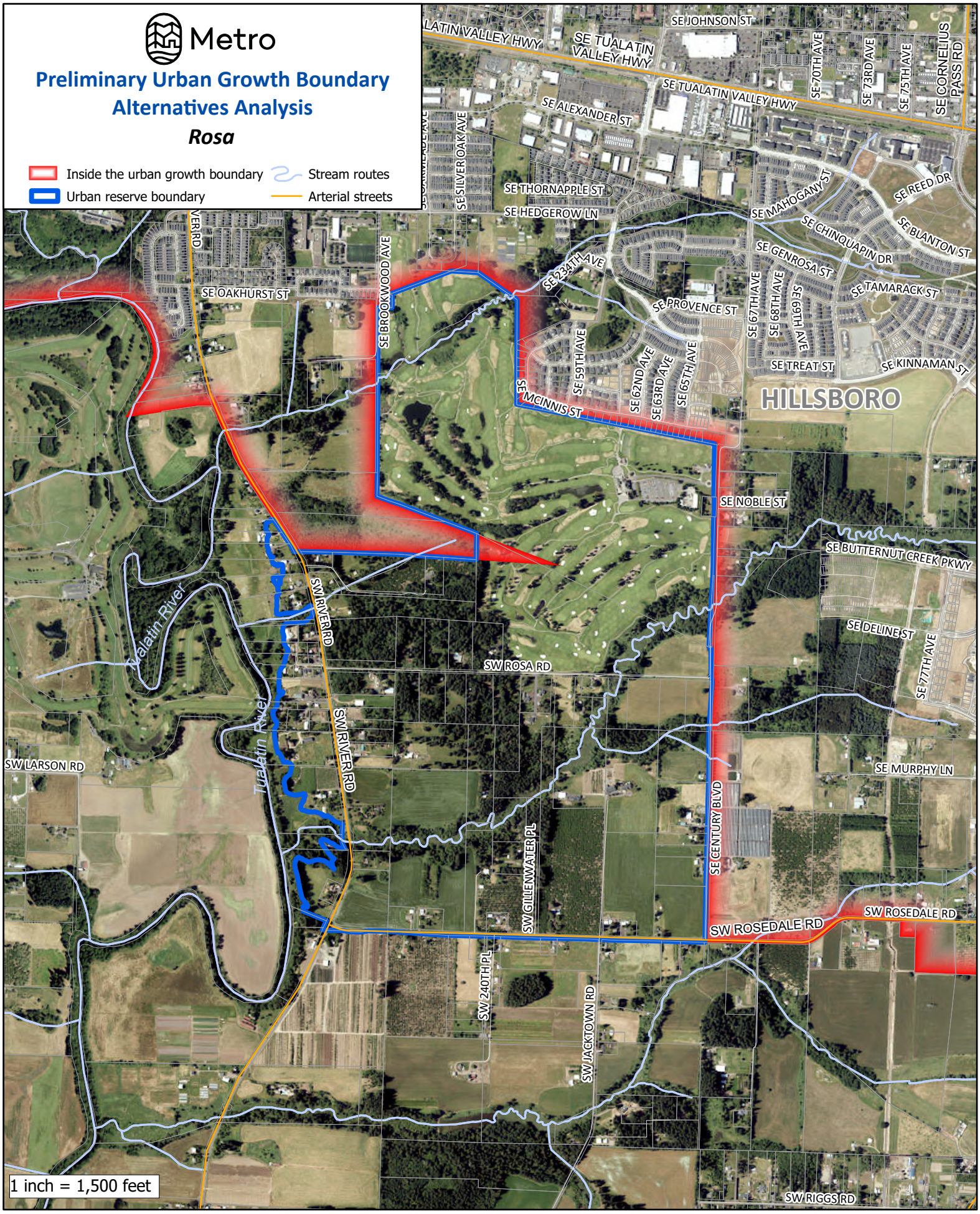
Metro

Preliminary Urban Growth Boundary Alternatives Analysis

Rosa

Inside the urban growth boundary
Urban reserve boundary
Stream routes
Arterial streets



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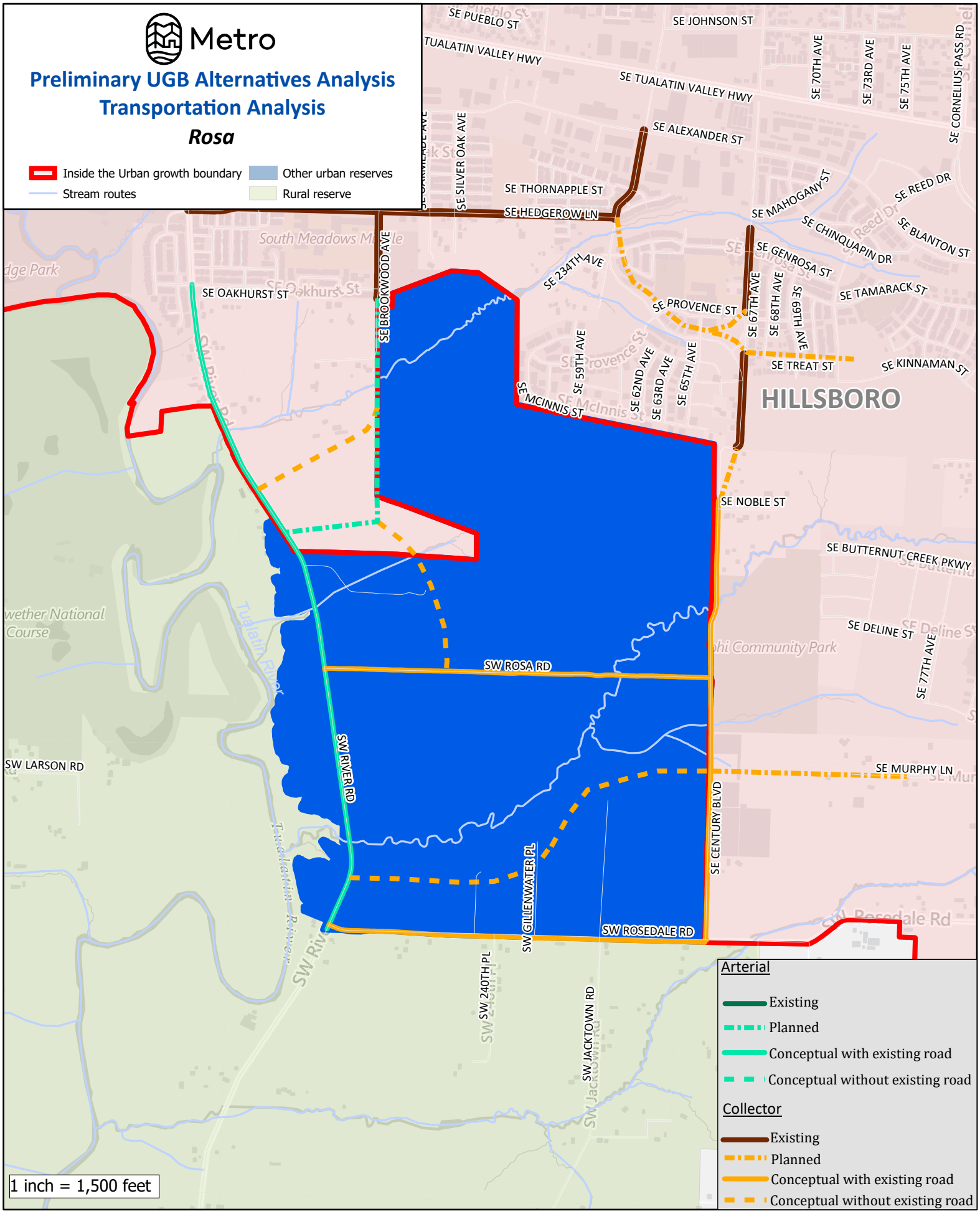

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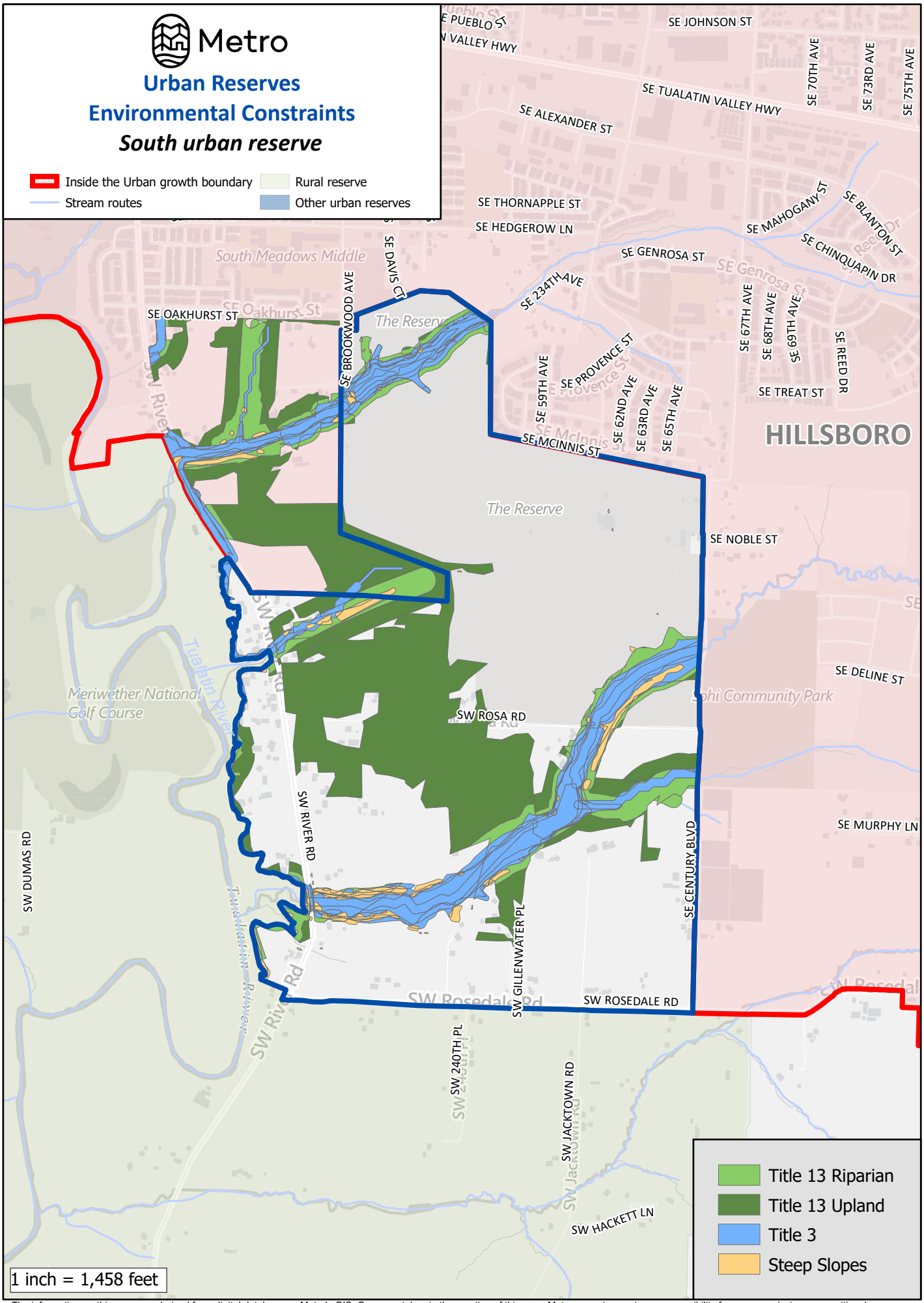

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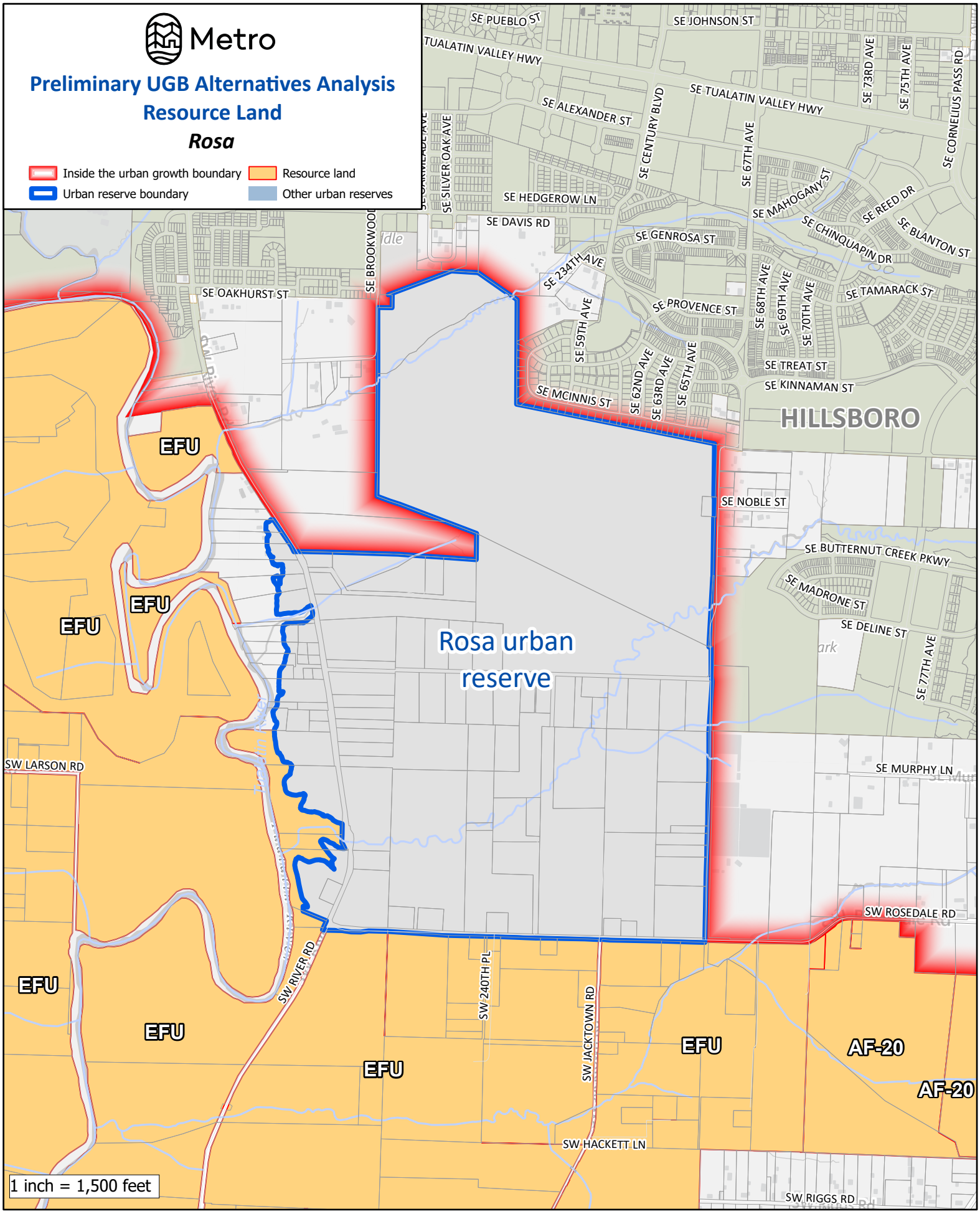

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ROSEMONT URBAN RESERVE

Total Reserve Area	128 acres
Total Tax Lot Area in Reserve (without Right-of-Way)	127 acres
Gross Vacant Buildable Area	112 acres
Net Vacant Buildable Area	**83 acres**

The Rosemont Urban Reserve is a relatively small area on the opposite side of S Rosemont Road from West Linn city limits. The UGB forms the reserve's northern and western boundaries, and the reserve is otherwise entirely surrounded by the separate Stafford Urban Reserve. The reserve is generally flat, with a bench along S Rosemont Road that gently slopes to the south and west. There are some slopes greater than 10 percent mainly along the reserve's other edges and in its center.

GOAL 14 BOUNDARY LOCATION FACTORS

Factor 1: Efficient accommodation of identified land needs

The Rosemont Urban Reserve contains 19 contiguous tax lots, all of which are entirely within the reserve. All but seven of the tax lots are larger than five acres each; one tax lot is more than 13 acres in area and another is more than 38 acres in area. One of the reserve's tax lots appears to only be a private access drive.

Roughly 70 percent of the reserve's tax lots are developed with rural residences and accessory uses. Aerial imagery indicates there is some minor agricultural activity (e.g., Christmas tree farming) in the reserve, as well as some forested patches. In total, 13 of the reserve's tax lots have assessed improvements, with the median assessed value of those tax lots' improvements being more than $1 million.

Rosemont Ridge Middle School and the West Linn Adult Community Center are directly adjacent to the reserve, and Trillium Creek Primary School is across S Rosemont Road. The reserve is also adjacent to urban low density residential development. Commercial and mixed-use developments, including a grocery store and medical offices, and a disc golf course are within a quarter mile of the east side of the reserve.

Access to the reserve is provided by S Rosemont Road, S Wisteria Road, and Salamo Road. The nearest highway interchange is the interchange of 10th Street with I-205, nearly two miles away via Salamo Road. There are no existing TriMet bus stops within a mile of the reserve.

Considering the reserve's overall small size, its limited highway access, slopes, large number of high value existing residences, and surrounding residential development, the reserve is not considered suitable for accommodating an employment land need. However, the existing and surrounding residential uses and the proximity of schools and recreational and commercial uses, could support and/or be cohesive with residential land uses. This reserve is considered able to accommodate a small residential land need.

However, regarding the "efficient" accommodation of identified land needs, it is important to note that the cities adjacent to the "Stafford Triangle" area, which includes the Rosemont Urban Reserve, have for decades opposed UGB expansions in that area, and those cities' elected officials have taken steps to restrict any city's ability to plan for the accommodation of future urban development. In 2019, the cities of Lake Oswego, Tualatin, and West Linn entered into an agreement that prohibits any of those cities from completing a concept plan for any part of the Borland, Rosemont, and Stafford Urban Reserve areas until, at the earliest, December 31, 2028. This restriction and the ongoing opposition of the three adjacent cities to planning, annexing, and developing the Rosemont Urban Reserve weighs heavily against this area regarding its ability to efficiently accommodate the identified needs for residential or employment land under Factor 1.

Factor 2: Orderly and economic provision of public facilities and services

Water Services

With regard to water services, the Rosemont Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

The City of West Linn serves the adjacent areas inside the UGB to the north and east. The West Linn Water System receives potable water from the South Fork Water Board (SFWB), with a treatment plant in Oregon City jointly owned by the Cities of West Linn and Oregon City. SFWB's water treatment process includes flocculation, sedimentation, filtration, and chlorination of raw water from the Clackamas River to remove harmful bacteria. The water treatment plant was upgraded in October 2016. There are currently no known major treatment system deficiencies or relevant pressure zone storage deficiencies. However, it is unclear whether there is sufficient pumping and distribution system capacity to fully serve buildout conditions, at least without system improvements.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Storage, transmission line, and pumping system improvements may be needed for West Linn to serve urban development of the Rosemont Urban Reserve.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Additional storage, pumping, and distribution system capacity may be needed to serve urban development of the Rosemont Urban Reserve while avoiding negative impacts to service to areas already inside the UGB.

d. Estimated water service-related costs for reserve development

Water piping, pumping, and storage costs	Cost
10-inch pipe	$0.67 million
12-inch pipe	$0
16-inch pipe	$0
Pumping	$2.9 million
Storage	$0.10 million
Total:	**$3.67 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$2,204**

Sanitary Sewer Services

With regard to sanitary sewer services, the Rosemont Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

The City of West Linn provides service to nearby lands in the UGB to the north and east. At the downstream end of the City of West Linn system are WES-owned pumps and force mains. Sewage ultimately gets pumped to the Tri-City Water Resource Recovery Facility (WRRF) located on the east side of the Willamette River. The Rosemont area would be part of the WES Willamette Basin, which flows to the Willamette Pump Station and then to the West Linn Interceptor. The WES Master Plan identifies an expansion of the existing treatment plant within the 2020-2040 timeframe, taking it from its existing 78.3 MGD capacity to 104 MGD capacity. The city's 2019 Sanitary Sewer Master Plan has identified potential system capacity deficiencies for modeled pipes in both existing and buildout scenarios. There are no deficiencies identified in the city system downstream of the likely Rosemont Urban Reserve connection point under existing conditions, but there may be deficiencies under buildout conditions downstream of the system near the Willamette River. The WES Master Plan identifies hydraulic deficiencies for future dry weather flow, groundwater infiltration, and rainfall derived infiltration and inflow.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Whether the development of the Rosemont Urban Reserve would strain the capacity of existing city system or WES facilities depends in part on the timing of its development and other development in and around the city. It's possible that sewage from the Rosemont Urban Reserve would need to flow toward the Stafford Urban Reserve on its way to the treatment plant; if so, sewer lines will be needed through this adjacent reserve potentially requiring its inclusion in the UGB as well. Existing piping and hydraulic deficiencies may also need to be addressed. The planned expansion of the

treatment plant should provide additional capacity that could help support development of the reserve.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

As explained above, treatment plant improvements and piping and hydraulic capacity improvements will likely be needed to avoid negative impacts to service within the existing UGB. Potential treatment plant improvement costs and other system-wide/adjacent reserve development costs are not included in the below figures.

d. Estimated sanitary sewer service-related costs for reserve development

Sanitary sewer piping and pumping costs	Cost
10-inch pipe	$1.43 million
12-inch pipe	$0
15-inch pipe	$0
Pump station	$0.90 million
Force mains	$1.12 million
Total:	**$3.45 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$2,072**

Stormwater Management Services

With regard to stormwater management services, the Rosemont Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

There is no indication of major capacity issues with existing stormwater facilities that serve the adjacent land inside the UGB. Based on topography, at stormwater from development of the Rosemont Urban Reserve would likely be conveyed, treated, and detained within the reserve and discharge directly to Fritchie Creek, which does not have any identified capacity issues.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Fritchie Creek is believed to have sufficient capacity to serve development in the reserve.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Stormwater from development of the Rosemont Urban Reserve would likely be conveyed, treated, and detained within the reserve and discharge directly to Fritchie

Creek, without connecting to any existing City of West Linn Stormwater infrastructure. Fritchie Creek is believed to have sufficient capacity. Therefore, no adverse impacts to existing facilities are anticipated.

d. Estimated stormwater service-related costs for reserve development

Stormwater piping and water quality/detention	Cost
18-inch pipe	$0
24-inch pipe	$0
30-inch pipe	$0
Water quality/dentition	$1.53 million
Total:	**$1.53 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$920**

Transportation Services

With regard to transportation services, the Rosemont Urban Reserve is given a "medium-high" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(e) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Figure 4.36 in Chapter 4 of the 2023 Regional Transportation Plan (RTP) displays 2020 home-based vehicle miles traveled (VMT) per capita by Metro transportation analysis zone, with average VMT per capita considered 11.32. According to Figure 4.36, areas in the UGB adjacent to and near the Rosemont Urban Reserve had an above average home-based VMT per capita in 2020.

Metro's adopted 2040 Growth Concept Map designates a town center in the adjoining City of West Linn. Town centers are meant to: serve populations of tens of thousands of people; offer more locally-focused retail uses and public amenities; and be well served by transit. West Linn's Willamette Town Center, which includes the Willamette Historic District, aligns with the 2040 Growth Concept Map. The town center area includes local retail commercial uses, medical facilities, school uses, police and fire stations, and some residential uses. Within the UGB but within half a mile of the reserve there is a grocery store, other retail commercial uses, banks, school uses, places of worship, a community center, medical services, multifamily housing, parks, and the West Linn City Hall. Growth in and near the town center and areas in the UGB near the reserve will not necessarily cause a significant increase in home-based VMT per capita in the future, as area residents will be able to access some daily needs with relatively short trips.

Two TriMet bus lines serve West Linn, including Route 35, which runs along Willamette Drive, and Route 154, which runs along Willamette Falls Drive. They provide transit

service to the Willamette Town Center and other portions of West Linn. Figure 4.3 in Chapter 4 of the 2023 RTP shows these existing routes as in the regional transportation network. There are currently no TriMet bus stops in the UGB within a mile of the reserve.

There are more than nine miles of dedicated bike lanes and five miles of bikeways in West Linn, including on portions of Blankenship Road and Willamette Falls Drive that help connect western ends of West Linn to the Willamette Town Center. Parker Road Rosemont Road, Salamo Road, and Santa Anita Drive, which are in the UGB near the reserve, all have dedicated bike lanes. Figure 4.5 in Chapter 4 of the 2023 RTP shows some existing bike facilities in West Linn, including those along Salamo Road, as in the regional bike network. However, there are gaps in the planned regional bike network in the city, such as along Willamette Falls Drive.

Large portions of West Linn are well served by sidewalks, especially in areas that have been developed more recently. There are sidewalks on the SW Borland Road bridge over the Tualatin River that join sidewalks on Brandon Plance and Dollar Street in the UGB that connect with the Fields Bridge Park, Athey Creek Middle School, and, eventually, the Willamette Town Center. The Willamette Falls Drive Streetscape Project improved pedestrian accessibility in the historic Willamette neighborhood. The Rosemont and Salamo Trails provide pedestrian connection routes along Rosemont Road and Salamo Road and that tie the lower and upper portions of West Linn together on the west side. There are also sidewalks along Bay Meadows Drive, Furlong Drive, Hidden Springs Road, Hoodview Avenue, Noble Lane, and Santa Anita Drive in the UGB near the reserve connecting to schools, commercial and civic uses, residential areas, and parks. Figure 4.4 in Chapter 4 of the 2023 RTP shows that there are some gaps in the planned regional pedestrian network in West Linn.

There are no high injury corridors or high injury intersections in West Linn's portion of the UGB identified on Figure 4.14 in Chapter 4 of the 2023 RTP.

The section of I-205 that crosses through the UGB near the reserve is identified as a throughway in Chapter 4, Figure 4.7 of the 2023 RTP. Figure 4.8 of the chapter indicates that the interstate section currently meets travel speed reliability performance thresholds, with no more than four hours per day when travel speeds fall below the identified minimum speed. RTP models indicate this reliability will continue at least to the year 2045.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The nearest highway interchange to the reserve is the interchange of 10th Street with I-205, nearly two miles away via Salamo Road. The section of I-205 near the reserve connecting Tualatin and West Linn is expected to continue to meet RTP travel speed reliability performance thresholds at least to the year 2045.

The Willamette Town Center is just over a mile from the reserve but, as noted above, there are other areas with commercial uses, including a grocery store, as well as civic and school uses, medical service, parks, and places of worship within half a mile of the reserve where future residents of the reserve could access daily needs without traveling a long distance (i.e., without increasing home-based VMT per capita). Indeed, Rosemont Ridge Middle School and the West Linn Adult Community Center are adjacent to the reserve and Trillium Creek Primary School is only about 500 feet away. As detailed below, these uses are already connected to the reserve by designated bike facilities and sidewalks, which reduces the need for future residents of the reserve to rely on private motor vehicle transportation to access them.

There is currently no transit service near to the reserve. The closest bus stop is on Willamette Drive, about 1.5 miles away via Santa Anita Drive and Pimlico Drive. However, as explained below, TriMet has plans to provide hourly service along Rosemont Road sometime in the future. In the meantime, there are dedicated bike facilities on Rosemont Road and Salamo Road adjacent to the reserve, as well as on Hidden Springs Road, Parker Road, and Santa Anita Drive leading to the reserve. These roads, as well as almost all of the nearby neighborhood streets, also have sidewalks and the Rosemont Trail along Rosemont Road provides access to the reserve. Past the nearby neighborhoods, there are some gaps in sidewalks or pedestrian facilities along the major streets that limits pedestrian movement.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Hidden Springs Road, Parker Road, Rosemont Road, Salamo Road, Santa Anita Drive, and S Wisteria Road would see additional private motor vehicle traffic as a result of urbanization of the reserve. However, the existing bike and pedestrian facilities adjacent to the reserve, future transit service along Rosemont Road, and the close proximity of schools, civic and commercial uses, medical facilities, parks, and places of worship could help to minimize that additional roadway traffic. Moreover, as future residents of the reserve would be able to use roadways other than I-205, as well as existing bike and pedestrian facilities, to access these uses/services, development of the relatively small reserve is not expected to cause I-205 to no longer meet throughway reliability thresholds.

d. Need for major transportation facility improvements and associated costs

To serve urban development, the half-mile-long portion of Rosemont Road adjacent to the northwest side of the reserve will likely need to be improved to urban arterial standards and the 0.36-mile-long portion of S Wisteria Road will likely need to be improved to urban collector standards, including with acquisition of additional right-of-way in both cases. These roadway improvements are considered half-street improvements for the purposes of this analysis, as the other halves would be improved to urban standards with the development of the adjacent Stafford Urban Reserve or are otherwise in the UGB.

Facilities	Cost
Arterials, existing/improved full street	$0
Arterials, existing/improved half street	$15.33 million
Arterials, new	$0
Collectors, existing/improved full street	$0
Collectors, existing/improved half street	$8.74 million
Collectors, new	$0
Total:	**$24.07 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$14,474**

e. Provision of public transit service

TriMet evaluated the reserve for providing transit service. TriMet could provide services to the reserve, although there is no guarantee of service; actual service will depend on the level of development in, and in the corridors leading to, the reserve. Future service is proposed in TriMet's 2045 Network Vision and would bring service through the northern portion of the reserve along Rosemont Road. Service could be provided at 60-minute headways for all day service, five days per week.

Prior to land being included in the UGB, a more detailed concept plan, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11, will be required. This concept plan process will develop more refined public facility and service needs and cost estimates.

Factor 3: Comparative environmental, social, energy, and economic consequences

Environmental consequences

Approximately 350 feet of an unnamed stream that ultimately flows into the Tualatin River is located adjacent to S Wisteria Road near the intersection with S Clematis Road. The stream flows through an open field and riparian habitat that is identified along the stream corridor. The stream would not necessarily be impacted by development of the are due to its location at the edge of the Rosemont Urban Reserve; however, any required improvements to S Wisteria Road to upgrade it to urban standards would have an impact on the stream. Therefore, urbanization of the reserve could result in comparatively low to moderate environmental consequences, depending on the impact from the road improvements. Additional environmental consideration, specifically regarding avoidance of conflict between urban development and regionally significant fish and wildlife habitat, is provided in the Metro Code Factors Analysis (Appendix 7A).

Considering the comparative environmental consequences of urbanization, the Rosemont Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Social, energy, and economic consequences

It is expected that urbanization of the Rosemont Urban Reserve will result in new housing replacing at least some of the existing rural residences over time, though many of these are higher-value homes, so their replacement and any resulting change in sense of place and degradation of rural lifestyle would likely be slow. Indeed, the close proximity of urban uses, including schools and commercial retail uses, already limits the rural character for the area.

As detailed more fully in response to Factor 2, there may be additional vehicle traffic generated from urbanization of the reserve, but increased VMT and related energy impacts would be relatively minimal.

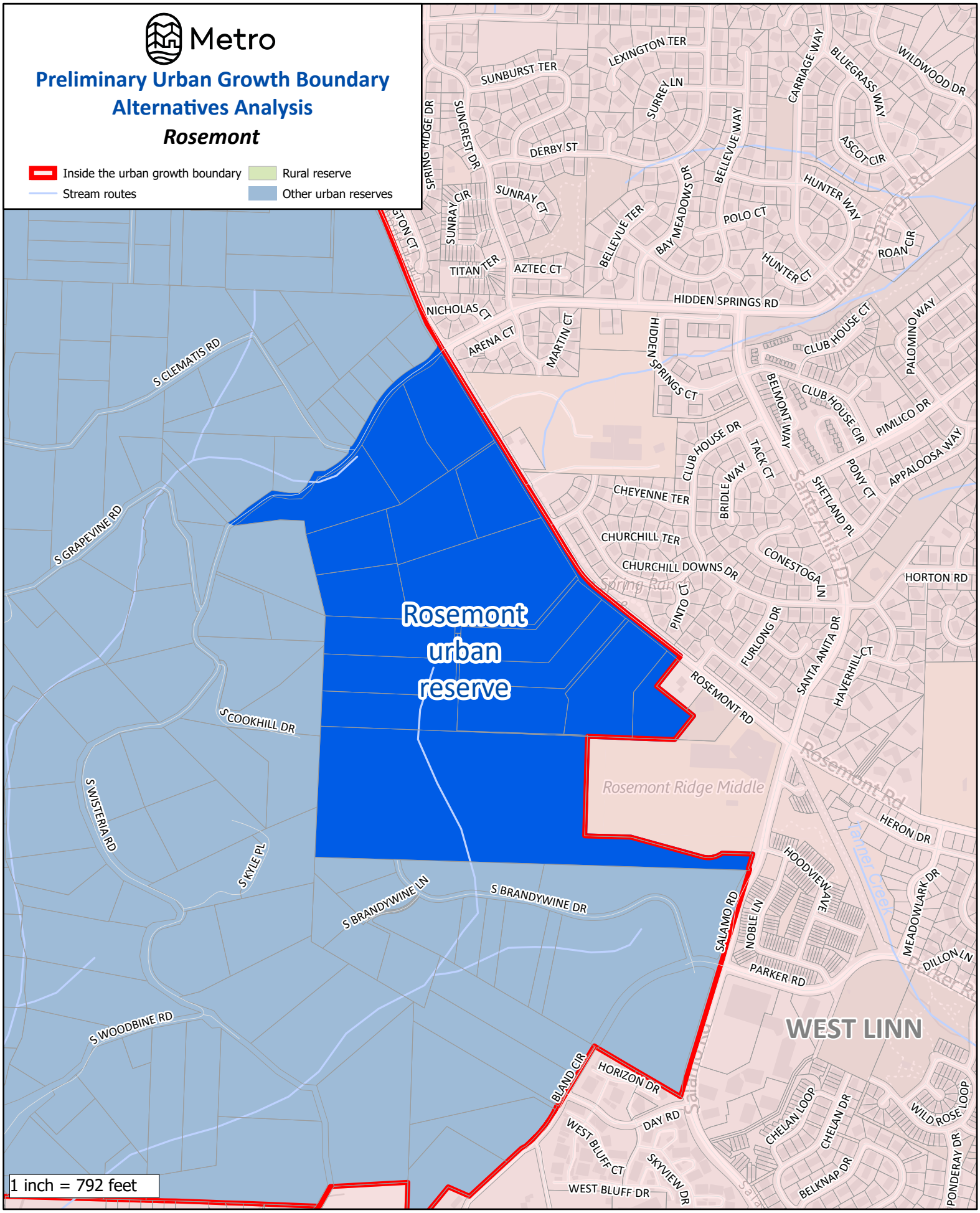
There may be fewer than 30 acres of agricultural activity occurring in the reserve, so the economic impacts of a loss in farming activity would likely be minimal; the economic benefits of residential development of the reserve may even outweigh this loss.

Overall, there would be comparatively low social, energy, and economic consequences from urbanization of this small reserve. The Rosemont Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Factor 4: Compatibility of the proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

There are no locations where lands outside the UGB but contiguous with the Rosemont Urban Reserve have Goal 3 or 4 resource land zoning for agricultural or forest activities. Therefore, the proposed urban uses are considered to have high compatibility with the nearby agricultural and forest activities occurring on farm and forest land.

The Rosemont Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location factor.



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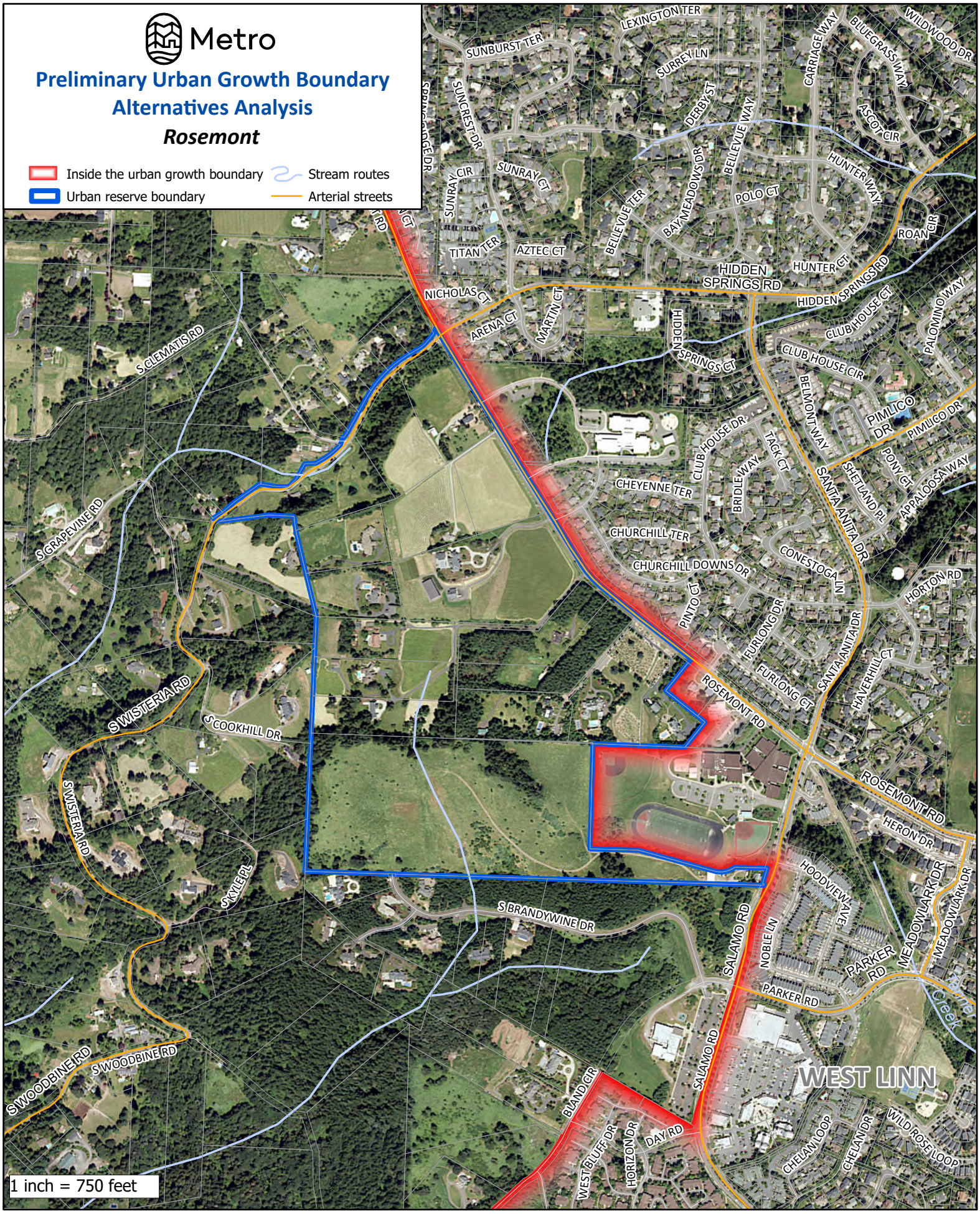
Metro

Preliminary Urban Growth Boundary Alternatives Analysis

Rosemont

Inside the urban growth boundary
Urban reserve boundary
Stream routes
Arterial streets



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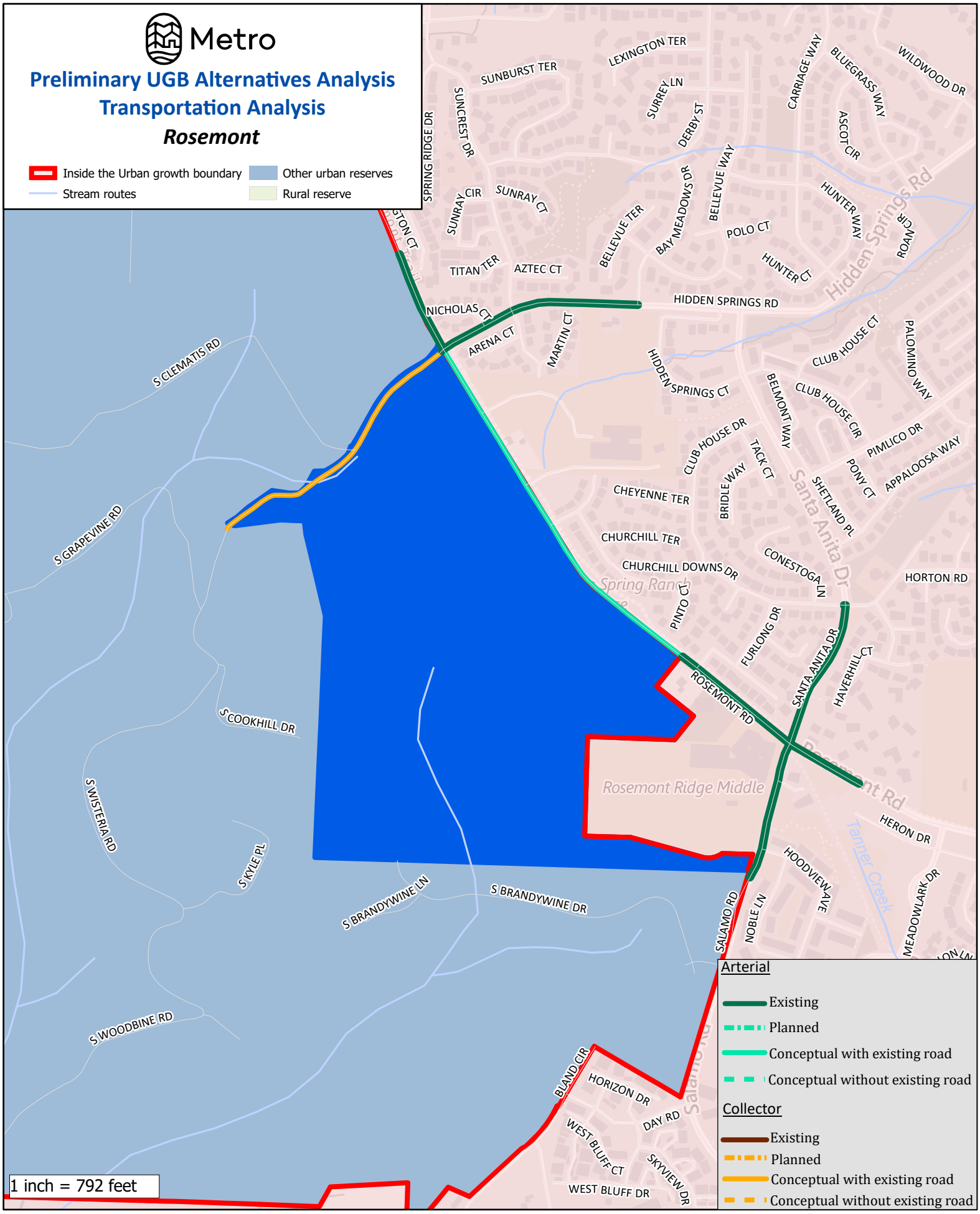

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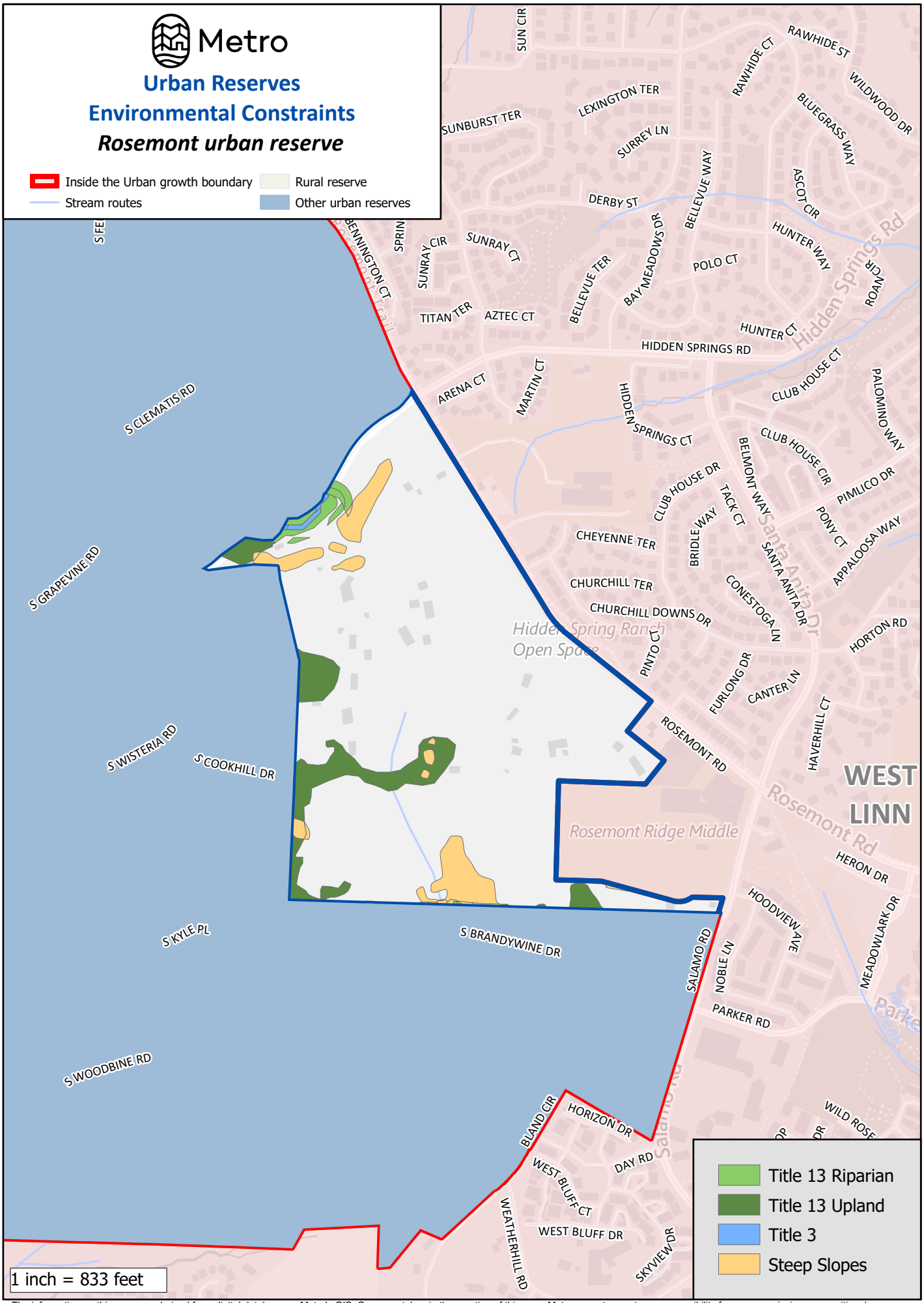

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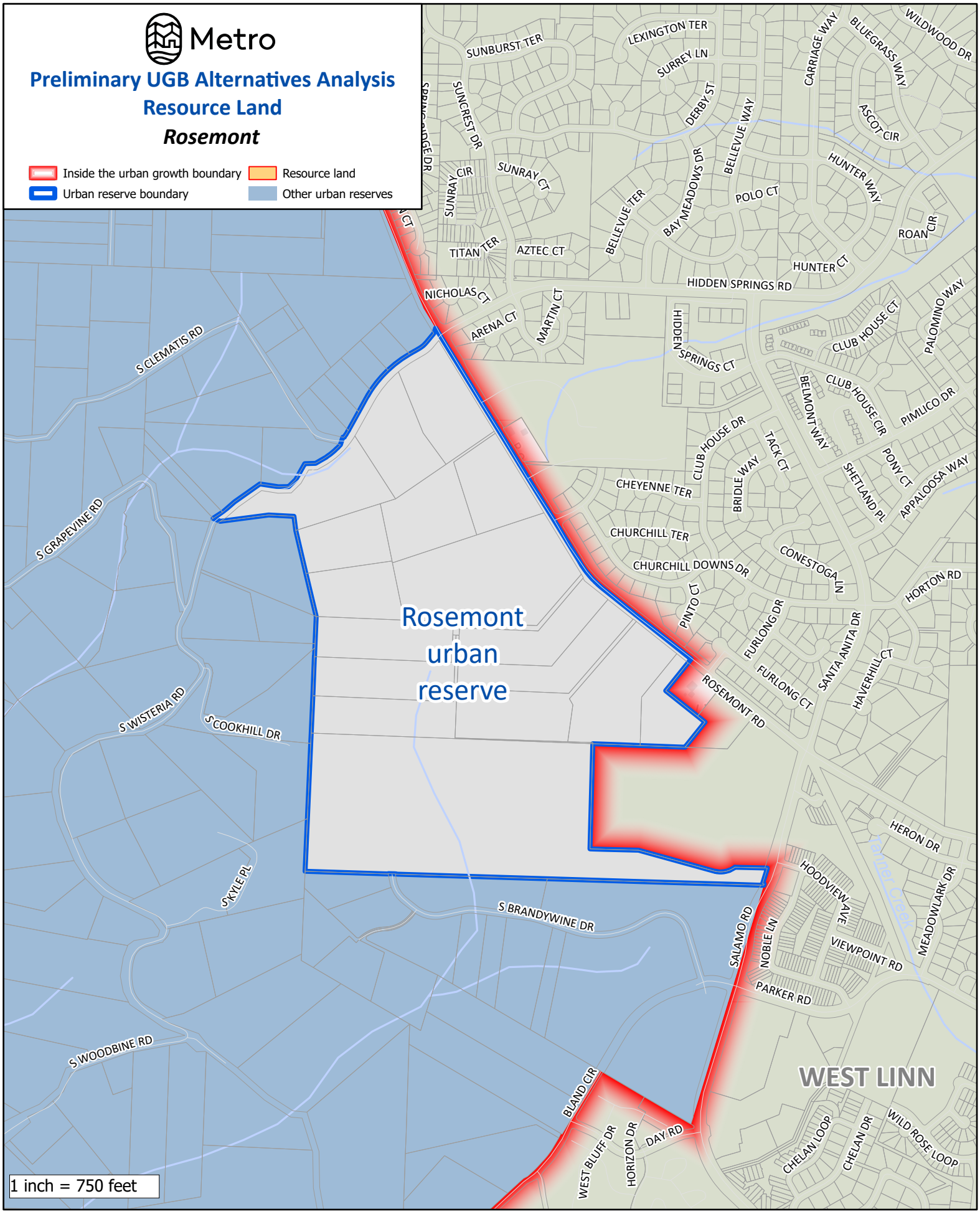

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SHERWOOD NORTH URBAN RESERVE

Total Reserve Area	123 acres
Total Tax Lot Area in Reserve (without Right-of-Way)	113 acres
Gross Vacant Buildable Area	62 acres
Net Vacant Buildable Area	**46 acres**

The Sherwood North Urban Reserve is located on the north side of Sherwood on both sides of Highway 99W (Pacific Highway). It is comprised of three disconnected and relatively thin "sub-areas". The 100-year floodplain and rural reserve lands form the northern boundary of all three sub-areas. The eastern sub-area is located north of SW Galbreath Drive, is accessible by SW Gerda Lane and SW Cipole Road, and is approximately 35 acres in size. The central sub-area is bisected by Highway 99W, is potentially accessible by SW Langer Farms Parkway, and is approximately 57 acres in size. The western sub-area is north of SW Seely Lane and is approximately 31 acres in size.

GOAL 14 BOUNDARY LOCATION FACTORS

Factor 1: Efficient accommodation of identified land needs

As noted above, the Sherwood North Urban Reserve has three disconnected sub-areas. The western sub-area is comprised of portions of 11 tax lots; only one of those tax lots has area in the reserve larger than five acres and several of the tax lots are publicly-owned (e.g., by Washington County or the federal government). The central sub-area is comprised of portions of five tax lots, including one owned by Portland General Electric (PGE) and another by a national home improvement retail chain; all portions of the central sub-area's tax lots within the reserve are larger than five acres, with three larger than 10 acres. The eastern sub-area is comprised of portions of seven tax lots, four of which are owned by the federal government; the portions of the eastern-sub area's tax lots within the reserve range in size from less than an acre to more than 11 acres. The combined area of all portions of the reserve's 23 tax lots within the reserve is approximately 113 acres. However, the reserve has just 62 gross vacant buildable acres and 46 net buildable acres.

According to aerial imagery: the western sub-area is comprised of groves of trees, some cleared land, and a few rural residential structures; the central sub-area is primarily agricultural land with a few rural structures; and the eastern sub-area is also primarily agricultural land, but with more rural development and a forested section at its southern end. Powerline easements cross portions of each sub-area. Overall, eight of the reserve's tax lots have assessed improvements, with the median assessed value of those tax lots' improvements being more than $284,000.

The central sub-area is bisected by Highway 99W, which is a 2040 Growth Concept designated corridor, while the western sub-area is within half a mile of the highway and the eastern sub-area approximately one mile away. All three sub-areas adjoin existing or planned employment uses and are within a mile of the Sherwood Town Center. The western sub-area is adjacent to existing low-density residential development already within the UGB, and local streets SW Seely Lane and SW Borchers Drive stub to the sub-area. There are existing TriMet bus stops within 1,000 feet of the

central and eastern sub-areas, and within about half a mile of the eastern sub-area on the opposite side of Highway 99W. The nearest public schools are approximately one mile away from each sub-area.

While each relatively flat, the three sub-areas contain only small amounts of fully buildable land due to the numerous power line easements. In addition, the majority of the urban reserve land is on tax lots that also include non-urban-reserve land (e.g., rural reserve land), which could complicate development. The irregular shape of the three sub-areas further reduces the ability to provide a well-connected residential development pattern and the western sub-area's "protrusion" into a rural reserve limits a secondary access from the north. Public ownership of the much of the reserve could also limit redevelopment potential. However, the existing street stubs to the western sub-area and the close proximity of Highway 99W and utility services could support some development. Indeed, the middle and eastern sub-areas being adjacent to existing employment uses provides the opportunity for extensions of these existing uses. This area is considered able to accommodate a very small portion of a residential and/or employment land need.

Factor 2: Orderly and economic provision of public facilities and services

Water Services

With regard to water services, the Sherwood North Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Adjacent lands inside the UGB are provided with water service by the City of Sherwood. The city obtains the majority of its water supply from the Willamette River Water Treatment Plant (WRWTP) in the city of Wilsonville, with the remainder coming from four groundwater wells in city limits. The city also maintains an emergency connection and transmission piping to a supply main serving Tualatin from Portland. The city's water distribution system includes three service zones served by three storage reservoirs and two pumping stations. The majority of Sherwood customers are served from the 380 Pressure Zone, which is supplied by gravity from the city's Sunset Reservoirs. The 535 Pressure Zone serves the area around the Sunset Reservoirs, supplied with constant pressure by the Sunset Pump Station, while the 455 Pressure Zone serves higher elevation customers on the city's western edge by gravity from the Kruger Reservoir. The Sherwood North Urban Reserve would likely become part of the 380 Pressure Zone.

Supply, storage, pumping, and distribution piping are considered sufficient to meet maximum daily demand of current development within the city's portion of the UGB; however, according to the city's 2015 Water System Master Plan, additional supply and storage capacity may be needed for full buildout. Efforts, including capital improvement projects, are planned to increase treatment plant capacity to satisfy buildout demand.

No pump stations are currently needed to serve the 380 Pressure Zone. Very few distribution deficiencies are identified in the Master Plan for either existing or buildout maximum daily demand (MDD) conditions and no additional deficiencies are identified in the Plan under peak hour demand conditions. New large diameter water lines will likely need to be extended through the currently underdeveloped Brookman Addition and Tonquin Employment Area to serve additional development.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Urbanization of this relatively small reserve should not itself require upgrades to the water treatment plant; however, buildout of the existing UGB and development of one more other urban reserves (e.g., the Sherwood West Urban Reserve) prior to development of the Sherwood North Urban Reserve could warrant the planned treatment plant improvements in order for it to be provided with adequate water service. There are several existing eight-inch sewer lines that extend from existing development near the reserve's southern boundary. The western sub-area of the reserve would likely be served by the Sherwood Trunk Line, while the eastern sub-area will likely be served by the Rock Creek Trunk Line, which are presumed to have adequate capacity to serve the Sherwood North Urban Reserve.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

With any preceding significant new development in current city limits and new urban development in one more other urban reserves (e.g., the Sherwood West Urban Reserve), additional treatment plant and storage capacity may be needed to also serve the Sherwood North Urban Reserve while avoiding adverse impacts to existing facilities in areas already inside the UGB. Those potential treatment system improvement costs and the full costs of new storage facilities also serving areas already inside the UGB are not included in the below figures.

d. Estimated water service-related costs for reserve development

Water piping, pumping, and storage costs	Cost
10-inch pipe	$2.52 million
12-inch pipe	$0
16-inch pipe	$0
Pumping	$0
Storage	$0.60 million
Total:	**$2.58 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$2,780**

Sanitary Sewer Services

With regard to sanitary sewer services, the Sherwood North Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

The City of Sherwood and Clean Water Services (CWS) together provide sanitary sewer services in adjacent areas already in the UGB. Two CWS sanitary sewer trunk lines connect to the local, city-maintained components of the system, including the 24-inch "Sherwood Trunk", which conveys sewage from the Cedar Creek sewage collection basin, and the 18-inch "Rock Creek Trunk", which conveys sewage from the Rock Creek sewage collection basin, to a CWS-owned pump station. Sewage is then directed to the Durham Advanced Wastewater Treatment Plant via the Upper Tualatin Interceptor, also owned by CWS.

The City of Sherwood updated its Sanitary Sewer Master Plan in 2016. The Master Plan includes areas within Sherwood city limits, as well as the Tonquin Employment Area (TEA) and the Brookman Addition, which are within the UGB. The Master Plan indicates that there is sufficient conveyance, pump station, and treatment plant capacity for existing development in areas already inside the UGB. However, at full buildout of the UGB, there may be deficiencies with the Sherwood and Rock Creek Trunk Lines, the Sherwood Pump Station, and the Upper Tualatin Interceptor. The city and CWS both have capital improvement projects planned to address these capacity issues. Responsibility for upsizing the Sherwood and Rock Creek Trunk Lines may be shared between city and CWS.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The existing treatment plant is assumed to have the capacity to serve future urban development of this relatively small reserve as well as development already in the UGB. There are several existing eight-inch sewer lines that extend from the adjacent developments near the reserve's southern boundary. The western sub-area would likely be served by the Sherwood Trunk Line, while the eastern sub-area will be served by the Rock Creek Trunk Line. The trunk line, pump station, and interceptor improvement projects mentioned above may be needed to provide sufficient capacity to urban development of the reserve, particularly in addition to buildout of areas already in the UGB; the full costs of these system-level improvements are not included in the figures below.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

The trunk line, pump station, and interceptor improvement projects mentioned above may be needed in order to avoid adverse impacts to service to areas already inside the UGB.

d. Estimated sanitary sewer service-related costs for reserve development

Sanitary sewer piping and pumping costs	Cost
10-inch pipe	$1.54 million
12-inch pipe	$0
15-inch pipe	$0
Pump station	$0.54 million
Force mains	$0
Total:	**$2.08 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$2,241**

Stormwater Management Services

With regard to stormwater management services, the Sherwood North Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

There is no indication of significant challenges with existing stormwater management facilities being able to serve existing development in adjacent areas inside the UGB.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Based on topography, stormwater from development of the reserve could likely outfall directly to Chicken Creek, Rock Creek, and their tributaries. Per CWS and city of Sherwood stormwater standards for new development, water quality and quantity should be provided on private property before outfalling to these water bodies; therefore, the existing facilities would not be impacted by the development of the reserve.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

As noted above, stormwater related to new development in the reserve could likely outfall directly to Chicken Creek, Rock Creek, and their tributaries, without connecting to other existing stormwater infrastructure. Therefore, no adverse impacts to existing facilities serving areas already inside the UGB are anticipated. It is also expected that stormwater will be treated and detained onsite, thereby limiting impacts to these water bodies.

d. Estimated stormwater service-related costs for reserve development

Stormwater piping and water quality/detention	Cost
18-inch pipe	$0
24-inch pipe	$0
30-inch pipe	$0
Water quality/dentition	$0.71 million
Total:	**$0.71 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$760**

Transportation Services

With regard to transportation services, the Sherwood North Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(e) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Figure 4.36 in Chapter 4 of the 2023 Regional Transportation Plan (RTP) displays 2020 home-based vehicle miles traveled (VMT) per capita by Metro transportation analysis zone. According to that figure, areas in the UGB adjacent to the Sherwood North Urban Reserve had average (11.32) and above average home-based VMT per capita in 2020.

Metro's adopted 2040 Growth Concept Map designates a town center in the adjoining City of Sherwood less than half a mile from the reserve. Town centers are meant to: serve populations of tens of thousands of people; offer more locally-focused retail uses and public amenities; and be well served by transit. The Langer Drive Commercial District of the City of Sherwood's 2013 "Sherwood Town Center Plan" generally aligns with the geography of the town center area on the Growth Concept Map. The Langer Drive Commercial District is envisioned as a walkable and active shopping district complete with more pedestrian-oriented buildings. Metro's 2017 State of the Centers Atlas showed that, in the area of the Langer Drive Commercial District, there was a very high jobs-to-housing ratio and a very low number of dwelling units per acre compared to other town centers in the region. According to aerial imagery, much of the area is already built out with commercial retail uses, including a grocery store, restaurants, and medical/dental offices, though there are numerous parking lots that may be able to accommodate redevelopment. Near to the Langer Drive Commercial District is a police station, the Sherwood Ice Arena, and other public/quasi-public land uses, as well as some undeveloped and underdeveloped tax lots. Sherwood is served by TriMet Route 94, which runs along Highway 99W, and Route 97, which runs along SW Tualatin-Sherwood Road; both routes include stops at the town center. The town center plan, its existing land uses and transit service, and some availability for new development in and

near the town center demonstrate that growth in the current UGB near to the Sherwood North Urban Reserve will not necessarily cause a significant increase in home-based VMT per capita in the future.

As noted above, TriMet Routes 94 and 97 both serve areas already in the UGB in the adjacent City of Sherwood. Currently, however, those routes only connect to the northern and central portions of the city and not to the city's south and west. Figure 4.3 in Chapter 4 of the 2023 RTP also shows a gap in "frequent transit service" in Sherwood's portion of the planned regional transit network.

Sherwood has more than 10 miles of dedicated bike lanes and established bikeways, including along major roadways, that connect with some other bike-friendly streets, as well as residential and employment uses, schools, and the town center. However, there are gaps in bike facility connections to some of the residential areas south of the railroad. Figure 4.5 in Chapter 4 of the 2023 RTP identifies existing bike facilities along Highway 99W and SW Tualatin-Sherwood Road as part of the planned regional on-street bike network and facilities in the central portion of the city as part of the planned regional off-street bike network, though there is a short network gap along SW Tualatin-Sherwood Road west of the highway and other gaps in the west, east, and south of the city.

Most developed neighborhoods in Sherwood, including the town center, have sidewalks. Figure 4.4 in Chapter 4 of the 2023 RTP identifies existing sidewalk facilities along SW Tualatin-Sherwood Road, SW Sunset Boulevard, and SW Main Street as part of the planned regional on-street pedestrian network, though there are network gaps along Highway 99W in the north of the city, along SW Brookman Road in the south of the city, and along SW Elwert Rd in the west of the city.

The Cedar Creek Trail in Sherwood is identified as an existing regional trail in Figure 4.6 in Chapter 4 of the 2023 RTP. The figure identifies gaps in connections of this trail to other regional trails in the planned regional trial network.

Construction has commenced on a pedestrian bridge over Highway 99W that, when completed, will connect Sherwood High School with the YMCA and surrounding neighborhoods. Goals of the project include: reducing vehicle/pedestrian conflicts and exposure; minimizing out of direction travel for pedestrians; and providing crossing opportunities that accommodate all pedestrians and bicyclists.

Figure 4.14 in Chapter 4 of the 2023 RTP identifies the SW Tualatin-Sherwood Road as a high injury corridor. The road, which is already inside the UGB, is less than a quarter mile from each of Sherwood North Urban Reserve's three sub-areas. There are no other RTP-designated high injury corridors in Sherwood's portion of the UGB.

Highway 99W is also already inside the UGB and generally bisects the city. Highway 99W is identified as a throughway in Figure 4.7 in Chapter 4 of the 2023 RTP. Figure 4.8 in Chapter 4 of the RTP indicates that it currently meets RTP travel speed reliability

performance thresholds, with no more than four hours per day when travel speeds fall below the identified minimum speed. RTP models indicate this reliability will continue at least to the year 2045.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The reserve's central sub-area is close to existing major roadways. Highway 99W bisects the central portion of the reserve and SW Tualatin-Sherwood Road is less than 1,000 feet from the eastern sub-area. As noted above, Highway 99W, an RTP-designated throughway in Sherwood, currently meets RTP travel speed reliability performance thresholds, though SW Tualatin-Sherwood Road is identified in the RTP as a high injury corridor.

TriMet Route 94 travels through the central sub-area along Highway 99W and there is a transit stop less than half a mile from the western sub-area. Route 97 has a transit stop about 800 feet from the eastern sub-area along SW Tualatin-Sherwood Road.

Highway 99W and most of SW Roy Rogers Road have dedicated bike lanes providing access to the western and central sub-areas. There is a 1,000-foot segment of SW Roy Rogers Road between Highway 99W and SW Borchers Drive that does not have a bike lane. There is an established bikeway along SW Tualatin-Sherwood Road that is about 800 feet from the eastern sub-area. These facilities provide connections to the town center.

Sidewalks connect to the western sub-area along SW Borchers Drive and SW Seely Lane. Sidewalks connect to the central sub-area along Highway 99W. There are sidewalks on SW Tualatin-Sherwood Road and SW Gerda Lane that stop approximately 600 feet short of the eastern sub-area. These facilities provide connections to the town center. There are no existing regional trails connected to the reserve.

Existing urban residential uses adjacent to the reserve could provide housing to future employees of the reserve, and nearby existing employment uses could provide employment opportunities to future residents of the reserve, helping to limit VMT. However, the existing nearby housing is relatively low in density and, as noted in response to Factor 1, the reserve is unlikely to provide significant residential development opportunities; therefore, future employees of the reserve may still mostly have to commute from further away.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

SW Roy Rogers Road, SW Langer Farms Parkway, and Highway 99W would see some additional private vehicle traffic with urban development of the reserve. However, considering the relatively small size of the reserve, the reserve's proximity to the Sherwood Town Center and its employment/public uses, and the availability of existing transit service and bike and pedestrian facilities near to the reserve, urban development of the reserve is not expected to significantly increase home-based VMT per capita in

nearby areas already in the UGB or jeopardize Highway 99W's ability to continue to meet throughway reliability thresholds. Nearby existing transit service and bike and pedestrian facilities would be expected to see additional use with development of the reserve.

d. Need for major transportation facility improvements and associated costs

No major transportation facility improvements (i.e., new or improved urban arterial or collector roads) are expected to be needed to serve urban development of the Sherwood North Urban Reserve.

Facilities	Cost
Arterials, existing/improved full street	$0
Arterials, existing/improved half street	$0
Arterials, new	$0
Collectors, existing/improved full street	$0
Collectors, existing/improved half street	$0
Collectors, new	$0
Total:	**$0**
Per dwelling unit at 20 units per net vacant buildable acre:	**$0**

e. Provision of public transit service

TriMet evaluated the reserve for providing transit service upon urbanization and determined that no additional service would necessary. Future service is proposed in TriMet's "2045 Network Vision" that would bring two new routes within half a mile of the reserve. Additionally, Route 94 already serves Sherwood and travels along the 99W corridor, which divides the reserve's central sub-area.

Factor 3: Comparative environmental, social, energy, and economic consequences

Environmental consequences

No streams or inventoried wetlands are located within the Sherwood North Urban Reserve, but a "100-year" floodplain forms the northern edge of all three sub-areas. There are sizeable locations of riparian or upland habitat identified in the eastern and western sub-areas associated with the location of the floodplain and the nearby Tualatin River National Wildlife Refuge. Some of the identified habitat is in locations that are currently in agricultural production, and a refined analysis required upon inclusion in the UGB will determine if those identified habitats warrant protection from urban development. In addition, some of the identified habitat in the western sub-area is located within powerline easements, which would provide some level of protection due to the inability to urbanize at a high level. The majority of the central sub-area is free of inventoried habitat areas. Some of the reserve's inventoried habitat is located on land owned by the federal government or Washington County and would not likely be urbanized.

Overall, urbanization of the reserve could occur with comparatively minimal to moderate impacts to the habitat areas, depending on the type and form of urban uses the reserve is developed with and the results of an updated habitat inventory conducted upon inclusion in the UGB. Additional environmental consideration, specifically regarding avoidance of conflict between urban development and regionally significant fish and wildlife habitat, is provided in the Metro Code Factors Analysis (Appendix 7A).

Considering the comparative environmental consequences of urbanization, the Sherwood North Urban Reserve is given a "medium-high" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Social, energy, and economic consequences

There are fewer than 10 residences in this relatively small reserve. Much of the land is in public or corporate ownership. Some of the land is also impacted by powerline easements that reduces the opportunity for urban development. The reserve's sub-areas already border urban residential and employment uses, as well as Highway 99W. Therefore, urbanization of the reserve would result in minimal change in sense of place or degradation of rural lifestyle for existing residents of the reserve. Moreover, urbanization of the reserve with a mixture of uses could bring new social and recreational opportunities for existing residents.

As detailed more fully in response to Factor 2 and due in part to the reserve's small size, additional VMT and related energy impacts from urbanization would be relatively minimal.

It appears that there are fewer than 20 acres of land in the reserve being used for commercial agriculture, so the adverse economic consequences from the loss of farming activity in the reserve would also be minimal; indeed, the economic benefits of residential and/or employment development of the reserve may outweigh this loss.

This analysis finds that there would be comparatively low social, energy, and economic consequences from urbanization of this small reserve. The Sherwood North Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Factor 4: Compatibility of the proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

All of the land outside of the UGB adjacent to the Sherwood North Urban Reserve has Goal 3 or 4 resource land zoning by Washington County for agricultural and forest activities, specifically with Agriculture and Fores (AF20) and Exclusive Farm Use (EFU) designations.

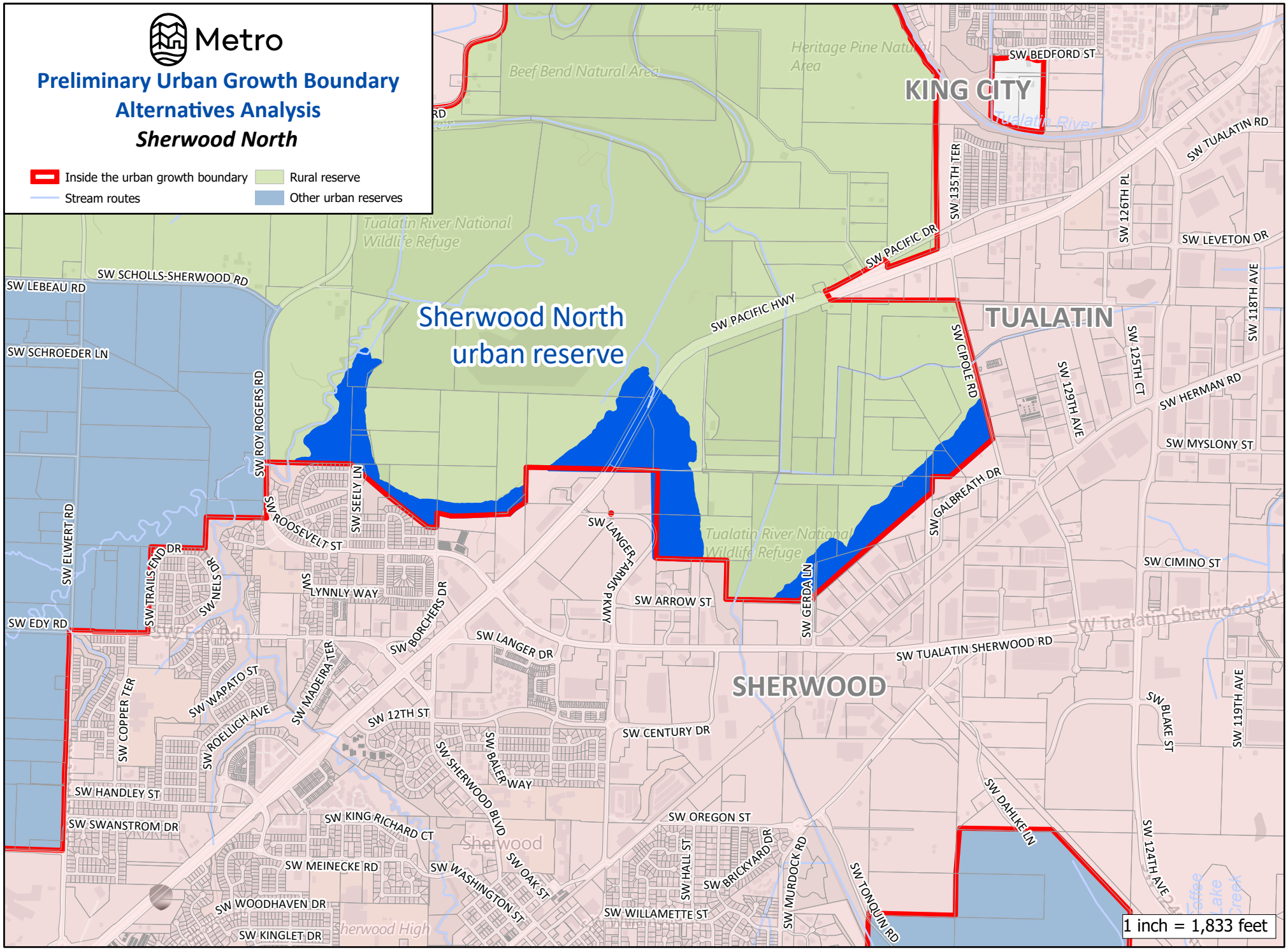
The lands outside the UGB and adjacent to the western sub-area area zoned EFU. However, it appears that no significant agricultural activity is occurring on these adjacent lands. The Chicken Creek riparian area provides a buffer on the west side of this sub-area and the land on the east and north side contains small patches of trees, scrub shrubs, powerlines, and only about five areas of cleared fields. Much of this location is in a flood hazard area. Considering these factors, urban

development of the western sub-area would be generally compatible with the nearby agricultural and forest activities occurring on this farm and forest land.

The land adjacent to the central sub-area is zoned EFU as well. The EFU land on the north side of SW Pacific Highway is not being farmed and appears to contain areas of standing water for significant portions of the year as part of the wildlife refuge operations. The EFU land to the south of SW Pacific Highway contains some limited agricultural activities including field crops, orchards, and pastureland. Urbanization of this portion of the sub-area may impact these agricultural activities; however, since the amount of development that could occur would be relatively small and could take access away from farmed areas, the impacts would not be significant. Therefore, the urban development of the central sub-area would generally be compatible with the nearby agricultural activities occurring on this farm and forest land as well.

Most of the land adjacent to the eastern sub-area is zoned EFU and there is a tract AF20-zoned land adjacent to the portion of eastern sub-area near SW Cipole Road. The majority of this resource land contains some level of agricultural activity, including field crops and pastureland. Urbanization of this portion of the sub-area may impact these agricultural activities; however, since the amount of development that could occur would again be relatively small and would also take access away from the farmed areas, the impact would still not be significant.

Overall, proposed urban uses in the reserve are considered to have high compatibility with nearby agricultural and forest activities occurring on farm and forest land outside the UGB. The Sherwood North Urban Reserve is given a “high” score in Attachment 3 for this Goal 14 boundary location factor.



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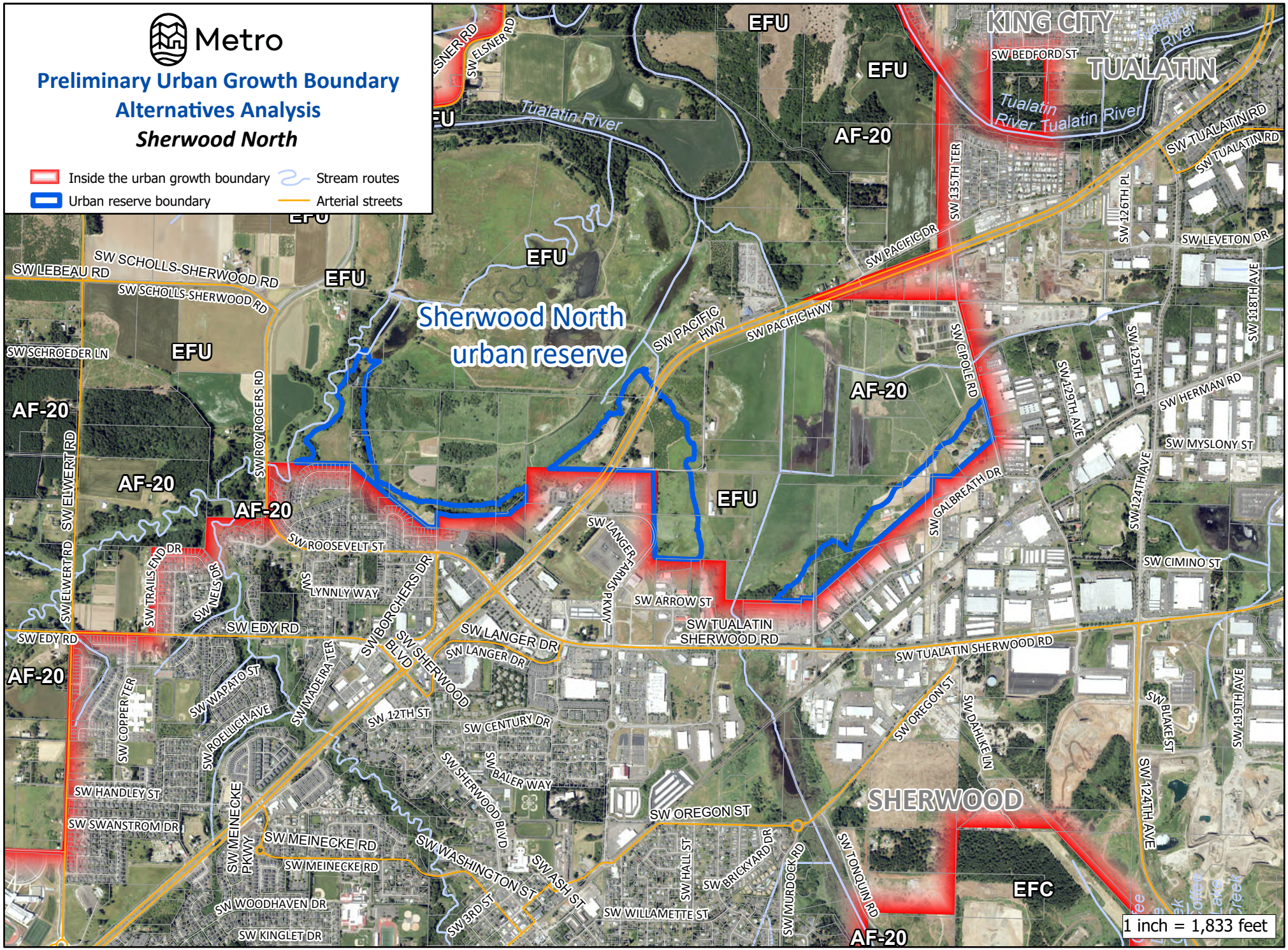

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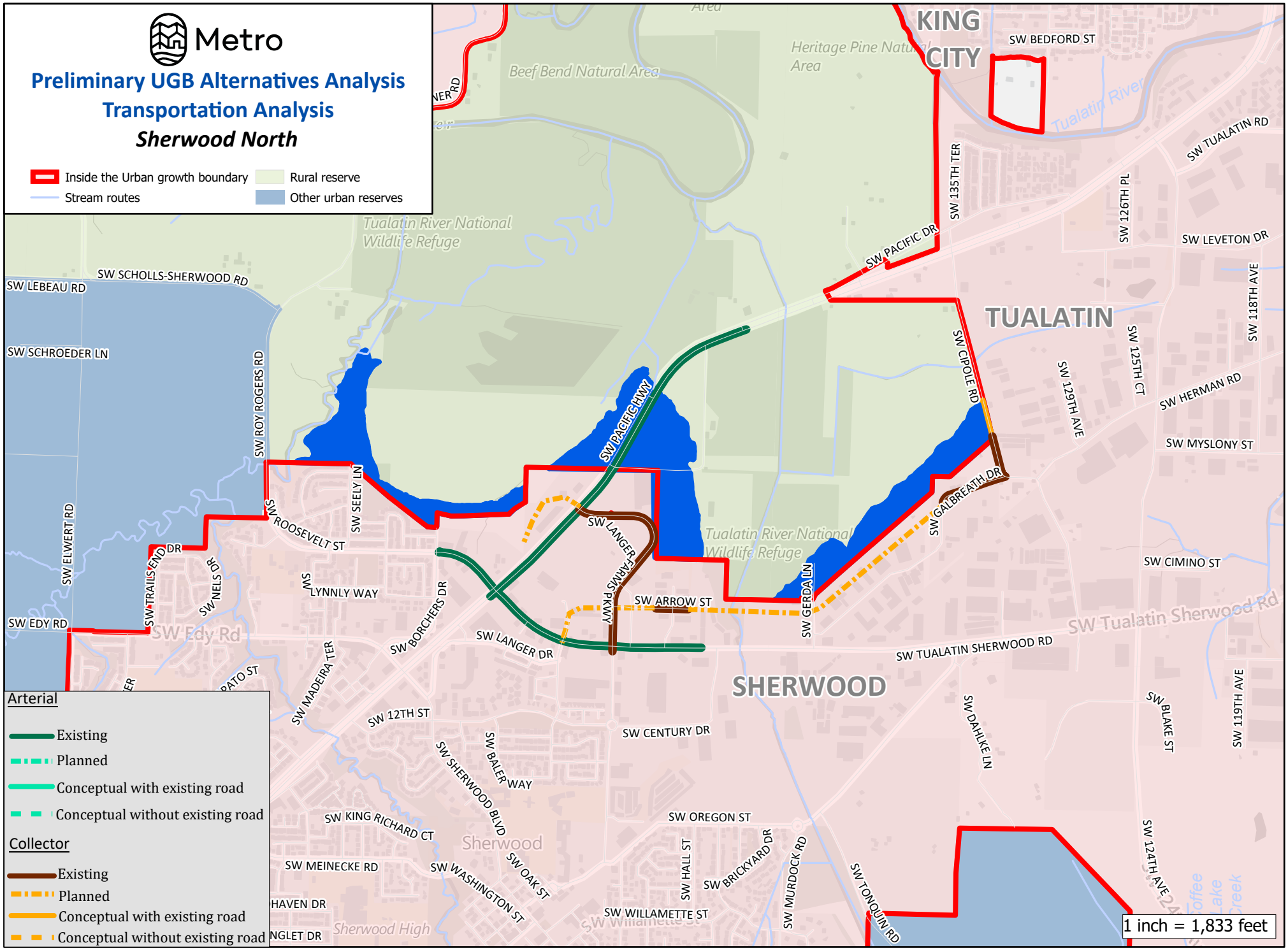

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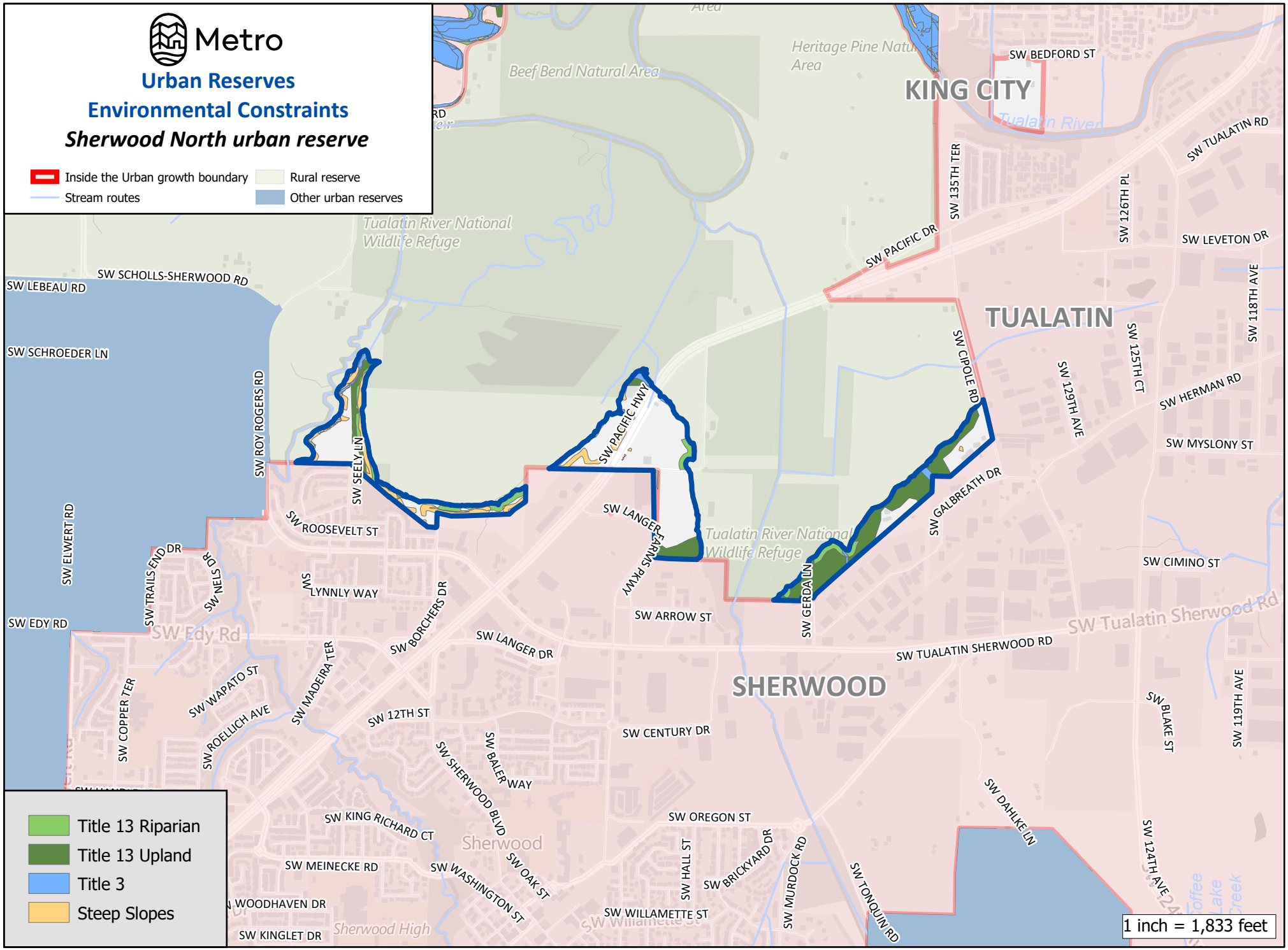

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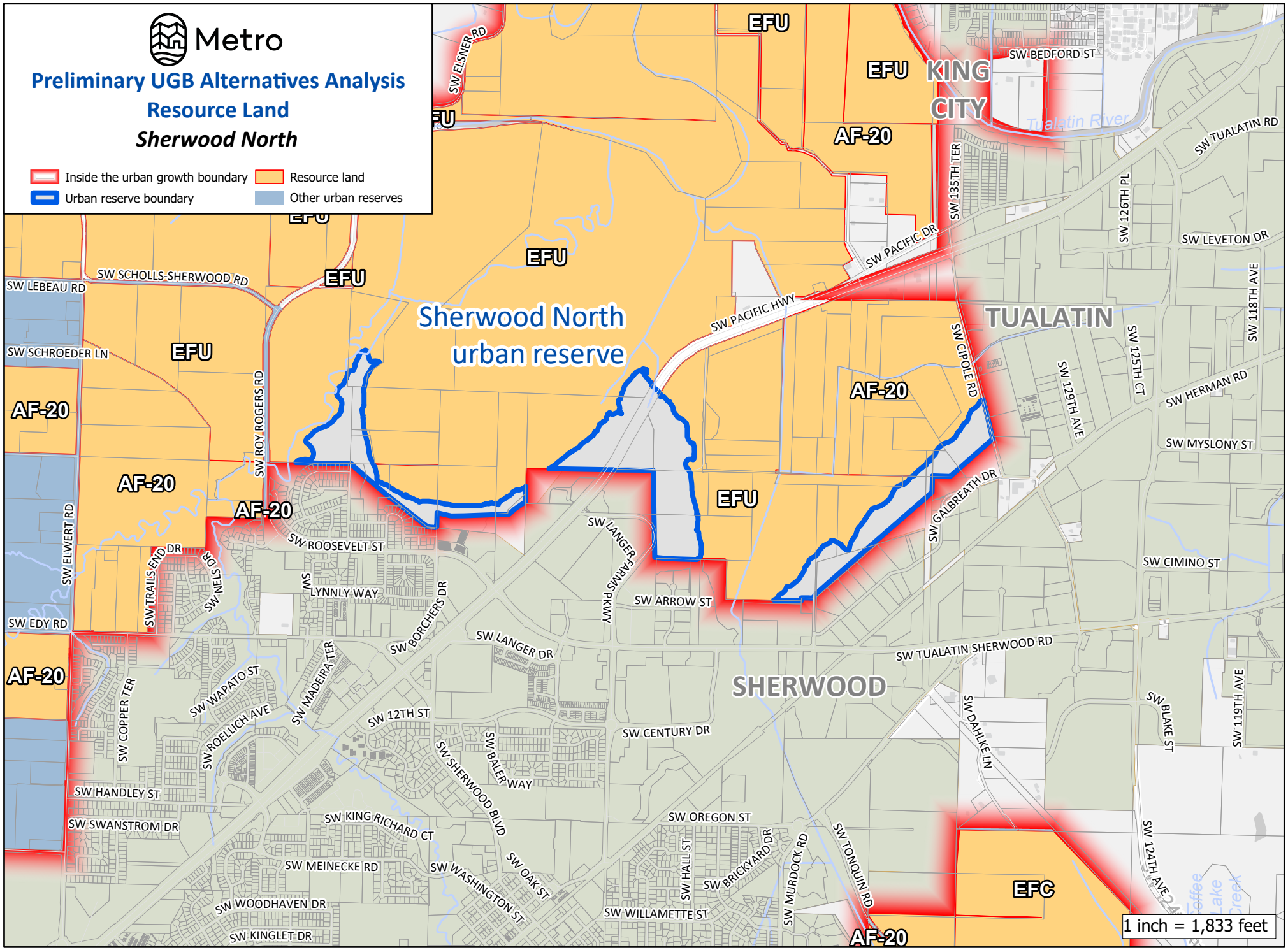

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SHERWOOD SOUTH URBAN RESERVE

Total Reserve Area	448 acres
Total Tax Lot Area in Reserve (without Right-of-Way)	424 acres
Gross Vacant Buildable Area	207 acres
Net Vacant Buildable Area	**155 acres**

The Sherwood South Urban Reserve is a rectangularly shaped area on the south side of Sherwood, south of SW Brookman Road and east of Highway 99W. The UGB forms the northern boundary and the Clackamas-Washington County line forms the eastern boundary; rural reserves are adjacent to the west and south. The reserve is served by SW Brookman Road, SW Middleton Road, and SW Oberst Road. The reserve has five streams, including the confluence of Goose and Cedar Creeks.

GOAL 14 BOUNDARY LOCATION FACTORS

Factor 1: Efficient accommodation of identified land needs

The Sherwood South Urban Reserve is comprised of 71 contiguous tax lots, all but one of which are entirely within the reserve. The combined land area of the 71 tax lots actually within the reserve is approximately 424 acres. Of the 70 tax lots entirely in the reserve, 77 percent are larger than two acres, 42 percent are larger than five acres, seven are larger than 10 acres, and one is larger than 50 acres. The one tax lot that is not entirely within the reserve nonetheless has more than 27 acres of territory in the reserve. As noted above, the entire reserve contains 207 gross vacant buildable acres and 155 net vacant buildable acres.

According to aerial imagery, there reserve includes rural residential development, forested lands, and limited agricultural activity, mostly pastureland, Christmas tree farms, and orchards. The area The Timberline Baptist Church is located on an 8.3-acre tax lot in the northwest corner of the reserve on SW Old Highway 99W and a Northwest Natural Gas facility is located on a 0.6-acre tax lot across the road. Overall, more than 90 percent of the reserve's tax lots have assessed improvements, with the median value of those tax lots' improvements exceeding $322,000.

Highway 99W runs along the western edge of the reserve and. Existing urban low density residential development and associated local streets lie directly across SW Brookman Road to the north. Some small rural commercial uses (e.g., retail food services, RV repair businesses) are outside of the reserve on the opposite side of the highway to the west. Middleton Elementary School is less than half a mile to the north of the reserve; Sherwood High School is about a mile away, but on the opposite side of Highway 99W. A half-mile section of Portland and Western Railroad track runs through the reserve's western portion. The nearest existing TriMet bus stop is approximately two miles away to the north via Highway 99W.

The reserve is a mixture of relatively flat areas, with some small hills and steeper slopes primarily near the streams that flow north towards Sherwood. Most of the flatter areas are near SW Old Highway 99W and SW Middleton Road and are made up of smaller tax lots that would likely need to be combined to provide opportunities for meaningful employment uses. Additionally, the limited

number of smaller and flatter sites in the reserve are more than a couple miles from Sherwood's existing employment lands. For these reasons, the reserve is not considered able to efficiently accommodate an employment land need, despite the proximity to Highway 99W. The existing rural residential development pattern and the agricultural lands in the reserve, the adjacent urban low density residential development, and nearby school uses provide the opportunity for future residential development. Thus, the area is able to accommodate a residential land need.

Factor 2: Orderly and economic provision of public facilities and services

Water Services

With regard to water services, the Sherwood South Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Adjacent lands inside the UGB are provided with water service by the City of Sherwood. The City obtains the majority of its water supply from the Willamette River Water Treatment Plant (WRWTP) in the City of Wilsonville, with the remainder coming from four groundwater wells in city limits. The City of Sherwood also maintains an emergency connection and transmission piping to a supply main serving Tualatin from Portland. The Sherwood's water distribution system includes three service zones served by three storage reservoirs and two pumping stations. The majority of Sherwood customers are served from the 380 Pressure Zone, which is supplied by gravity from the Sherwood's Sunset Reservoirs. The 535 Pressure Zone serves the area around the Sunset Reservoirs, supplied with constant pressure by the Sunset Pump Station, while the 455 Pressure Zone serves higher elevation customers on the city's western edge by gravity from the Kruger Reservoir. At least part of the Sherwood South Urban Reserve would likely become part of the 380 Pressure Zone.

Supply, storage, pumping, and distribution piping are considered sufficient to meet maximum daily demand of current development within the city's portion of the UGB; however, according to the city's 2015 Water System Master Plan, additional supply and storage capacity may be needed for full buildout. Efforts, including capital improvement projects, are planned to increase treatment plant capacity to satisfy buildout demand. No pump stations are currently needed to serve the 380 Pressure Zone. Very few distribution deficiencies are identified in the Master Plan for either existing or buildout maximum daily demand (MDD) conditions and no additional deficiencies are identified in the Plan under peak hour demand conditions. New large diameter water lines will likely need to be extended through the currently underdeveloped Brookman Addition and Tonquin Employment Area to serve additional development.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Full buildout of the existing UGB and development of Sherwood South Urban Reserve could warrant the planned treatment plant improvements in order for the reserve to be provided with adequate water service. Additional storage capacity, distribution capacity, and some pumping capacity will also likely be needed.

Potential treatment system improvement costs, water main extension costs, and the full costs of new storage facilities also serving areas already inside the UGB are unknown and not included in the below figures. Sherwood's 2015 Water System Master Plan does not address urban water service to this reserve.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Full buildout of the existing UGB and development of Sherwood South Urban Reserve could warrant the planned treatment plant improvements in order for the reserve to be provided with adequate water service. Additional storage, piping, and pumping capacity are also likely needed. Those potential treatment system improvement costs and the full costs of improved storage facilities also serving areas already inside the UGB are not included in the below figures.

d. Estimated water service-related costs for reserve development

Water piping, pumping, and storage costs	Cost
10-inch pipe	$4.94 million
12-inch pipe	$3.32 million
16-inch pipe	$0
Pumping	$13.34 million
Storage	$0.20 million
Total:	**$21.80 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$7,051**

Sanitary Sewer Services

With regard to sanitary sewer services, the Sherwood South Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

The City of Sherwood and Clean Water Services (CWS) together provide sanitary sewer services in adjacent areas already in the UGB. Two CWS sanitary sewer trunk lines

connect to the local, city-maintained components of the system, including the 24-inch "Sherwood Trunk", which conveys sewage from the Cedar Creek sewage collection basin, and the 18-inch "Rock Creek Trunk", which conveys sewage from the Rock Creek sewage collection basin, to a CWS-owned pump station. Sewage is then directed to the Durham Advanced Wastewater Treatment Plant via the Upper Tualatin Interceptor, also owned by CWS.

The City of Sherwood updated its Sanitary Sewer Master Plan in 2016. The Master Plan includes areas within the City of Sherwood city limits, as well as the Tonquin Employment Area (TEA) and the Brookman Addition, which are within the UGB. The Master Plan indicates that there is sufficient conveyance, pump station, and treatment plant capacity for existing development in areas already inside the UGB. However, at full buildout of the UGB, there may be deficiencies with the Sherwood and Rock Creek Trunk Lines, the Sherwood Pump Station, and the Upper Tualatin Interceptor. The city and CWS both have capital improvement projects planned to address these capacity issues. Responsibility for upsizing the Sherwood and Rock Creek Trunk Lines may be shared between the city and CWS.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The city's 2016 Sanitary Sewer Master Plan does not plan for urban development of the Sherwood South Urban Reserve, so information on the existing system's capacity to serve the reserve is limited. However, given the size of the reserve, it is possible that the existing treatment plant would be insufficient to serve both full buildout of the current UGB and development of the reserve. Trunk line and pumping capacity are also likely insufficient. Currently, sewer service does not extend to the reserve, and a sewer line would need to be constructed through the Brookman Addition inside the UGB to serve the reserve's development. Costs associated with increasing the capacity of the treatment plant, as well as sewer lines and pumping systems outside the reserve, to levels necessary to serve both full buildout of the current UGB and the reserve are unknown and are not included in the below figures. However, those costs are likely to be significant.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

The treatment system, sewer line, and pumping system improvements noted above are likely needed in order to avoid adverse impacts to service to areas already inside the UGB.

d. Estimated sanitary sewer service-related costs for reserve development

Sanitary sewer piping and pumping costs	Cost
10-inch pipe	$5.78 million
12-inch pipe	$0
15-inch pipe	$0
Pump station	$0
Force mains	$0
Total:	**$5.78 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$1,868**

Stormwater Management Services

With regard to stormwater management services, the Sherwood South Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

The City of Sherwood's 2016 Stormwater Master Plan states that, overall, the existing stormwater network for areas inside the UGB is in good condition, though there are some isolated deficiencies. There is no indication of significant challenges with existing stormwater management facilities being able to serve existing development specifically in areas of the UGB adjacent to the reserve.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Based on topography, stormwater from development of the reserve could likely outfall directly to Cedar Creek and its tributaries. Per CWS and City of Sherwood stormwater standards for new development, water quality and quantity should be provided on private property before outfalling to these water bodies; therefore, the existing facilities would not be impacted by the development of the reserve.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

As noted above, stormwater related to new development in the reserve could likely outfall directly to Cedar Creek and its tributaries, without connecting to other existing stormwater infrastructure. Therefore, no adverse impacts to existing facilities serving areas already inside the UGB are anticipated. It is also expected that stormwater will be treated and detained onsite, thereby limiting impacts to these water bodies.

d. Estimated stormwater service-related costs for reserve development

Stormwater piping and water quality/detention	Cost
18-inch pipe	$4.00 million
24-inch pipe	$2.10 million
30-inch pipe	$0
Water quality/dentition	$6.56 million
Total:	**$12.77 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$4,132**

Transportation Services

With regard to transportation services, the Sherwood South Urban Reserve is given a "low-medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(e) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Figure 4.36 in Chapter 4 of the 2023 Regional Transportation Plan (RTP) displays 2020 home-based vehicle miles traveled (VMT) per capita by Metro transportation analysis zone, with average VMT per capita considered 11.32. According to Figure 4.36, areas in the UGB adjacent to the Sherwood South Urban Reserve had above average and significantly above average home-based VMT per capita in 2020.

Metro's adopted 2040 Growth Concept Map designates a town center in the adjoining City of Sherwood. Town centers are meant to: serve populations of tens of thousands of people; offer more locally-focused retail uses and public amenities; and be well served by transit. The Langer Drive Commercial District of the City of Sherwood's 2013 "Sherwood Town Center Plan" generally aligns with the geography of the town center area on the Growth Concept Map. The Langer Drive Commercial District is envisioned as a walkable and active shopping district complete with more pedestrian-oriented buildings. Metro's 2017 State of the Centers Atlas showed that, in the area of the Langer Drive Commercial District, there was a very high jobs-to-housing ratio and a very low number of dwelling units per acre compared to other town centers in the region. According to aerial imagery, much of the area is already built out with commercial retail uses, including a grocery store, restaurants, and medical/dental offices, though there are numerous parking lots that may be able to accommodate redevelopment. Near to the Langer Drive Commercial District is a police station, the Sherwood Ice Arena, and other public/quasi-public land uses, as well as some undeveloped and underdeveloped tax lots. Sherwood is served by TriMet Route 94, which runs along Highway 99W, and Route 97, which runs along SW Tualatin-Sherwood Road; both routes include stops in the town center. The city's adopted town center plan, its existing land uses and transit

service, and some availability for new development in and near the town center demonstrate that growth in the current UGB will not necessarily cause a significant increase in home-based VMT per capita in the future. However, the area already in the UGB and adjacent to the Sherwood South Urban Reserve is approximately two miles from the town center.

As noted above, TriMet Routes 94 and 97 both serve areas already in the UGB in the adjacent City of Sherwood. Currently, however, those routes only connect to the northern and central portions of the city and not to the city's south and west. Figure 4.3 in Chapter 4 of the 2023 RTP also shows a gap in "frequent transit service" in Sherwood's portion of the planned regional transit network.

Sherwood has more than 10 miles of dedicated bike lanes and established bikeways, including along major roadways, that connect with some other bike-friendly streets, as well as residential and employment uses, schools, and the town center. However, there are gaps in bike facility connections to some of the residential areas south of the railroad near the Sherwood South Urban Reserve. Figure 4.5 in Chapter 4 of the 2023 RTP identifies existing bike facilities along Highway 99W and SW Tualatin-Sherwood Road as part of the planned regional on-street bike network and facilities in the central portion of the City as part of the regional off-street bike network, though there is a short network gap along SW Tualatin-Sherwood Road west of the highway and other gaps in the west, east, and south of the City, including along Highway 99W in the UGB near the Sherwood South Urban Reserve.

Most developed neighborhoods in Sherwood, including the town center, have sidewalks. Figure 4.4 in Chapter 4 of the 2023 RTP identifies existing sidewalk facilities along SW Tualatin-Sherwood Road, SW Sunset Boulevard, and SW Main Street as part of the planned regional on-street pedestrian network, though there are network gaps along Highway 99W in the north of the city, along SW Brookman Road in the south of the city adjacent to the Sherwood South Urban Reserve, and along SW Elwert Rd in the west of the city.

The Cedar Creek Trail in Sherwood is identified as an existing regional trail in Figure 4.6 in Chapter 4 of the 2023 RTP. The figure identifies gaps in connections of this trail to other regional trails in the planned regional trail network.

Construction has commenced on a pedestrian bridge over Highway 99W that, when completed, will connect Sherwood High School, which is in the UGB, with the YMCA and surrounding urban neighborhoods. Goals of the project include: reducing vehicle/pedestrian conflicts and exposure; minimizing out of direction travel for pedestrians; and providing crossing opportunities that accommodate all pedestrians and bicyclists.

Figure 4.14 in Chapter 4 of the 2023 RTP identifies the SW Tualatin-Sherwood Road as a high injury corridor. The road, which is already inside the UGB, is more than two miles

from the Sherwood South Urban Reserve. There are no other RTP-designated high injury corridors within Sherwood's portion of the UGB.

Highway 99W is also already inside the UGB, bisecting the City of Sherwood. Highway 99W is identified as a throughway in Figure 4.7 in Chapter 4 of the 2023 RTP. Figure 4.8 in Chapter 4 of the RTP indicates that it currently meets travel speed reliability performance thresholds, with no more than four hours per day when travel speeds below the identified minimum speed. RTP models indicate this reliability will continue at least to the year 2045.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The reserve is adjacent to Highway 99W. As noted above, Highway 99W, an RTP-designated throughway, currently meets travel speed reliability performance thresholds.

There is currently no transit service near to the reserve. The closest transit stop, for TriMet Route 94, is over one mile away.

There are dedicated bike lanes on Highway 99W at the SW Brookman Road intersection, though the bike lanes on Highway 99W may not be the most comfortable environment for all bicyclists. There is a small 650-foot bike lane section on SW Ladd Hill Road between SW Sunset Boulevard and SW Willow Drive; however, this bike lane does not connect to any other bike facilities and is over half a mile from the reserve.

SW Sunset Boulevard has sidewalks, as do the residential neighborhoods south of the road; however, these sidewalks only provide connections internal to the subdivisions. SW Ladd Hill Road has as sidewalk on one side that extends to SW Brookman Road, which is just shy of half a mile from the reserve. Sidewalks will be provided with the residential development that is occurring on the north side of SW Brookman Road opposite of the reserve. The pedestrian bridge noted above that is currently being constructed over Highway 99W is nearly a mile from the closest point of the reserve. There are no existing regional trails connected to the reserve.

As noted in response to Factor 1, the reserve is unlikely to efficiently accommodate employment uses. There are also no significant employment uses within the UGB near to the reserve. Therefore, future residents of the reserve will likely have to commute multiple miles to get to employment.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

SW Brookman Road and Highway 99W would see additional private vehicle traffic from urbanization of the reserve. Indeed, considering the reserve's distance from the Sherwood Town Center, the unlikelihood of the reserve itself being able to accommodate employment land uses (e.g., commercial uses), the lack of nearby transit service, and gaps in connections to existing nearby bike, pedestrian, and trail networks, development of the Sherwood South Urban Reserve is likely to rely significantly on

private motor vehicle transportation in the future. Resulting traffic may impact home-based VMT per capita in nearby areas already inside the UGB and the performance of Highway 99W as a throughway, though the number of new dwelling units the reserve is likely to accommodate is relatively low.

The dedicated bike lanes on Highway 99W could see additional use, though, as noted above, they are not particularly comfortable for all cyclists. The small bike lane section on SW Ladd Hill Road would most likely not see any additional use as it does not connect to any other bike facilities. The sidewalk on SW Ladd Hill Road and the sidewalks on SW Sunset Boulevard could see additional use once the gap from SW Brookman Road is completed, as that would provide a (somewhat long) connection north of SW Sunset Boulevard along SW Main Street to the town center. The sidewalks in the new residential areas to the north would be expected to see some additional use, although the railroad tracks provide a barrier to connecting to the remainder of the city.

d. Need for major transportation facility improvements and associated costs

To serve urban development of the reserve, more than a mile of SW Brookman Road will likely need to be improved to urban arterial standards, including with acquisition of additional right-of-way. However, this improvement of SW Brookman Road is considered a half-street improvement for the purposes of this analysis, as the north side of the future road is already included in the UGB. Sections of W Middleton Road, SW Labrousse Road, and SW Oberst Road, with a combined length of approximately 1.68 miles will also likely need to be improved to urban collector standards, including with acquisition of additional right-of-way. Two new collectors with a combined length of just over a mile are expected to be needed as well. The new and improved roadways would need to traverse areas with steeper topography and waterbodies, so some associated per-mile costs are estimated to be higher than normal costs.

Facilities	Cost
Arterials, existing/improved full street	$0
Arterials, existing/improved half street	$36.52 million
Arterials, new	$0
Collectors, existing/improved full street	$61.42 million
Collectors, existing/improved half street	$0
Collectors, new	$45.76 million
Total:	**$143.70 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$46,490**

e. Provision of public transit service

The Sherwood South Urban Reserve is outside the TriMet Service District. TriMet evaluated the reserve for providing transit service and determined they could reroute a potential new bus line along Roy Rogers Road, slated for Forward Together 2.0 improvements. Analysis determined that the service would not create significant,

additional costs. TriMet could provide services to the reserve, although there is no guarantee of service. Actual service depends on the level of development in, and in the corridors leading to, the reserve. An on-route, pantograph-style fast charger at a capital cost of approximately $1,000,000 – $1,500,000 would be required to provide this service.

Prior to land being included in the UGB, a more detailed concept plan, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11, is required. This concept plan process will develop more refined public facility and service needs and cost estimates.

Factor 3: Comparative environmental, social, energy, and economic consequences

Environmental consequences

Five streams flow through the Sherwood South Urban Reserve, including Goose Creek, Cedar Creek, and unnamed tributaries to Cedar Creek. Goose Creek flows south through a predominately wooded area for approximately 1,400 feet to join Cedar Creek in the middle of the reserve. Cedar Creek enters the reserve in its southwest corner and flows northeast for approximately 3,930 feet to its confluence with Goose Creek. This section of Cedar Creek flows mainly through a wooded riparian area that is well-established and located away from existing development and also contains an associated 3.1-acre wetland identified on the National Wetland Inventory (NWI). Cedar Creek continues flowing northeast for approximately 2,100 feet, again through a mostly wooded riparian corridor. This section of the creek also has an adjacent half-acre NWI wetland. There is a considerable amount of floodplain associated with these two streams that would help protect the riparian corridors due to floodplain development limitations.

Three tributaries to Cedar Creek flow north through the eastern portion of the reserve. The two most eastern streams flow through wooded areas with total lengths of approximately 4,650 feet. A half-acre NWI wetland has been identified along the easternmost stream and a small pond not identified as a wetland is along the other stream. The third stream flows through a mostly cleared landscape of pastureland and land with farm-related structures, before crossing through a wooded area with rural residences. The total length of this stream section is approximately 2,180 feet and also includes a fairly large irrigation pond.

Both riparian and upland wildlife habitat have been identified along all of the stream corridors. The five streams and associated wildlife habitat essentially break up the reserve into smaller sections of unconstrained land. In order for these sections to urbanize the area in a well-connected manner with necessary transportation options, numerous stream crossings would be required; these crossings would most likely negatively impact the stream corridors. If urbanization occurs with less roadway connectivity, then impacts to the natural resources can be reduced. 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 fabric, resulting in a natural amenity for the public.

This analysis finds that urbanization of the reserve could occur with comparatively moderate to significant impacts to the stream corridors and habitat areas, depending on the urban form and extent of road connections. Additional environmental consideration, specifically regarding avoidance of conflict between urban development and regionally significant fish and wildlife habitat, is provided in the Metro Code Factors Analysis (Appendix 7A).

Considering the comparative environmental consequences of urbanization, the Sherwood South Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Social, energy, and economic consequences

There are a number of rural residences on smaller tax lots in the Sherwood South Urban Reserve, as well as agricultural uses, a place of worship, and forested and other natural areas. Becaause natural areas would receive some protections from urbanization when added to the UGB, and because existing development and parcelization may limit or slow opportunities for new development, likely levels of urbanization of the reserve may not result in significant changes in residents' sense of place or in degradation of an existing rural lifestyle. However, the reserve does border rural reserves on two sides, and undeveloped lands on its other sides; the residents of this reserve are somewhat separated from urban development and any levels of growth may be a perceptible change.

As detailed more fully in response to Factor 2, future residents of the reserve may be fairly reliant on private motor vehicle transportation. However, given the somewhat limited buildable area of the reserve, overall increases in VMT and, therefore, adverse energy consequences, may be minimal to moderate.

Aerial imagery suggests there are a few locations of larger-scale agricultural activity within the reserve, primarily Christmas tree farming, ranching, and some pastureland, as well as some smaller-scale agriculture on tax lots with rural residences. The economic consequences of a loss in these agricultural activities may be outweighed by the economic benefits of residential development of the reserve.

Overall, there would be comparatively low to moderate social, energy, and economic consequences from urbanization of this reserve. The Sherwood South Urban Reserve is given a "medium-high" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Factor 4: Compatibility of the proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

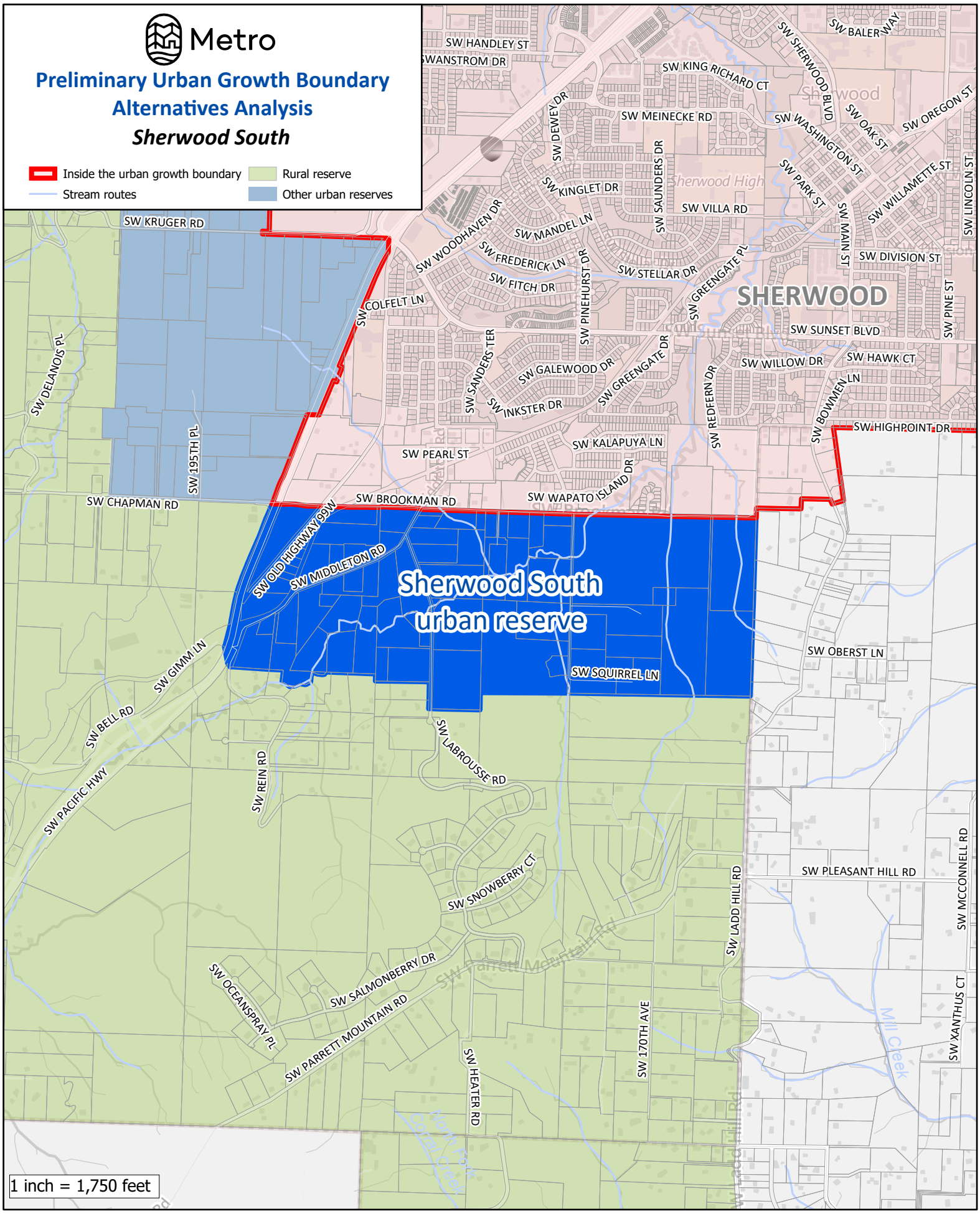
Goal 3 agricultural lands or Goal 4 forest lands, specifically lands zoned Agriculture and Forest (AF20) by Washington County, border the Sherwood South Urban Reserve to the north and west.

There is a 127-acre tract of AF20-zoned land directly south of the reserve between SW Ladd Hill Road and SW Labrousee Road. The majority of this land is forested with just some rural residences and a very small amount of agricultural activity. Two unnamed tributaries to Cedar Creek flow in deep ravines north through the forested portion; timber harvesting may already be limited in this area due to topography, riparian habitat protections, and nearby rural residential development. Given the limited nature of agricultural activities, that there is no indication of commercial timber activities already occurring in this area, practical constraints on timber harvesting in the future, and that access is available through roads other than those going through the reserve, the proposed urban uses are considered compatible with the nearby agricultural and forest activities occurring in this location.

A second tract of AF20-zoned land is located west of the reserve, on the west side of Highway 99W between SW Chapman Road and SW Gimm Lane, and extends approximately one and a half miles to the Washington County – Yamhill County line. Agricultural activities near Highway 99W include orchard and field crops and a 44-acre equestrian center. There are also a few rural residences in this location, as well as some smaller-scale commercial activities, some of which are agricultural-related. The Highway 99W right-of-way, which is approximately 150 feet wide, provides a meaningful buffer between the reserve and agricultural activities in this location. In addition, the equestrian center site, with its large, constructed facilities, as well as rural residential uses and stands of trees along the highway provide additional buffering from the agricultural activities that occur further to the west. Traffic from urban development of the reserve is not likely to adversely impact roadways to the west of Highway 99W. For these reasons, the proposed urban uses are considered compatible with the nearby agricultural activities occurring on the farm and forest land to the west of the reserve.

A third, nearly 450-acre tract of AF20-zoned land is located approximately a quarter of a mile south of the reserve along SW Rein Road. This land is approximately 100 feet higher in elevation than the reserve and is separated from the reserve by several rural residences. Considering that this land is not directly adjacent to the reserve, that traffic from urbanization of the reserve is unlikely to adversely impact this area, the differences in topography, and that there are already a number of rural residences located on the slope between the two areas, the proposed urban uses are considered to be compatible with nearby agricultural or forest activities occurring on this farm or forest land as well.

This analysis finds that proposed urban uses of this reserve are considered to have high compatibility with nearby agricultural and forest activities occurring on farm and forest land outside the UGB. The Sherwood South Urban Reserve is given a “high” score in Attachment 3 for this Goal 14 boundary location factor.



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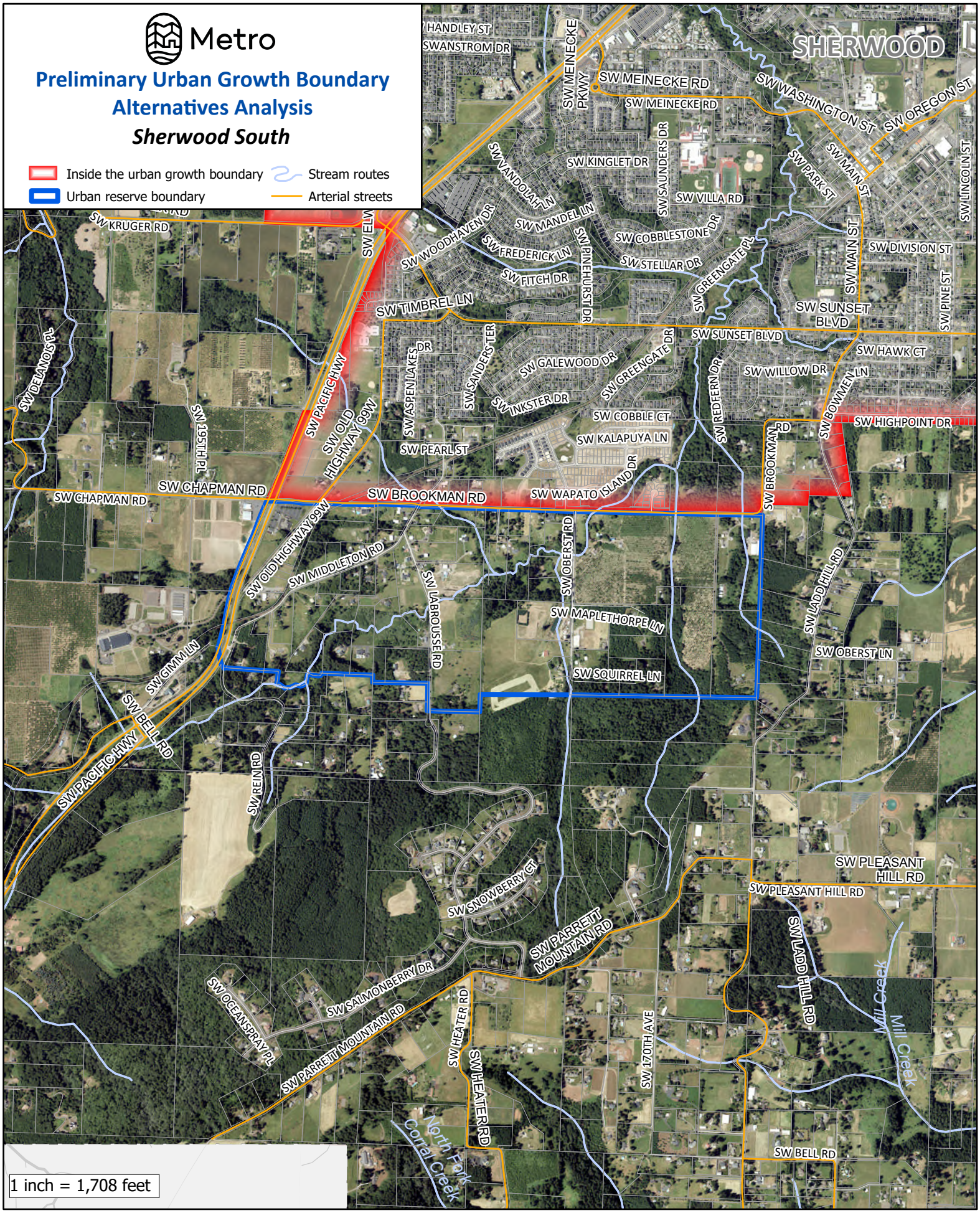
Metro

Preliminary Urban Growth Boundary Alternatives Analysis

Sherwood South

Inside the urban growth boundary
Urban reserve boundary
Stream routes
Arterial streets



1 inch = 1,708 feet

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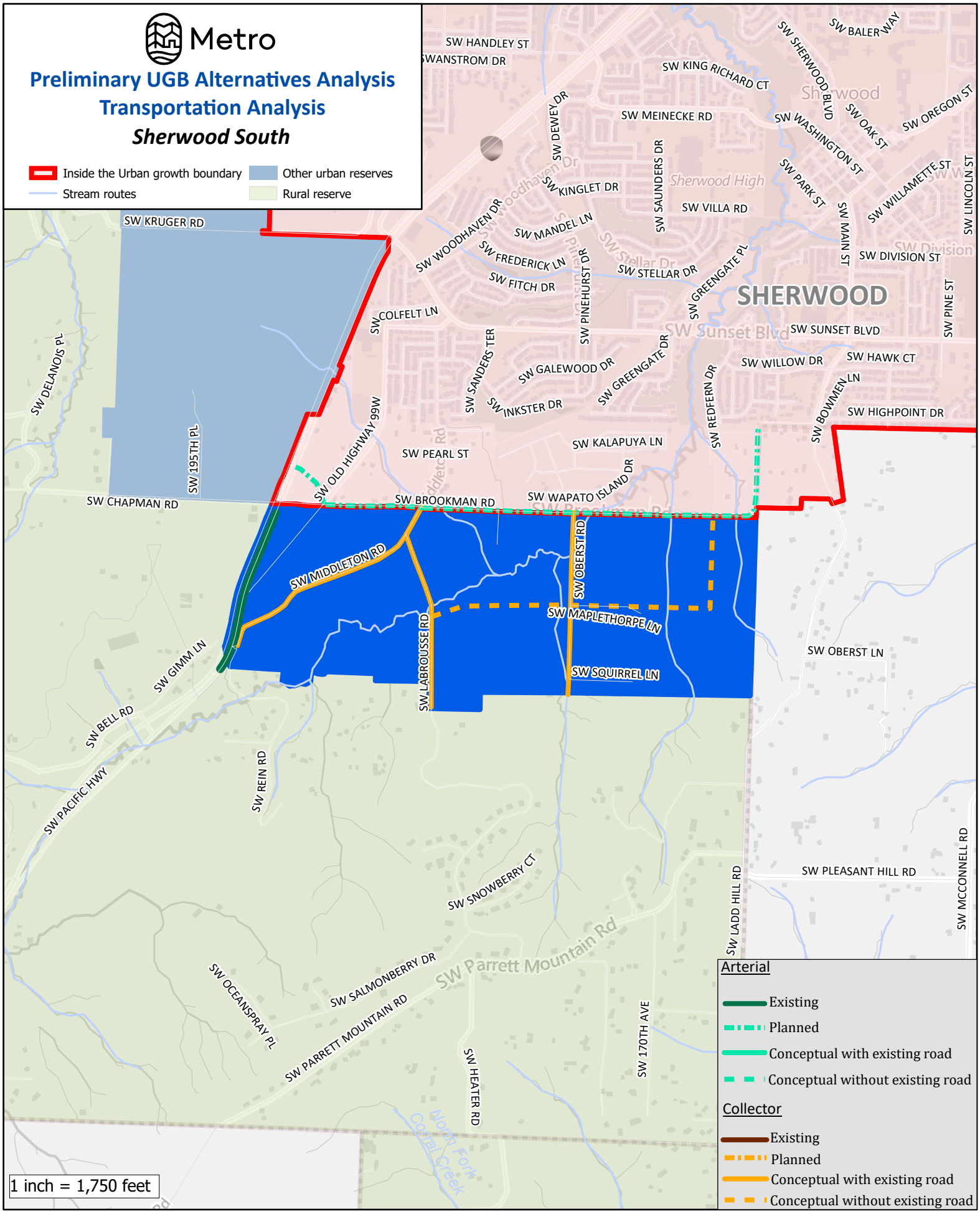

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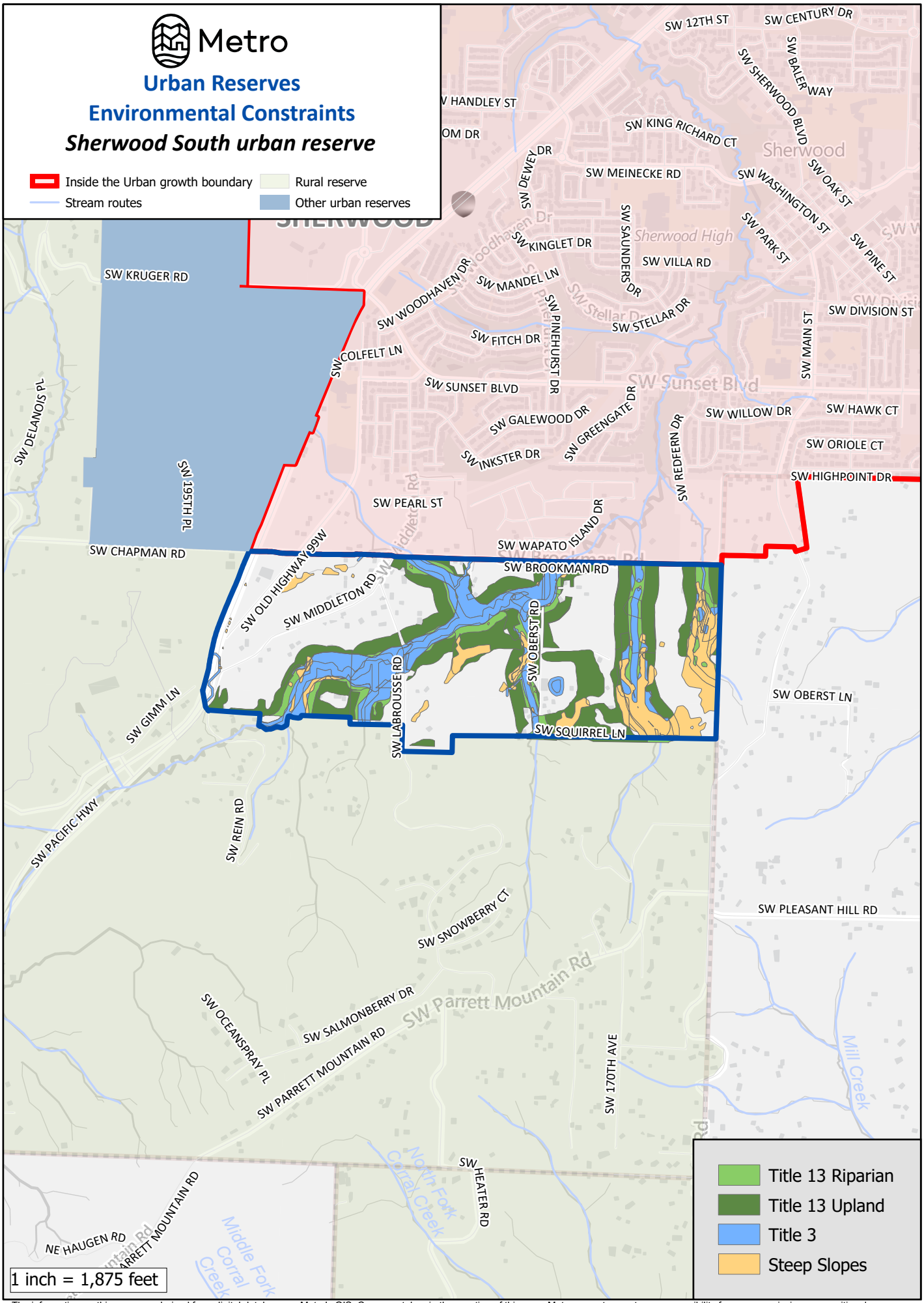

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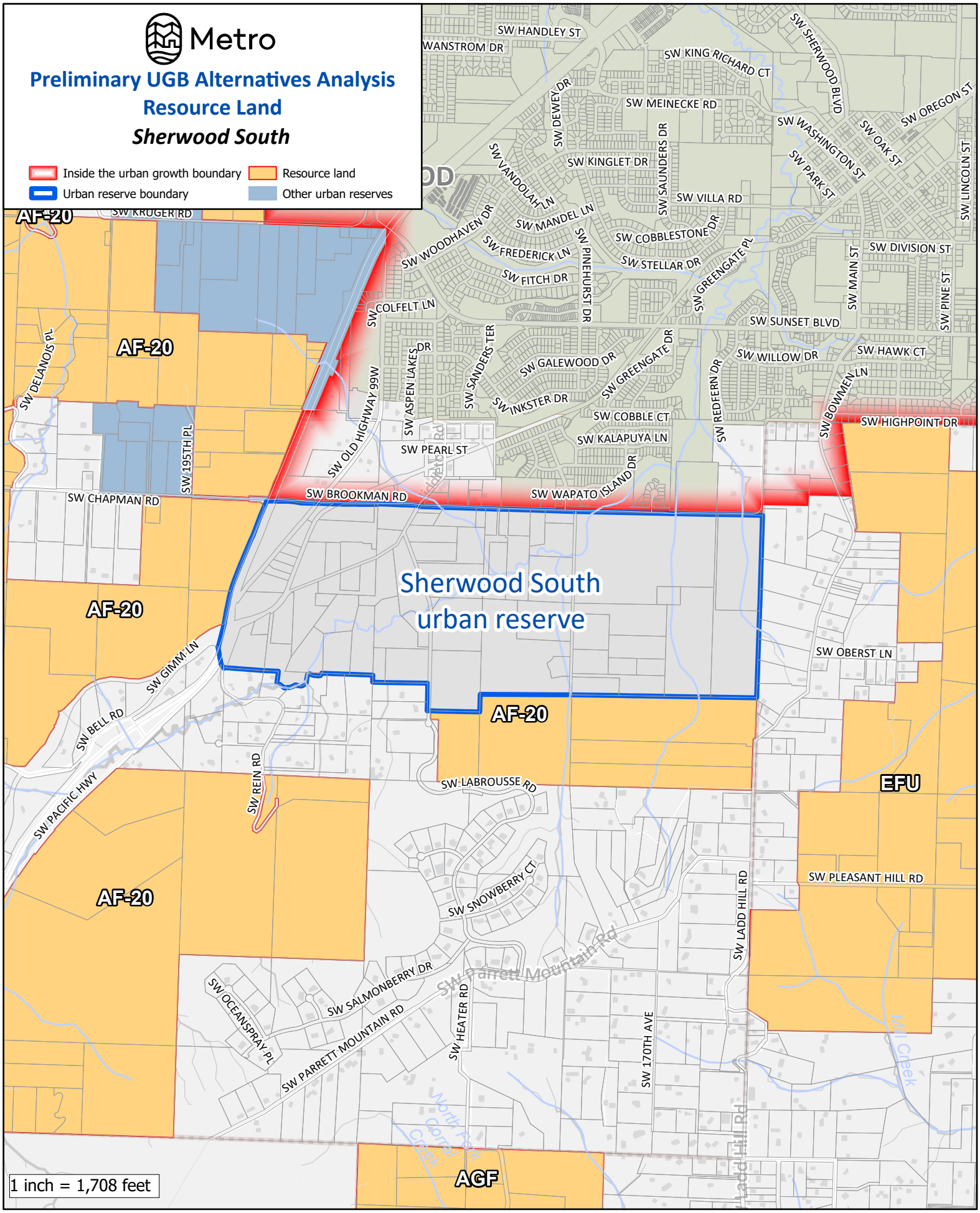

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SHERWOOD WEST URBAN RESERVE

Total Reserve Area	1,205 acres
Total Tax Lot Area in Reserve (without Right-of-Way)	1,157 acres
Gross Vacant Buildable Area	797 acres
Net Vacant Buildable Area	**594 acres**

The Sherwood West Urban Reserve is located on the west side of Sherwood and stretches from SW Lebau Road and SW Scholls-Sherwood Road in the north to SW Chapman Road in the south. The UGB constitutes most of the urban reserve's eastern boundary. Those portions of the urban reserve not bordering the UGB are adjacent to rural reserves. Sherwood West generally slopes uphill from east to west, with the highest elevations in the reserve's southwest portion. Chicken Creek flows toward the northeast through the central portion of the reserve and has several tributaries. Access to the reserve north of Chicken Creek is provided by SW Roy Rogers Road, SW Scholls-Sherwood Road, and SW Elwert Road. Access to the area south of Chicken Creek is provided by SW Elwert Road, SW Edy Road, SW Kruger Road, and SW Chapman Road. The southern portion of the reserve is adjacent to and includes sections of Highway 99W.

GOAL 14 BOUNDARY LOCATION FACTORS

Factor 1: Efficient accommodation of identified land needs

The Sherwood West Urban Reserve is comprised of 126 contiguous tax lots. The combined land area of those tax lots is roughly 1,157 acres. Approximately 20 percent of the reserve's tax lots are smaller than two acres, while more than 60 percent are larger than five acres. Nearly a quarter are larger than 10 acres, including 12 tax lots larger than 20 acres and two larger than 50 acres. As noted above, the entire reserve contains 797 gross vacant buildable acres and 594 net vacant buildable acres.

The reserve is generally characterized by rural residential uses, pockets of agricultural uses, and forested tracts. Overall, 75 percent of the tax lots have assessed improvements, with the median assessed value of those tax lots' improvements being approximately $384,000. Assessment records also indicate that the Free Methodist Church of North America owns a nearly 10-acre tax lot in the central portion the reserve along SW Edy Road and that the Countryside Community Church owns a 4.3-acre tax lot in the south of the reserve across from Sherwood High School. The City of Sherwood owns two tax lots in the reserve with a combined area of about 14 acres; one of the City-owned tax lots is used for a water storage facility. Two sets of powerlines run through the reserve, one cutting diagonally across the very northern section of the reserve and the second generally paralleling Chicken Creek.

The southern half of the reserve wraps around the Sherwood High School campus and is adjacent to Middleton Elementary on the opposite side of Highway 99W. Ridges Elementary School is less than half a mile from the central portion of the reserve and the Saint Paul Lutheran Church and Preschool is within 500 feet of the northern half of the reserve. The Sherwood Regional Family

YMCA, which features a swimming pool, sports court, climbing wall, and dance/gymnastics studio space, is directly across Highway 99W from the reserve and planned to be connected with a future pedestrian bridge over the highway.

The central portion of the reserve abuts existing urban residential development. The northern and central portions of the reserve are only about half a mile from the Sherwood Town Center and its commercial development via SW Roy Rogers Road and SW Edy Road, respectively. The southern portion of the reserve is more than a mile away from the town center via Highway 99W. The southern portion of the reserve fronts along Highway 99W and the northern portion of the reserve is less than a mile from the highway via SW Roy Rogers Road. There are currently no transit connections between the reserve and the town center.

The reserve has a mixture of relatively flat land along its eastern edge and moderately sloped hills to its west. There are areas with slopes greater than 10 percent where employment-related land uses would be limited; however, there are also some fairly large tracts of flat land as well.

The proximity of the highway to the reserve and the availability of some larger and relatively flat tax lots suggest the reserve could accommodate employment land uses. At the same time, the reserve's existing and nearby residential development, and the proximity of schools and recreational facilities, could be cohesive with and supportive of residential land uses. Therefore, this reserve is considered able to help serve both employment and residential land needs.

As noted in the Introduction and Methodologies section of Appendix 7, as well as in Attachment 3, the Sherwood West Urban Reserve is the only urban reserve to have an adopted concept plan for its future urbanization. This concept plan indicates that the City of Sherwood is committed to urbanizing the reserve and has a plan in place to do so. The concept plan significantly increases the likelihood that the reserve will actually develop and be able to efficiently accommodate the identified need for residential and employment land within a reasonable timeframe.

Factor 2: Orderly and economic provision of public facilities and services

Water Services

With regard to water services, the Sherwood West Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below. The reserve has an adopted concept plan addressing future water services to the area.

a. Capacity of existing facilities to serve areas already inside the UGB

Lands adjacent to the reserve inside the UGB are provided with water service by the City of Sherwood. The city obtains the majority of its water supply from the Willamette River Water Treatment Plant (WRWTP) in the City of Wilsonville, with the remainder coming from four groundwater wells in city limits. The city also maintains an emergency connection and transmission piping to a supply main serving Tualatin from Portland. The city's water distribution system includes three service zones served by

three storage reservoirs and two pumping stations. The majority of Sherwood customers are served from the 380 Pressure Zone, which is supplied by gravity from the city's Sunset Reservoirs. The 535 Pressure Zone serves the area around the Sunset Reservoirs, supplied with constant pressure by the Sunset Pump Station, while the 455 Pressure Zone serves higher elevation customers on the city's western edge by gravity from the Kruger Reservoir. The reserve might be part of Pressure Zones 380 and 455 when urbanized.

Supply, storage, pumping, and distribution piping are considered for the purposes of this analysis to be sufficient to meet maximum daily demand of current development within the city's portion of the UGB; however, according to the City's 2015 Water System Master Plan, additional supply and storage capacity may be needed for full buildout. Efforts, including capital improvement projects, are planned to increase treatment plant capacity to satisfy buildout demand. No pump stations are currently needed to serve the 380 Pressure Zone, though additional pumping capacity may be needed to serve other areas at full buildout. Very few distribution deficiencies are identified in the Master Plan for either existing or buildout maximum daily demand (MDD) conditions and no additional deficiencies are identified in the Plan under peak hour demand conditions.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The city's 2015 Sherwood Water System Master Plan, and the Sherwood West Concept Plan formally adopted by the city in 2023 and updated in 2024, consider water service to the reserve. The concept plan will have costs associated with water services that may differ from those listed in (d) below. This can be due in part to differences in costing methodology, in what facility improvements are attributed to the reserve's development, and in assumptions of future densities.

According to the concept plan, initial anticipated urban development of Sherwood West is expected to be served by extending the existing 380 and 455 Pressure Zone distribution mains. Future customers along the ridge north and south of the existing Kruger Reservoir could potentially be served by constant pressure from the proposed Kruger Pump Station at the existing reservoir site. Some future customers in the reserve may need to be served through a Pressure Relief Valve (PRV)-controlled sub-zone or through individual PRVs on each service in order to maintain required service pressures. A small area on the western edge of the reserve, along Edy Road near Eastview Road, is likely too high in elevation to receive adequate service pressure from the adjacent 380 Pressure Zone; this area could instead potentially be served by constant pressure from the proposed Edy Road Pump Station. An additional pump station would potentially be needed to serve this area. Some large-diameter mains will also likely be needed to expand the city's water service area to supply water to the reserve as development occurs.

Full buildout of the areas already in Sherwood, plus full urban development of reserve, is expected to require treatment plant improvements in order for the reserve to be provided with adequate water service. Additional water storage capacity will also likely be needed.

However, potential treatment system improvement costs, water main extension costs, and the full costs of new storage facilities also serving areas already inside the UGB are currently unknown and not included in the below figures. Additional information on costs of water service will be prepared during the comprehensive planning of the reserve when added to the UGB.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

As noted above, full buildout of the areas in the existing UGB, plus full urban development of the reserve, is expected to require the planned treatment plant improvements in order for the reserve to be provided with adequate water service. Additional storage, piping, and pumping capacity are also likely needed. Those potential treatment system improvement costs and the full costs of improved storage facilities also serving areas already inside the UGB are not included in the below figures.

d. Estimated water service-related costs for reserve development

Water piping, pumping, and storage costs	Cost
10-inch pipe	$0
12-inch pipe	$14.62 million
16-inch pipe	$0
Pumping	$13.34 million
Storage	$0.78 million
Total:	**$28.74 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$2,421**

Sanitary Sewer Services

With regard to sanitary sewer services, the Sherwood West Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below. The reserve has an adopted concept plan addressing future sanitary sewer services to the area.

a. Capacity of existing facilities to serve areas already inside the UGB

The City of Sherwood and Clean Water Services (CWS) together provide sanitary sewer services in adjacent areas already in the UGB. Two CWS sanitary sewer trunk lines connect to the local, city-maintained components of the system, including the 24-inch

"Sherwood Trunk", which conveys sewage from the Cedar Creek sewage collection basin, and the 18-inch "Rock Creek Trunk", which conveys sewage from the Rock Creek sewage collection basin to a CWS-owned pump station. Sewage is then directed to the Durham Advanced Wastewater Treatment Plant via the Upper Tualatin Interceptor, also owned by CWS.

The city updated its Sanitary Sewer Master Plan in 2016. The Master Plan includes areas within the Sherwood city limits, as well as the Tonquin Employment Area (TEA) and the Brookman Addition, which are within the UGB. The Master Plan indicates that there is sufficient conveyance, pump station, and treatment plant capacity for existing development in areas already inside the UGB. However, at full buildout of the UGB, there may be deficiencies with the Sherwood and Rock Creek Trunk Lines, the Sherwood Pump Station, and the Upper Tualatin Interceptor. The city and CWS both have capital improvement projects planned to address these capacity issues. Responsibility for upsizing the Sherwood and Rock Creek Trunk Lines may be shared between city and CWS.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The Sherwood West Concept Plan formally adopted by the city in 2023 and updated in 2024 contemplates service to the Sherwood West Urban Reserve. The concept plan will have costs associated with sanitary sewer services that may differ from those listed in (d) below, in part due to differences in costing methodology, in what facility improvements are attributed to the reserve's development, and in assumptions of future densities.

According to the concept plan, development of the reserve north of Haide Road is expected to be served by the proposed Chicken Creek Pump Station and Force Main, while development to the south of Haide Road is expected to be served by the Sherwood Trunk line via the Brookman Trunk line, which has already been partially extended through the Brookman Addition as part of residential subdivisions occurring in the area. The city and CWS expect to extend the trunk line from its current terminus in the Brookman Addition to Sherwood High School, located adjacent to the reserve. A portion of the Chicken Creek Force Main is being installed as part of the Roy Rogers Road widening project. Required sewer upgrades to serve urban development of the reserve are expected to be completed by 2029.

Given the size of the reserve, it is possible that the existing treatment plant would be insufficient to serve both full buildout of the current UGB and development of the reserve, warranting treatment plant upgrades. Costs associated with increasing the capacity of the treatment plant, as well as sewer lines and pumping systems outside the reserve, to levels necessary to serve both full buildout of the current UGB and the reserve are unknown and are not included in the below figures. However, those costs could be significant.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

The treatment system, sewer line, and pumping system improvements noted above may be needed in order to avoid adverse impacts to service to areas already inside the UGB. Additional information on costs of sanitary sewer service will be prepared during the comprehensive planning of the reserve when added to the UGB.

d. Estimated sanitary sewer service-related costs for reserve development

Sanitary sewer piping and pumping costs	Cost
10-inch pipe	$0.77 million
12-inch pipe	$0
15-inch pipe	$1.39 million
Pump station	$7.02 million
Force mains	$0
Total:	**$9.18 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$773**

Stormwater Management Services

With regard to stormwater management services, the Sherwood West Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below. The reserve has an adopted concept plan addressing future stormwater management services to the area.

a. Capacity of existing facilities to serve areas already inside the UGB

The City of Sherwood's 2016 Stormwater Master Plan represents that, overall, the existing stormwater network for areas inside the UGB is in good condition, though there are some isolated deficiencies. There is no indication of significant challenges with existing stormwater management facilities being able to serve existing development specifically in areas of the UGB adjacent to the reserve.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The Sherwood West Concept Plan formally adopted by the city in 2023 and updated in 2024 addresses stormwater services to future urban development in the Sherwood West Urban Reserve.

According to the concept plan, as development occurs, stormwater would likely be discharged into the floodplains of the adjacent creeks (e.g., Chicken and Cedar Creeks) and tributaries flowing to the north and south of the high school site that drains the middle part of the reserve. The city requires that all stormwater facilities meet the requirements of CWS Design and Construction Standards for conveyance, water quality

treatment, hydromodification, and water quantity treatment. The city has also indicated that, where possible, they would prefer to use regional stormwater facilities with Low Impact Development Approaches (LIDA), and proprietary treatment. Per CWS and city stormwater standards for new development, water quality and quantity should be provided on private property before outfalling directly to an adjacent water body; therefore, the existing facilities are not expected to be impacted by the development of the reserve.

The concept plan will have costs associated with stormwater services that may differ from those listed in (d) below, in part due to differences in costing methodology, in what facility improvements are attributed to the reserve's development, and in assumptions of future impervious surfaces.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

As noted above, stormwater related to new development in the reserve could likely outfall directly an adjacent water body, without connecting to other existing stormwater infrastructure. Therefore, no adverse impacts to existing facilities serving areas already inside the UGB are anticipated. It is also expected that stormwater will be treated and detained onsite, thereby limiting impacts to these water bodies.

d. Estimated stormwater service-related costs for reserve development

Stormwater piping and water quality/detention	Cost
18-inch pipe	$3.24 million
24-inch pipe	$1.70 million
30-inch pipe	$0
Water quality/dentition	$13.64 million
Total:	**$18.58 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$1,565**

Transportation Services

With regard to transportation services, the Sherwood West Urban Reserve is given a "medium-high" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(e) below. The reserve has an adopted concept plan addressing future transportation services.

a. Capacity of existing facilities to serve areas already inside the UGB

Figure 4.36 in Chapter 4 of the 2023 Regional Transportation Plan (RTP) displays 2020 household-based vehicle miles traveled (VMT) per capita by Metro transportation analysis zone, with average VMT per capita considered 11.32. According to that figure,

areas in the UGB adjacent to the Sherwood West Urban Reserve had average and above the regional average home-based VMT per capita in 2020.

Metro's adopted 2040 Growth Concept Map designates a town center in the adjoining City of Sherwood. Town centers are meant to: serve populations of tens of thousands of people; offer more locally-focused retail uses and public amenities; and be well served by transit. The Langer Drive Commercial District of the City of Sherwood's 2013 "Sherwood Town Center Plan" generally aligns with the geography of the town center area on the Growth Concept Map. The Langer Drive Commercial District is envisioned as a walkable and active shopping district complete with more pedestrian-oriented buildings. Metro's 2017 State of the Centers Atlas showed that, in the area of the Langer Drive Commercial District, there was a very high jobs-to-housing ratio and a very low number of dwelling units per acre compared to other town centers in the region. According to aerial imagery, much of the area is already built out with commercial retail uses, including a grocery store, restaurants, and medical/dental offices, though there are numerous parking lots that may be able to accommodate redevelopment. Near to the Langer Drive Commercial District is a police station, the Sherwood Ice Arena, and other public/quasi-public land uses, as well as some undeveloped and underdeveloped tax lots. Sherwood is served by TriMet Route 94, which runs along Highway 99W, and Route 97, which runs along SW Tualatin-Sherwood Road; both routes include stops at the town center. The City's adopted town center plan, its existing land uses and transit service, and some availability for new development in and near the town center demonstrate that growth in the current UGB will not necessarily cause a significant increase in home-based VMT per capita in the future. The area already in the UGB and adjacent to the north end of the Sherwood West Urban Reserve is approximately half a mile from the town center; the area already in the UGB and adjacent to the south end of the reserve is approximately two miles away.

As noted above, TriMet Routes 94 and 97 both serve areas already in the UGB in the adjacent city of Sherwood. Currently, however, those routes only connect to the northern and central portions of the city and not to the city's south and west. Figure 4.3 of the 2023 RTP also shows a gap in "frequent transit service" in Sherwood's portion of the planned regional transit network.

Sherwood has more than 10 miles of dedicated bike lanes and established bikeways, including along major roadways, that connect with some other bike-friendly streets, as well as residential and employment uses, schools, and the town center. However, there are gaps in bike facility connections to some of the residential areas south of the railroad. Figure 4.5 in Chapter 4 of the 2023 RTP identifies existing bike facilities along Highway 99W and SW Tualatin-Sherwood Road as part of the regional on-street bike network and facilities in the central portion of the city as part of the planned regional off-street bike network. However, there is a short network gap along SW Tualatin-Sherwood Road west of the highway and other gaps in the west, east, and south of the City, including along Highway 99W in the UGB near the reserve.

Most developed neighborhoods in Sherwood, including the town center, have sidewalks. Figure 4.4 in Chapter 4 of the 2023 RTP identifies existing sidewalk facilities along SW Tualatin-Sherwood Road, SW Sunset Boulevard, and SW Main Street as part of the planned regional on-street pedestrian network. Again, however, there are network gaps along Highway 99W in the north of the City, along SW Brookman Road in the south of the City adjacent to the Sherwood South Urban Reserve, and along SW Elwert Rd in the west of the City.

The Cedar Creek Trail in Sherwood is identified as an existing regional trail in Figure 4.6 of Chapter 4 of the 2023 RTP. The figure identifies gaps in connections of this trail to other regional trails in the planned regional trail network.

Construction has commenced on a pedestrian bridge over Highway 99W that, when completed, will connect Sherwood High School, which is in the UGB and adjacent to the reserve, with the YMCA and surrounding urban neighborhoods. Goals of the project include: reducing vehicle/pedestrian conflicts and exposure; minimizing out of direction travel for pedestrians; and providing crossing opportunities that accommodate all pedestrians and bicyclists.

Figure 4.14 in Chapter 4 of the 2023 RTP identifies the SW Tualatin-Sherwood Road as a high injury corridor. The road, which is already inside the UGB, is approximately three quarters of a mile from the northern end of the reserve and more than two miles from the south end of the reserve. There are no other RTP-designated high injury corridors in Sherwood's portion of the UGB.

Highway 99W is also already inside the UGB and generally bisects the city of Sherwood. Highway 99W is identified as a throughway in Chapter 4's Figure 4.7 of the 2023 RTP. Figure 4.8 of that same chapter indicates that the highway currently meets travel speed reliability performance thresholds, with no more than four hours per day below the identified minimum speed. RTP models indicate this reliability will continue at least to the year 2045.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The reserve is adjacent to – indeed, includes a small length of – Highway 99W. As noted above, Highway 99W, an RTP-designated throughway in Sherwood, currently meets travel speed reliability performance thresholds.

The reserve currently lacks a transit service connection. The closest transit stop to the north end of the reserve, which is for TriMet Route 94, is nearly one mile away and the south end of the reserve is even further away from existing stops.

There are dedicated bike lanes on Highway 99W at the SW Kruger Road intersection. These bike lanes connect to other bike lanes on SW Meinecke Parkway, which provide access to the middle school, "Old Town", and the town center. There is also a dedicated bike lane on SW Sunset Boulevard that runs for approximately half a mile before

connecting to a trail. There are bike lanes on SW Roy Rogers Road that extend north into rural lands and south into the city, but these bike lanes stop short of connecting to the bike lanes on Highway 99W.

There are sidewalks on SW Kruger Road and SW Haide Road that would provide easy pedestrian access from the central portion of the reserve to the Sherwood High School campus. As noted above, a pedestrian bridge is also being constructed to provide pedestrian access from the high school are to the YMCA and other urban development on the other side of Highway 99W. Sidewalks on SW Sunset Boulevard, across Highway 99W from SW Kruger Road, connect with numerous residential areas and "Old Town" via SW Main Street. Additionally, there are sidewalks on SW Handley Street and SW Swanstrom Drive that connect to the sidewalks on SW Meinecke Parkway, which provides additional pedestrian access to the schools, "Old Town", and the town center. Sidewalks on SW Edy Road provide access to Edy Ridge Elementary School and sidewalks on SW Roy Rogers Road connect to the northern portion of the city. Sidewalks along SW Roy Rogers Road provide some pedestrian connection to the northern end of the reserve, but the southern end has no nearby pedestrian connections.

No existing regional trails are connected to the reserve. However, a trail running through green space connects the north end of the reserve at SW Roy Rogers Road to SW Seely Lane and there are trails through greenspace connecting the central portion of the reserve on SW Elwert Road to SW Copper Terrace and Ridges Elementary School.

The Sherwood West Urban Reserve was determined in response to Factor 1 to be able to accommodate both residential and employment land uses. Existing residential and public (e.g., school) uses in the UGB adjacent and near to the reserve could provide housing and educational services to future employees and residents of the reserve and thereby help to limit home-based VMT per capita.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

SW Kruger Road, SW Haide Road, SW Elwert Road, SW Edy Road, and Highway 99W would all be expected to see additional private traffic as a result of urbanizing the reserve. Indeed, the reserve is moderately distant from the Sherwood Town Center and currently lacks transit service to it. However, there are existing and developing bike and pedestrian facilities that provide connections to the town center, as well as to schools and recreational facilities. Additionally, and as detailed in response to Factor 1, the reserve is considered able to accommodate both residential and employment land uses, allowing for the possibility that future residents of the reserve and nearby areas in the UGB could access at least some services and employment opportunities within the reserve itself. For these reasons, urban development of the reserve may result in only moderate impacts to home-based VMT per capita in nearby areas already inside the UGB and to the performance of Highway 99W as a throughway. However, any additional motor vehicle traffic on SW Tualatin-Sherwood Road resulting from development of the north end of the reserve may exacerbate the road's high-crash conditions.

The dedicated bike lanes on Highway 99W at the SW Kruger Road intersection would be expected to see increased use from urbanization of the reserve, although the highway is not the most comfortable environment for all bicyclists and some may be deterred from using it. The bike lanes on SW Meinecke Parkway would also be expected to see additional use as they provide access to schools, "Old Town", and the Town Center. This route, however, requires a three-quarter-mile ride along the highway, which, as noted, may have conditions that limit or reduce the number of users. The bike lane on SW Roy Rogers Road would also be expected to see additional use.

The sidewalks around the high school campus, as well as the developing pedestrian bridge over Highway 99W, would see more use if the central portion of the reserve were to be urbanized. The sidewalks on SW Sunset Boulevard across Highway 99W from SW Kruger Road would also be expected to see additional use, as they connect to numerous residential areas and eventually "Old Town" via SW Main Street. The sidewalks on SW Handley Street and SW Swanstrom Drive that connect to the sidewalks on SW Meinecke Parkway would likely see additional use from development of the central portion of the reserve, as they provide access to schools, "Old Town", and the town center. Likewise, the sidewalks on SW Edy Road that provide access to Edy Ridge Elementary School and the sidewalks on SW Roy Rogers Road would be expected to see additional use. The trail between SW Roy Rogers Road and SW Seely Lane would see more use with the development of the northern section of the reserve.

d. Need for major transportation facility improvements and associated costs

The adopted Sherwood West Concept Plan includes several potential future street layouts conceived of by the city and addresses associated costs, though these layouts and cost predictions may change during comprehensive planning of the reserve if/when added to the UGB. In order to compare each of Metro's 27 urban reserves with each other for the purposes of Factor 2, the same assumptions and methodologies used in the preliminary analyses of the other reserves' transportation facility improvement needs and costs are employed here in the preliminary analysis of the Sherwood West Urban Reserve.

According to those assumptions and methodologies, urbanization of the reserve would require the following to be improved to urban arterial standards, including acquisition of additional right-of-way: a 1.63-mile section of SW Elwert Road; a 0.57-mile section of SW Roy Rogers Road; a 0.57-mile section of SW Scholls Sherwood Road; and a 0.23-mile section and SW Lebeau Road. Portions of SW Elwert Road and SW Roy Rogers Road sections are considered for the purposes of this analysis to be half-street improvements, as their other halves would be in the current UGB. The following is also expected to be improved to urban collector standards, with acquisition of additional right-of-way: a 0.26-mile section of SW Conzelmann Road; a 0.8-mile section of SW Edy Road; a 0.4-mile section of SW Kruger Road; and a 0.45-mile section SW Chapman Road. Two new collectors with a combined length of nearly 2.5 miles may be needed to provide access to the center of the reserve between SW Chapman Road and SW Edy Road and to extend

SW Conzelmann Road east from SW Elwert Road to SW Roy Rogers Road. Due to topography and water crossings, some sections of new and improved roadways are expected to have higher than normal per-mile costs.

Facilities	Cost
Arterials, existing/improved full street	$126.45 million
Arterials, existing/improved half street	$23.22 million
Arterials, new	$0
Collectors, existing/improved full street	$66.54 million
Collectors, existing/improved half street	$0
Collectors, new	$103.26 million
Total:	**$319.47 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$26,912**

e. Provision of public transit service

The reserve is currently outside the TriMet Service District. Nonetheless, TriMet evaluated the reserve for the possibility of providing transit service in the future and determined they could reroute a potential new bus line along Roy Rogers Road that is slated for "Forward Together 2.0" improvements to serve the reserve. An analysis determined that such service would not create significant, additional costs. While TriMet could provide services to the reserve, there is no guarantee of service. Actual service will depend on the level of development in the reserve and in the corridors to it. If service were to be provided, an on-route, pantograph-style fast charger at a capital cost of approximately $1,000,000 – $1,500,000 could be required.

Factor 3: Comparative environmental, social, energy, and economic consequences

Environmental consequences

Chicken Creek runs northeastward through the northern half of the reserve for more than two miles, eventually flowing through the Tualatin River National Wildlife Refuge and to the Tualatin River. There are four linear wetlands that are identified on the National Wetland Inventory (NWI) and associated with Chicken Creek that total at least 30 acres and encompass a significant portion of the creek's riparian area. Much of the wetlands are forested, as is most of the stream corridor that is outside of the wetlands. In addition, there are a few locations of "100-year" floodplain along the stream corridor outside of the wetland areas. There are significant areas of riparian and upland habitat associated with Chicken Creek and its wetlands, much of which are also within a powerline easement that runs through this portion of the reserve. Considering that floodplains, wetlands, streams, and inventoried habitat areas receive additional regulatory protections when added to the UGB, and considering that the powerline easement could reduce buildability and thereby limit urbanization that could adversely impact environmental features, urbanization in this area may be able to occur without significant impacts to the Chicken Creek riparian corridor. Moreover, the size of the associated habitat areas could make new road crossings

in the area comparatively expensive; if those road crossings aren't built to a large scale, adverse impacts from new street connectivity could also be limited. However, if new road crossings were to be built through the habitat areas, then the impacts could be significant.

There are two unnamed tributaries to Chicken Creek that flow into the stream from the central portion of the reserve. The first tributary is approximately 2,000 feet long, flows along the forested edge of agricultural lands and open space, and also has a small NWI wetland associated with it. The second tributary is a short, roughly 480-foot stream section near the corner of SW Edy and SW Elwert Roads that also is within a 1.7-acre NWI wetland and the "100-year" floodplain.

A nearly 1,500-foot section of the West Fork Chicken Creek also flows through the northern end of the reserve and joins Chicken Creek near SW Elwert Road. This stream also flows within the "100-year" floodplain. Additionally, there is a 1,600-foot tributary to West Fork Chicken Creek north of the intersection of SW Edy Road and SW Eastview Road; this stream flows through a forested ravine with slopes greater than 25 percent, which, given the difficulty in developing on steep slopes, will likely provide an additional level of protection for the stream corridor. Similar to the main stem of Chicken Creek described above, there are areas of riparian and upland habitat associated with these stream corridors and wetland. Given the increased protection levels for floodplains, wetlands, streams, and habitat areas within the UGB, urbanization of the reserve could occur without significant impacts to the various tributaries to Chicken Creek.

Finally, a nearly 1,500-foot headwater section of Goose Creek flows south through the southeastern portion of the reserve into current Sherwood city limits on the opposite side of Highway 99W. This creek section has NWI wetland associated with it and flows mainly through forested land, which has been identified as riparian and upland habitat. The stream corridor has associated inventoried habitat areas, which may be impacted by urbanization, particularly new street crossings serving development in the area.

In summary, urbanization of the reserve could occur with comparatively minimal or moderate impacts to the natural resources. If numerous and/or sizeable road crossings are constructed to serve new development, then the impacts to natural resources could be more significant. Additional environmental consideration, specifically regarding avoidance of conflict between urban development and regionally significant fish and wildlife habitat, is provided in the Metro Code Factors Analysis (Appendix 7A).

Considering the comparative environmental consequences of urbanization, the Sherwood West Urban Reserve is given a "medium-high" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Social, energy, and economic consequences

Existing rural residential development in the reserve is relatively sparse and evenly distributed, though there is more existing development on smaller tax lots in the central portion of the reserve and along SW Edy Road near the reserve's western edge. This

parcelization and existing development, which includes some higher-value homes, can discourage rapid redevelopment and help maintain a more rural character for the area for a longer period of time. These areas are somewhat separated from other portions of the reserve by stream and habitat corridors and powerlines, which can help buffer them from urban development that may happen more quickly and at a larger scale on bigger and less developed tax lots elsewhere in the reserve.

These areas that may be more readily available are closer to existing urban development, including the Sherwood High School campus and urban residential development around Ridges Elementary School. Urbanization in these areas of the reserve might support the schools being more central community focal points. And, while urban development could contribute to a loss of sense of place or degradation of a more rural lifestyle for some existing residents of the reserve, it could also bring them new civic, social, and recreational opportunities.

As detailed more fully in response to Factor 2, urbanization of the reserve may lead to moderate levels of VMT. Developing the reserve with a mix of uses would allow existing and future residents the opportunity to access daily needs closer to home, there by limiting adverse energy consequences of urbanization.

There are agricultural uses occurring throughout the reserve, primarily Christmas tree farms, pastureland, orchards, and field crops, though there are some tracts of row crops as well. There are also stands of timber that may be intended for future harvesting. Urbanization of the reserve would result in a loss in farming activity, which could have adverse economic consequences. However, those consequences may be outweighed by the economic benefits of new residential development and urban employment opportunities. Timber stands could also be harvested as a part of urbanization, though not necessarily replanted. Levels of urban density will determine whether, on a per-unit basis, the costs of extending urban services and protecting natural resource areas will be moderate or more considerable.

This analysis finds there would be comparatively moderate social, energy, and economic consequences from urbanization of this reserve. The Sherwood West Urban Reserve is given a “medium” score in Attachment 3 for this Goal 14 boundary location sub-factor.

Factor 4: Compatibility of the proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

Goal 3 agricultural lands or Goal 4 forest lands, specifically lands zoned Agriculture and Forest (AF20) or Exclusive Farm Use (EFU) by Washington County, border the reserve in four locations.

The first location is near the north of the reserve where reserve lands border an extensive tract of EFU-zoned land on the opposite side of SW Scholls Sherwood Road. The EFU-zoned land appears to be entirely in agricultural use, with the exception of some rural residential development, a food truck, and some agricultural-related commercial activity closer to SW Roy Rogers Road. Lands

along the bank of the Tualatin River are also not in agricultural production and are instead generally forested. Agricultural activities near the north of the reserve include field and row crops, pastureland, and orchards. SW Scholls Sherwood Road separates these agricultural activities from the reserve; however, the road itself would not provide an adequate buffer between urban development and agricultural activity. Development of the reserve in this location could lead to land use conflicts related to safety, liability, and vandalism and complaints due to noise, odor, dust, and the use of pesticides and fertilizer. In addition, the improvement of SW Scholls Sherwood Road to urban standards, and associated street light illumination and bicycle and pedestrian movements, may further jeopardize the compatibility of the two uses, though the impacts of urban roadways on adjacent agricultural activity may be minimized through road design. Urbanization could significantly increase traffic on SW Scholls Sherwood Road and SW Roy Rogers Road and that additional traffic could impact the movement of both farm equipment and goods. Urban development of the reserve is therefore considered incompatible with the nearby agricultural activities occurring on EFU-zoned lands to the north of the reserve.

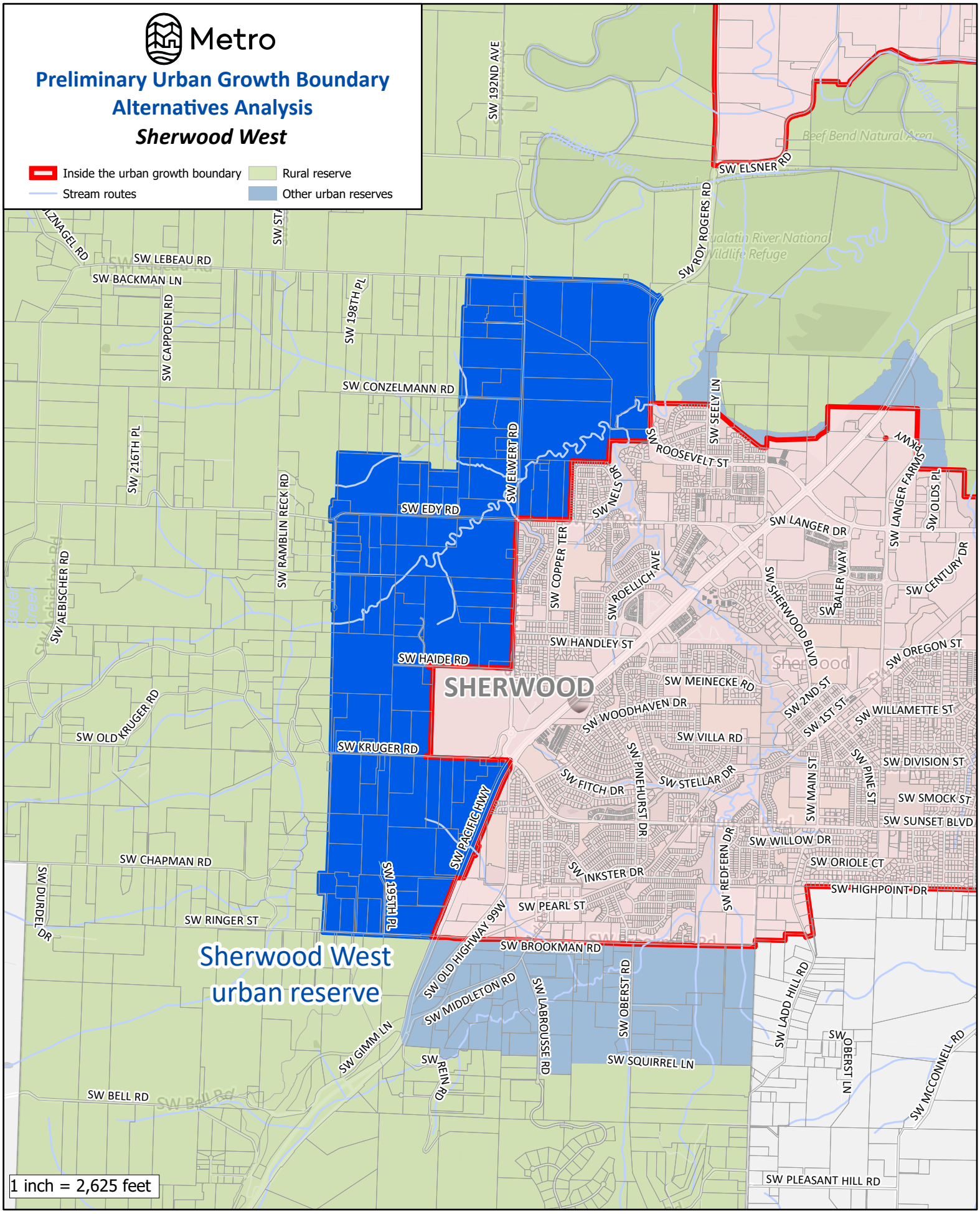
The second location is a roughly 335-acre tract of AF20-zoned land located north of SW Edy Road in the vicinity of SW Conzelmann Road. This area has a mixture of agricultural activities, forested areas, and rural residential development. The forested portions could buffer some of the agricultural activities from development of the reserve, as may the stream corridor located north of the intersection of SW Edy Road and SW Eastview Road. The forested areas do not appear to be in commercial timber production, and riparian habitat productions and nearby residential development may practically limit the potential for larger-scale commercial harvesting. Urban development of the reserve would have fewer traffic-related impacts on the sections of SW Edy Road and SW Conzelmann Road in this area. Therefore, the proposed urban uses are considered to be generally compatible with the nearby agricultural and forest activities occurring on this tract of farm and forest land.

The third location is a large tract of AF20-zoned land on the southwest side of the reserve between SW Kruger Road and SW Chapman Road. This area is characterized by a mixture of agricultural activity, tasting rooms and other commercial activity, stretches of forest generally along Chicken Creek, and rural residential development, including some large, high-value homes. Chicken Creek flows north through this area in a ravine that is approximately 120 feet lower in elevation than the western edge of the reserve. The forested areas in along Chicken Creek and its ravine, the associated topography, and existing residential development would provide a meaningful buffer between urban development in the reserve and agricultural activity to the west. There is no indication that the forested areas in this location are stands for commercial timber harvesting; indeed, the topography, riparian habitat protections, and existing residential development could practically limit commercial forestry opportunities. Urban development of the reserve is unlikely to generate significant additional traffic on roadways in these adjacent AF20-zoned lands as urban traffic will primarily head eastward toward Highway 99W rather than westward. Therefore, the proposed urban uses are considered compatible with the nearby agricultural and forest activities occurring in this location of farm and forest land.

The fourth location is at the south of the reserve on the opposite side of SW Chapman Road. Here, there are AF20-zoned tax lots adjacent to the reserve which have agricultural activity, including Christmas tree farms and row and field crops. There also some rural residences as well as the Red Berry Barn, which is an agriculturally-associated commercial use that includes a garden center, bakery, and country store and that hosts various farm-related seasonal events, such as a harvest festival. These uses are separated from the previously-mentioned equestrian center to the south by stands of mature trees. Urbanization of the southern portion of the reserve would result in new development adjacent to a small amount of actively farmed land, which could result in land use conflicts related to safety, liability, vandalism, and complaints due to noise, odor, dust, and the use of pesticides and fertilizer. SW Chapman Road itself would not provide an adequate buffer for the agricultural activities on the opposite side of the road from the reserve. Improvement of SW Chapman Road to urban standards, and associated street light illumination and bicycle and pedestrian movements, may further jeopardize the compatibility of the two uses, though the impacts of urban roadways on adjacent agricultural activity may be minimized through road design.

Overall, without impact mitigation measures, urban development in the northern and southern portions of the reserve would be considered incompatible with nearby agricultural and forest activities occurring on farm and forest land outside the UGB. Urbanization of the middle portion of the reserve, however, would be considered compatible with nearby agricultural and forest activities occurring on farm and forest land outside the UGB. Therefore, reserve-wide, the proposed urban uses have a moderate compatibility with nearby agricultural and forest activities occurring on farm and forest land outside the UGB.

The Sherwood West Urban Reserve is given a “medium” score in Attachment 3 for this Goal 14 boundary location factor.



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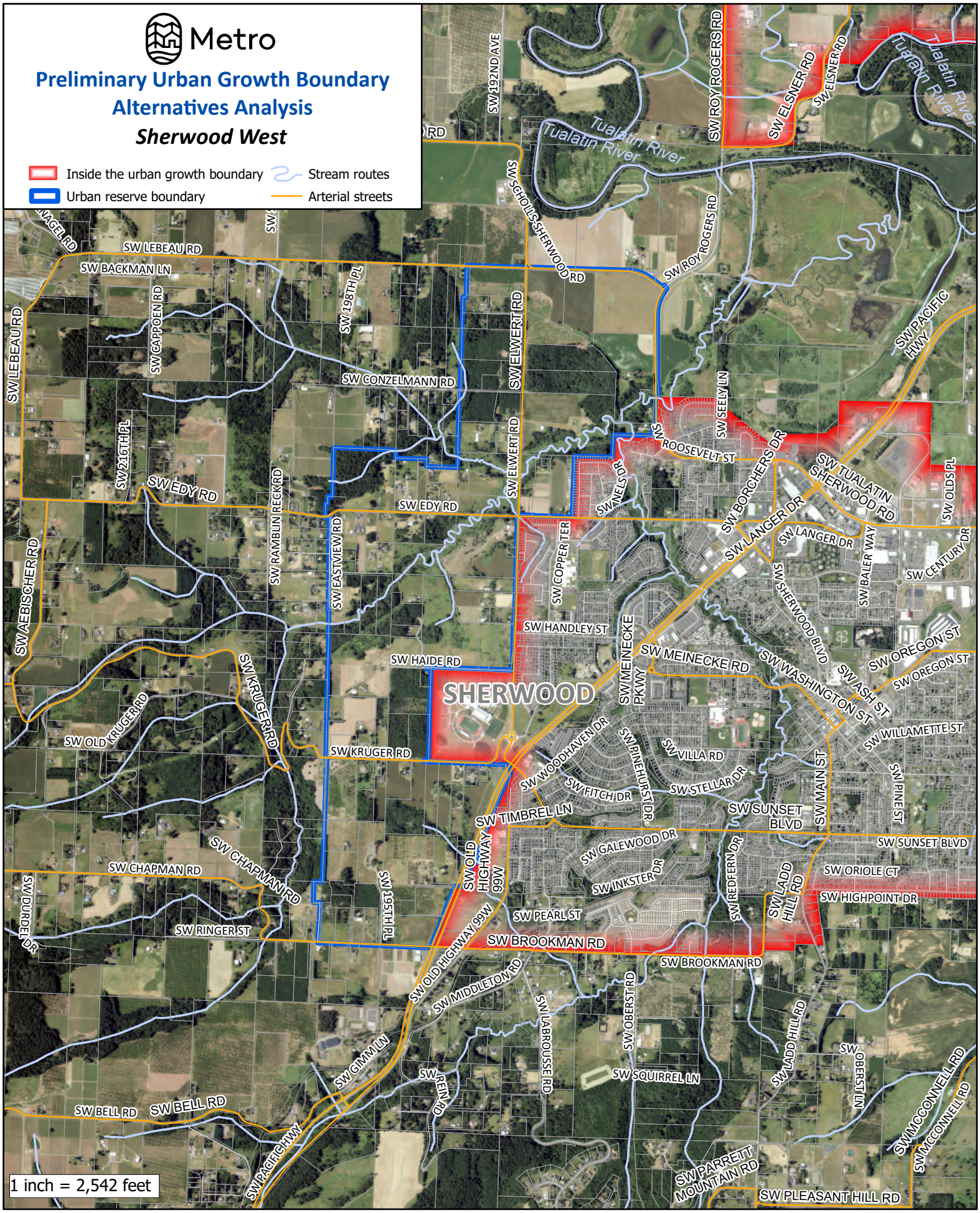
Metro

Preliminary Urban Growth Boundary Alternatives Analysis

Sherwood West

Inside the urban growth boundary
Urban reserve boundary
Stream routes
Arterial streets



1 inch = 2,542 feet

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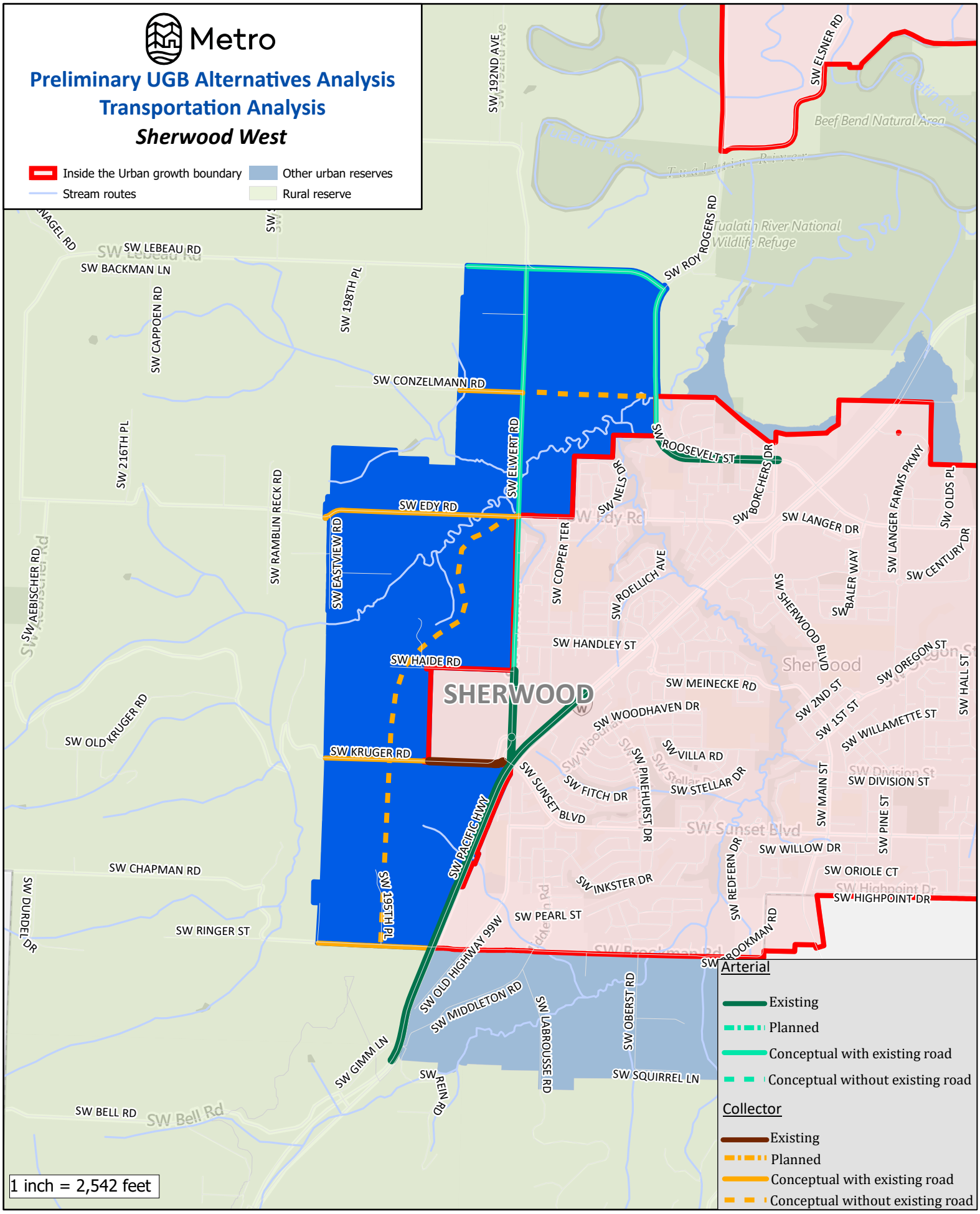

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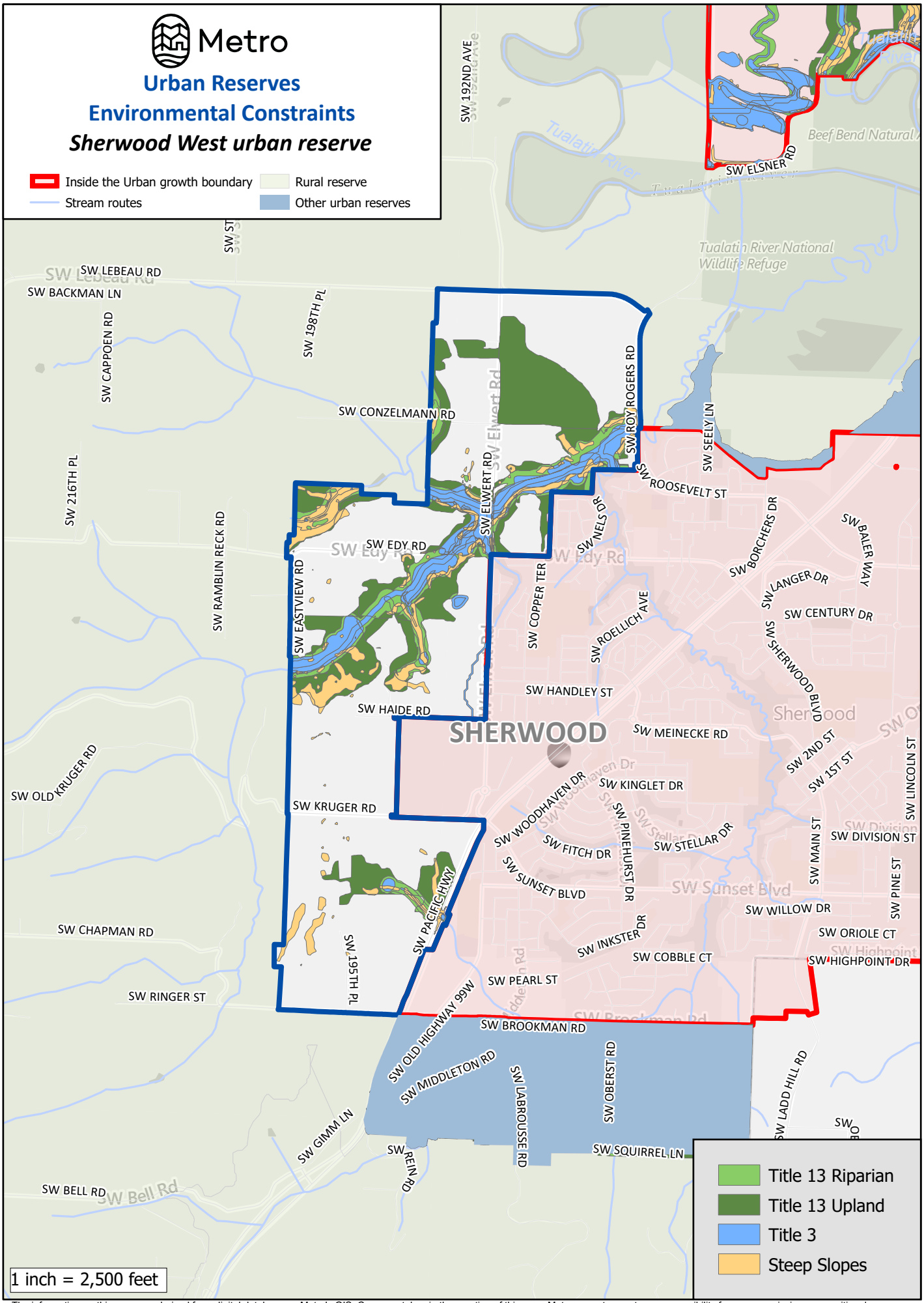

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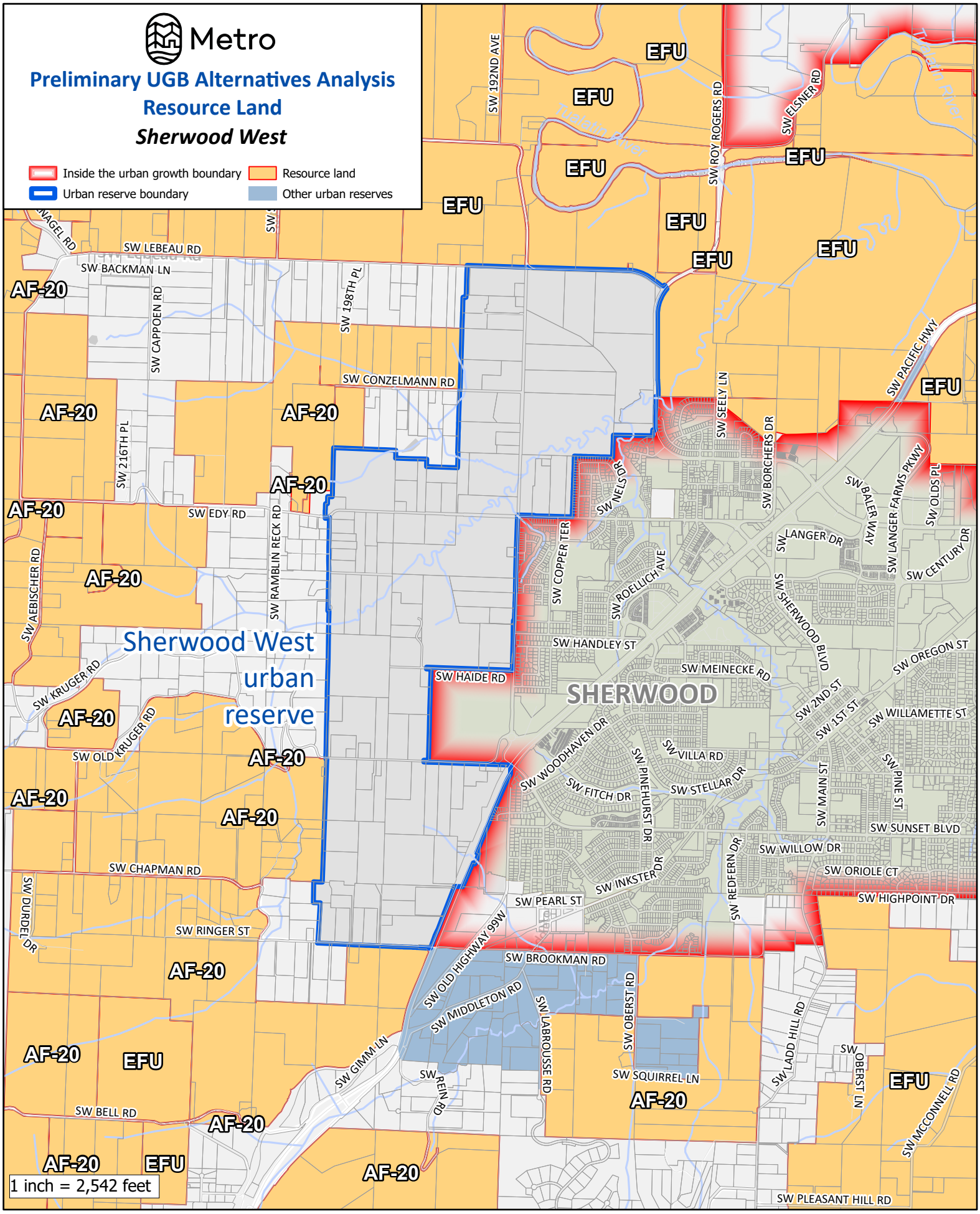

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STAFFORD URBAN RESERVE

Total Reserve Area	3,200 acres
Total Tax Lot Area in Reserve (without Right-of-Way)	2,964 acres
Gross Vacant Buildable Area	1,258 acres
Net Vacant Buildable Area	**937 acres**

The Stafford Urban Reserve is adjacent to the east end of the City of Tualatin, the south side of the City of Lake Oswego, and the west side of the City of West Linn. The UGB forms the reserve's northern boundary and most of its eastern boundary, the Tualatin River is its southern boundary, and the separate Rosemont Urban Reserve neighbors to the east. I-205 crosses through the southern portion of the reserve. There are numerous streams that flow through the southern portion of the reserve as well toward the Tualatin River, including Pecan Creek and Wilson Creek. The reserve's topography slopes down from north to south, dropping over 500 feet from S Bergis Road to the Tualatin River. A significant amount of the reserve has slopes greater than 10 percent, with slopes greater than 25 percent along many of the stream corridors. Access to the reserve is provided by S Rosemont Road, SW Johnson Road, SW Childs Road, and SW Stafford Road.

GOAL 14 BOUNDARY LOCATION FACTORS

Factor 1: Efficient accommodation of identified land needs

The Stafford Urban Reserve includes 799 contiguous tax lots, all but two of which are entirely in the reserve. Slightly more than half of the reserve's tax lots are smaller than two acres each and about 80 percent are smaller than 50 acres each. There are 19 tax lots that are larger than 20 acres each, including three that are each between 50 and 80 acres in area and one that is nearly 170 acres in area. The 170-acre tax lot, as well as multiple others, appear from assessment records to be open space tracts owned by a private homeowners association as part of existing residential subdivisions. The City of Lake Oswego owns 15 tax lots in the reserve with a combined area of nearly 150 acres; this area includes the public Luscher Farm featuring gardens, demonstration farming, a sports field, and park amenities and activities. Clackamas County owns 18 tax lots in the reserve with a combined area of more than 30 acres, Metro owns nine tax lots in the reserve with a combined area of nearly 99 acres, and the State of Oregon owns six tax lots with a combined area of 3.5 acres. PGE-owned tax lots with a combined area of 22 acres have substation facilities and two water service providers, Mossy Brae Water District and Sunny Slope Water District, also have facilities in the reserve. Willamette Christian Church, located on S Brandywine Drive, is on a 31-acre tract. As noted above, the entire reserve contains 1,258 gross vacant buildable acres and 937 net vacant buildable acres.

The reserve is characterized by rural residences and accessory uses, some agricultural activity, large forested areas, steep slopes, and numerous stream corridors. In total, nearly three-quarters of the reserve's tax lots have assessed improvements, with the median assessed value of those tax lots' improvements being more than $450,000.

The east side of the reserve is within 1,000 feet of Trillium Creek Primary School and just over half a mile from Rosemont Ridge Middle School and West Linn Adult Community Center. Stafford Primary School and Ahthey Creek Middle School are just on the opposite side of the Tualatin River from the west end of the reserve. The reserve contains the Luscher Farms complex, as noted above, and is less than a quarter mile from Lake Oswego Golf Course.

The reserve is mostly surrounded by rural and urban residential uses. Commercial and mixed-use development, including a grocery store and medical offices, are on the opposite side of Salamo Road from the reserve's eastern end. The SW Stafford Road interchange with I-205 is less than a mile to the southwest, on the other side of the Tualatin River.

Despite the proximity of the highway and the reserve's overall larger area, the reserve's steep topography, numerous streams, large tracts of public- and homeowners-association-owned lands, and existing residential development limit opportunities for employment uses. However, the existing and surrounding residential uses and the proximity of schools and recreational and commercial uses, could support and/or be cohesive with residential land uses. This reserve is considered able to accommodate a residential land need, but not an employment land need.

However, regarding the "efficient" accommodation of identified land needs, it is important to note that the cities adjacent to the "Stafford Triangle" area, which includes the Stafford Urban Reserve, have for decades opposed UGB expansions in that area, and those cities' elected officials have taken steps to restrict any city's ability to plan for the accommodation of future urban development. In 2019, the cities of Lake Oswego, Tualatin, and West Linn entered into an agreement that prohibits any of those cities from completing a concept plan for any part of the Borland, Rosemont, and Stafford Urban Reserve areas until, at the earliest, December 31, 2028. This restriction and the ongoing opposition of the three adjacent cities to planning, annexing, and developing the Stafford Urban Reserve weighs heavily against this area regarding its ability to efficiently accommodate the identified needs for residential or employment land under Factor 1.

Factor 2: Orderly and economic provision of public facilities and services

Water Services

With regard to water services, the Stafford Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

The City of Lake Oswego provides service to the adjacent areas inside the UGB to the north and west of the Stafford Urban Reserve, while the City of West Linn provides water service to the adjacent areas inside the UGB to the east of the reserve.

Lake Oswego's water source is the Clackamas River. In 2017, construction of five new major water facilities was completed in partnership with the City of Tigard to increase capacity of drinking water from the Clackamas River to Lake Oswego and Tigard. The

construction included a new river intake pump station in Gladstone, a water treatment plant in West Linn, a 3.5 MG reservoir in Lake Oswego, and a pump station in Tigard, as well as more than 10 miles of large diameter backbone piping. The new Lake Oswego-Tigard Water Partnership water service area includes a portion of the Stafford Urban Reserve in its plans for buildout. It is believed that, following these upgrades, there is sufficient supply, pumping, storage, and piping capacity to provide adequate service to existing development currently within the Lake Oswego's portion of the UGB.

The primary water source for City of West Linn is also the Clackamas River, provided by the South Fork Water Board (SFWB) water treatment plant in Oregon City that was upgraded in 2016. Emergency supply may also be available from the Lake Oswego Water Treatment Plant, though the SFWB plant is understood to be adequate to serve areas already in the UGB. The adjacent West Linn UGB areas are in the Horton, Rosemont, and Willamette Pressure Zones. It is believed that, under normal (non-emergency) conditions, existing storage and piping capacity is adequate to serve existing development, but it is not entirely clear from master plans whether these facilities, or the treatment plant, are sufficient to serve full UGB buildout.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Both cities have previously indicated the ability to provide potable water to new development in the reserve, but it is not known just how much development in the reserve could be accommodated with existing treatment plant capacity. Transmission line, water storage, and pumping capacity may also be limited. Potential connection points exist at Laurel Street and Erickson Street, where access is made to the Bergis Reservoir for transmission. There is a 16-inch waterline in Rosemont Road that could be used to serve the reserve as well. Additional storage may need to be created in the reserve itself. A pump station at McVey and Oak Street is available, but will likely need expansion. There will be several pressure zones within the reserve and new water tanks may be needed to provide both adequate storage and pressure.

Only limited knowledge is available at this time regarding the amount of facility improvements that would be needed to serve urban development of the reserve. The full costs of these improvements can't yet be known so are not included in the below figures. The Borland Urban Reserve may need to precede urbanization of this reserve, as doing so would allow for location of water facilities and the related distribution network.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Additional treatment plant, storage, pumping, and distribution system capacity, as well as potentially urbanization of the adjacent Borland Urban Reserve, may be needed to serve urban development of the Stafford Urban Reserve while avoiding negative impacts to service to areas already inside the UGB.

d. Estimated water service-related costs for reserve development

Water piping, pumping, and storage costs	Cost
10-inch pipe	$0
12-inch pipe	$0
16-inch pipe	$35.5
Pumping	$0
Storage	$1.24 million
Total:	**$36.74 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$1,960**

Sanitary Sewer Services

With regard to sanitary sewer services, the Stafford Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

The City of Lake Oswego provides service to the adjacent areas inside the UGB to the north and west of the Stafford Urban Reserve, while the City of West Linn provides water service to the adjacent areas inside the UGB to the east of the reserve.

The cities send their sewer in different directions. Lake Oswego sends sewer to the City of Portland's facility at the Tryon Creek Wastewater Treatment Plant; there are no known major deficiencies with the plant's capacity to serve existing development already in the UGB. Based on topography, connection points to the City of Lake Oswego infrastructure would be in SW Childs Road in the Canal Basin and SW Stafford Road in the South Shore Basin. Lake Oswego's Wastewater Master Plan, as amended in 2020, identifies several deficiencies for the 25-year storm event under existing conditions; these deficiencies are all downstream of the likely points of connection, generally occur in large diameter trunk lines, and have associated improvement projects in the master plan to address them.

The serving West Linn is provided by the Tri-City Service District made up of West Linn, Oregon City, and Gladstone and is managed by Clackamas Water Environment Services (WES). Improvements are planned at the treatment plant, which will provide sufficient capacity to meet current UGB needs. The gravity sewer line downstream of the Johnson Pump Station, a likely connection point for Stafford Urban Reserve to the West Linn System, has two identified deficiencies, including system capacity issues that may cause backwatering in the collection system under existing and buildout conditions.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Lake Oswego could potentially serve the reserve, but system upgrades and additions to facilities within the UGB may be necessary. Connection points to the system that might facilitate such service can be found at: Atherton Road near Stafford Road; Childs Road near SW 35th Court; and via the Bryant Road Pump Station at Bryant Road and Cardinal Drive. The City of West Linn has previously indicated that the wastewater treatment plant may need to be expanded in order to provide capacity for development in the Stafford Urban Reserve, and there is understood to be space for expansion at the treatment plant. An alternative to consider could be to construct a pre-treatment plant within the Stafford Urban Reserve itself. In addition, existing pump stations would likely require upgrades. Existing pipe capacities are not fully known and significant further analysis would be required to determine the extent of necessary trunk line upgrades. Trunk lines and pumps stations may need to be developed within the reserve itself. Considering topography, West Linn may be the logical provider of sewer services to the Stafford Urban Reserve, but sewer might need to flow through the Borland Urban Reserve to connect to the existing gravity line in Willamette Falls Drive; therefore, the Borland Urban Reserve may need to be added to the UGB and urbanized first.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

As explained above, treatment plant improvements and pumping and piping capacity improvements could be needed to avoid negative impacts to service within the existing UGB. Potential treatment plant improvement costs and other system-wide costs are not included in the below figures.

d. Estimated sanitary sewer service-related costs for reserve development

Sanitary sewer piping and pumping costs	Cost
10-inch pipe	$1.29 million
12-inch pipe	$13.58 million
15-inch pipe	$0
Pump station	$1.80 million
Force mains	$1.86 million
Total:	**$18.53 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$989**

Stormwater Management Services

With regard to stormwater management services, the Stafford Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

There is no indication of major capacity issues with existing stormwater facilities that serve the adjacent land inside the UGB. Based on topography, the majority of stormwater from development of the Stafford Urban Reserve would likely flow toward the Tualatin River and not need to connect to any existing infrastructure.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Stormwater will likely mostly be conveyed, treated, and disposed of within the reserve and discharge to the Tualatin River, rather than connecting to existing facilities in the UGB.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

As noted above, stormwater will likely mostly be conveyed, treated, and disposed of within the reserve and discharge to the Tualatin River, rather than connecting to existing facilities in the UGB. Therefore, no adverse impacts to existing facilities are anticipated.

d. Estimated stormwater service-related costs for reserve development

Stormwater piping and water quality/detention	Cost
18-inch pipe	$10.88 million
24-inch pipe	$0
30-inch pipe	$0
Water quality/dentition	$23.08 million
Total:	**$33.96 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$1,812**

Transportation Services

With regard to transportation services, the Stafford Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(e) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Figure 4.36 in Chapter 4 of the 2023 Regional Transportation Plan (RTP) displays 2020 home-based vehicle miles traveled (VMT) per capita by Metro transportation analysis zone, with average VMT per capita considered 11.32. According to Figure 4.36, areas in the UGB adjacent to and near the Stafford Urban Reserve had above average and significantly above average home-based VMT per capita in 2020.

Metro's adopted 2040 Growth Concept Map designates a town center in the adjoining cities of Lake Oswego and West Linn. Town centers are meant to: serve populations of tens of thousands of people; offer more locally-focused retail uses and public amenities; and be well served by transit.

The 2040 Growth Concept Map's Lake Oswego Town Center includes Downtown Lake Oswego. The town center is approximately one mile from those areas in the UGB adjacent to the reserve. The town center includes multiple grocery stores, other retail commercial uses, school uses, child services, multifamily housing, and recreational uses. Growth in and near the town center will not necessarily cause a significant increase in home-based VMT per capita in the future, as area residents will be able to access some daily needs with relatively short trips.

Five TriMet bus routes serve Lake Oswego along the major roadways of the city, including Country Club Road, Boones Ferry Road, Kruse Way, Highway 43, and South Shore Boulevard. These bus routes connect the Lake Oswego Town Center to transit centers and downtown Portland. Figure 4.3 in Chapter 4 of the 2023 RTP shows gaps in the planned frequent service regional transit network along Highway 43, Iron Mountain Road, and McVey Avenue.

Lake Oswego has more than 10 miles of dedicated bike lanes and seven miles of established bikeways, though not all connect to other bike facilities which results in gaps in the system. While there are dedicated bike facilities along Country Club Road and a section of Highway 43 in the south of the city, the town center is generally not well served by bike facilities and Figure 4.5 in Chapter 4 of the 2023 RTP shows gaps in the planned regional bike network on Iron Mountain Road, South Shore Boulevard, SW Boones Ferry Road, and Highway 43 in the north of the city.

A significant portion of Lake Oswego's roads do not have sidewalks, including those in many residential areas in the UGB nearer to the reserve. There are sidewalks in the town center, as well as along a major portion of SW Boones Ferry Road. Figure 4.4 in Chapter 4 of the 2023 RTP shows gaps in the planned regional pedestrian network along McVey Avenue and South Shore Boulevard in the south of the city. The Kruse Way Trail, the Stafford Trail, and the William Stafford Pathway along the Willamette River provide some longer pedestrian connections, however.

West Linn's Willamette Town Center, which includes the Willamette Historic District, aligns with the 2040 Growth Concept Map as well. This town center area is approximately one mile from the east end of the reserve, and includes local retail commercial uses, medical facilities, school uses, police and fire stations, and some residential uses. Additionally, within a quarter mile of the reserve's east end is a grocery store, other retail commercial uses, banks, school uses, places of worship, a community center, medical services, multifamily housing, parks, and the West Linn City Hall. Growth in and near the town center and areas in the UGB near the reserve will not

necessarily cause a significant increase in home-based VMT per capita in the future, as area residents will be able to access some daily needs with relatively short trips.

Two TriMet bus lines serve West Linn, including Route 35, which runs along Willamette Drive, and Route 154, which runs along Willamette Falls Drive. They provide transit service to the Willamette Town Center and other portions of West Linn. Figure 4.3 in Chapter 4 of the 2023 RTP shows these existing routes as in the regional transportation network. There are currently no TriMet bus stops in the UGB within a mile of the reserve.

There are more than nine miles of dedicated bike lanes and five miles of bikeways in West Linn, including on portions of Blankenship Road and Willamette Falls Drive that help connect western ends of West Linn to the Willamette Town Center. Parker Road Rosemont Road, Salamo Road, and Santa Anita Drive, which are in the UGB near the reserve, all have dedicated bike lanes. Figure 4.5 in Chapter 4 of the 2023 RTP shows some existing bike facilities in West Linn, including those along Salamo Road, as in the regional bike network. However, there are gaps in the planned regional bike network in the city, such as along Willamette Falls Drive.

Large portions of West Linn are well served by sidewalks, especially in areas that have been developed more recently. There are sidewalks on the SW Borland Road bridge over the Tualatin River that join sidewalks on Brandon Plance and Dollar Street in the UGB that connect with the Fields Bridge Park, Athey Creek Middle School, and, eventually, the Willamette Town Center. The Willamette Falls Drive Streetscape Project improved pedestrian accessibility in the historic Willamette neighborhood. The Rosemont and Salamo Trails provide pedestrian connection routes along Rosemont Road and Salamo Road and that tie the lower and upper portions of West Linn together on the west side. There are also sidewalks along Bay Meadows Drive, Furlong Drive, Hidden Springs Road, Hoodview Avenue, Noble Lane, and Santa Anita Drive in the UGB near the reserve connecting to schools, commercial and civic uses, residential areas, and parks. Figure 4.4 in Chapter 4 of the 2023 RTP shows that there are some gaps in the planned regional pedestrian network in West Linn.

There are no high injury corridors or high injury intersections in wither Lake Oswego's or West Linn's portions of the UGB identified on Figure 4.14 in Chapter 4 of the 2023 RTP.

The section of I-205 that crosses through the UGB near the reserve is identified as a throughway in Chapter 4, Figure 4.7 of the 2023 RTP. Figure 4.8 of the chapter indicates that the interstate section currently meets travel speed reliability performance thresholds, with no more than four hours per day when travel speeds fall below the identified minimum speed. RTP models indicate this reliability will continue at least to the year 2045.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The SW Stafford Road interchange with I-205 is less than a mile from the reserve to the southwest, on the other side of the Tualatin River. There is also an interchange at 10th Street, nearly two miles away via Salamo Road. The section of I-205 near the reserve connecting Tualatin and West Linn is expected to continue to meet RTP travel speed reliability performance thresholds at least to the year 2045.

The Lake Oswego Town Center is roughly a mile from the north end of the reserve. There is a grocery store on McVey Avenue that is closer to the north end of the reserve, but few other commercial uses in this area to mee the daily needs of future residents of the reserve's north. The areas of the UGB to the north and west of the reserve are generally characterized by low density residential development with incomplete sidewalks and no bike facilities. The Stafford Trail and marked crosswalks on SW Stafford Road at Atheron Drive do provide some pedestrian connections to the west of the reserve and there are about a quarter mile of designated bike facilities on SW Stafford Road leading to the other side of the Tualatin River.

The Willamette Town Center is just over a mile from the east end of the reserve but, as noted above, there are closer areas with commercial uses, civic and school uses, medical service, parks, and places of worship where future residents of the reserve's east end could access daily needs without traveling a long distance (i.e., without increasing home-based VMT per capita). Indeed, Trillium Creek Primary School, Rosemont Ridge Middle School, and the West Linn Adult Community Center are within a quarter mile of the reserve's east end. As detailed below, these uses are already connected to the reserve by designated bike facilities and sidewalks, which reduces the need for future residents of the reserve's east to rely on private motor vehicle transportation to access them.

There is currently no transit service near to the reserve and the vast majority of the reserve is two or three miles from a bus route. There is a bus stop on Willamette Drive, about 1.5 miles away from the east edge of the reserve via Santa Anita Drive and Pimlico Drive. TriMet Route 36, which runs along South Shore Boulevard in Lake Oswego, is approximately one mile from the north of the reserve via SW Stafford Road. However, as explained below, TriMet has plans to provide hourly service along Rosemont Road sometime in the future.

In the meantime, there are dedicated bike facilities on Rosemont Road and Salamo Road adjacent to the reserve's east. These roads, as well as almost all of the nearby neighborhood streets, also have sidewalks and the Rosemont Trail along Rosemont Road provides access to the east end of the reserve. Past the nearby neighborhoods, there are some gaps in sidewalks or pedestrian facilities along the major streets that limits pedestrian movement.

As explained in response to Factor 1, the reserve is unlikely to efficiently accommodate employment uses. Therefore, without robust transit service, and considering the lack of existing commercial uses and bike and pedestrian facilities near to the reserve's west and north, future residents of the reserve are likely to be reliant on private motor vehicle traffic to meet their daily needs.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Hidden Springs Road, Parker Road, Rosemont Road, Salamo Road, Santa Anita Drive, SW Bergis Road, SW Johnson Road, SW Stafford Road, and SW Sweetbriar Road would see additional private motor vehicle traffic as a result of urbanization of the reserve. The existing bike and pedestrian facilities adjacent to the east end of the reserve, future transit service along Rosemont Road, and the close proximity of schools, civic and commercial uses, medical facilities, parks, and places of worship could help to minimize that additional roadway traffic on some roadways but, as noted above, future residents of the reserve are likely to be reliant on private motor vehicle traffic to meet their daily needs. Nonetheless, because future residents of the reserve would be able to use roadways other than I-205 to access these uses/services, development of the relatively small reserve is not expected to cause I-205 to no longer meet throughway reliability thresholds.

d. Need for major transportation facility improvements and associated costs

To serve urban development, the following will likely need to be improved to urban arterial standards, including with acquisition of additional right-of-way: a 1.28-mile section of SW Stafford Road; a 2.14-mile section S Rosemont Road; a 0.37-mile section of SW Johnson Road; a 0.36-mile section of SE Long Farm Road; a 0.36-mile section of S Sunshine Lane; and a 0.34-mile section of S Station Lane. Of the S Rosemont Road section improvements, approximately 0.28 miles are considered half-street improvements for the purposes of this analysis, as the other half of the roadway section is inside the UGB. One new 0.14-mile arterial is assumed to be needed to connect SW Long Farm Road to S Sunshine Lane. The following will likely need to be improved to urban collector standards, including with acquisition of additional right-of-way: a 0.66-mile section of S Bergis Road; a 0.41-mile section of S Whitten Road; a 1.83-mile section of S Sweetbriar Road; a 0.7-mile section of S Clematis Road; a 1.25-mile section of S Wisteria Road; and a 2.31-mile section of SW Johnson Road. Two new collectors are expected to be needed, one 0.85-mile collector between SW Johnson Road and S Sweetbriar Road and a 0.44-mile collector between S Whitten Lane and S Bergis Road. Some of these new and improved roadways will need to traverse areas of steeper topography and water bodies, leading to higher-than-normal per-mile costs.

Facilities	Cost
Arterials, existing/improved full street	$283.71 million
Arterials, existing/improved half street	$8.59 million
Arterials, new	$12.26 million
Collectors, existing/improved full street	$268.26 million
Collectors, existing/improved half street	$0
Collectors, new	$58.28 million
Total:	**$631.10 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$33,673**

e. Provision of public transit service

TriMet evaluated the reserve for providing transit service. TriMet could provide services to the reserve, although there is no guarantee of service; actual service will depend on the level of development in, and in the corridors leading to, the reserve. Future service is proposed in TriMet's 2045 Network Vision and would bring service through the northern portion of the reserve along Rosemont Road. Service could be provided at 60-minute headways for all day service, five days per week.

Prior to land being included in the UGB, a more detailed concept plan, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11, will be required. This concept plan process will develop more refined public facility and service needs and cost estimates.

Factor 3: Comparative environmental, social, energy, and economic consequences

Environmental consequences

There are seven stream corridors that flow south through the Stafford Urban Reserve and ultimately drain into the Tualatin River.

One stream flows along the western edge of the reserve for 1,370 feet through five rural residential properties. The stream includes a wooded riparian canopy with slopes greater than 25 percent and there is riparian and some upland habitat identified along the stream corridor. The portion of the reserve where this stream joins the Tualatin River is within the "100-year" floodplain. The increased protection levels for streams, wetlands, steep slopes, and habitat areas for areas added to the UGB will help to limit potential impacts from urbanization. Considering the relatively small size of tax lots in this area, and the fact that they abut existing residences in Lake Oswego and thereby will be less likely to have new urban road connections with development of the reserve, any impacts on the stream corridor and habitat areas in this area from reserve development could be comparatively minor.

Pecan Creek flows through the western portion of the reserve as well, for 1.2 miles west of SW Stafford Road and SW Pattulo Way. Over 3,000 feet of the creek flows through land

either owned by Metro and committed as open space, by the City of Lake Oswego for use as park land, or by Portland General Electric; these lands are unlikely to be developed with urban uses that could significantly impact the natural environment. Other lengths of the creek flow along the back edges of rural residential tax lots that are generally wooded. A significant portion of lower Pecan Creek is adjacent to steep slopes and there is riparian and upland habitat identified along the stream corridor. The area where Pecan Creek joins the Tualatin River is within the "100-year" floodplain. There are two tributaries to Pecan Creek, totaling 3,600 feet in length, that primarily flow along the wooded edges of residential tax lots as well. The western tributary runs mainly through an area where the slopes are greater than 25 percent and that topography reduces opportunities for development. In addition, an 850-foot portion of the northern tributary runs through land owned by the City of Lake Oswego. The two tributaries also have adjacent riparian and upland habitat identified along the corridors. Considering the increased protection levels for streams, steep slopes, and habitat areas in areas added to the UGB, and the fact that significant portions of the streams are on publicly owned land that is unlikely to see significant amounts of urban development, impacts to Pecan Creek and its tributaries from future urbanization of the reserve would be minor.

A small stream flows south through the Shadow Wood Park neighborhood on the east side of SW Stafford Road for approximately 2,900 feet. A significant portion of the stream flows through Clackamas County owned land, Shadow Park Homeowners Association land, or platted street right-of-way that is not constructed. This stream corridor also contains slopes greater than 25 percent, where development is unlikely. The northern portion of the stream is within a very large tax lot that could very well be developed in the future and would be susceptible to impacts from that urbanization. There is riparian and upland habitat identified along the stream corridor and "100-year" floodplain where the stream meets the Tualatin River. Nonetheless, when again considering the increased protection levels for streams, steep slopes, and habitat areas inside the UGB, as well as public and homeowners association ownership of certain lands, urbanization in this area can occur without major impacts to this stream, except for that length north of SW Johnson Road, which could see moderate impacts, depending on the design of the future urban development.

Wilson Creek flows south through the central portion of the reserve for approximately 2.3 miles before draining into the Tualatin River. A 0.88-acre wetland identified on the National Wetland Inventory (NWI) is located at the headwaters of the stream and "100-year" floodplain is identified where the stream meets the Tualatin River. Almost the entire length of the stream flows through forested portions of tax lots that either contain rural residences or are vacant. Approximately 4,520 feet of Wilson Creek is on land owned by the City of Lake Oswego or Metro or is private open space land. There are slopes greater than 25 percent along the stream corridor, mostly occurring on the Metro or private open space land. The entire length of the Wilson Creek corridor has been identified as riparian habitat with numerous locations of upland habitat also identified. In several locations, the stream is located such that urbanization of the area would not impact the stream corridor; however, there are a few large vacant tax lots where impacts could occur if the area was developed to

urban densities and standard transportation connections are made. There are five tributaries to Wilson Creek that range in length from 1,200 feet to just over one mile and total 3.1 miles in length. A 0.35-acre wetland identified on the NWI is located along one stream and numerous ponds not identified as wetlands are also present. The smallest tributary is located on private open space and a portion of another tributary is on Metro-owned land. About half of the stream corridors flow through forested areas with the remaining half in open fields. Riparian habitat is identified along the stream corridors with some upland habitat identified in areas that are forested. There are significant stretches where the streams could be impacted by future development, though the extent of the impact will depend on the need for transportation connections to serve future urban development. Considering the increased protection levels for streams and habitat areas on land inside the UGB, public ownership of lands in the area, and the private open space land, there will be some protections from impacts of urbanization on the stream corridors. However, as Wilson Creek runs lengthwise through the center of the reserve and its tributaries spread out mainly to the east through some large vacant and developable tax lots, the opportunity for impacts to the stream and habitat areas from urbanization, especially through needed transportation connections, is significant.

Another stream flows south from the S Sweetbriar Road area for approximately 1.3 miles before draining into the Tualatin River near where I-205 crosses the river. About 2,500 feet of the stream flows through private open space land, with the remaining portion flowing along forested sections of rural residential tax lots. There are slopes greater than 25 percent along a significant length of the stream and riparian and upland habitat is identified along the entire length of the stream. Under these conditions, and again considering the increased protection level for streams, habitat areas, and steep slopes for land inside the UGB, urbanization could occur with minimal impacts to the stream corridor.

The sixth stream flows south from the S Clematis Road area for approximately 1.3 miles before draining into the Tualatin River near SW Johnson Road. The stream flows between S Grapevine Road and S Wisteria Road, along the back edges of the rural residential tax lots that front onto the two roads. A significant portion of the stream is within a forested ravine and riparian and upland habitat is identified along its entire length. A small second stream that flows from the I-205 area appears to meet this stream at the Tualatin River. This stream is piped in some locations and has four wetlands identified on the NWI that are located in the general area. In addition, there is a considerable area of “100-year” floodplain where the streams meet the Tualatin River. Given the location of the stream between the tax lots described above, the presence of steep slopes, and the increased protection level for riparian and upland habitat, wetlands, and floodplain inside the UGB, urbanization could occur with minimal impacts to the stream corridors.

Finally, the seventh stream flows south from the S Brandywine Drive area for just over one mile before flowing into the City of West Linn and draining into the Tualatin River. Roughly half of the stream flows through vacant forested tax lots that have some large areas of slopes greater than 25 percent. The remainder of the stream is located on the back portion

of rural residential properties. Similar to the other streams mentioned above, there is riparian and upland habitat identified along the stream corridor. The steep slopes and habitat areas on the vacant tax lots will limit the amount of development that can occur, thereby reducing the impacts of urbanization on the stream and habitat areas. In addition, the rural residential properties contain high value homes that will also deter future redevelopment of those properties further reducing opportunities for urbanization to no impact this stream corridor.

This analysis finds that urbanization of the reserve could occur with moderate or high impacts to the streams, wetlands, and habitat areas, depending on the overall design of the development and, most importantly, on future road connections.

Considering the comparative environmental consequences of urbanization, the Stafford Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Social, energy, and economic consequences

It is expected that urbanization of the Stafford Urban Reserve would, over time, result in new housing replacing some existing rural residences, which could contribute to a loss of sense of place. However, given the amount of existing rural development, including a large number of high-value homes, and levels of parcelization, urbanization of more developed areas will be slow and piecemeal. Other lands in the reserve are in public ownership or constrained by steep slopes, stream corridors, and habitat areas; these dynamics can act to limit and also isolate new urban development. More immediately developable areas are closer to the current UGB and existing development, where urbanization may have less of a dramatic effect on sense of place character of the area. Large and relatively flat agricultural lands may be able to accommodate more significant urban development that could degrade the rural lifestyle for nearby residents.

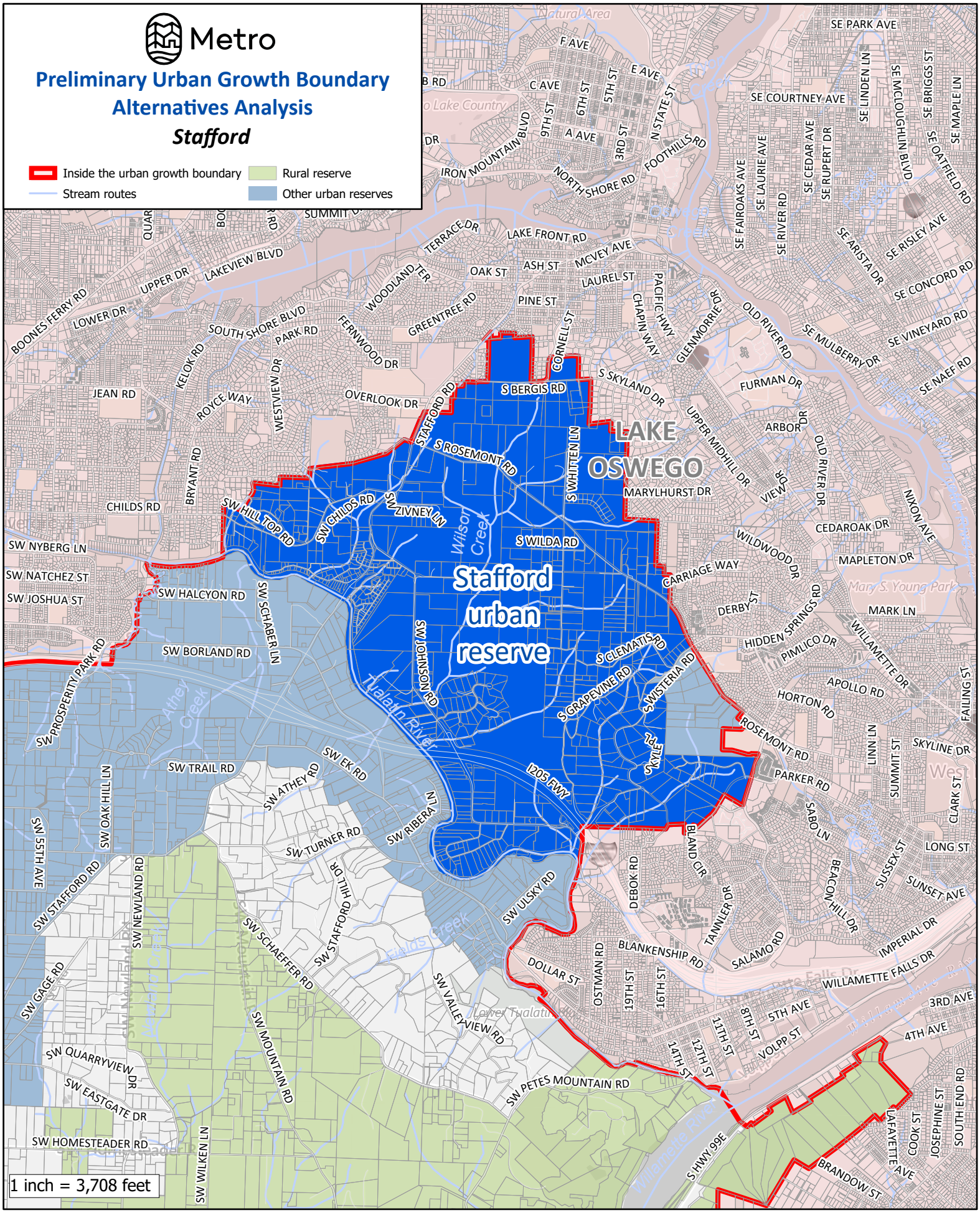
As detailed more fully in response to Factor 2, future residents of the reserve are expected to be particularly reliant on private motor vehicle transportation, which could have some adverse energy consequences.

There are large tracts of agricultural land in the reserve, particularly along SW Johnson Road and Rosemont Road and east of SW Stafford Road. Much of these lands are for field crops and pastureland, though there are some large vineyards and nursery operations. The City of Lake Oswego owns Luscher Farm and operates it as a park; this property, while in agricultural use, is not likely to urbanize. There would be adverse economic consequences from loss in farming activity with urbanization of the other agricultural lands, though these losses may be outweighed by the economic benefits of urban development.

This analysis finds that there would be comparatively moderate social, energy, and economic consequences from urbanization of this reserve. The Stafford Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Factor 4: Compatibility of the proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

There are no locations where lands outside the UGB but contiguous with the Stafford Urban Reserve have Goal 3 or 4 resource land zoning for agricultural or forest activities. Therefore, the proposed urban uses are considered to have high compatibility with the nearby agricultural and forest activities occurring on farm and forest land. The Stafford Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location factor.



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Metro

Preliminary Urban Growth Boundary Alternatives Analysis

Stafford

Inside the urban growth boundary
Urban reserve boundary
Stream routes
Arterial streets

1 inch = 3,625 feet

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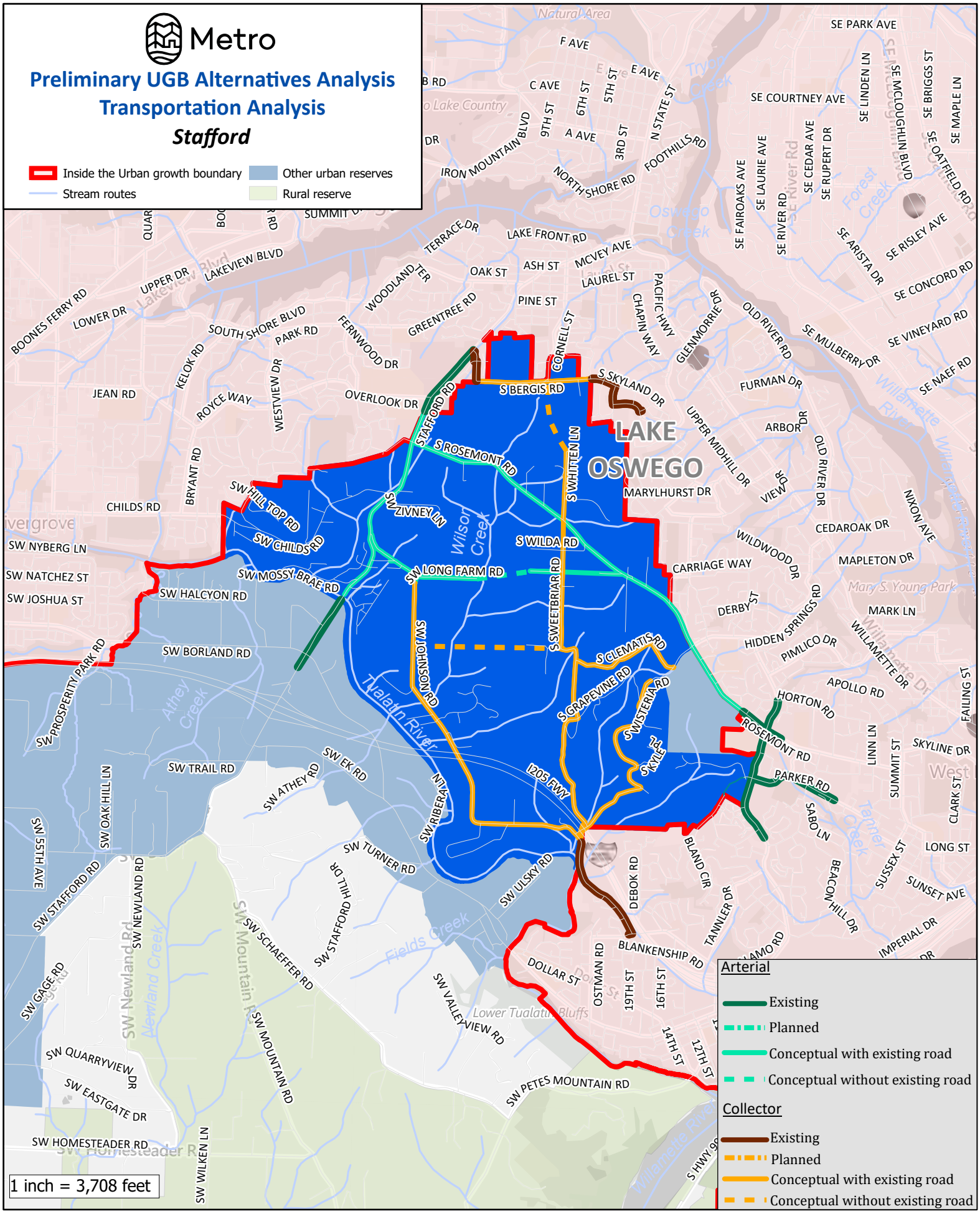

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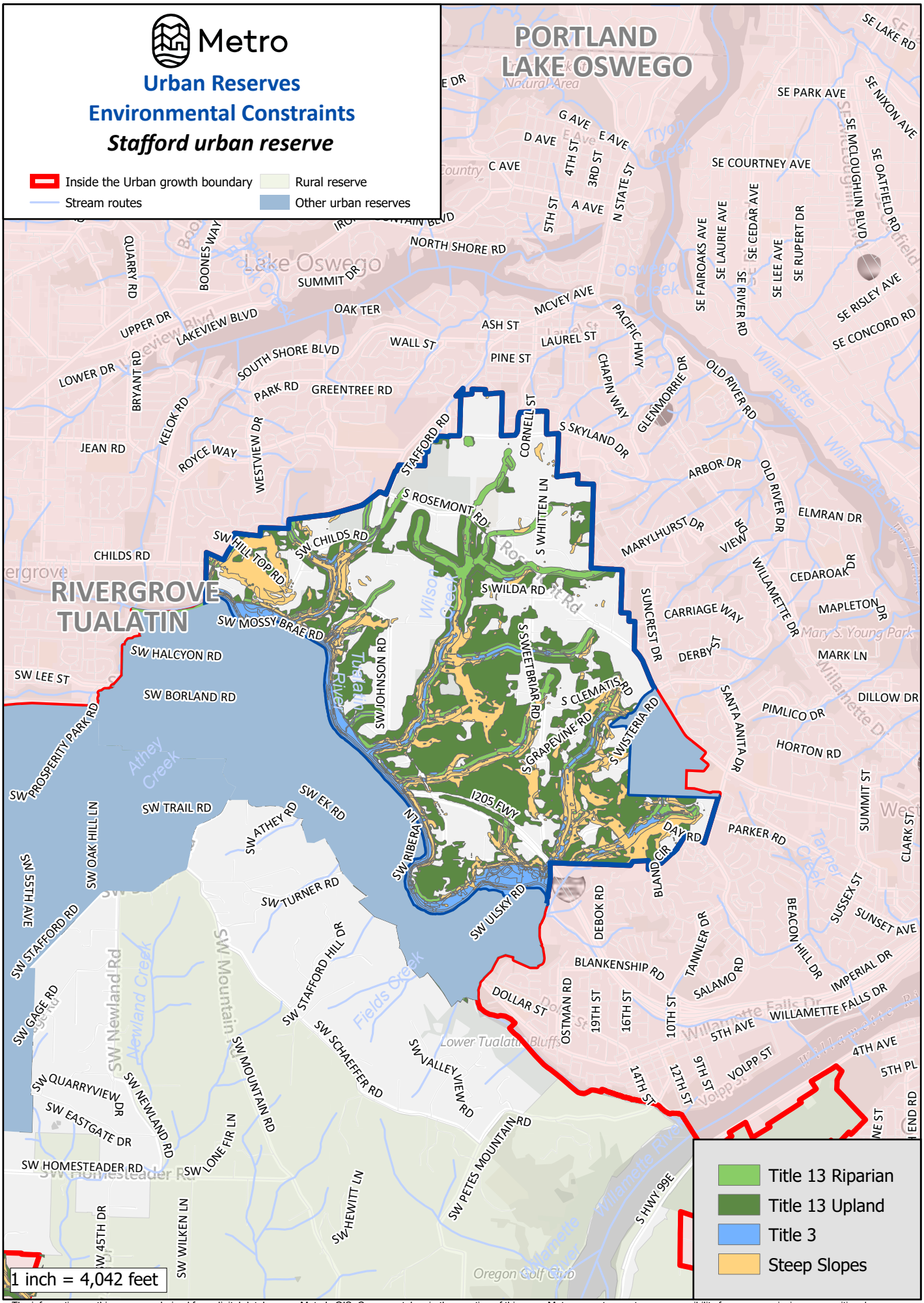

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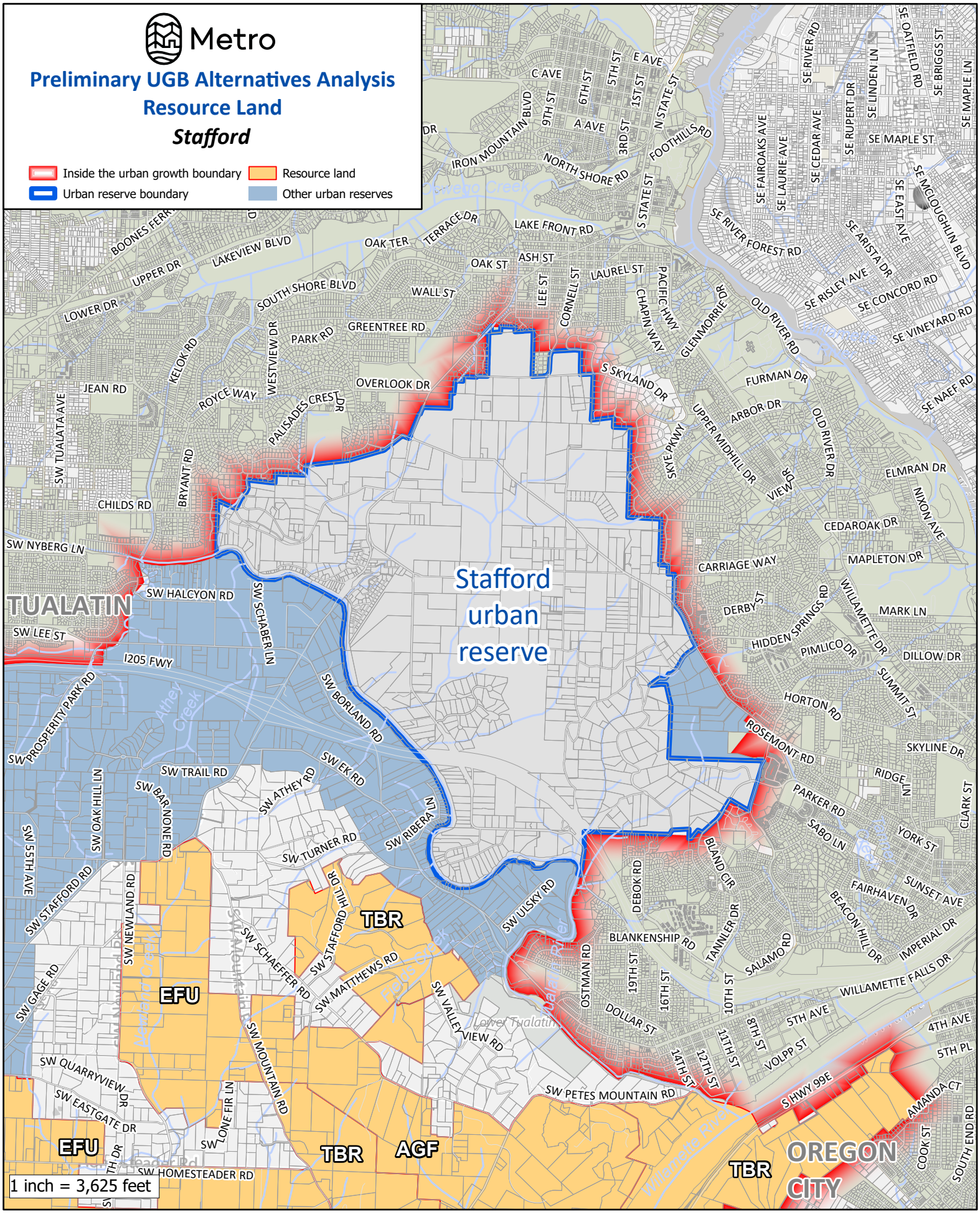

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TONQUIN URBAN RESERVE

Total Reserve Area	572 acres
Total Tax Lot Area in Reserve (without Right-of-Way)	560 acres
Gross Vacant Buildable Area	168 acres
Net Vacant Buildable Area	**125 acres**

The Tonquin Urban Reserve is adjacent to the east side of the City of Sherwood, and about a quarter mile from the city limits of Tualatin and Wilsonville. The UGB generally forms the northern, western, and eastern edge of the reserve, with undesignated and rural reserve lands to the south. SW Tonquin Road runs from the reserve's northwest corner to its east and divides the reserve in to two roughly equal areas. On the west side of the road, Rock Creek flows from the south of the reserve to the northwest on its way to the Tualatin River.

GOAL 14 BOUNDARY LOCATION FACTORS

Factor 1: Efficient accommodation of identified land needs

The Tonquin Urban Reserve is comprised of 31 contiguous tax lots, all but three of which are entirely within the reserve. Of those tax lots entirely within the reserve, only five are less than two acres each, 19 are greater than five acres each, eight are larger than 20 acres each, and one is more than 160 acres. The three tax lots only partially within the reserve have area within the reserve ranging from less than one acre to nearly 60 acres. The combined tax lot area within the reserve is approximately 560 acres. As noted above, the entire reserve contains 168 gross vacant buildable acres and 126 net vacant buildable acres.

Significant portions of the reserve are occupied by quarry sites. A firearm training facility, a gun club shooting range, a 19-acre fire department facility, and a kennel also occupy sizeable portions of the other lands in the reserve. The federal government owns more than 60 acres in the reserve, which are part of the Rock Creek Unit of the Tualatin River National Wildlife Refuge, and Metro owns a 3,500-square-foot tax lot in the reserve that serves as an access to the adjacent North Coffee Lake Creek Wetlands area. Aerial imagery suggests there are few rural residences in the south end of the reserve. Overall, 12 of the tax lots that are wholly or partially in the reserve have assessed improvements, with the median assessed value of those tax lots' improvements exceeding $250,000.

The west side of the reserve neighbors existing and developing urban low density residential development, with an urban local street, SW McKinley Drive, stubbing to this west side. The north end and east side of the reserve neighbor existing and developing industrial uses, powerlines, and quarry sites.

Hawks View Elementary School, St Francis Catholic School, and commercial retail uses in the Sherwood Town Center are all within two miles of the north end of the reserve via SW Tonquin Rd, SW Oregon St, and SW Sherwood Boulevard.

An interchange with I-5 is approximately two miles from the south end of the reserve via SW Tonquin Rd, Basalt Creek Parkway, SW Day Road, and SW Elligsen Road. Highway 99W is also about two miles away from the north end of the reserve via SW Tonquin Road, SW Oregon Street, SW Langer Farms Parkway, and SW Tualatin-Sherwood Road. TriMet Route 97 has bus stops about 1.5 miles to the north of the reserve on SW Tualatin Sherwood Road.

The existing land uses and ownership patterns of the reserve constrain its ability to efficiently accommodate new urban land needs. As noted above, a significant portion of the area is currently being used for quarry operations and once a quarry is no longer being mined, a reclamation plan must be implemented. Thus, any re-use of the quarry areas will be well in the future, possibly even beyond the 20-year timeframe for this analysis. The area also contains a large amount of natural resources that greatly reduce the ability to accommodate a significant amount of residential or employment land need. The Ice Age Tonquin Trail is planned to bisect the area diagonally connecting Sherwood with both Tualatin and Wilsonville.

Nonetheless, the reserve has a few sizable undeveloped tax lots, is near to both existing residential and employment land uses, schools, and commercial uses, and is within relatively close proximity to two highways (I-5 and Highway 99W). This reserve is considered able accommodate a very limited amount of residential and employment land needs.

Factor 2: Orderly and economic provision of public facilities and services

Water Services

With regard to water services, the Tonquin Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Adjacent lands inside the UGB are provided with water service by the City of Sherwood. Sherwood obtains the majority of its water supply from the Willamette River Water Treatment Plant (WRWTP) in the City of Wilsonville, with the remainder coming from four groundwater wells in city limits. Sherwood also maintains an emergency connection and transmission piping to a supply main serving Tualatin from Portland. Sherwood's water distribution system includes three service zones served by three storage reservoirs and two pumping stations. The majority of Sherwood customers are served from the 380 Pressure Zone, which is supplied by gravity from the city's Sunset Reservoirs. The 535 Pressure Zone serves the area around the Sunset Reservoirs, supplied with constant pressure by the Sunset Pump Station, while the 455 Pressure Zone serves higher elevation customers on the city's western edge by gravity from the Kruger Reservoir. The Tonquin Urban Reserve would likely become part of the 380 Pressure Zone.

Supply, storage, pumping, and distribution piping are considered sufficient to meet maximum daily demand of current development within the city's portion of the UGB;

however, according to the city's 2015 Water System Master Plan, additional supply and storage capacity may be needed for full buildout. Efforts, including capital improvement projects, are planned to increase treatment plant capacity to satisfy buildout demand. No pump stations are currently needed to serve the 380 Pressure Zone. Very few distribution deficiencies are identified in the Master Plan for either existing or buildout maximum daily demand (MDD) conditions and no additional deficiencies are identified in the Plan under peak hour demand conditions.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Full buildout of the existing UGB and development of Tonquin Urban Reserve could warrant the planned treatment plant improvements in order for the reserve to be provided with adequate water service. Additional storage capacity is also likely needed. There is currently no water main connected to the reserve, so one will need to be extended to it, likely through the adjacent, but as yet underdeveloped, Tonquin Employment Area (TEA). Potential treatment system improvement costs, water main extension costs, and the full costs of new storage facilities also serving areas already inside the UGB are unknown and not included in the below figures. However, given the size of the Tonquin Urban Reserve, they are presumed to be significant. The city's 2015 Water System Master Plan does not address urban water service to this reserve.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

As noted above, additional treatment plant and storage capacity may be needed to serve full buildout of the UGB as well as new development in the Tonquin Urban Reserve, while avoiding adverse impacts to existing facilities in areas already inside the UGB.

d. Estimated water service-related costs for reserve development

Water piping, pumping, and storage costs	Cost
10-inch pipe	$5.29 million
12-inch pipe	$0
16-inch pipe	$0
Pumping	$0
Storage	$0.16 million
Total:	**$5.45 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$2,174**

Sanitary Sewer Services

With regard to sanitary sewer services, the Tonquin Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

The City of Sherwood and Clean Water Services (CWS) together provide sanitary sewer services in adjacent areas already in the UGB. Two CWS sanitary sewer trunk lines connect to the local, city-maintained components of the system, including the 24-inch "Sherwood Trunk", which conveys sewage from the Cedar Creek sewage collection basin, and the 18-inch "Rock Creek Trunk", which conveys sewage from the Rock Creek sewage collection basin, to a CWS-owned pump station. Sewage is then directed to the Durham Advanced Wastewater Treatment Plant via the Upper Tualatin Interceptor, also owned by CWS.

The City of Sherwood updated its Sanitary Sewer Master Plan in 2016. The Master Plan includes areas within the City of Sherwood city limits, as well as the TEA and the Brookman Addition, which are within the UGB. The Master Plan indicates that there is sufficient conveyance, pump station, and treatment plant capacity for existing development in areas already inside the UGB. However, at full buildout of the UGB, there may be deficiencies with the Sherwood and Rock Creek Trunk Lines, the Sherwood Pump Station, and the Upper Tualatin Interceptor. The city and CWS both have capital improvement projects planned to address these capacity issues. Responsibility for upsizing the Sherwood and Rock Creek Trunk Lines may be shared between city and CWS.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The city's 2016 Sanitary Sewer Master Plan does not plan for urban development of the Tonquin Urban Reserve, so information on the existing system's capacity to serve the reserve is limited. However, given the size of the reserve, it is possible that the existing treatment plant would be insufficient to serve both full buildout of the current UGB and development of the reserve. Trunk line and pumping capacity are also likely insufficient. Currently, sewer service does not extend to the reserve, and a sewer line would need to be constructed through the TEA inside the UGB to serve the reserve's development. New lines will also need to be extended throughout the reserve. Costs associated with increasing the capacity of the treatment plant, as well as sewer lines and pumping systems outside the reserve, to levels necessary to serve both full buildout of the current UGB and the reserve are unknown and are not included in the below figures. However, those costs are likely to be significant.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

The treatment system, sewer line, and pumping system improvements noted above are likely needed in order to avoid adverse impacts to service to areas already inside the UGB.

d. Estimated sanitary sewer service-related costs for reserve development

Sanitary sewer piping and pumping costs	Cost
10-inch pipe	$7.65 million
12-inch pipe	$0
15-inch pipe	$0
Pump station	$0.54 million
Force mains	$1.55 million
Total:	**$9.74 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$3,885**

Stormwater Management Services

With regard to stormwater management services, the Tonquin Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

The City of Sherwood's 2016 Stormwater Master Plan states that, overall, the existing stormwater network for areas inside the UGB is in good condition, though there are some isolated deficiencies. There is no indication of significant challenges with existing stormwater management facilities being able to serve existing development specifically in areas of the UGB adjacent to the reserve.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Based on topography, stormwater from development of the reserve could likely outfall directly to Rock Creek and its tributaries. Per CWS and City of Sherwood stormwater standards for new development, water quality and quantity should be provided on private property before outfalling to these water bodies; therefore, the existing facilities would not be impacted by the development of the reserve.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

As noted above, stormwater related to new development in the reserve could likely outfall directly to Rock Creek and its tributaries, without connecting to other existing stormwater infrastructure. Therefore, no adverse impacts to existing facilities serving areas already inside the UGB are anticipated. It is also expected that stormwater will be treated and detained onsite, thereby limiting impacts to these water bodies.

d. Estimated stormwater service-related costs for reserve development

Stormwater piping and water quality/detention	Cost
18-inch pipe	$1.16 million
24-inch pipe	$1.66 million
30-inch pipe	$0
Water quality/dentition	$4.23 million
Total:	**$7.05 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$2,812**

Transportation Services

With regard to transportation services, the Tonquin Urban Reserve is given a "low" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(e) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Figure 4.36 in Chapter 4 of the 2023 Regional Transportation Plan (RTP) displays 2020 home-based VMT per capita by Metro transportation analysis zone, with average VMT considered 11.32. According to Figure 4.36 in Chapter 4, areas in the UGB adjacent to the Tonquin Urban Reserve had average and above average home-based VMT per capita in 2020.

Metro's 2040 Growth Concept Map designates a town center in the adjoining City of Sherwood. Town centers are meant to: serve populations of tens of thousands of people; offer more locally-focused retail uses and public amenities; and be well served by transit. The Langer Drive Commercial District of the City of Sherwood's 2013 "Sherwood Town Center Plan" generally aligns with the geography of the town center area on the Growth Concept Map. The Langer Drive Commercial District is envisioned as a walkable and active shopping district complete with more pedestrian-oriented buildings. Metro's 2017 State of the Centers Atlas showed that, in the area of the Langer Drive Commercial District, there was a very high jobs-to-housing ratio and a very low number of dwelling units per acre compared to other town centers in the region. According to aerial imagery, much of the area is already built out with commercial retail uses, including a grocery store, restaurants, and medical/dental offices, though there are numerous parking lots that may be able to accommodate redevelopment. Near to the Langer Drive Commercial District is a police station, the Sherwood Ice Arena, and other public/quasi-public land uses, as well as some undeveloped and underdeveloped tax lots. Sherwood is served by TriMet Route 94, which runs along Highway 99W, and Route 97, which runs along SW Tualatin-Sherwood Road; both routes include stops at the town center. The town center plan, its existing land uses and transit service, and some availability for new

development in and near the town center demonstrate that growth in the current UGB will not necessarily cause a significant increase in home-based VMT per capita in the future. However, areas already in the UGB and adjacent to the Tonquin Urban Reserve are more than a mile from the town center.

As noted above, TriMet Routes 94 and 97 both serve areas already in the UGB in the adjacent City of Sherwood. Currently, however, those routes only connect to the northern and central portions of the city and not to the city's south and west. Figure 4.3 in Chapter 4 of the 2023 RTP also shows a gap in planned "frequent transit service" in Sherwood's portion of regional transit network.

Multiple TriMet bus routes and the Westside Express Service (WES) Commuter Rail also serve the nearby City of Tualatin. These routes are spread out along the major roadways, including Highway 99W, SW Tualatin-Sherwood Road, and SW Boones Ferry Road, providing service to the Tualatin Town Center and nearby employment and residential areas.

Sherwood has more than 10 miles of dedicated bike lanes and established bikeways, including along major roadways, that connect with some other bike-friendly streets, as well as residential and employment uses, schools, and the town center. However, there are gaps in bike facility connections to some of the residential areas south of the railroad. Figure 4.5 in Chapter 4 of the 2023 RTP identifies bike facilities along Highway 99W and SW Tualatin-Sherwood Road as in the regional on-street bike network and facilities in the central portion of the city as in the regional off-street bike network, though there is a short network gap along SW Tualatin-Sherwood Road west of the highway and other gaps in the west, east, and south of the city, including along SW Tonquin Road in the UGB near Tonquin Urban Reserve.

Tualatin has around 25 miles of dedicated bike lanes, seven miles of established bikeways, and local trails that connect the employment areas and Tualatin Town Center to the Tualatin's residential areas. There are two bike lane connections across I-5 to provide access to the eastern portion of the city.

Most developed neighborhoods in Sherwood, including its town center, have sidewalks. Figure 4.4 in Chapter 4 of the 2023 RTP identifies sidewalk facilities along SW Tualatin-Sherwood Road, SW Sunset Boulevard, and SW Main Street as in the planned regional on-street pedestrian network, though there are network gaps along Highway 99W in the north of Sherwood and along SW Tonquin Road in the UGB near Tonquin Urban Reserve.

Construction has commenced on a pedestrian bridge in Sherwood over Highway 99W that, when completed, will connect Sherwood High School with the YMCA and surrounding urban neighborhoods. Goals of the project include: reducing vehicle/pedestrian conflicts and exposure; minimizing out of direction travel for

pedestrians; and providing crossing opportunities that accommodate all pedestrians and bicyclists.

Most of the residential areas of nearby Tualatin have sidewalks, but there are fewer pedestrian connections in the city's employment areas. The Tualatin Town Center has a fairly well-established pedestrian network that includes access to some trails as well. The Tualatin River Greenway Trail, for example, connects the Town Center to parks in Durham and Tigard to the north as well as to Browns Ferry Park along the Tualatin River on the east side of I-5.

Figure 4.14 in Chapter 4 of the 2023 RTP identifies the SW Tualatin-Sherwood Road as a high injury corridor. The road, which is already inside the UGB, is less than a mile from the northern end of the Tonquin Urban Reserve. There are no other RTP-designated high injury corridors in Sherwood's or Tualatin's portions of the UGB. The intersection of SW Tualatin-Sherwood Road and SW Boones Ferry Road, as well as the intersection of SW Martinazzi Avenue and SW Boones Ferry Road, are within the UGB and approximately 3.5 miles from the reserve; both of these intersections are identified in Figure 4.14 of the RTP as top five percent high injury intersections.

Highway 99W is also already inside the UGB, bisecting the City of Sherwood. Highway 99W is identified as a throughway in Chapter 4's Figure 4.7 of the 2023 RTP. Figure 4.8 in Chapter 4 of the RTP indicates that it currently meets travel speed reliability performance thresholds, with no more than four hours per day when travel speeds fall below the identified minimum speed. RTP models indicate this reliability will continue at least to the year 2045.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The reserve is about two miles from Highway 99W. As noted above, Highway 99W, an RTP-designated throughway, currently meets travel speed reliability performance thresholds.

There is currently no transit service near to the reserve. The closest TriMet bus route is Route 97, which provides service between Sherwood and Tualatin during the morning and afternoon commute times along SW Tualatin-Sherwood Road. All other bus routes are over a mile away. The WES Commuter Rail tracks are only about a quarter of a mile away, but the closest station is about four miles away in Tualatin.

The closest bike facility is the dedicated bike lane on SW Oregon Street in Sherwood that is approximately one-third of a mile from the reserve via SW Tonquin Road. This bike lane is approximately half a mile long, running from the roundabout to just short of SW Tualatin-Sherwood Road. The bike lane doesn't yet provide a connection point to other dedicated bike facilities.

There are complete sidewalks on SW McKinley Drive, which stubs to the west side of the reserve. These sidewalks wind through residential areas before ultimately connecting to

the Town Center. There are also sidewalks along SW Oregon Street, approximately one-third of a mile away from the north end of the reserve. These sidewalks connect to the sidewalks along SW Tualatin-Sherwood Road to the north that extend towards the Town Center and employment areas. There is a one-third-mile gap in sidewalks to the south that leads to Sherwood's "Old Town".

There are no existing regional trails connected to the reserve.

Existing urban residential uses adjacent to the reserve could provide housing to future employees of the reserve, and nearby existing employment uses could provide employment opportunities to future residents of the reserve, helping to limit home-based VMT per capita. However, the existing nearby housing is relatively low in density and, as noted in response to Factor 1, the reserve is unlikely to provide significant residential development opportunities; therefore, future employees of the reserve may still mostly have to commute from further away.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

SW McKinley Dr, Basalt Creek Parkway, and SW 124th Avenue would be expected to see additional private vehicle traffic from development of the reserve. Indeed, the reserve is moderately distant from the Sherwood Town Center and currently lacks direct transit service to it. However, there are existing and developing bike and pedestrian facilities that provide connections to the town center, as well as to schools and recreational facilities. Additionally, as detailed in response to Factor 1, the reserve is considered able to accommodate a small amount of both residential and employment land uses, allowing for the possibility that its future residents of the reserve and nearby areas in the UGB could access at least some services and employment opportunities within the reserve itself. Nearby residences could provide housing to employees of the reserve, and new employment uses in the reserve could provide jobs for nearby residents. For these reasons, development of the reserve may result in only moderate impacts to home-based VMT per capita in nearby areas already inside the UGB and the performance of Highway 99W as a throughway. Any additional motor vehicle traffic on SW Tualatin-Sherwood Road resulting from development of the reserve, however, may exacerbate the road's high-crash conditions.

The dedicated bike lane on SW Oregon Street in Sherwood would be expected to see additional use; however, the one-third-mile gap on the portion of SW Tonquin Road that is already inside the UGB and the larger gap on SW Oregon Street would need to be addressed to reach maximum potential future use.

The sidewalks along SW Oregon Street would be expected to see additional use, though gap in SW Tonquin Road noted above would need to be addressed to make the important connection to "Old Town".

d. Need for major transportation facility improvements and associated costs

To serve urban development, approximately 1.32 miles SW Tonquin Road would likely need to be improved to urban arterial standards, including with acquisition of additional right-of-way. A 1.5-mile-long new collector would also need to be built to connect SW Dahlke Lane and the east side of the reserve to SW Tonquin Road. These new and improved roadways would need to traverse some areas of relatively steep topography as well as water bodies; therefore, some associated per-mile costs are higher than normal.

Facilities	Cost
Arterials, existing/improved full street	$97.01 million
Arterials, existing/improved half street	$0
Arterials, new	$0
Collectors, existing/improved full street	$0
Collectors, existing/improved half street	$0
Collectors, new	$52.78 million
Total:	**$149.79 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$59,773**

e. Provision of public transit service

TriMet evaluated the reserve for providing transit service and determined that an extension of conceptual routes would be the most effective way to serve future development in this area. TriMet could provide services to the reserve, although there is no guarantee of service. Actual service depends on the level of development in, and in the corridors leading to, the reserve. TriMet's 2045 Network Vision could reroute conceptual line W10 before terminating in Basalt Creek. This service could operate at 60-minute headways, with a capital cost of $2,000,000 – $3,000,000 for two additional zero-emission buses and an additional annual operating cost for the route extension at $1,216,800 and grows with inflation each year.

Prior to land being included in the UGB, a more detailed concept plan, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11, is required. This concept plan process will develop more refined public facility and service needs and cost estimates.

Factor 3: Comparative environmental, social, energy, and economic consequences

Environmental consequences

Rock Creek and a tributary flow north through the western portion of the Tonquin Urban Reserve for just over one mile. Approximately two-thirds of the stream corridor is on federal land that is part of the Tualatin River National Wildlife Refuge. The non-federal land that contains Rock Creek is, as of July 2020, included in the Refuge's Rock Creek Unit acquisition boundary, indicating a desire for the Refuge to purchase the land in the future. There are two National Wetland Inventory (NWI) wetlands associated with Rock Creek,

each approximately 11 acres in size, that are also on federal land. There is a significant amount of riparian and upland habitat associated with Rock Creek. Two additional NWI wetlands have been identified that total 1.4 acres in area. The riparian corridor and adjacent upland habitat on the Refuge land will not be impacted by urbanization of the reserve. However, urbanization of the land between the Refuge properties may impact the stream corridor resulting in negative effects downstream, unless the Refuge is successful in purchasing this land that is within the acquisition boundary.

Coffee Lake Creek flows south through the eastern portion of the reserve for approximately 1.5 miles. The northern portion of the stream flows through cleared land under powerlines and forested areas of sportsmen's club property, prior to draining into a pond associated with a quarry operation. An 8.9-acre NWI wetland is associated with this portion of the stream corridor. The remaining portion of the stream is manipulated by a series of quarry operations before leaving the reserve. Numerous NWI wetlands, totaling approximately 18 acres, are identified on the various quarry lands. As expected, there is no evidence of habitat on the quarry sites. It is not practically possible to assess the impacts urbanization may have on the stream and wetlands prior to the quarry reclamation plan being developed.

This analysis finds that urbanization of the reserve could occur with comparatively low to moderate impacts to the stream corridors, wetlands, and upland habitat areas, depending on the ability of the Wildlife Refuge to purchase additional land and the components of the reclamation plans for the individual quarry sites.

Considering the comparative environmental consequences of urbanization, the Tonquin Urban Reserve is given a "medium-high" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Social, energy, and economic consequences

There are only a handful of rural residences in the Tonquin Urban Reserve. Much of the reserve is instead dedicated to quarry operations, a private gun club, commercial dog kennels, and publicly owned natural areas. The reserve is nearly entirely surrounded by urban land uses, quarry operations, powerline easements, and a moderately-size vehicle dismantling and/or junk yard operation. Urbanization of this reserve is not expected to cause significant changes in the reserve residents' sense of place or in degradation of an existing rural lifestyle. Indeed, urbanization of the reserve could bring at least some new social, educational, and recreational opportunities for existing residents.

As detailed more fully in response to Factor 2, urbanization of the reserve is expected to result in, at most, moderate VMT, so the resulting energy consequences would also not be significant.

While there does not appear to be any commercial agricultural uses in the reserve, quarry activity within the reserve is significant; the adverse economic consequences of stopping this extraction prior to the resource being exhausted could be considerable. There could also be adverse economic consequences in discontinuing the gun club and dog kennel uses

in the reserve in order to accommodate new urban development, though that economic benefits of urban development may outweigh those consequences.

Overall, there would be comparatively low to moderate social, energy, and economic consequences from urbanization of this reserve, largely depending on the timing of completion of quarry operations. The Rosa Urban Reserve is given a "medium-high" score in Attachment 3 for this Goal 14 boundary location sub-factor.

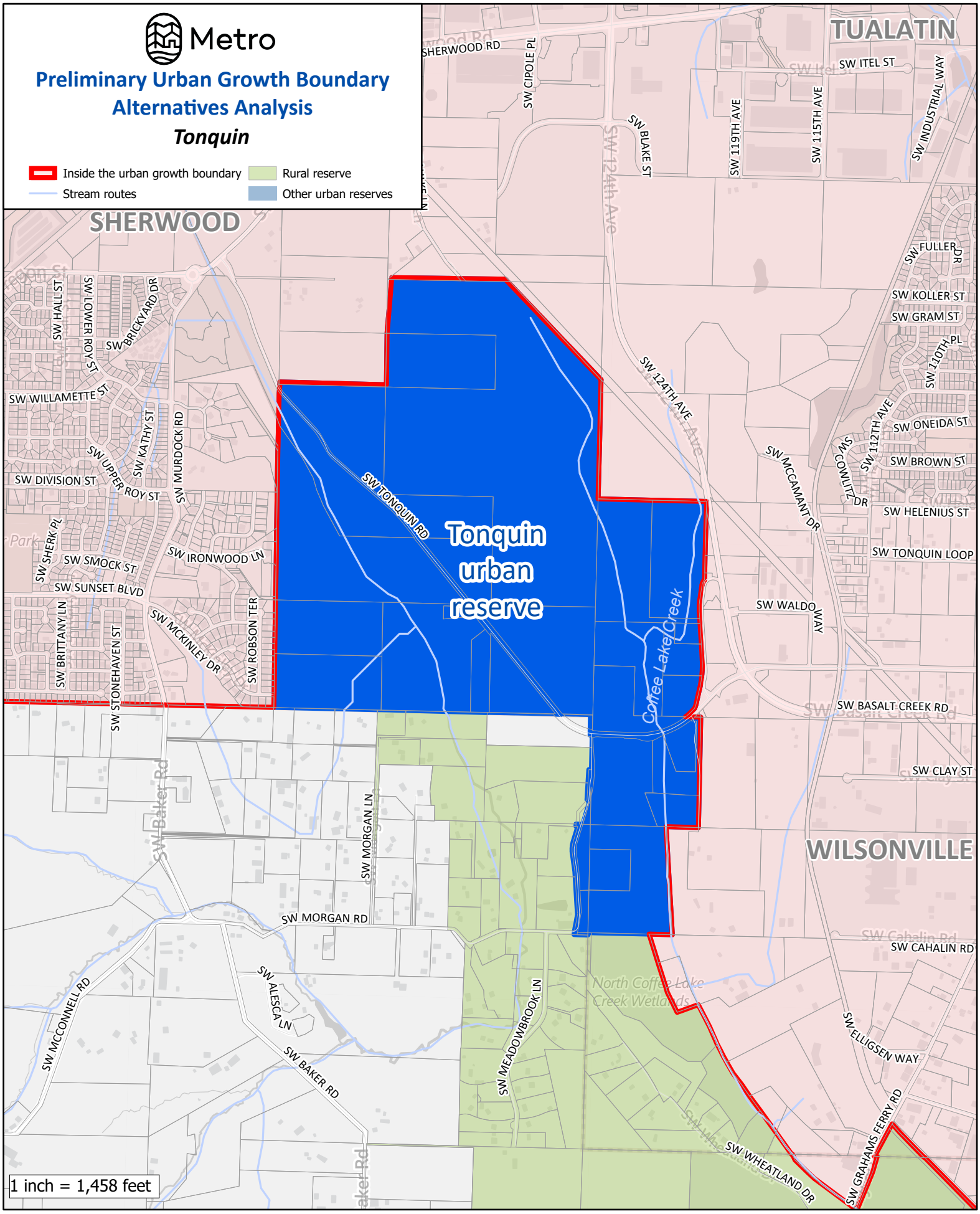
Factor 4: Compatibility of the proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

Only the southern edge of the Tonquin Urban Reserve is *not* defined by the UGB and the vast majority of the adjacent land is zoned for rural residential use. There is one very small tract of adjacent land with Goal 3 zoning, specifically Exclusive Farm Use (EFU) zoning by Clackamas County, located outside the UGB at the reserve's southwestern corner. This land, comprised of just two tax lots, contains rural residences and no apparent agricultural activities. While there are some stands of trees on these tax lots, they are small and the existing development could limit harvesting potential. Moreover, access to these tax lots are not accessed via the reserve. Therefore, the proposed urban uses are considered to have high compatibility with nearby agricultural and forest activities occurring on farm and forest land outside the UGB. The Tonquin Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location factor.

Metro

Preliminary Urban Growth Boundary Alternatives Analysis

Tonquin



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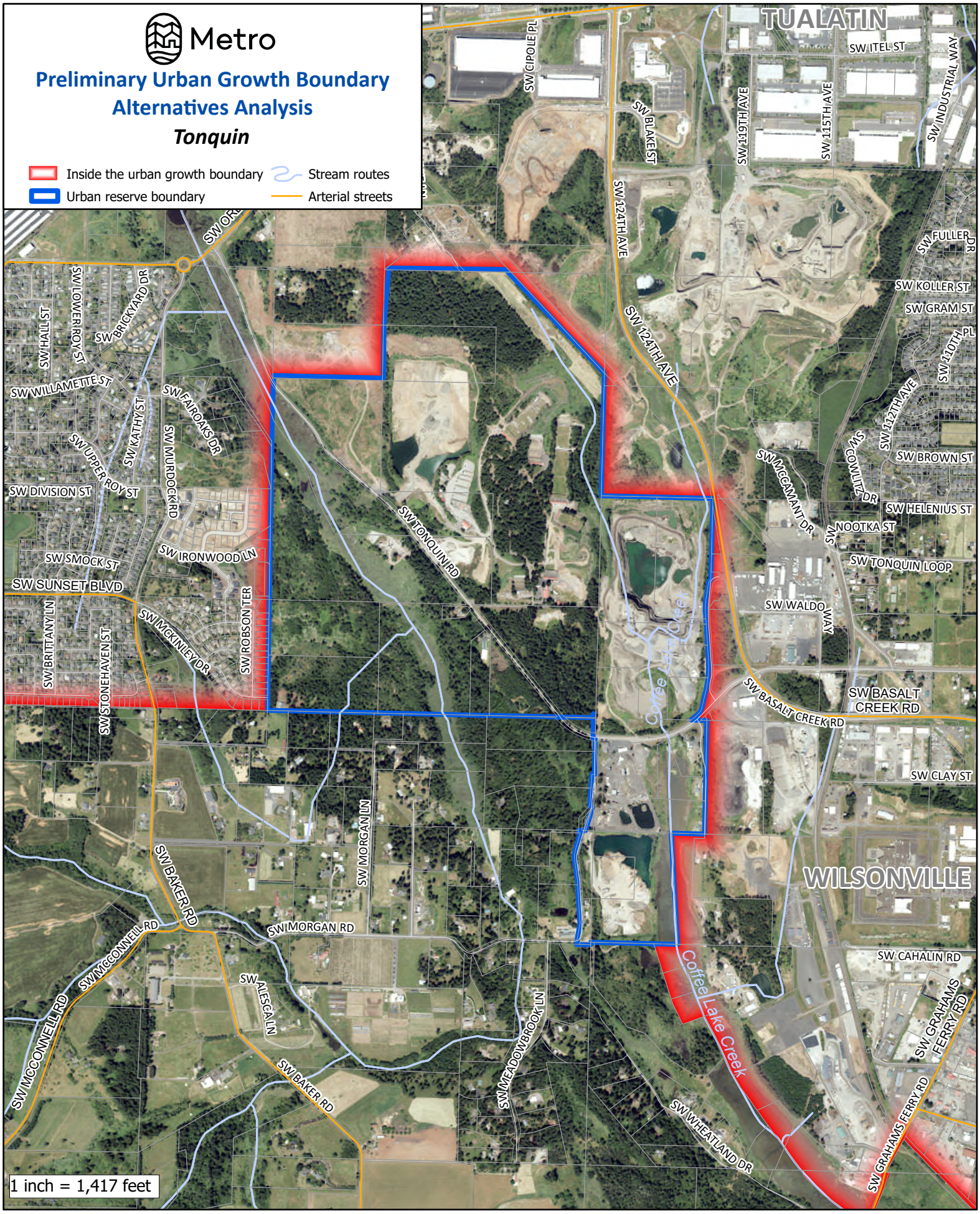
Metro

Preliminary Urban Growth Boundary Alternatives Analysis

Tonquin

Inside the urban growth boundary
Urban reserve boundary
Stream routes
Arterial streets



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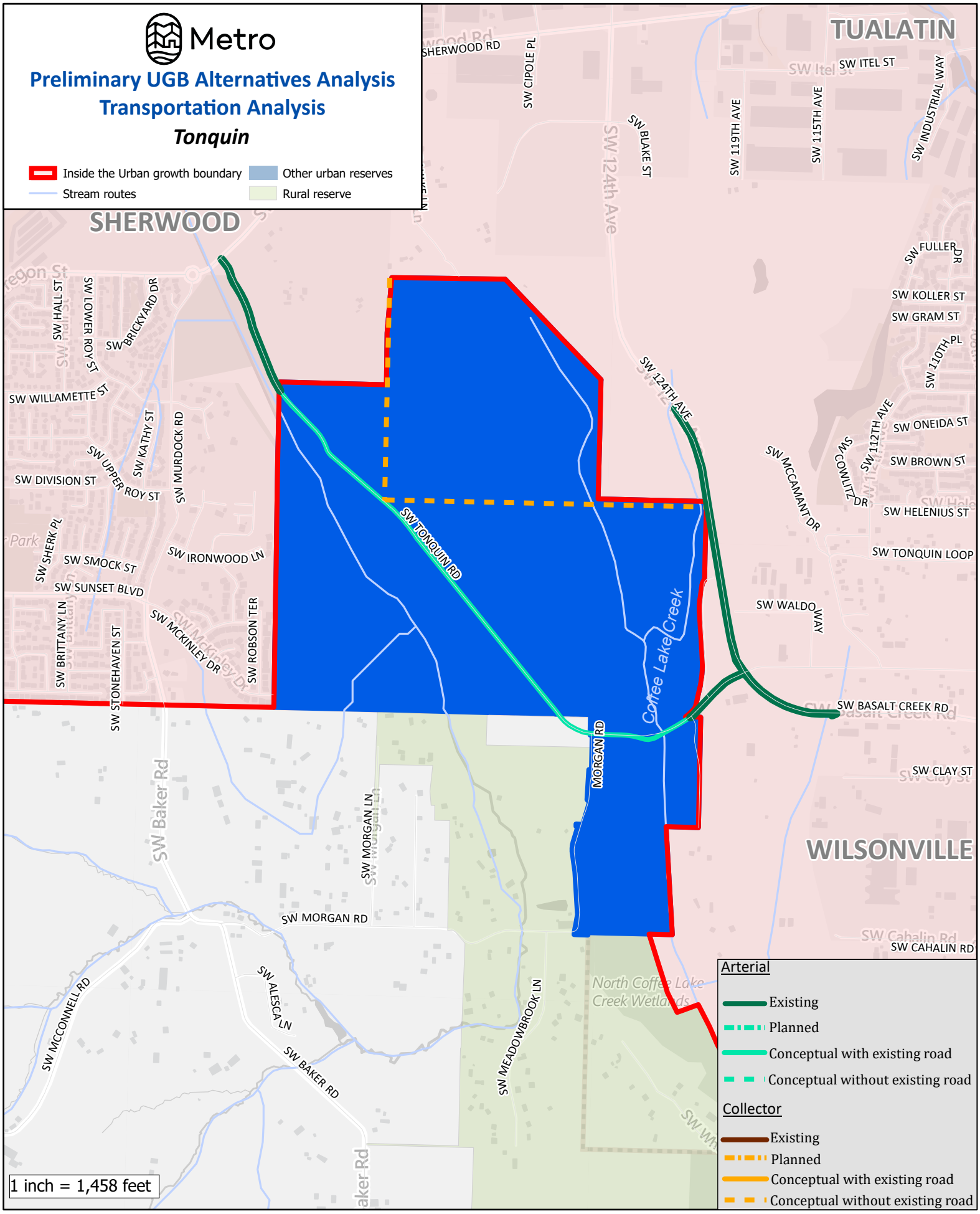

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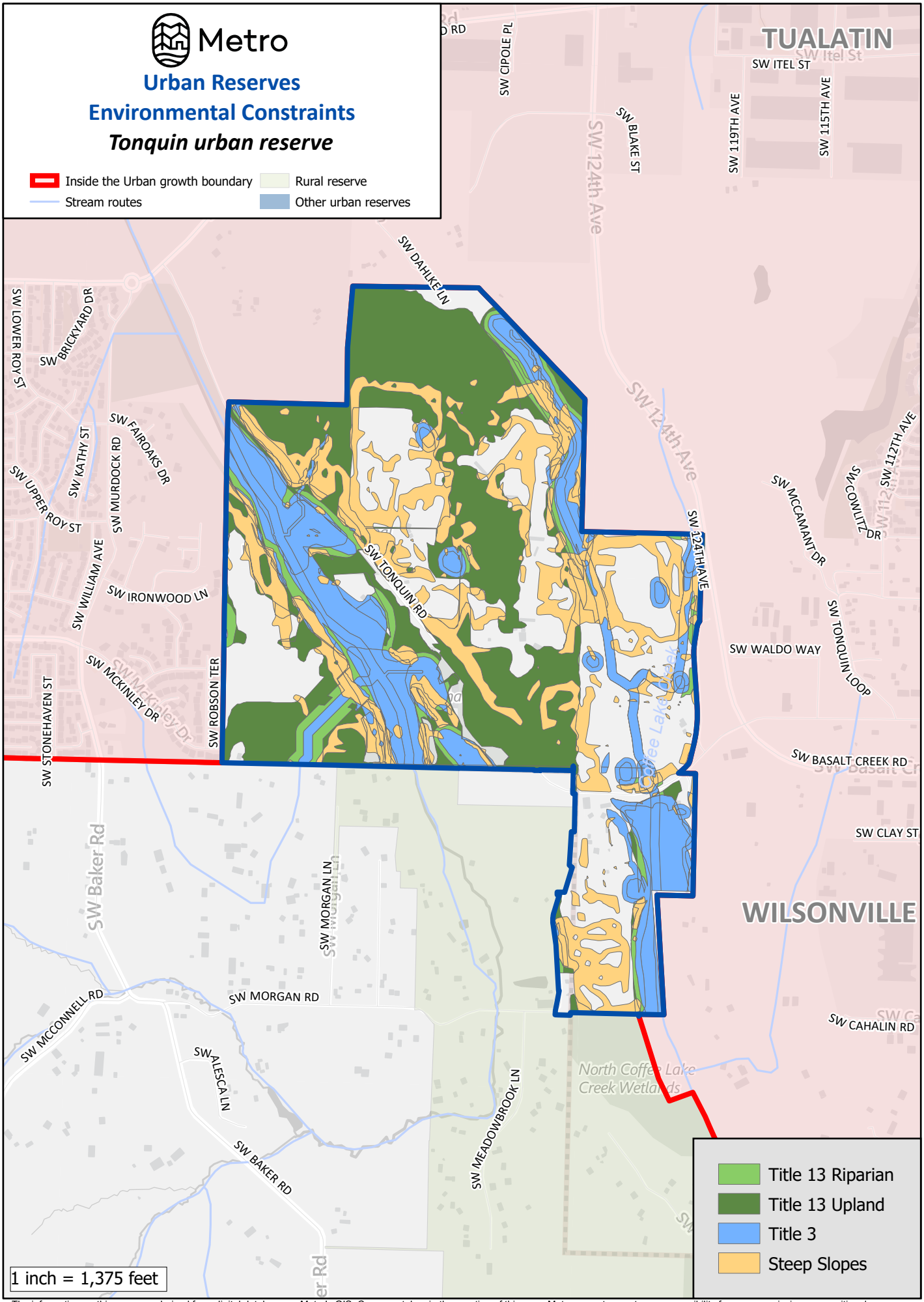
Metro

Urban Reserves
Environmental Constraints
Tonquin urban reserve

Inside the Urban growth boundary
Stream routes
Rural reserve
Other urban reserves



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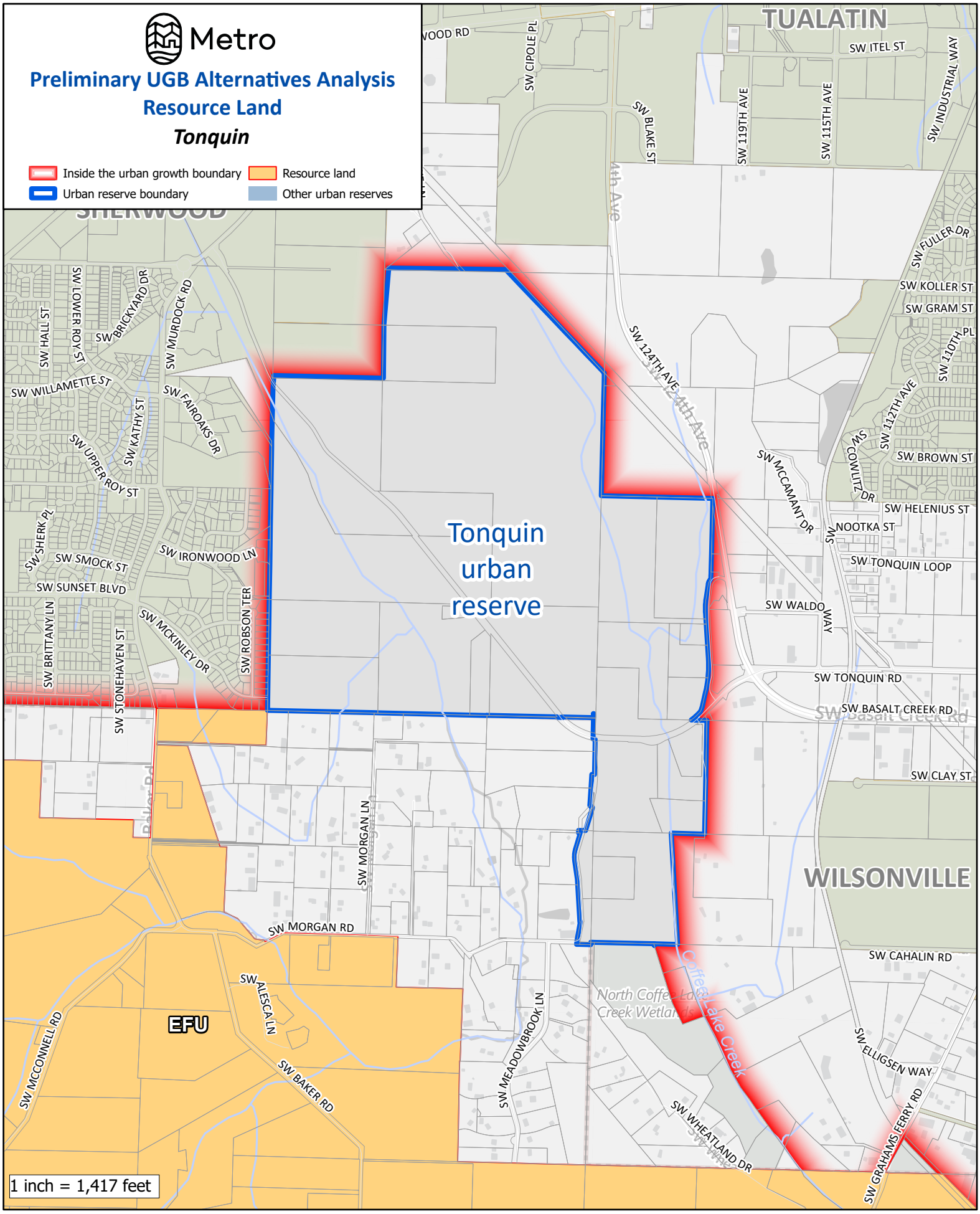

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WILSONVILLE SOUTHWEST URBAN RESERVE

Total Reserve Area	67 acres
Total Tax Lot Area in Reserve (without Right-of-Way)	64 acres
Gross Vacant Buildable Area	27 acres
Net Vacant Buildable Area	**20 acres**

The Wilsonville Southwest Urban Reserve is a somewhat triangularly shaped area on the south side of SW Wilsonville Road and only about 250 feet northwest of the Willamette River. The east side of the reserve is adjacent to the UGB and Wilsonville city limits and the reserve is otherwise entirely surrounded by rural reserve lands, which include the Metro-owned Graham Oaks Nature Park directly to the north across SW Wilsonville Road.

GOAL 14 BOUNDARY LOCATION FACTORS

Factor 1: Efficient accommodation of identified land needs

The Wilsonville Southwest Urban Reserve is comprised of just four tax lots, all of which are entirely within the reserve and are contiguous. The combined area of these tax lots is 64 acres. Three of the tax lots are between two and six acres in area; the other tax lot is larger than 50 acres. As noted above, the entire reserve contains 27 gross vacant buildable acres and 20 net vacant buildable acres.

According to aerial imagery, the reserve has only a few rural residences and the vast majority of the land is in agricultural use. Three of the tax lots have assessed improvements, with a median assessed value of those tax lots' improvements exceeding $833,000.

The reserve is adjacent to Corral Creek Natural Area and the Graham Oaks Nature Park and is less than 1,000 feet from River Fox Park. Boones Ferry Primary School and Inza R. Wood Middle School are about a quarter mile away via SW Wilsonville Road. The reserve is separated from existing urban low density residential development to the east by Willamette Way, a local street. The nearest interstate, I-5, is approximately 1.5 miles away. Existing employment uses along SW Boones Ferry Road and SW Bailey St, are also within 1.5 miles. South Metro Area Regional Transit (SMART) has a bus stop directly across SW Wilsonville Road from the reserve.

Large sections of the reserve have slopes greater than 10 percent, though the northernmost portion of the reserve near SW Wilsonville Road is generally flat. These flatter areas, with nearby transit service and relatively direct access to I-5, could potentially accommodate employment uses. The remainder of the reserve closer to the Willamette River and still near to schools and recreational facilities are more suitable to residential land uses.

In general, this reserve is considered able to accommodate both residential and employment land needs.

Factor 2: Orderly and economic provision of public facilities and services

Water Services

With regard to water services, the Wilsonville Southwest Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Adjacent lands inside the UGB are served by the City of Wilsonville. The city's primary supply comes from the Willamette River. There is a single water treatment plant, the Willamette River Water Treatment Plant, that serves the city and is in shared ownership with Tualatin Valley Water District. The treatment plant is understood to be capable of processing 15 MGD, and a planned improvement will bring capacity to 20 MGD in order to serve development in the existing UGB through the year 2036. There are currently no significant known storage, pumping, or distribution system deficiencies.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The city is believed to have ample water rights for the long term, so water supply to urban development of the reserve is likely not an issue. The planned expansion of the treatment plant should provide sufficient capacity for development of the reserve. Existing storage tanks, however, do not have capacity to serve development outside of the existing UGB. Based on topography, the reserve could be served by gravity from the Elligsen Reservoirs (i.e., not require pumping). Future system infrastructure as shown in the City of Wilsonville Water System Master Plan is adequately sized for required fire flow and operating pressures.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

Additional storage capacity will be needed to avoid negative impacts to service in the UGB.

d. Estimated water service-related costs for reserve development

Water piping, pumping, and storage costs	Cost
10-inch pipe	$0.81 million
12-inch pipe	$0
16-inch pipe	$1.1 million
Pumping	$0
Storage	$0.02 million
Total:	**$1.93 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$4,789**

Sanitary Sewer Services

With regard to sanitary sewer services, the Wilsonville Southwest Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Wastewater from adjacent lands in the City of Wilsonville is conveyed in a city-owned and operated collection system to the Wilsonville Wastewater Treatment Plant (WWTP), which was upgraded in 2014 to a capacity of 4.0 MGD, resulting in excess capacity. That excess capacity is believed to be able to accommodate growth in the Frog Pond areas recently added to the UGB. The city is planning to planning on necessary system upgrades to meet future needs. The existing system, including its piping and pump stations, is not known to have any hydraulic deficiencies.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

Depending on the timing of additional development in the UGB, planned treatment plant upgrades may be needed sooner in order for the system to also serve new development in the Willsonville Southwest Urban Reserve. There are currently no capacity issues with any of the three pumps that may serve the reserve; however, they are all reaching the end of their useful service and the city has identified capital improvement projects to rehabilitate them within the next 20 years. Based on topography, a new pump station will be required to connect sanitary lines for the reserve to the existing system. This pump station is identified in the City of Wilsonville Wastewater Master Plan.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

As noted above, aging pump stations will likely need to be rehabilitated and, depending on timing of other growth, treatment plant facilities upgraded, in order for Wilsonville Southwest development to not negatively impact service to areas already inside the UGB.

d. Estimated sanitary sewer service-related costs for reserve development

Sanitary sewer piping and pumping costs	Cost
10-inch pipe	$0.45 million
12-inch pipe	$0
15-inch pipe	$0
Pump station	$0.18 million
Force mains	$0.21 million
Total:	**$0.84 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$2,109**

Stormwater Management Services

With regard to stormwater management services, the Wilsonville Southwest Urban Reserve is given a "medium" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(d) below.

a. Capacity of existing facilities to serve areas already inside the UGB

The City of Wilsonville Stormwater Master Plan (2012) identified "problem areas" (areas with flooding and evidence of significant erosion) based on observation during a 25-year storm event in 2009. The identified problem areas were isolated and there were no serious flooding issues identified under existing conditions.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The City of Wilsonville requires that stormwater management (water quality and flow control) be provided for all new impervious surfaces. Based on topography, it seems likely that stormwater management for the development of Wilsonville Southwest would occur within the development area and outfall directly to Corral Creek, which drains directly to the Willamette River without connecting to an existing public stormwater system. The aforementioned master plan does not indicate any problem areas in the short portion of Corral Creek between the Wilsonville Southwest Urban Reserve and the Willamette River.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

If stormwater outfalls directly to Corral Creek via private outfalls from development areas and public outfalls from roadways, there would be no impacts to existing storm facilities.

d. Estimated stormwater service-related costs for reserve development

Stormwater piping and water quality/detention	Cost
18-inch pipe	$0.92 million
24-inch pipe	$0
30-inch pipe	$0
Water quality/dentition	$0.87 million
Total:	**$1.79 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$4,453**

Transportation Services

With regard to transportation services, the Wilsonville Southwest Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location factor, for the reasons detailed in (a)-(e) below.

a. Capacity of existing facilities to serve areas already inside the UGB

Figure 4.36 in Chapter 4 of the 2023 Regional Transportation Plan (RTP) displays 2020 home-based vehicle miles traveled (VMT) per capita by Metro transportation analysis zone, with average VMT per capita considered 11.32. According to that figure, areas in the UGB adjacent to the Wilsonville Southwest Urban Reserve had an above the regional average home-based VMT per capita in 2020.

Metro's adopted 2040 Growth Concept Map designates a town center in the adjoining City of Wilsonville. Town centers are meant to: serve populations of tens of thousands of people; offer more locally-focused retail uses and public amenities; and be well served by transit. The roughly 100-acre and centrally-located Wilsonville Town Center aligns with this 2040 Growth Concept Map area. The City of Wilsonville's Town Center Plan envisions it as vibrant, walkable destination that inspires people to come together and socialize, shop, live, and work. The town center, as well as nearby employment areas on the opposite (west) side of I-5, include grocery and drug stores, a library, medical and dental offices, banks, and restaurants. These areas also contain and are adjacent to residential uses, including higher-density residential uses. The town center is located a short distance from the terminus of the TriMet's Westside Express Service (WES) Commuter Rail line, which provides service up to Beaverton.

South Metro Area Regional Transit (SMART), the City of Wilsonville's bus service, provides transit services to the city through seven bus lines; Route 4 "Wilsonville Road Line" connects the town center to areas in the western portion of Wilsonville's UGB, such as the Graham Oak Nature Park, and to development in the east of the city along SW Wilsonville Road.

The town center's existing land uses and transit service, and some availability for new development in and near the town center, demonstrate that growth in the current UGB near the town center will not necessarily cause a significant increase in VMT per capita, as residents will be able to access some daily needs through modes other than private motor vehicle transport. Growth in other areas of the city where residential uses surround schools and parks are is also unlikely to significantly impact VMT per capita.

However, the town center and its adjacent employment areas are more than a mile away from the areas in the UGB adjacent to the reserve. Those areas in the UGB near the reserve are primarily zoned for low density residential development rather than for employment uses, and the transit service to these areas is limited. Under these conditions, growth in these areas in the UGB near the reserve may continue to rely on

private motor vehicle transportation, though existing transit service and bike and pedestrian infrastructure can provide alternatives.

Indeed, in addition to routes described above, SMART also provides medical transport services, a Villebois shopping shuttle, and connections to Keizer and Woodburn. The vast majority of the city's developed areas are within a quarter of a mile of a transit stop. Figure 4.3 in Chapter 4 of the 2023 RTP does, nonetheless, identify a gap in frequent transit service along SW Boones Ferry Road and other locations in the north of the city.

Wilsonville has a well-defined bike network of at least 19 miles of dedicated bike lanes and at least eight miles established bikeways that connect neighborhoods, schools, parks, community centers, business districts, and natural resource areas. Figure 4.5 in Chapter 4 of the 2023 RTP shows several existing bike facilities in Wilsonville as a part of the planned regional bike network, including facilities on SW Boekman Road and SW Wilsonville Road. There is identified gap in regional bike facilities on SW Stafford Road.

The city also has a fairly well-defined pedestrian network in its town center and residential neighborhoods, though with less pedestrian amenities in some industrial and employment areas. I-5 generally provides a barrier for east-west pedestrian connections, but there are sidewalks along both sides of SW Wilsonville Road as it crosses under I-5; there are no sidewalks on SW Boeckman Road over I-5. Figure 4.4 in Chapter 4 of the 2023 RTP shows a number of streets in Wilsonville as on the regional pedestrian network, including SW Wilsonville Road, SW Barber Street, and SW Boeckman Road west of I-5. The figure identifies gaps in the planned regional pedestrian network along SW Boeckman Road east of I-5.

Figure 4.6 in Chapter 4 of the 2023 RTP identifies a number of trails in the south and west of Wilsonville as in the planned regional trail network.

There are no high injury corridors or high injury intersections in Wilsonville's portion of the UGB identified on Figure 4.14 in Chapter 4 of the 2023 RTP.

The portion of I-5 bisecting Wilsonville is identified as a throughway in Figure 4.7 in Chapter 4 of the 2023 RTP. Figure 4.8 in Chapter 4 of the RTP indicates that it currently meets RTP travel speed reliability performance thresholds, with no more than four hours per day when travel speeds fall below the identified minimum speed. RTP models indicate this reliability of this section of I-5 will continue at least to the year 2045.

b. Capacity of existing facilities to serve areas proposed for addition to the UGB

The nearest RTP-designated throughway, I-5, is about 1.5 miles from the reserve. As noted above, I-5 through Wilsonville currently meets RTP travel speed reliability performance standards. Given its relatively small size, urban development of the reserve is unlikely to generate sufficient traffic on the highway to cause it to no longer meet those performance thresholds.

SMART's Route 4 already serves the Graham Oaks Nature Park that is across SW Wilsonville Road from the reserve. SW Wilsonville Road also has a dedicated bike lane and Graham Oaks Nature Park has an established bikeway that connects to Villebois and other bike facilities. Also nearby is an established bikeway along the Ice Age Tonquin Trail that connects to the Willamette River east of the reserve. SW Wilsonville Road and some has sidewalks, and a crosswalk across SW Wilsonville Road provides access to the Graham Oaks Nature Park and Villebois to the north and the Ice Age Tonquin Trial and the Willamette River to the south and east of the reserve. However, some of the local streets in the adjoining residential neighborhood in the UGB lack sidewalks, including much of Willamette Way along the east side of the reserve.

School uses (Boones Ferry Primary School and Inza R. Wood Middle School) are only about a quarter mile from the reserve, and are connected to it by the bike and pedestrian facilities along SW Wilsonville Road noted above, allowing the opportunity for future residents of the reserve to access these schools without travel by private motor vehicle. The facilities along SW Willsonville Road and the SMART transit service would also provide some alternatives to private motor vehicle use for future residents accessing the nearby town center and surrounding employment uses.

c. Impacts to existing facilities that serve nearby areas already inside the UGB

SW Wilsonville Road would see some additional private motor vehicle traffic as a result of urbanization of the reserve. However, given the small size of the reserve, the proximity of schools, parks, the town center, and employment uses, and the direct availability of transit service and bike and pedestrian facilities, additional traffic is likely to be minimal. The bike and pedestrian facilities and nearby trails would see some amount of additional use.

Development of this small reserve is unlikely to cause facilities in Wilsonville to become high injury corridors or intersections, jeopardize the throughway reliability of I-5, or cause significant increases in the area's home-based VMT per capita.

d. Need for major transportation facility improvements and associated costs

To serve urban development, approximately 0.38 miles of SW Wilsonville Road at the north of the reserve will likely need to be improved to urban arterial standards, including with acquisition of additional right-of-way. The terrain the improved roadway would cross is moderately flat and no stream-crossings are necessary; therefore, normal per-mile costs are expected.

Facilities	Cost
Arterials, existing/improved full street	$18.35 million
Arterials, existing/improved half street	$0
Arterials, new	$0
Collectors, existing/improved full street	$0
Collectors, existing/improved half street	$0
Collectors, new	$0
Total:	**$18.35 million**
Per dwelling unit at 20 units per net vacant buildable acre:	**$45,647**

c. Provision of public transit service

SMART evaluated the reserve for providing transit service. SMART could potentially provide services to the reserve, although there is no guarantee of service. Actual service depends on the level of development and the feasibility of a navigable turnaround for Category A buses. Service could be provided at 15- to 30-minute headways weekdays and Saturdays. Annual service cost of adding fixed-route and complementary paratransit service would be $55,000 in addition to services already being provided. This annual service cost would increase with the cost of inflation each year.

Prior to land being included in the UGB, a more detailed concept plan, consistent with the requirements of Metro's Urban Growth Management Functional Plan Title 11, is required. This concept plan process will develop more refined public facility and service needs and cost estimates.

Factor 3: Comparative environmental, social, energy, and economic consequences

Environmental consequences

There are no stream corridors or wetlands within the Wilsonville Southwest Urban Reserve. Corral Creek is located just south of the reserve on Metro-owned land that is unlikely to be developed. Some riparian and upland habitat associated with Corral Creek is identified in the southern portion of the reserve. Mapped upland habitat extends into what appear to actually be orchards in the reserve, but orchards would not be included in a natural resource protection program adopted prior to urbanization because they are for agriculture. Urbanization could likely avoid the identified natural resources located in the southern portion of the reserve, with no impacts to the habitat areas. Therefore, urbanization of the reserve is expected to have comparatively low environmental consequences. Additional environmental consideration, specifically regarding avoidance of conflict between urban development and regionally significant fish and wildlife habitat, is provided in the Metro Code Factors Analysis (Appendix 7A).

Considering the comparative environmental consequences of urbanization, the Wilsonville Southwest Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Social, energy, and economic consequences

Relative to other reserves, the Wilsonville Southwest Urban Reserve is quite small and future urbanization of the reserve will be minor in scale. While any development will impact the few existing residences in the reserve, these residences' location already close to an established urban neighborhood of Wilsonville, a primary school, a middle school, and the Grahams Oak Nature Park will mean that development will not lead to significant changes in the area's character. Moreover, urbanization of the reserve with a mixture of uses could bring new social and recreational opportunities for existing residents.

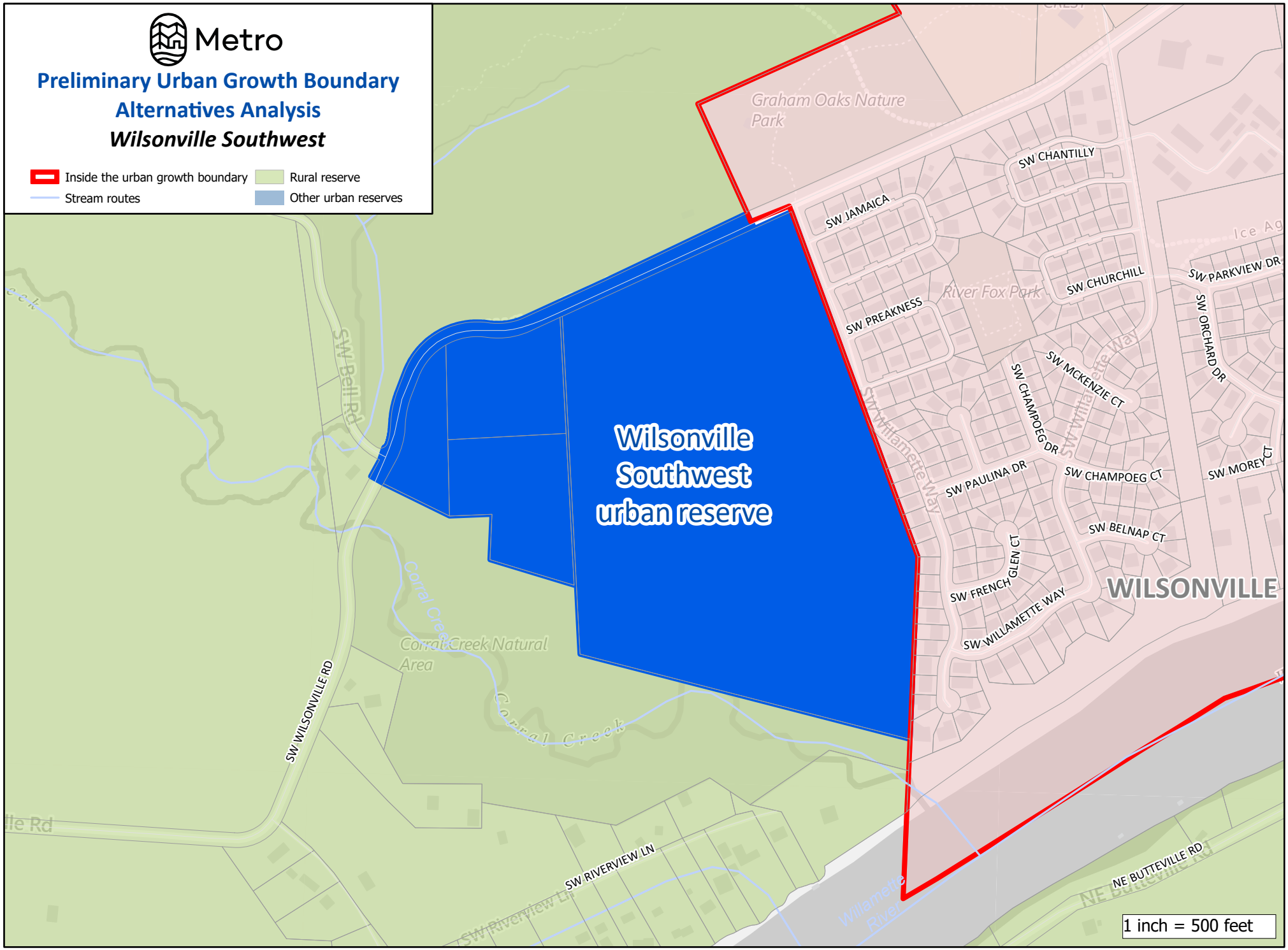
SW Wilsonville Road provides an easy connection to commercial and employment areas in the City of Wilsonville, bike facilities, the WES commuter line, and I-5, which, as detailed more fully in response to Factor 2, could help limit increased VMT from urbanization. In addition, given the modest amount of development that would occur, the increase in traffic would not be great and would not lead to significant energy consequences.

The agricultural acreage within the reserve is minimal at only about 40 acres, so the economic impact from the loss of agricultural activity would not be considerable; indeed, the economic benefits of residential and/or employment development of the reserve may outweigh this loss.

This analysis finds that there would be comparatively low social, energy, and economic consequences from urbanization of this small reserve. The Wilsonville Southwest Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location sub-factor.

Factor 4: Compatibility of the proposed urban uses with nearby agricultural and forest activities occurring on farm and forest land outside the UGB

All of the lands bordering the Wilsonville Southwest Urban Reserve outside of the UGB have Goal 3 zoning, specifically Exclusive Farm Use (EFU) zoning by Clackamas County. There are no apparent agricultural activities occurring on these adjoining EFU lands and, while some are forested, nearly all of it is owned by Metro and therefore not likely to be used for commercial forestry. One small adjoining EFU-zoned tax lot at the intersection of SW Wilsonville Road and SW Bell Road has a rural residence. Considering these conditions and the fact that the relatively small reserve could accommodate only minimal development, the proposed urban uses (i.e., urban development of the reserve) is considered to have high compatibility with nearby agricultural activities occurring on farm and forest land outside the UGB. The Wilsonville Southwest Urban Reserve is given a "high" score in Attachment 3 for this Goal 14 boundary location factor.



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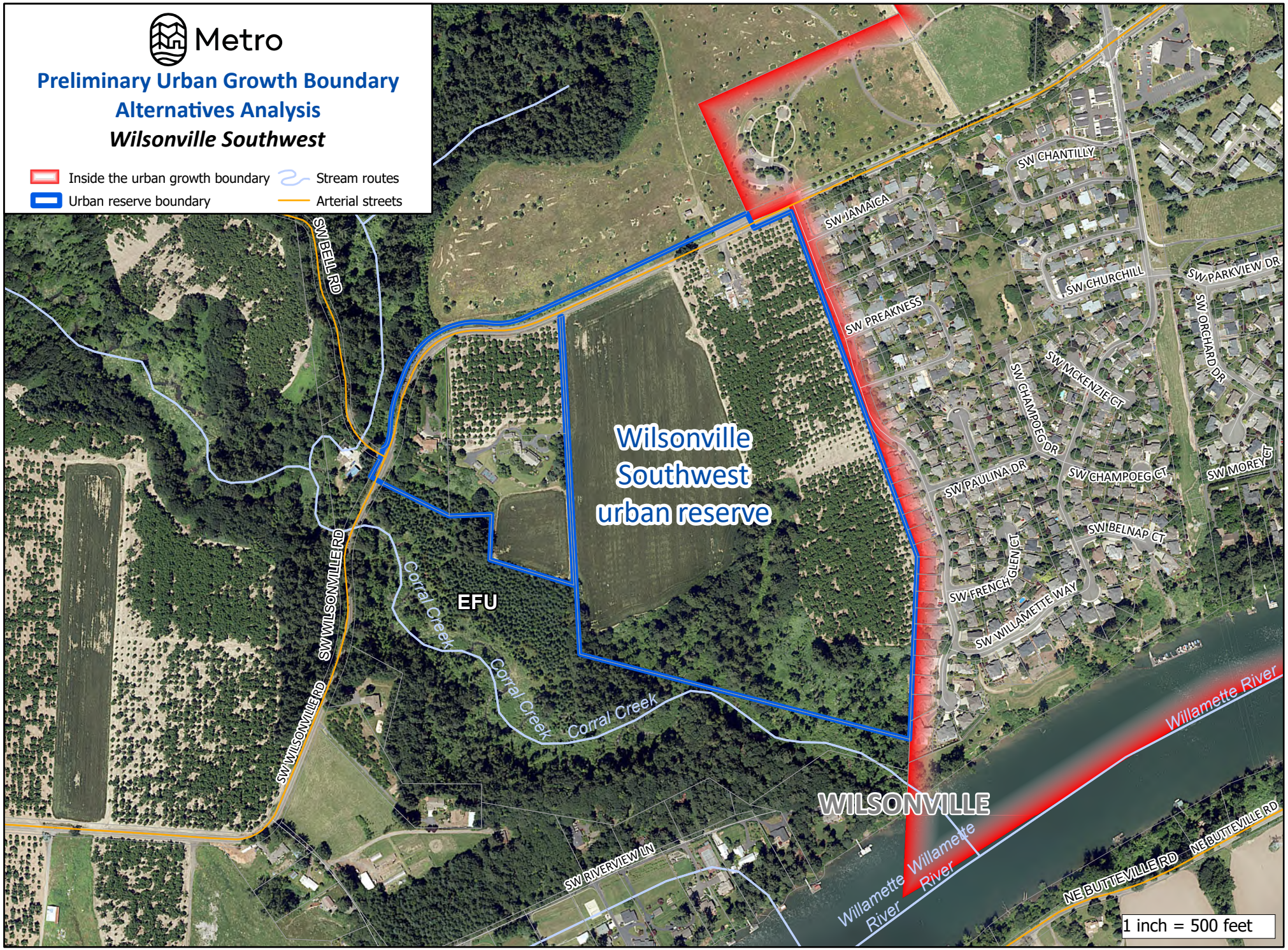
Metro

Preliminary Urban Growth Boundary Alternatives Analysis

Wilsonville Southwest



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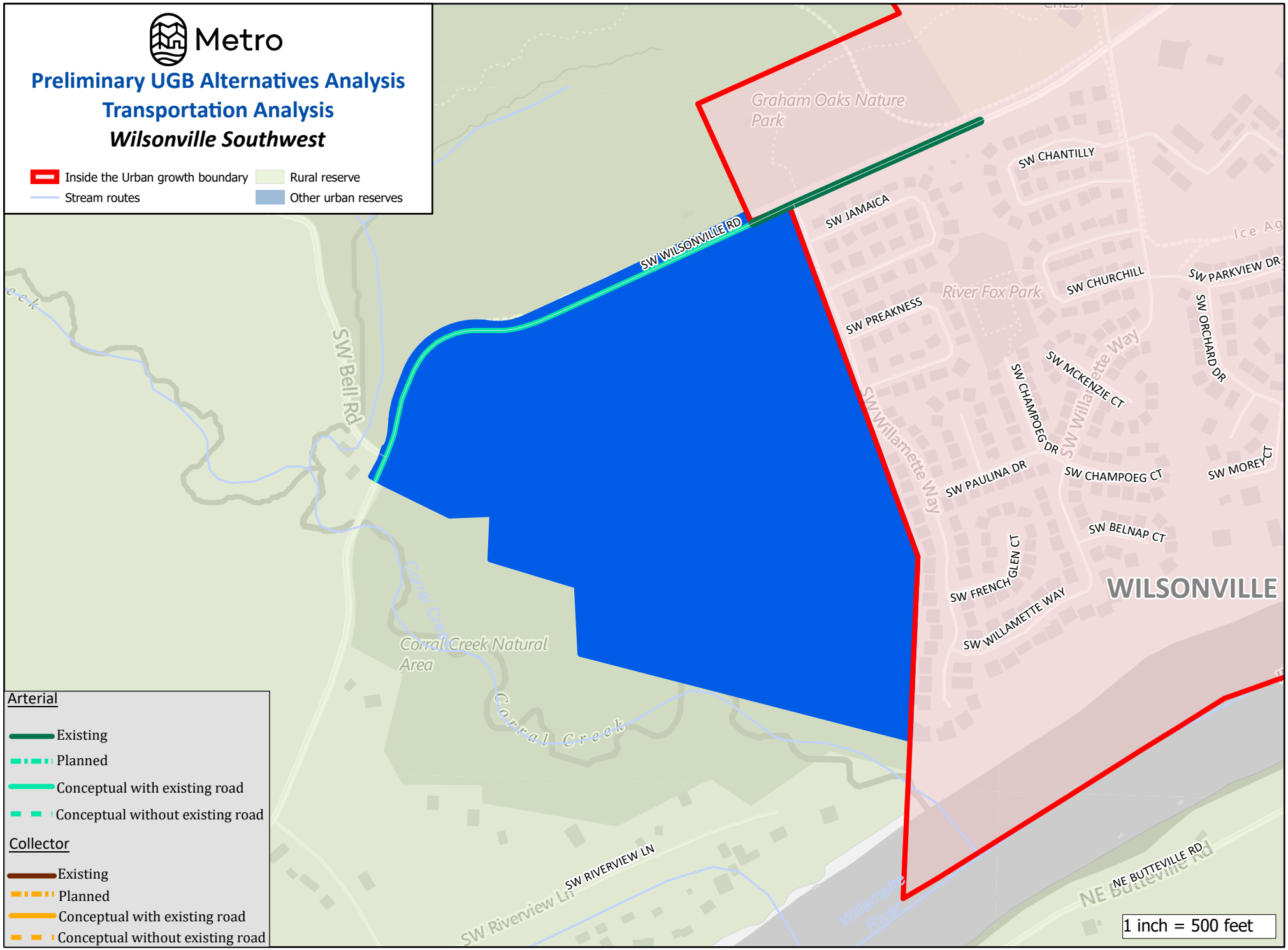

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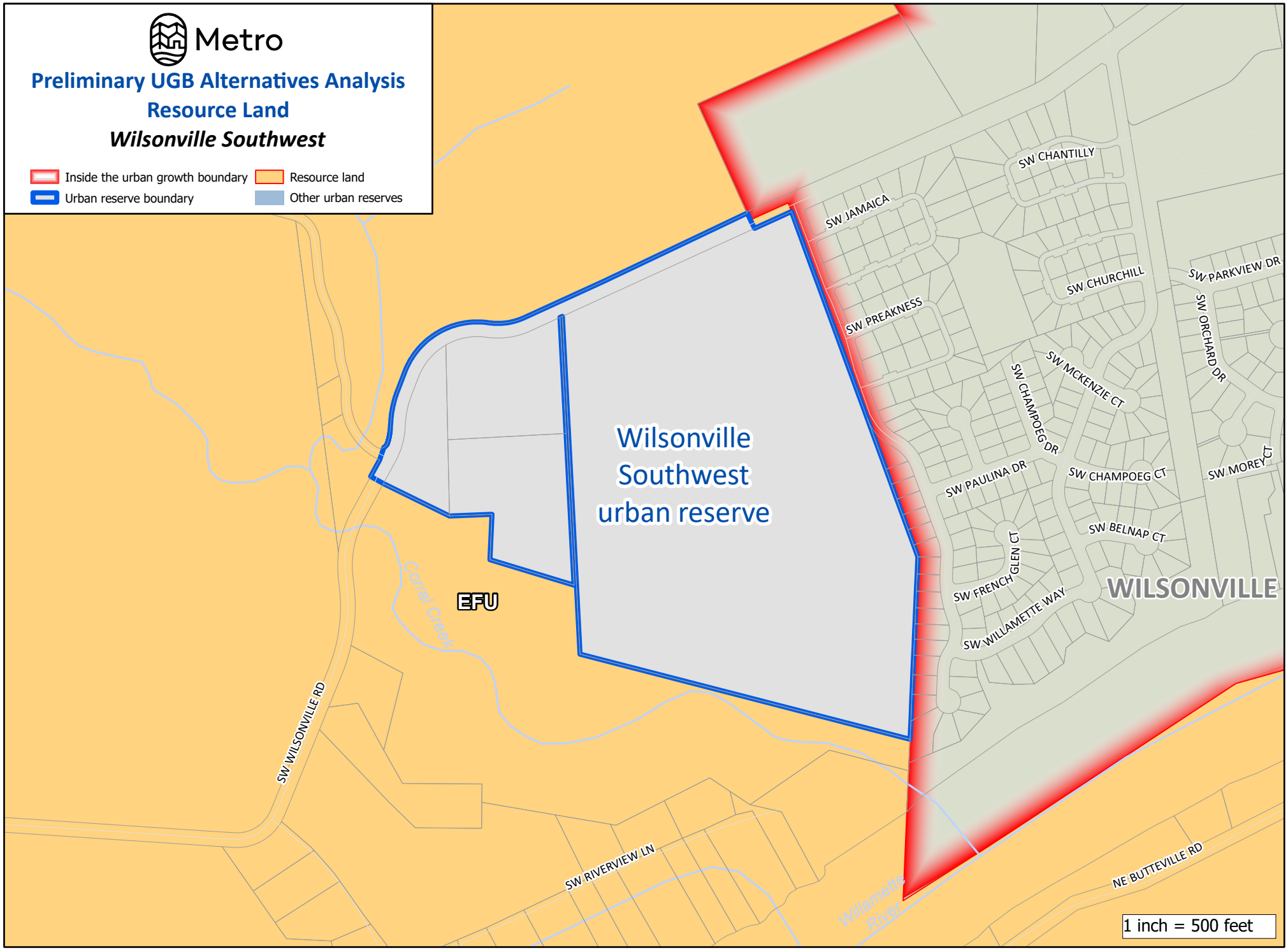

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Appendix 7, Attachment 3: Goal 14 Boundary Location Factors Analysis Results (Page 1 of 2)
2024 Urban Growth Report

	Factor 1	Factor 2				Factor 3		Factor 4
Urban Reserve	**Accommodation of Land Need[1]**	**Water Services**	**Sanitary Sewer Services**	**Stormwater Management Services**	**Transportation Services**	**Environmental Consequences[2]**	**Social/Energy/ Economic Consequences[2]**	**Compatibility with Ag and Forest Activities**
Beaver Creek Bluffs	Yes (R)	Medium	Low	Medium	Low-Medium	Low (High)	Low (High)	High
Bendemeer	Yes (R) (E)	High	High	Medium	Medium-High	Medium-High (Low)	Low (High)	Medium-High
Bethany West	Yes (R) (E)	High	High	Medium	Medium	Low (High)	Low (High)	Medium
Boring	Yes (R) (E)	Low	Low	Medium	Low	Medium-High (Low)	Medium	Low
Boring – Highway 26	Yes (R) (E)	Low	Low	Medium	Low	Low (High)-Medium	Low (High)-Medium	Medium-High
Borland	Yes[3] (R) (E)	Medium	Low	Medium	Medium	Low (High)-Medium	Low (High)	Medium-High
Brookwood Parkway	Yes (R)	Medium	High	High	Medium	Low (High)	Low (High)	High
Damascus	Yes (R) (E)	Medium	Low	High	Low	Low (High)-Medium	Medium-High (Low)	High
David Hill	Yes (R)	Medium	Medium	Low	Low	Low (High)	Medium	Medium
Elligsen Road North	Yes (R) (E)	High	Low	Medium	High	Low (High)	Medium	Low
Elligsen Road South	Yes (R) (E)	High	Low	Medium	Medium	Medium-High (Low)	Low (High)	Low
Grahams Ferry	Yes (R)	Medium	Medium	Medium	High	Low (High)	Low (High)	High
Gresham East	Yes (R) (E)	Medium	Low	High	Medium	Medium-High (Low)	Medium	Low
Henrici	Yes (R)	Low	Medium	Medium	Medium	Low (High)	Low (High)	High
Holcomb	Yes (R)	Low	Low	Medium	Low	Low (High)	Low (High)-Medium	Medium-High
Holly Lane – Newell Creek Canyon	Yes (R)	Medium	Medium	Medium	Medium	Low (High)	Low (High)	High

Appendix 7, Attachment 3: Goal 14 Boundary Location Factors Analysis Results (Page 2 of 2)
2024 Urban Growth Report

	Factor 1	Factor 2				Factor 3		Factor 4
Urban Reserve	**Accommodation of Land Need[1]**	**Water Services**	**Sanitary Sewer Services**	**Stormwater Management Services**	**Transportation Services**	**Environmental Consequences[2]**	**Social/Energy/ Economic Consequences[2]**	**Compatibility with Ag and Forest Activities**
I-5 East – Washington County	Yes (R)	Low	Medium	High	Low-Medium	Medium-High (Low)	Medium	Low
Maplelane	Yes (R)	Medium	Low	Medium	Low-Medium	Medium-High (Low)	Low (High)	High
Norwood	Yes (R)	Low	Low	Medium	Low	Low (High)-Medium	Low (High)-Medium	Low
Rosa	Yes (R)	Medium	Medium	Medium	Low	Low (High)-Medium	Medium	Medium
Rosemont	Yes[3] (R)	Medium	Low	High	Medium-High	Low (High)	Low (High)	High
Sherwood North	Yes (R) (E)	High	Medium	High	High	Low (High)-Medium	Low (High)	High
Sherwood South	Yes (R)	Low	Low	Low	Low-Medium	Medium-High (Low)	Low (High)-Medium	High
Sherwood West	Yes[4] (R) (E)	Medium[4]	Medium[4]	High[4]	Medium-High[4]	Low (High)– Medium	Medium	Medium
Stafford	Yes[3] (R)	Medium	Low	Medium	Low	Medium-High (Low)	Medium	High
Tonquin	Yes (R) (E)	Low	Low	Medium	Low	Low (High)-Medium	Low (High)-Medium	High
Wilsonville Southwest	Yes (R) (E)	Medium	Medium	Medium	High	Low (High)	Low (High)	High

Notes:

1: (R) = Can accommodate a *residential* land need; (E) = Can accommodate an *employment* land need

2: Goal 14 Factor 3 reports on the consequences of urbanizing an area. Therefore, a "low" consequence receives a "high" score, while a "high" consequence receives a "low" score.

3: In 2019, the cities of Lake Oswego, Tualatin, and West Linn entered into an agreement that prohibits any one of those cities from completing a concept plan for any part of the Borland, Rosemont, and Stafford Urban Reserve areas until, at the earliest, December 31, 2028, which weighs heavily against these reserves regarding their ability to efficiently accommodate identified needs for residential or employment land under Goal 14 Factor 1.

4: The Sherwood West Urban Reserve is the only reserve with an adopted concept plan, which, as detailed in the *Introduction and Methodologies* section of Appendix 7, is a primary consideration in whether the reserve can efficiently accommodate an identified land need under Goal 14 Factor 1 and will facilitate the orderly and economic provision of public facilities and services in the future under Goal 14 Factor 2.

MACKENZIE.

METRO RESERVES GOAL 14 – UTILITY ANALYSIS

To
Metro

Dated
June 3, 2024

Project Number
2230233.00

MACKENZIE
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PROJECT PURPOSE

The goal of this project is to complete a comparative analysis of Metro's urban reserves to identify land suitable for addition to the Urban Growth Boundary (UGB). The analysis must comply with Oregon Administrative Rules (OAR) Chapter 660, which requires an evaluation and comparison of the relative costs, advantages, and disadvantages of alternative UGB expansion areas with respect to the provision of public facilities and services (water, sanitary sewer, stormwater management, and transportation facilities) that would be needed for urban development of those alternative locations. Mackenzie has completed the water, sanitary sewer and stormwater components in this report.

The purpose of this project is to analyze:

- The capacity of the existing public water, sanitary sewer, and stormwater facilities to serve areas already inside the UGB.
- The capacity of the existing water, sanitary sewer, and stormwater facilities to serve areas that may be proposed for addition to the UGB (i.e. the 27 Metro urban reserves).
- The impacts to existing water, sanitary sewer, and stormwater facilities that serve nearby areas already inside the UGB.

The Metro Goal 14 Utility Analysis was divided into 6 tasks:

Task 1: Kickoff meeting and refinement of work program. The project began with a meeting to clarify and refine the work program, define the format of the products, and finalize data needs to be provided by Metro. It was also discussed whether the analysis should assume only urban residential development or other urban uses (e.g. commercial, industrial, or institutional uses). Metro provided maps, acreage, base maps, assumed number of dwelling units and preliminary arterial and collector roadway networks for all 27 urban reserves.

Tasks 2-4: Assessment of the capacity of existing water, sanitary sewer and stormwater facilities to serve areas already inside the UGB, areas proposed for addition to the UGB, and the impacts that serving areas proposed for addition to the UGB to areas currently inside the UGB. Mackenzie used the data and documents provided by Metro, as well as publicly available GIS information to analyze the size and location of existing public water, sanitary sewer, and stormwater infrastructure. In addition, jurisdictional master plans were reviewed, and for some sites, contact was made with City or County staff when information was absent or incomplete.

Task 5: Development of preliminary cost estimates for providing water, sanitary sewer, and stormwater services to each of the 27 urban reserves. Mackenzie put together Cost Estimate Tables for each of the 27 urban reserves based on utility demands as calculated for the assumed dwelling units per net acre provided by Metro.

Task 6: Final report. A draft report was provided to Metro for comments and questions, which were incorporated into the final report. The final report includes Utility Analysis Maps and Cost Estimate Tables.

ASSUMPTIONS

- All buildable land will be developed as residential, at a rate of 20 dwelling units per residential acre (as provided by Metro). Mackenzie has reviewed the capacity needs for this level of residential development versus non-specific commercial, industrial, and institutional development and their typical lot or area coverage. In general, environmental constraints have equal impact across all development types, with the expectation that residential may have higher potential on greater slopes. For water, sanitary sewer, and stormwater utility service needs, the assumption of residential development provides sufficient comparison for comparison to other uses.
- Franchise utilities such as natural gas, electricity, and telecommunications were not included in the study. In general, these utilities install infrastructure on demand as development occurs. This is not to suggest that these utilities do not need to plan for future growth and expansion of their distribution systems; however, since they are not public agencies, their long-range planning objectives may not be publicly available. In our experience, coordination with franchise utility providers is an important step for new development, and public infrastructure improvements – roadways in particular – should consider providing franchise utility easements or other access to the infrastructure backbone.
- Residents per dwelling unit: 2.2 (as provided by Metro)
- Residential water demand = 150 gallons per capita per day (gpcpd)
- Residential sanitary demand = residential water demand

COST DETERMINATION

Cost estimates presented in this analysis have been developed at a planning level. Unit costs for water, sewer, and storm drainage system upgrades are based on linear feet of pipe through a development area and are meant to reflect construction of the various parts of the overall conveyance system such as pipe, manholes, inlets, valves, etc. The cost estimates do not include soft costs such as design, permitting, and system development charges. Construction cost updates have been estimated based on cost factors reported by RS Means, Engineering News Record, local utility master plans, and recent bid tabulations. The following tables summarize the unit costs used for this study.

General Cost Determination Assumptions:

- Large diameter pipes will be located in existing and planned arterials and collectors within the urban reserve area (URA) as shown in the Preliminary Urban Growth Boundary Transportation Analysis provided by Metro. For some sites where a master plan has already indicated a size and location for large diameter pipes, those are shown in lieu of placing within the arterials and collectors. Construction for on-site utilities, such as private water, sewer, and storm drainage piping or treatment facilities, is not included in the study methodology and cost estimate.

- Costs associated with capital improvement projects identified in jurisdictional master plans outside the URA boundary and required to provide service to URAs are included unless the project is identified as currently funded.

- Required improvements to existing jurisdictional facilities outside the URA may be discussed in the narrative, but costs are not included in the Cost Estimate Tables.

Water

- Storage Reservoirs – It is assumed each URA will be required to provide additional storage (unless surplus capacity is identified in jurisdictional master plans as specifically serving URAs in this report) and is calculated based on number of dwelling units as provided by Metro assuming the required storage volume is for a 24-hour period. Additional storage could be an expansion of an existing facility or a new facility depending on when development of URAs occur and other development occurring outside the URA at the same time. For this reason, storage is not shown on the Utility Analysis Maps.

- Pump Stations – Costs for pump stations are included for URAs that are projected to be served by pressure zones that require pumping as indicated in jurisdictional master plans and is calculated based on number of dwelling units as provided by Metro.

- Water Mains – Located in existing and planned arterials and collectors within the URA.

Table 1: Water Construction Unit Costs		
Item	**Units**	**Unit Cost**
10” Pipe	Linear Feet (LF)	$350
12” Pipe	Linear Feet (LF)	$400
15” Pipe	Linear Feet (LF)	$500
Pump Station	Million Gallons/Day (MGD)	$5,800,000
Storage Reservoir	Million Gallons (MG)	$200,000

Sanitary Sewer

- Locations for sanitary mains are identified based on topography and shown in existing or proposed arterials and collectors where possible.

- Pump Stations – where topography indicates a need, pumps and force mains are shown on the Utility Analysis Maps and included in Cost Estimate Tables. Proposed force mains are combined into one unit cost; force main sizing considers several design factors and is beyond the scope of this analysis.

Table 2: Sanitary Sewer Construction Unit Costs		
Item	**Units**	**Unit Cost**
10” Pipe	Linear Feet (LF)	$275
12” Pipe	Linear Feet (LF)	$350
15” Pipe	Linear Feet (LF)	$375
Force Main	Linear Feet (LF)	$310
Pump Station	Million Gallons/Day (MGD)	$1,800,000

Stormwater

- Locations for storm mains are identified based on topography and shown in existing or proposed arterials and collectors where possible. Outfalls are strategically located to convey presumably treated storm runoff to local creeks and tributaries in as few locations as required to reduce the number of concentrated flows introduced to the watershed.

- Water quality/detention – calculated using a sizing factor based on linear feet of roadway as given by Metro in the Preliminary Urban Growth Boundary Transportation Analysis which gives locations for existing and proposed arterials and collectors in and around the Urban Reserve Areas. For the calculation, it is assumed that the width of a collector is 24-feet and the width of an arterial is 48-feet.

Table 3: Stormwater Construction Unit Costs		
Item	**Units**	**Unit Cost**
18” Pipe	Linear Feet (LF)	$400
24” Pipe	Linear Feet (LF)	$425
30” Pipe	Linear Feet (LF)	$500
Water Quality/Detention	Square Feet (SF)	$150

UTILITY ANALYSIS

BEAVER CREEK BLUFFS

Water

The Beaver Creek Bluffs URA would likely be served by Oregon City and Clackamas River Water (CRW) as it is located adjacent to existing Oregon City limits/service area and partially within existing service/planning area for CRW. Beaver Creek Bluffs is adjacent to Oregon City Upper Pressure Zone which serves the CRW Meyers Pressure Zone. The Oregon City Upper Pressure Zone is supplied by the Boynton Reservoir (served by the Mountainview Pump Station) and Henrici Reservoir (no pump station).

Both Clackamas River Water (South System) and Oregon City receive water from the South Fork Water Board (SFWB), with plans to construct a backbone connecting the south system to the north system and the CRW water treatment plant in the future.

The following assessment is based on information from the City of Oregon City Water Distribution System Master Plan, dated January 2012. The Clackamas River Water - Water System Master Plan, South System, dated April 2019, does not discuss the Meyers Pressure Zone as it is small and contains mostly undeveloped land. For the assessment, buildout conditions for Oregon City are within the existing UGB only and do not include development of the Beaver Creek Bluffs URA.

Assessment of the capacity of existing water facilities to serve areas already inside the UGB.

Based on the following information, the existing water facilities have capacity to serve areas already inside the UGB (within the Upper Pressure Zone).

- Storage – Under existing conditions, the Boynton, Henrici and Mountainview Reservoirs have a combined surplus of 5.89 MG.
- Pump – the Mountainview Pump Station has a surplus of 3,408 gpm under existing conditions.
- Distribution – according to the Oregon City Master Plan, the existing Oregon City distribution system performs adequately with fire flow deficiencies generally isolated to small diameter or dead-end pipes.

Assessment of the capacity of existing water facilities to serve areas proposed for addition to the UGB.

Based on the following information, there is some surplus capacity available to serve areas proposed for addition to the UGB within the Upper Pressure Zone, however the surplus is not enough to support the development of the entire Beaver Creek Bluffs URA.

- Storage – the Boynton and Henrici Reservoirs have a combined surplus of 0.38 MG under buildout conditions.
- Pump – The Mountainview Pump Station has a surplus of 236 gpm under buildout conditions.
- Distribution – according to the Oregon City Master Plan, the future Oregon City distribution system performs adequately with fire flow deficiencies generally isolated to small diameter or dead-end pipes.

Assessment of the impacts to existing water facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

The Oregon City reservoirs and pump station that would serve the Beaver Creek Bluffs URA all have surplus capacity under full buildout conditions however the calculated demand of the URA exceeds the surplus available. The existing system would experience storage and pumping deficits if additional capacity were not provided at the time of development.

Sanitary Sewer

The Beaver Creek Bluffs URA would likely be served by the City of Oregon City based on proximity. Based on topography, which generally flows south away from existing City infrastructure, sanitary for this URA will need to be pumped north to join existing Oregon City infrastructure. Due to the shape of the Beavercreek Bluffs URA, there are various connections points to the existing infrastructure along the City limits. Based on these points of connection, this URA will be served by the Parish Road and Nobel Ridge Pump Stations.

Wastewater from Oregon City flows to the Tri-City Sewer District (TCSD) trunks, interceptors and eventually the Tri-City Water Resource Recovery Facility (WRRF), all of which is owned and operated by Water Environment Services (WES).

The following assessment is based on information from City of Oregon City Sanitary Sewer Master Plan, dated November 2014 and Sanitary Sewer System Master Plan for Water Environment Services, dated January 2019. The Master Plan considers the future condition to include development areas at the boundaries of the City's UGB, expected development within City limits (considered by the City to be developable), and individual parcels within City limits with redevelopment potential. Beaver Creek Bluffs URA is not included in the future condition.

Assessment of the capacity of existing water facilities to serve areas already inside the UGB.

Surcharging (ranging from minor to severe) exists throughout the existing City collection system. There are also capacity deficiencies in several locations in the WES system.

Two of the twelve existing pump stations (Settler's Point and Cook Street) have existing peak flows that exceed their firm capacity.

Assessment of the capacity of existing water facilities to serve areas proposed for addition to the UGB.

There are several locations within the existing system that have predicted flooding under future conditions.

Neither pump station that would serve the Beaver Creek Bluffs URA have capacity issues under future conditions.

Assessment of the impacts to existing water facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

Some of the surcharged pipes indicated in the master plan are downstream of the Beaver Creek Bluffs URA. Development of this URA will contribute to further surcharging of these pipes if they aren't corrected.

The Parish Road Pump Station has a total capacity of 760 gpm and a future demand of 535 gpm, leaving a surplus of 225 gpm. The Nobel Ridge Pump Station has a total capacity of 140 gpm and a future demand of 55 gpm, leaving a surplus of 85 gpm. These surpluses are not significant enough to serve the development of the Beaver Creek Bluffs URA in its entirety and additional pump capacity will be needed to avoid creating a pumping deficit for the existing system.

Storm

City of Oregon City is the likely provider for Beaver Creek Bluffs URA, as it is located within the Beaver Basin and is adjacent to the City service area boundary. The Beaver Basin does not contain any existing stormwater infrastructure and based on topography generally flows south away from City limits toward Beaver Creek, which flows west and outfalls to the Willamette River.

Generally, the City's topographic high point is at the center of the City and receiving waters are on all sides of the City. Because of this, much of the existing infrastructure are small, dispersed pipes and culverts rather than larger trunk lines.

The following assessment is based on information from City of Oregon City Stormwater Master Plan, dated July 2019. The study area for the Master Plan covers drainage areas to the following receiving water bodies: Abernathy Creek, the Clackamas River, Beaver Creek and the Willamette River.

Assessment of the capacity of existing water facilities to serve areas already inside the UGB.

The Master Plan identifies problem areas within the existing stormwater system, categorized as issues related to flooding, infrastructure, maintenance or natural channels.

As described above, Beaver Creek Bluffs URA would likely join City infrastructure near the existing City limits. Infrastructure downstream of these connection points appear to potentially occur within the South End, Central Point, Mud, Coffee, and Amanda Court basins. These basins contain several identified problem areas in all four categories, with capital improvement projects identified to address these issues. The following is a summary of capacity issues in relevant basins:

- Central Point Basin has an undersized conveyance system in the vicinity of Central Point Road that is further complicated by a series of irregular flow patterns and structure connections.
- The Coffee Creek area near Hazelwood Drive is an ongoing capacity concern that impacts private properties.
- The South End Basin will need an upsized conveyance system to support future development and expansion of South End Road.

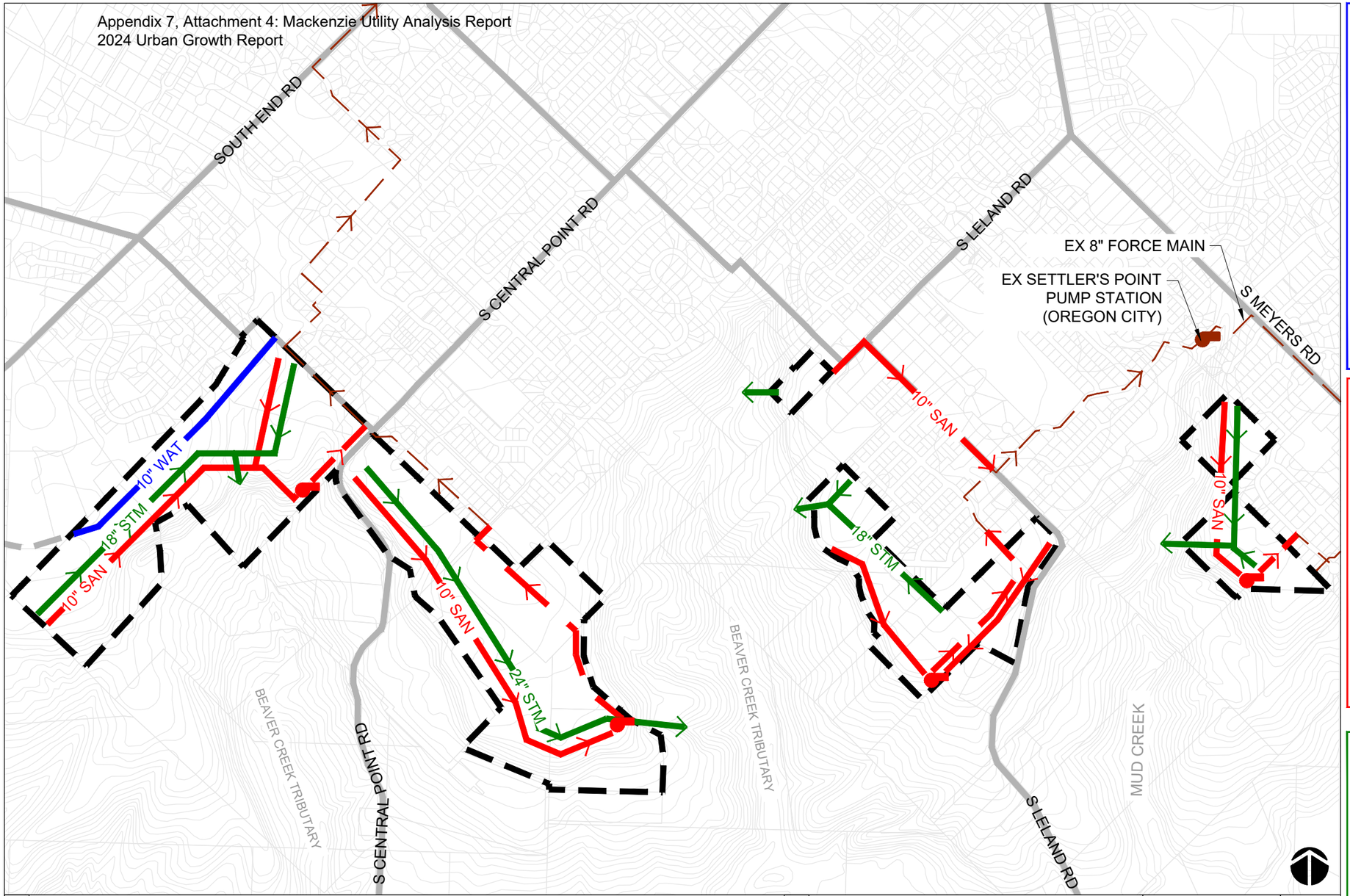
Assessment of the capacity of existing water facilities to serve areas proposed for addition to the UGB.

There are several problem areas (as defined by the Master Plan) under existing conditions for infrastructure downstream of the URA connections points. Adding stormwater from areas outside the UGB will likely contribute to these existing problems and potentially cause additional problem areas if they are not addressed.

Assessment of the impacts to existing water facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

Capital improvement projects to address capacity issues described above are presented in the Master Plan. Completion of these projects is required to provide adequate capacity to serve the study area (which includes the Beaver Basin as it drains to Beaver Creek) during a 25-year storm event.

Based on topography the Beaver Creek Bluffs URA would likely outfall directly to Mud Creek and tributaries of Beaver Creek and thus would not connect to existing City storm infrastructure. The addition of the Beaver Creek Bluffs URA to the UGB would thus have no impacts to existing stormwater facilities.



WATER

WATER PROVIDER: OREGON CITY/CLACKAMAS RIVER WATER (CRW)

PRESSURE ZONE: UPPER (OREGON CITY)/MEYERS (CRW)

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	2,600	$350	$910,000
12" PIPE (LF)	0	$400	0
16" PIPE (LF)	0	$500	0
PUMP STATION (MGD)	0.7	$5,800,000	$4,060,000
STORAGE RESERVOIR (MG)	0.7	$200,000	$146,000
TOTAL			$5,116,000

SANITARY

SANITARY PROVIDER: CITY OF OREGON CITY

ZONE: SOUTH/CENTRAL

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	14,300	$275	$3,932,500
12" PIPE (LF)	0	$350	$0
15" PIPE (LF)	0	$375	$0
PUMP STATION (MGD)	0.7	$1,800,000	$1,260,000
SAN FORCE (LF)	5,200	$310	$1,612,000
TOTAL			$6,804,500

STORM

STORM PROVIDER: CITY OF OREGON CITY

WATERSHED: ABERNETHY CREEK-WILLAMETTE RIVER

SUB-WATERSHED: BEAVER CREEK

PROPOSED IMPROVEMENTS

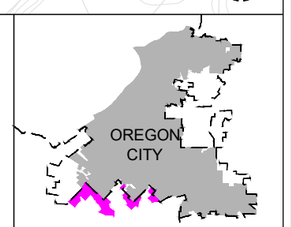
ITEM	UNITS	UNIT COST	TOTAL COST
18" PIPE (LF)	8,000	$400	$3,200,000
24" PIPE (LF)	4,100	$425	$1,742,500
30" PIPE (LF)	0	$500	$0
WATER QUALITY/ DETENTION (SF)	7,540	$150	$1,131,000
TOTAL			$6,073,500

LEGEND

- RESERVE BOUNDARY
- WATER LINE
- SANITARY LINE
- SANITARY FORCE MAIN
- SANITARY LINE (EX)
- SANITARY PUMP STATION
- SANITARY PUMP STATION (EX)
- STORM LINE

ABBREVIATIONS

CRW	CLACKAMAS RIVER WATER
EX	EXISTING
LF	LINEAR FEET
MG	MILLION GALLONS
MGD	MILLION GALLONS PER DAY
SF	SQUARE FEET



METRO RESERVES GOAL 14 - UTILITY ANALYSIS MAP

BEAVER CREEK BLUFFS

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BENDEMEER

Water

Bendemeer URA would most likely be served by Tualatin Valley Water District (TVWD) as it is adjacent to their existing service area boundary and City of Hillsboro facilities do not extend north of Highway 26. TVWD does not have a publicly available Master Plan.

The following assessment is based on information provided by a TVWD Development Services Engineer, with specific regard to the Bendemeer site and assuming residential development at a density of 20 units per acre.

Assessment of the capacity of existing water facilities to serve areas already inside the UGB.

TVWD's existing water facilities have adequate capacity to serve customers in areas already inside the UGB.

Assessment of the capacity of existing water facilities to serve areas proposed for addition to the UGB.

Based on current development projections for areas already inside the UGB, and assuming a density of 20 units per acre within the URA, TVWD's existing water facilities have adequate capacity to serve the URA.

Assessment of the impacts to existing water facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

It does not appear at this time that TVWD's water facilities already inside the UGB will experience marked impacts resulting from adding the URA, assuming a density of 20 units per acre. Changes in densities or development types within the URA could introduce or increase impacts that may require water facility upgrades.

Sanitary Sewer

Clean Water Services (CWS) is the likely provider for the Bendemeer URA as there is existing CWS sanitary sewer infrastructure south of NW West Union Road and running through the southeast corner of the URA near Rock Creek.

The Master Plan for the Clean Water Services (West Basin) is currently in development. The following assessment is based on information from communication with Clean Water Services Capital Planning Division Manager.

Assessment of the capacity of existing sanitary sewer facilities to serve areas already inside the UGB.

CWS is currently developing the West Basin Master Plan (WBMP) which is anticipated to be completed in early 2025. The WBMP will identify sanitary projects at both the Water Resource Recovery Facilities (WRRFs) and in the conveyance system necessary to accommodate redevelopment of underdeveloped areas within the UGB and green-field development of large areas recently brought into the UGB that are undergoing community planning and/or development.

Much of the conveyance infrastructure required for growing demands within the UGB is anticipated to be constructed privately during the development process and coordinated by CWS and local jurisdictions. The CWS WBMP will identify trunk line projects and pump stations necessary to accommodate growth of these areas; these projects will be incorporated into the CWS long-range capital improvement plan (CIP) at strategic times necessary to meet expected capacity demands. The CWS CIP will be updated and adjusted annually to reflect the latest growth patterns and anticipated timing.

CWS did not indicate whether the existing sanitary sewer system as a whole had the capacity to serve areas already inside the UGB. They did provide information related to the likely point of connection for the Bendemeer URA specifically (an existing 24-inch sanitary trunk running parallel to Rock Creek), which has adequate capacity to serve the addition of the Bendemeer URA to the UGB, which presumably means it has capacity to serve existing areas.

Assessment of the capacity of existing sanitary sewer facilities to serve areas proposed for addition to the UGB.

The CWS WBMP will acknowledge the potential for growth in the Bendemeer URA. Full development of areas inside the UGB does not happen prior to the addition of the URA into the UGB; the CWS WBMP will assume there is overlap in the continued development of the UGB while simultaneous development begins in the URA added to the UGB. According to CWS, the existing 24-inch sewer running parallel to Rock Creek has adequate capacity to serve the Bendemeer URA.

Assessment of the impacts to existing sanitary sewer facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

The CWS WBMP will address the infrastructure needs in unincorporated areas as well as the partner cities to accommodate planned growth. CWS regularly calibrates, updates, and maintains a hydraulic model that predicts sewer flows under development conditions. The hydraulic model is a key component in the identification of both the magnitude and timing of capital projects to meet growth demands. According to CWS, the existing 24-inch sewer running parallel to Rock Creek has adequate capacity to serve the Bendemeer URA.

Storm

Bendemeer URA would be served by the City of Hillsboro and Clean Water Services. Bendemeer is included in the planning area of the City of Hillsboro Master Plan (Rock Creek Basin). Bendemeer is currently unincorporated Washington County, and the City of Hillsboro has not yet started the long-term planning for this area.

The following assessment is based on information from the City of Hillsboro Stormwater Master Plan, dated 2021. The study area in the Master Plan includes the incorporated City, portions of the UGB where the City has adopted plans for development, and portions of the UGB where the City intends to begin planning in the next several years (including the Bendemeer URA).

Assessment of the capacity of existing stormwater facilities to serve areas already inside the UGB.

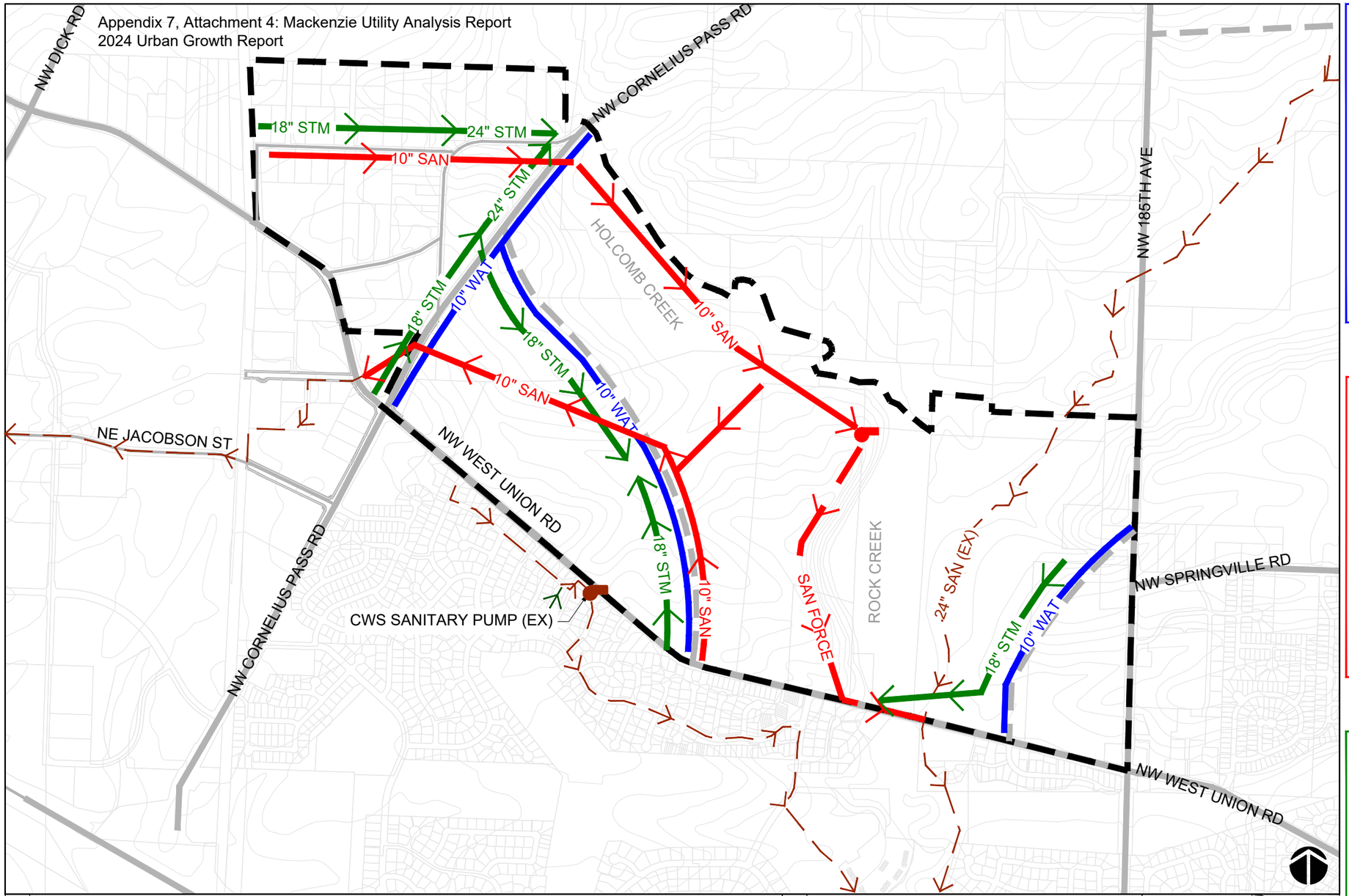
The Master Plan discusses currently undeveloped areas as expected to be provided with adequately sized conveyance and stormwater treatment by private development as it occurs. These appropriately sized stormwater facilities would presumably discharge directly to Rock Creek and would not impact the capacity of existing stormwater infrastructure. Per CWS, it is expected that treatment and detention be provided on development sites so that discharge to Holcomb Creek and Rock Creek does not have any negative impacts.

Assessment of the capacity of existing stormwater facilities to serve areas proposed for addition to the UGB.

The Master Plan discusses currently undeveloped areas as expected to be provided with adequately sized conveyance and stormwater treatment by private development as it occurs. These appropriately sized stormwater facilities would presumably discharge directly to Rock Creek and would not impact the capacity of existing stormwater infrastructure. Per CWS, it is expected that treatment and detention be provided on development sites so that discharge to Holcomb Creek and Rock Creek does not have any negative impacts.

Assessment of the impacts to existing stormwater facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

Clean Water Services standards require on-site detention for expansion areas, which includes the Bendemeer URA. Based on topography, the Bendemeer URA would discharge directly to Holcomb Creek and Rock Creek via private outfalls from development areas and public outfalls from roadways and would thus not connect to or impact any of the existing City of Hillsboro infrastructure.



WATER

WATER PROVIDER: TUALATIN VALLEY WATER DISTRICT

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	9,450	$350	$3,307,500
12" PIPE (LF)	0	$400	$0
16" PIPE (LF)	0	$500	$0
PUMP STATION (MGD)	0	$5,800,000	$0
STORAGE RESERVOIR (MG)	1.6	$200,000	$320,000
TOTAL			$3,627,500

SANITARY

SANITARY PROVIDER: CLEAN WATER SERVICES

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	12,300	$275	$3,382,500
12" PIPE (LF)	0	$350	$0
15" PIPE (LF)	0	$375	$0
PUMP STATION (MGD)	0.8	$1,800,000	$1,440,000
SAN FORCE (LF)	3,300	$310	$1,023,000
TOTAL			$5,845,500

STORM

STORM PROVIDER: CITY OF HILLSBORO

WATERSHED: ROCK CREEK-TUALATIN RIVER

SUB-WATERSHED: UPPER ROCK CREEK

PROPOSED IMPROVEMENTS

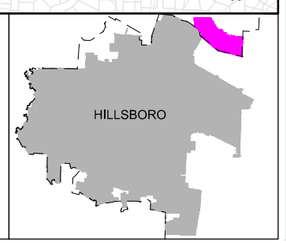
ITEM	UNITS	UNIT COST	TOTAL COST
18" PIPE (LF)	8,600	$400	$3,440,000
24" PIPE (LF)	3,400	$425	$1,445,000
30" PIPE (LF)	0	$500	$0
WATER QUALITY/ DETENTION (SF)	59,600	$150	$8,940,000
TOTAL			$13,825,000

LEGEND

- RESERVE BOUNDARY
- WATER LINE
- SANITARY LINE
- SANITARY FORCE MAIN
- SANITARY LINE (EX)
- SANITARY PUMP STATION
- SANITARY PUMP STATION (EX)
- STORM LINE

ABBREVIATIONS

EX	EXISTING
LF	LINEAR FEET
MG	MILLION GALLONS
MGD	MILLION GALLONS PER DAY
SF	SQUARE FEET



METRO RESERVES GOAL 14 - UTILITY ANALYSIS MAP

BENDEMEER

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BETHANY WEST

Water

Bethany West URA would most likely be served by Tualatin Valley Water District (TVWD) as it partially within and otherwise adjacent to their existing service area boundary. TVWD does not have a publicly available Master Plan.

The following assessment is based on information provided by a TVWD Development Services Engineer, with specific regard to the Bethany West site and assuming residential development at a density of 20 units per acre.

Assessment of the capacity of existing water facilities to serve areas already inside the UGB.

TVWD's existing water facilities have adequate capacity to serve customers in areas already inside the UGB.

Assessment of the capacity of existing water facilities to serve areas proposed for addition to the UGB.

Based on current development projections for areas already inside the UGB, and assuming a density of 20 units per acre within the URA, TVWD's existing water facilities have adequate capacity to serve the URA.

Assessment of the impacts to existing water facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

It does not appear at this time that TVWD's water facilities already inside the UGB will experience marked impacts resulting from adding the proposed URAs, assuming a density of 20 units per acre. Changes in densities or development types within the URA could introduce or increase impacts that may require water facility upgrades.

Sanitary Sewer

Clean Water Services (CWS) is the likely provider for the Bethany West URA as there is an existing 24-inch CWS sanitary sewer main running northeast to southwest through the site (adjacent to Rock Creek).

The Master Plan for the Clean Water Services (West Basin) is currently in development. The following assessment is based on information from communication with Clean Water Services Capital Planning Division Manager.

Assessment of the capacity of existing sanitary sewer facilities to serve areas already inside the UGB.

CWS is currently developing the West Basin Master Plan (WBMP) which is anticipated to be completed in early 2025. The WBMP will identify sanitary projects at both the Water Resource Recovery Facilities (WRRFs) and in the conveyance system necessary to accommodate redevelopment of underdeveloped areas within the UGB and green-field development of large areas recently brought into the UGB that are undergoing community planning and/or development.

Much of the conveyance infrastructure required for growing demands within the UGB is anticipated to be constructed privately during the development process and coordinated by CWS and local jurisdictions. The CWS WBMP will identify trunk line projects and pump stations necessary to accommodate growth of these areas; these projects will be incorporated into the CWS long-range capital improvement plan (CIP) at strategic times necessary to meet expected capacity demands. The CWS CIP will be updated and adjusted annually to reflect the latest growth patterns and anticipated timing.

CWS did not indicate whether the existing sanitary sewer system as a whole had the capacity to serve areas already inside the UGB. They did provide information related to the likely point of connection for the Bethany West URA specifically (an existing 24-inch sanitary trunk running parallel to Rock Creek), which has adequate capacity to serve the addition of the Bethany West URA to the UGB, which presumably means it has capacity to serve existing areas.

Assessment of the capacity of existing sanitary sewer facilities to serve areas proposed for addition to the UGB.

The CWS WBMP will acknowledge the potential for growth in the Bethany West URA. Full development of areas inside the UGB does not happen prior to the addition of URAs into the UGB; the CWS WBMP will assume there is overlap in the continued development of the UGB while simultaneous development begins in URA added to the UGB. According to CWS, the existing 24-inch sewer running parallel to Rock Creek has adequate capacity to serve the Bendemeer URA.

Assessment of the impacts to existing sanitary sewer facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

The CWS WBMP will address the infrastructure needs in unincorporated areas as well as the partner cities to accommodate planned growth. CWS regularly calibrates, updates, and maintains a hydraulic model that predicts sewer flows under development conditions. The hydraulic model is a key component in the identification of both the magnitude and timing of capital projects to meet growth demands. According to CWS, the existing 24-inch sewer running parallel to Rock Creek has adequate capacity to serve the Bethany West URA.

Storm

Clean Water Services (CWS) is the likely storm provider for the Bethany West URA based on topography it would outfall to Rock Creek which generally flows south through CWS service area until it reaches the Tualatin River.

Clean Water Services standards require on-site detention for expansion areas, which includes the Bethany West URA. Based on topography, the Bethany West URA would discharge directly to Rock Creek via private outfalls from development areas and public outfalls from roadways and would thus not connect to any of the existing CWS infrastructure.

Assessment of the capacity of existing stormwater facilities to serve areas already inside the UGB.

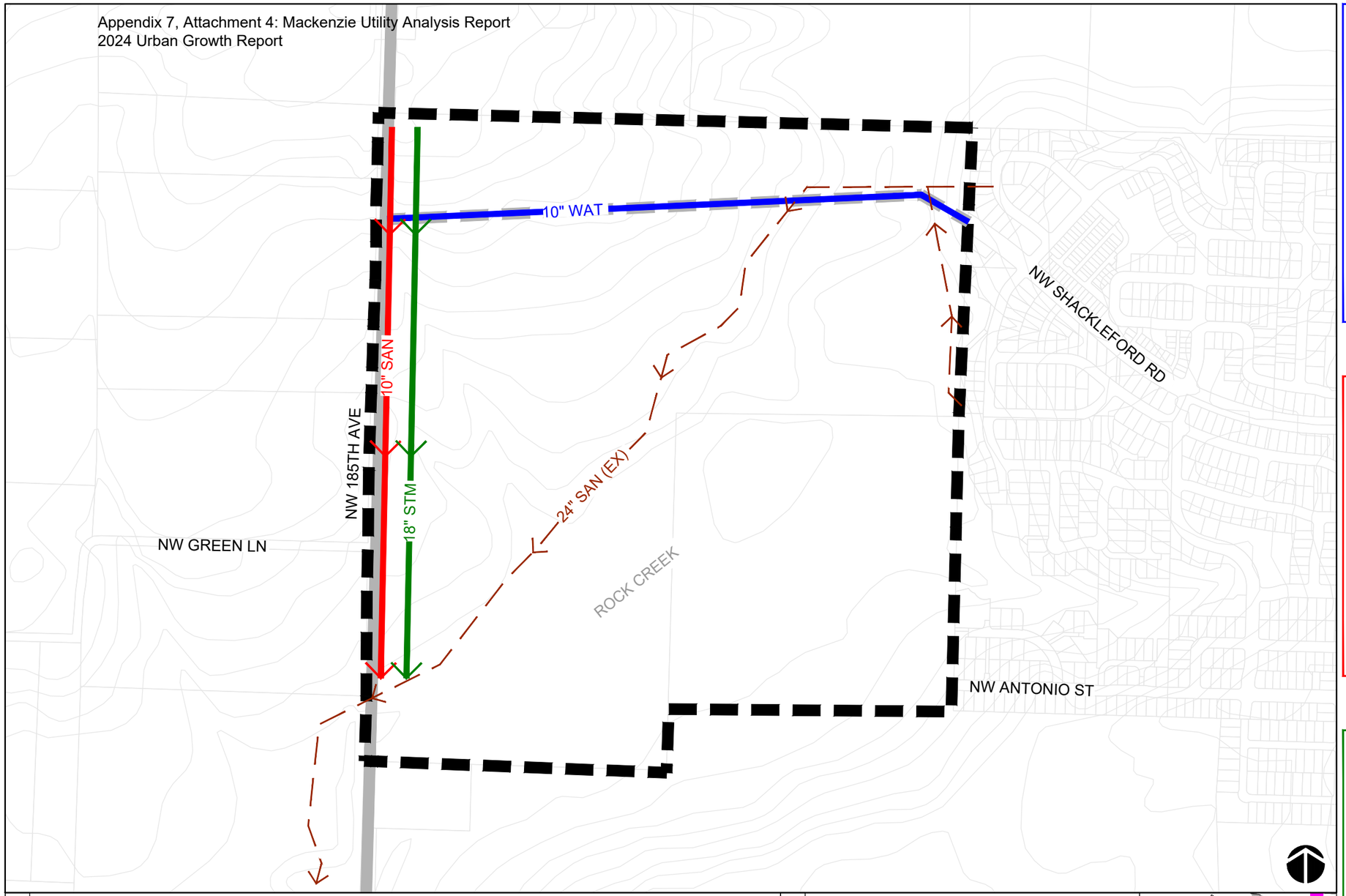
CWS did not indicate whether the existing stormwater system had the capacity to serve areas already inside the UGB.

Assessment of the capacity of existing stormwater facilities to serve areas proposed for addition to the UGB.

Based on topography, the Bethany West URA would discharge directly to Rock Creek. CWS requires that stormwater from development areas be treated and detained on-site therefore having no negative impacts on the existing system.

Assessment of the impacts to existing stormwater facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

CWS requires that stormwater from development areas be treated and detained on-site so as not to negatively impact the existing system.



WATER

WATER PROVIDER: TUALATIN VALLEY WATER DISTRICT

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	2,655	$350	$929,250
12" PIPE (LF)	0	$400	$0
16" PIPE (LF)	0	$500	$0
PUMP STATION (MGD)	0	$5,800,000	$0
STORAGE RESERVOIR (MG)	0.3	$200,000	$60,000
TOTAL			$989,250

SANITARY

SANITARY PROVIDER: CLEAN WATER SERVICES

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	2,500	$275	$687,500
12" PIPE (LF)	0	$350	$0
15" PIPE (LF)	0	$375	$0
PUMP STATION (MGD)	0	$1,800,000	$0
SAN FORCE (LF)	0	$310	$0
TOTAL			$687,500

STORM

STORM PROVIDER: CLEAN WATER SERVICES

WATERSHED: ROCK CREEK-TUALATIN RIVER

SUB-WATERSHED: UPPER ROCK CREEK

PROPOSED IMPROVEMENTS

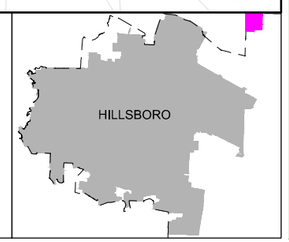
ITEM	UNITS	UNIT COST	TOTAL COST
18" PIPE (LF)	2,500	$400	$1,000,000
24" PIPE (LF)	0	$425	$0
30" PIPE (LF)	0	$500	$0
WATER QUALITY/ DETENTION (SF)	12,200	$150	$1,830,000
TOTAL			$2,830,000

LEGEND

- RESERVE BOUNDARY
- WATER LINE
- SANITARY LINE
- SANITARY LINE (EX)
- STORM LINE

ABBREVIATIONS

EX	EXISTING
LF	LINEAR FEET
MG	MILLION GALLONS
MGD	MILLION GALLONS PER DAY
SF	SQUARE FEET



METRO RESERVES GOAL 14 - UTILITY ANALYSIS MAP

BETHANY WEST

MACKENZIE.

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BORING

Water

The Boring URA would likely be served by the Boring Water District based on proximity.

The Boring Water District has four wells in the deep Troutdale Aquifer and has been granted water rights by Oregon Water Resources Department (OWRD) to withdraw up to 5.8 MGD. Existing storage is provided by three tanks. Two tanks are located at Meier Dairy, one at 352,000 gallons and another at 443,000 gallons. The other tank is located at SE Wally Road at the top of Polivka Hills with a capacity of 100,000 gallons.

The following assessment is based on information from Boring Water District Water System Master Plan, dated April 2003 and the Boring Water District System Master Plan Update, dated November 2009. The Master Plan Update indicates that development of urban reserve areas is planned for a 50-year time horizon and are not included in future demands calculations.

Assessment of the capacity of existing water facilities to serve areas already inside the UGB.

- Supply – the total pumping capacity being drawn from the wells is 1.69 MGD. The Master Plan cites the source capacity as the total capacity from all wells assuming the highest producing well is offline. The Marx well is the highest producing well and draws 0.65 MGD. With the Marx well offline, there is an existing deficit of 0.18 MGD. This is a conservative approach presented in the Master Plan Update for calculating capacity and does not actually indicate there is a supply deficit for existing facilities.
- Storage –Total storage capacity is 895,000 gallons (0.895 MG) and existing demand (as of 2009) is 1.55 MG, creating a deficit of 0.655 MG. This deficit indicates there is not sufficient storage capacity to provide for peak day demands and fire requirements.
- Distribution – the Boring Water District distribution network provides sufficient delivery of water for existing demands (as of 2009).

Assessment of the capacity of existing water facilities to serve areas proposed for addition to the UGB.

- Supply – There is a future deficit from the wells of 120 gpm (0.17 MGD) assuming that the largest well, the Marx well, is offline (conservative approach presented in the Master Plan Update for calculating capacity). According to the Master Plan, the future deficit is not within the range of accuracy of the estimates and describes a reasonable expectation that future peak demand can be met without the Marx well, but only if additional wells are drilled, developed and reliably productive. This applies to the development of Boring URA.
- Storage – Current storage is 0.895 MG and estimated future storage (2029) is 2.55 MG, resulting in a storage deficit of 1.65 MG.
- Distribution – According to the Master Plan Update, the Boring Water District distribution network provides sufficient delivery of water for future 2029 demands.

Assessment of the impacts to existing water facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

- Supply – A future supply deficit exists without considering the development of Boring URA. Without additional supply, there will be negative impacts on the existing system.
- Storage – A future storage deficit exists without considering the development of Boring URA. Without additional storage, there will be negative impacts on the existing system.
- Distribution – It is unclear whether the future 2029 demands from the Master Plan include the capacity to serve Boring URA.

Sanitary Sewer

The Boring URA would likely be served by Clackamas County Water Environment Services (WES) based on proximity and a southern portion of the Boring URA falls within the WES Rate Zone 2. This portion of area routes sanitary from 60 households and businesses to the Boring Water Resource Recovery Facility (Boring WRRF) for treatment. The Boring WRRF consists of lagoons and a sand filter to provide tertiary treatment for up to 20,000 gallons per day (0.02 MGD).

The following assessment is based on information from the Water Environment Services (WES) Capital Improvement Plan Fiscal Years 2024/25-2028/29 and the Boring WRRF Facilities Plan Technical Memorandum, dated August 2020.

Assessment of the capacity of existing sanitary sewer facilities to serve areas already inside the UGB.

According to a study summarized in the Boring WRRF Facilities Plan, the design capacity of the Boring WRRF is 0.018 MGD and the existing (2018) average annual flow is 0.019 MGD. The WRRF can therefore adequately serve the current service area, with no capacity for future development.

Assessment of the capacity of existing sanitary sewer facilities to serve areas proposed for addition to the UGB.

The Boring WRRF struggles to meet treatment requirements for existing demands, let alone additional demands from future urban reserve areas. The report summarized in the Boring WRRF Facilities Plan advises that the Boring WRRF be abandoned, and wastewater be pumped to another facility for treatment, either a town of Sandy facility or other WES facility.

The closest WES sewer main connection point would be at the intersection of Hwy 212 and Hwy 224. The sewer mainline extension would follow Hwy 212 to Boring, and it would be approximately 8.5 miles of pipeline to extend to the URA.

Assessment of the impacts to existing sanitary sewer facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

The existing sanitary sewer infrastructure does not have the capacity to serve additional area. Extensive improvements (as described above), including approximately 8.5 miles of sanitary piping, would be required to serve the Boring URA.

Storm

It is currently unknown what municipal stormwater facilities or infrastructure, if any, serve the area in Boring as it remains an unincorporated community in Clackamas County. The nearest adjacent stormwater management area is Water Environment Services (WES) which borders Boring to the west.

The following assessment is based on information from communication with a Clackamas County Principal Planner.

Assessment of the capacity of existing stormwater facilities to serve areas already inside the UGB.

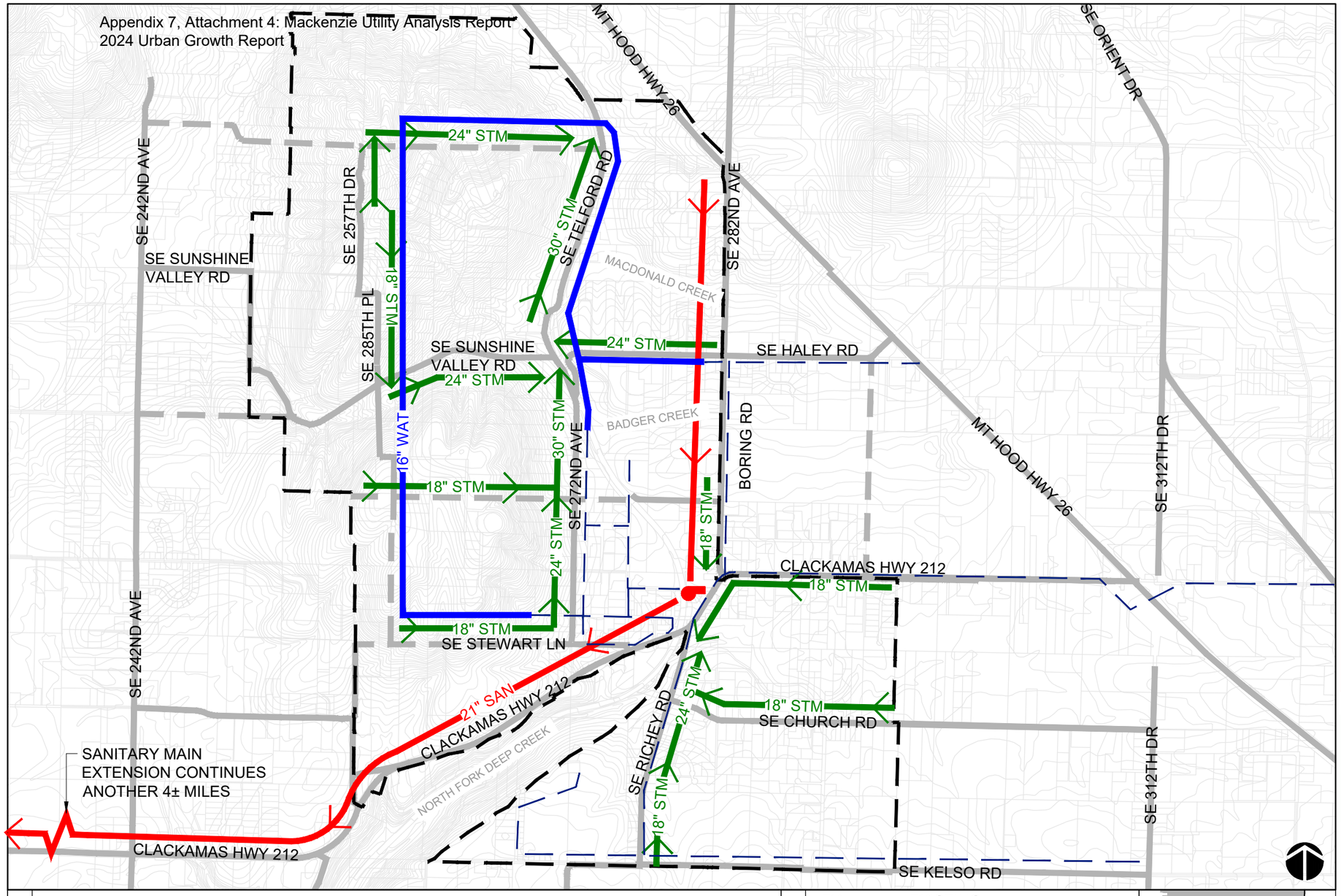
It is currently unknown what municipal stormwater facilities or infrastructure, if any, serve the area in Boring, Oregon. Based on existing topography, it seems likely that the Boring URA could outfall directly to North Fork Deep Creek and not impact any existing stormwater infrastructure.

Assessment of the capacity of existing stormwater facilities to serve areas proposed for addition to the UGB.

It is currently unknown what municipal stormwater facilities or infrastructure, if any, serve the area in Boring, Oregon. Based on existing topography, it seems likely that the Boring URA could outfall directly to North Fork Deep Creek and not impact any existing stormwater infrastructure.

Assessment of the impacts to existing stormwater facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

It is currently unknown what municipal stormwater facilities or infrastructure, if any, serve the area in Boring, Oregon. Based on existing topography, it seems likely that the Boring URA could outfall directly to North Fork Deep Creek and not impact any existing stormwater infrastructure.



WATER

WATER PROVIDER: BORING WATER DISTRICT

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	0	$350	$0
12" PIPE (LF)	0	$400	$0
16" PIPE (LF)	23,100	$500	$11,550,000
PUMP STATION (MGD)	0	$5,800,000	$0
STORAGE RESERVOIR (MG)	6.6	$200,000	$1,320,000
TOTAL			$12,870,000

SANITARY

SANITARY PROVIDER: CLACKAMAS COUNTY WATER ENVIRONMENT SERVICES (WES)

ZONE: RATE ZONE 2

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	0	$275	$0
12" PIPE (LF)	0	$350	$0
21" PIPE (LF)	44,800	$425	$19,040,000
PUMP STATION (MGD)	9.2	$1,800,000	$16,560,000
SAN FORCE (LF)	0	$0	$0
TOTAL			$35,600,000

STORM

STORM PROVIDER: CLACKAMAS COUNTY

WATERSHED: JOHNSON CREEK, LOWER CLACKAMAS RIVER

SUB-WATERSHED: UPPER JOHNSON CREEK, NORTH FORK DEEP CREEK

PROPOSED IMPROVEMENTS

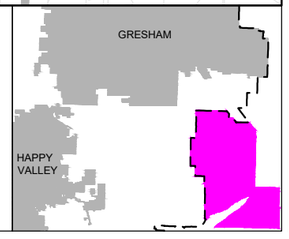
ITEM	UNITS	UNIT COST	TOTAL COST
18" PIPE (LF)	24,000	$400	$9,600,000
24" PIPE (LF)	12,900	$425	$5,482,500
30" PIPE (LF)	5,500	$500	$2,750,000
WATER QUALITY & DETENTION	128,150	$150	$19,222,500
TOTAL			$37,055,000

LEGEND

- RESERVE BOUNDARY
- WATER LINE
- WATER LINE (EX)
- SANITARY LINE
- SANITARY PUMP STATION
- STORM LINE
- STORM LINE (EX)

ABBREVIATIONS

EX	EXISTING
LF	LINEAR FEET
MG	MILLION GALLONS
MGD	MILLION GALLONS PER DAY
SF	SQUARE FEET



METRO RESERVES GOAL 14 - UTILITY ANALYSIS MAP

BORING

MACKENZIE.

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BORING – HIGHWAY 26

Water

The Boring – Highway 26 URA would likely be served by the Boring Water District based on proximity.

The Boring Water District has four wells in the deep Troutdale Aquifer and has been granted water rights by Oregon Water Resources Department (OWRD) to withdraw up to 5.8 MGD. Existing storage is provided by three tanks. Two tanks are located at Meier Dairy, one at 352,000 gallons and another at 443,000 gallons. The other tank is located at SE Wally Road at the top of Polivka Hills with a capacity of 100,000 gallons.

The following assessment is based on information from Boring Water District Water System Master Plan, dated April 2003 and the Boring Water District System Master Plan Update, dated November 2009. The Master Plan Update indicates that development of urban reserve areas is planned for a 50-year time horizon and are not included in future demands calculations.

Assessment of the capacity of existing water facilities to serve areas already inside the UGB.

- Supply – the total pumping capacity being drawn from the wells is 1.69 MGD. The Master Plan cites the source capacity as the total capacity from all wells assuming the highest producing well is offline. The Marx well is the highest producing well and draws 0.65 MGD. With the Marx well offline, there is an existing deficit of 0.18 MGD. This is a conservative approach presented in the Master Plan Update for calculating capacity and does not actually indicate there is an existing supply deficit for existing facilities.
- Storage – Total storage capacity is 895,000 gallons (0.895 MG) and existing demand (as of 2009) is 1.55 MG, creating a deficit of 0.655 MG. This deficit indicates there is not sufficient storage capacity to provide for peak day demands and fire requirements.
- Distribution – the Boring Water District distribution network provides sufficient delivery of water for existing demands (as of 2009).

Assessment of the capacity of existing water facilities to serve areas proposed for addition to the UGB.

- Supply – There is a future deficit from the wells of 120 gpm (0.17 MGD) assuming that the largest well, the Marx well, is offline. According to the Master Plan, the future deficit is not within the range of accuracy of the estimates and describes a reasonable expectation that future peak demand can be met without the Marx well, but only if additional wells are drilled, developed and reliably productive. This applies to the development of Boring – Highway 26 URA.
- Storage – Current storage is 0.895 MG and estimated future storage (2029) is 2.55 MG, resulting in a storage deficit of 1.65 MG.
- Distribution – According to the Master Plan Update, the Boring Water District distribution network provides sufficient delivery of water for future 2029 demands.

Assessment of the impacts to existing water facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

- Supply – A future supply deficit exists without considering the development of Boring – Highway 26 URA. Without additional supply, there will be negative impacts on the existing system.
- Storage – A future storage deficit exists without considering the development of Boring – Highway 26 URA. Without additional storage, there will be negative impacts on the existing system.
- Distribution – It is unclear whether the future 2029 demands from the master plan include the capacity to serve Boring – Highway 26 URA.

Sanitary Sewer

The Boring – Highway 26 URA would likely be served by Clackamas County Water Environment Services (WES) based on proximity and a southern portion of the Boring – Highway 26 URA falls within the WES Rate Zone 2. This portion of area routes sanitary from 60 households and businesses to the Boring Water Resource Recovery Facility (Boring WRRF) for treatment. The Boring WRRF consists of lagoons and a sand filter to provide tertiary treatment for up to 20,000 gallons per day (0.02 MGD).

The following assessment is based on information from the Water Environment Services (WES) Capital Improvement Plan Fiscal Years 2024/25-2028/29 and the Boring WRRF Facilities Plan Technical Memorandum, dated August 2020.

Assessment of the capacity of existing sanitary sewer facilities to serve areas already inside the UGB.

According to a study summarized in the Boring WRRF Facilities Plan, the design capacity of the Boring WRRF is 0.018 MGD and the existing (2018) average annual flow is 0.019 MGD. The WRRF can therefore adequately serve the current service area, with no capacity for future development.

Assessment of the capacity of existing sanitary sewer facilities to serve areas proposed for addition to the UGB.

The Boring WRRF struggles to meet treatment requirements for existing demands, let alone additional demands from future urban reserve areas. The report summarized in the Boring WRRF Facilities Plan advises that the Boring WRRF be abandoned, and wastewater be pumped to another facility for treatment, either a town of Sandy facility or other WES facility.

The closest WES sewer main connection point would be at the intersection of Hwy 212 and Hwy 224. The sewer mainline extension would follow Hwy 212 to Boring, and it would be approximately 8.5 miles of pipeline to extend to the URA.

Assessment of the impacts to existing sanitary sewer facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

The existing sanitary sewer infrastructure does not have the capacity to serve additional area. Extensive improvements (as described above), including approximately 8.5 miles of sanitary piping, would be required to serve the Boring – Highway 26 URA.

Storm

It is currently unknown what municipal stormwater facilities or infrastructure, if any, serve the area in Boring as it remains an unincorporated community in Clackamas County. The nearest adjacent stormwater management area is Water Environment Services (WES) which borders Boring to the west.

The following assessment is based on information from communication with a Clackamas County Principal Planner.

Assessment of the capacity of existing stormwater facilities to serve areas already inside the UGB.

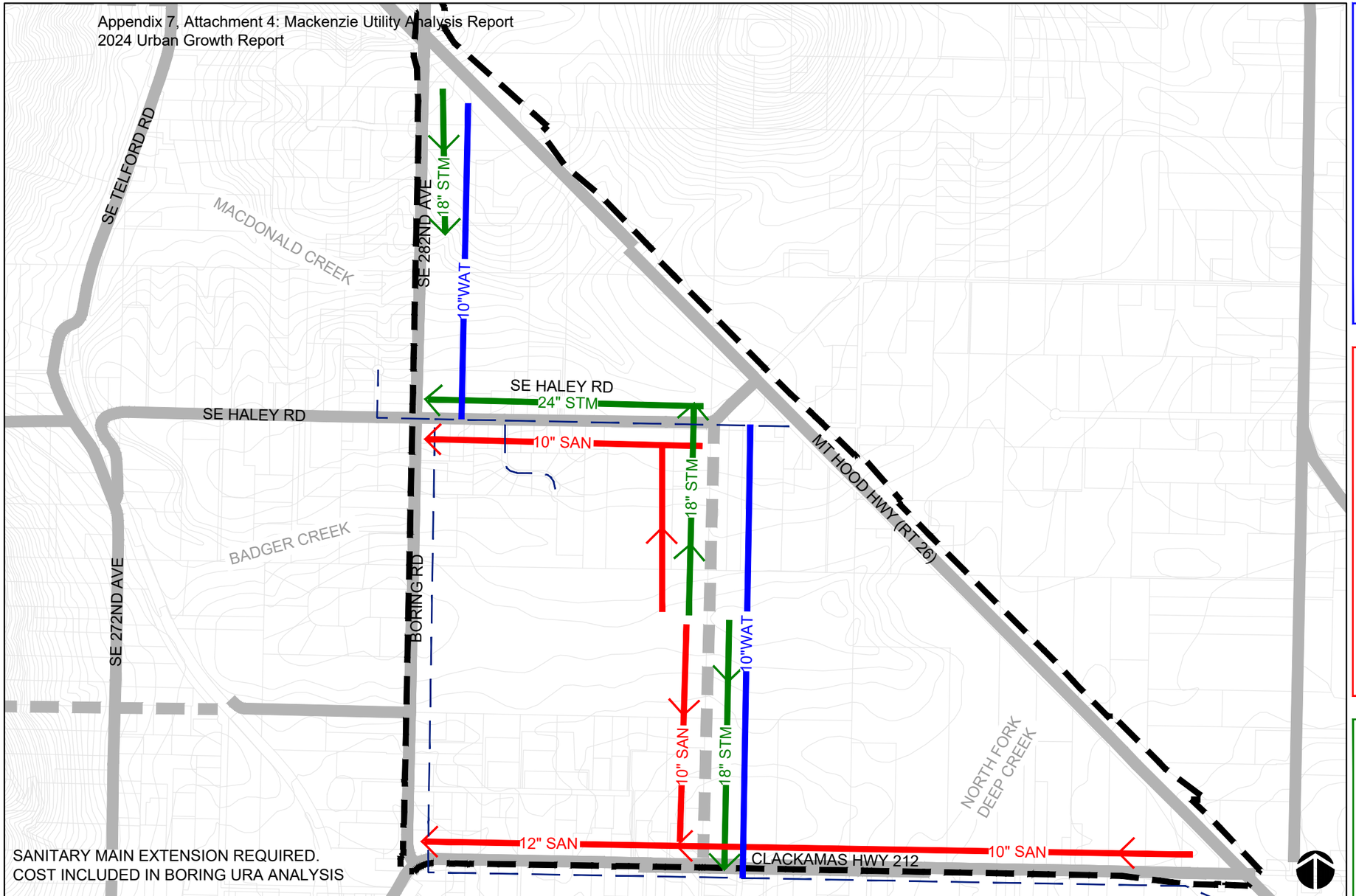
It is currently unknown what municipal stormwater facilities or infrastructure, if any, serve the area in Boring, Oregon.

Assessment of the capacity of existing stormwater facilities to serve areas proposed for addition to the UGB.

It is currently unknown what municipal stormwater facilities or infrastructure, if any, serve the area in Boring, Oregon.

Assessment of the impacts to existing stormwater facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

It is currently unknown what municipal stormwater facilities or infrastructure, if any, serve the area in Boring, Oregon.



WATER

WATER PROVIDER: BORING WATER DISTRICT

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	9,100	$350	$3,185,000
12" PIPE (LF)	0	$400	$0
16" PIPE (LF)	0	$500	$0
PUMP STATION (MGD)	0	$5,800,000	$0
STORAGE RESERVOIR (MG)	2.5	$200,000	$500,000
TOTAL			$3,685,000

SANITARY

SANITARY PROVIDER: CLACKAMAS COUNTY WATER ENVIRONMENT SERVICES (WES)

ZONE: RATE ZONE 2

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	10,300	$275	$2,832,500
12" PIPE (LF)	2,300	$350	$805,000
15" PIPE (LF)	0	$375	$0
PUMP STATION (MGD)	0	$1,800,000	$0
SAN FORCE (LF)	0	$310	$0
TOTAL			$3,637,500

STORM

STORM PROVIDER: CLACKAMAS COUNTY

WATERSHED: JOHNSON CREEK, LOWER CLACKAMAS RIVER

SUB-WATERSHED: UPPER JOHNSON CREEK, NORTH FORK DEEP CREEK

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
18" PIPE (LF)	5,400	$400	$2,160,000
24" PIPE (LF)	2,500	$425	$1,062,500
30" PIPE (LF)	0	$500	$0
WATER QUALITY/ DETENTION (SF)	82,750	$150	$12,412,500
TOTAL			$15,635,000

LEGEND

- RESERVE BOUNDARY
- WATER LINE
- WATER LINE (EX)
- SANITARY LINE
- STORM LINE
- SANITARY LINE (EX)

ABBREVIATIONS

EX	EXISTING
LF	LINEAR FEET
MG	MILLION GALLONS
MGD	MILLION GALLONS PER DAY
SF	SQUARE FEET

METRO RESERVES GOAL 14 - UTILITY ANALYSIS MAP

BORING HWY 26

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BORLAND

Water

The Borland URA would most likely be served by the City of Tualatin based on proximity and would be part of the B pressure zone. Pressure zone B is served by two storage reservoirs, a 2.2 MG reservoir (B-1) and 2.8 MG reservoir (B-2) which were previously supplied by the Martinazzi and Boones Ferry Pump Stations. Both of these pump stations have reached the end of their usable lives and do not currently operate. Pressure zone B is now supplied by the Boones Ferry flow control valve/pressure reducing valve.

The City of Tualatin's sole source of water is treated water purchased from Portland Water Bureau. Water is delivered through a 36-inch supply line from the Washington County Supply Line.

The following assessment is based on information from City of Tualatin Water System Master Plan, dated March 2023. Buildout conditions in the City of Tualatin Master Plan include the existing service area and defined expansion areas, of which Norwood is not included.

Assessment of the capacity of existing water facilities to serve areas already inside the UGB.

- Storage – there is a storage surplus of 0.19 MG for pressure zone B under current (2020) conditions.
- Distribution – There are existing industrial deficiencies in pressure zone B. Existing transmission line capacity is also deficient in pressure zone B.

Assessment of the capacity of existing water facilities to serve areas proposed for addition to the UGB.

- Storage – there is a storage deficit of 1.0 MG for pressure zone B under buildout conditions.
- Distribution – new customers requiring large fire flows in pressure zone B are required to install fire flow pumps.

Assessment of the impacts to existing water facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

- Storage – while there is a storage surplus under existing conditions, there is a deficit under the full buildout condition. Assuming adding Borland URA to the UGB would occur after full buildout of the areas already within the UGB, incorporation of Borland would cause a greater deficit without the addition or expansion of storage facilities.
- Distribution – transmission line improvements are identified in the Master Plan capital improvement projects.

Sanitary Sewer

The Borland URA would most likely be served by the City of Tualatin and/or City of West Linn based on proximity and topography. The likely point of connection to the City of Tualatin infrastructure would be either the Orchard Hill Pump Station or the Borland Pump Station (both in the Nyberg basin). The likely connection point to the City of West Linn infrastructure would be an existing gravity sanitary main in Willamette Falls Drive (in the Willamette Town basin).

Downstream of the likely point of connection to the City of Tualatin sanitary infrastructure is the Nyberg Trunk which eventually flows to the Durham Advanced Wastewater Treatment Facility (AWWTF). The City of Tualatin's sewage is treated at the Durham Advanced Wastewater Treatment Facility which is owned and operated by Clean Water Services. Clean Water Services is also responsible for gravity sewers over 24-inches in size, pump stations and force mains.

From the likely point of connection at Willamette Falls Drive, sanitary flows southeast toward the Willamette River toward the Willamette Pump Station (owned by Water Environment Services). The Willamette Falls force main follows Interstate 205 and the Willamette River toward. At the downstream end of the City of West Linn sanitary system as Clackamas County Water Environment Services (WES) owned pumps and force mains. Sanitary ultimately gets pumped to the Tri-City Water Resource Recovery Facility (WRRF) located on the east side of the Willamette River.

The following assessment is based on information from City of Tualatin Sewer Master Plan, dated August 2019, the Clean Water Services East Basin 2019 Master Plan Project, dated June 2021, the City of West Linn Sanitary Sewer Master Plan Update, dated September 2019, and the Water Environment Services Sanitary Sewer System Master Plan, dated January 2019.

Assessment of the capacity of existing sanitary sewer facilities to serve areas already inside the UGB.

Tualatin

Both the Borland and Orchard Hill Pump Stations have surplus capacity under existing (2020) conditions (per CWS). Per the City of Tualatin Master Plan, there are several sections of the Nyberg Trunk with no remaining capacity under existing conditions.

West Linn

There do not appear to be any capacity issues downstream of the assumed point of connection to the City of West Linn infrastructure under existing conditions.

Assessment of the capacity of existing sanitary sewer facilities to serve areas proposed for addition to the UGB.

Tualatin

The Borland and Orchard Hill Pump Stations have a surplus capacity through 2040 (based on estimated peak hour flows) per CWS. By 2075 the Borland pump station has a deficiency of 1.8 MGD. Per the City of Tualatin Master Plan, under buildout conditions there are several sections of the Nyberg Trunk with deficient capacity where backwatering occurs.

West Linn

There are two identified deficiencies downstream of the assumed point of connection to the City of West Linn infrastructure under buildout conditions. They both occur in gravity piping near where the City system crosses the Willamette River. There is a WES capital improvement project currently in the design phase to increase capacity of the Willamette Pump Station to meet future wet weather flows, with an expected completion in 2027. The Master Plan does not address what the current or increased capacity would be.

Assessment of the impacts to existing sanitary sewer facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

Tualatin

According to CWS Master Plan, there is surplus capacity of 0.3 MG at the Orchard Hill Pump Station through 2075, and a surplus capacity of 0.1 MG at the Borland Pump Station through 2040. Based on preliminary calculations, this surplus capacity would not be enough to serve the entire Borland URA, so additional capacity will be needed. There are several pipe capacity deficiencies in the Nyberg basin under buildout conditions. The addition of the Borland URA would further contribute to these deficiencies.

West Linn

The Willamette Pump Station improvements discussed above will increase capacity to meet future wet weather flows, however the amount of additional capacity and whether it could serve the Borland URA is not clear and is dependent on when development occurs.

Storm

Borland URA would likely be served by the City of West Linn and City of Tualatin for stormwater based on proximity and topography. A majority of the Borland URA flows northeast toward the Tualatin River and new stormwater infrastructure within the URA would likely outfall directly to the river and not need to connect to any existing City infrastructure.

The following assessment is based on information from the City of Tualatin Stormwater Master plan, dated April 2019 and the City of West Linn Storm Drainage Master Plan, dated September 2019.

Assessment of the capacity of existing stormwater facilities to serve areas already inside the UGB.

Tualatin

The Master Plan identifies capacity issues related to modeled future flows through the existing system and does not specifically address the capacity of the existing system related to existing flows. However, hydraulic modeling summarized in the Master Plan indicates that within modeled areas, full development would result in minimal or no increase to future flows, therefore it can be assumed that identified capacity issues are related to existing flows and not future flows.

West Linn

The Master Plan identifies capacity issues related to modeled future flows through the existing system and does not specifically address the capacity of the existing system related to existing flows. However, hydraulic modeling summarized in the Master Plan indicates that within modeled areas, full development would result in minimal or no increase to future flows, therefore it can be assumed that identified capacity issues are related to existing flows and not future flows. There are four high priority capital improvement projects recommended in the Master Plan to address capacity related issues, all of which occur at the downstream end of the stormwater system near the Willamette River.

Assessment of the capacity of existing stormwater facilities to serve areas proposed for addition to the UGB.

Tualatin

The same capacity issues identified in the Master Plan for existing conditions are problematic when considering serving areas outside the existing service area and should be corrected based on proposed capital improvement projects prior to serving additional area. Capacity issues do not exist in every basin so necessary improvements are dependent on the location of the proposed development area. A small portion of the Borland URA is within the Saum Creek Basin which does not have any identified capacity related issues.

West Linn

The same capacity issues identified in the Master Plan for the existing service area are problematic when considering serving additional areas and should be corrected based on proposed capital improvement projects prior to serving additional area. Capacity issues do not exist in every basin so necessary improvements are dependent on the location of the proposed development area. The Borland URA is does not fall within any of the currently defined City of West Linn basins.

Because the Borland URA is outside both City of West Linn and City of Tualatin City limits, existing stormwater infrastructure does not appear to exist in this area. Based on topography, a majority of the Borland URA flows northeast toward the Tualatin River and new stormwater infrastructure within the URA would likely outfall directly to the river and not need to connect to any existing City infrastructure.

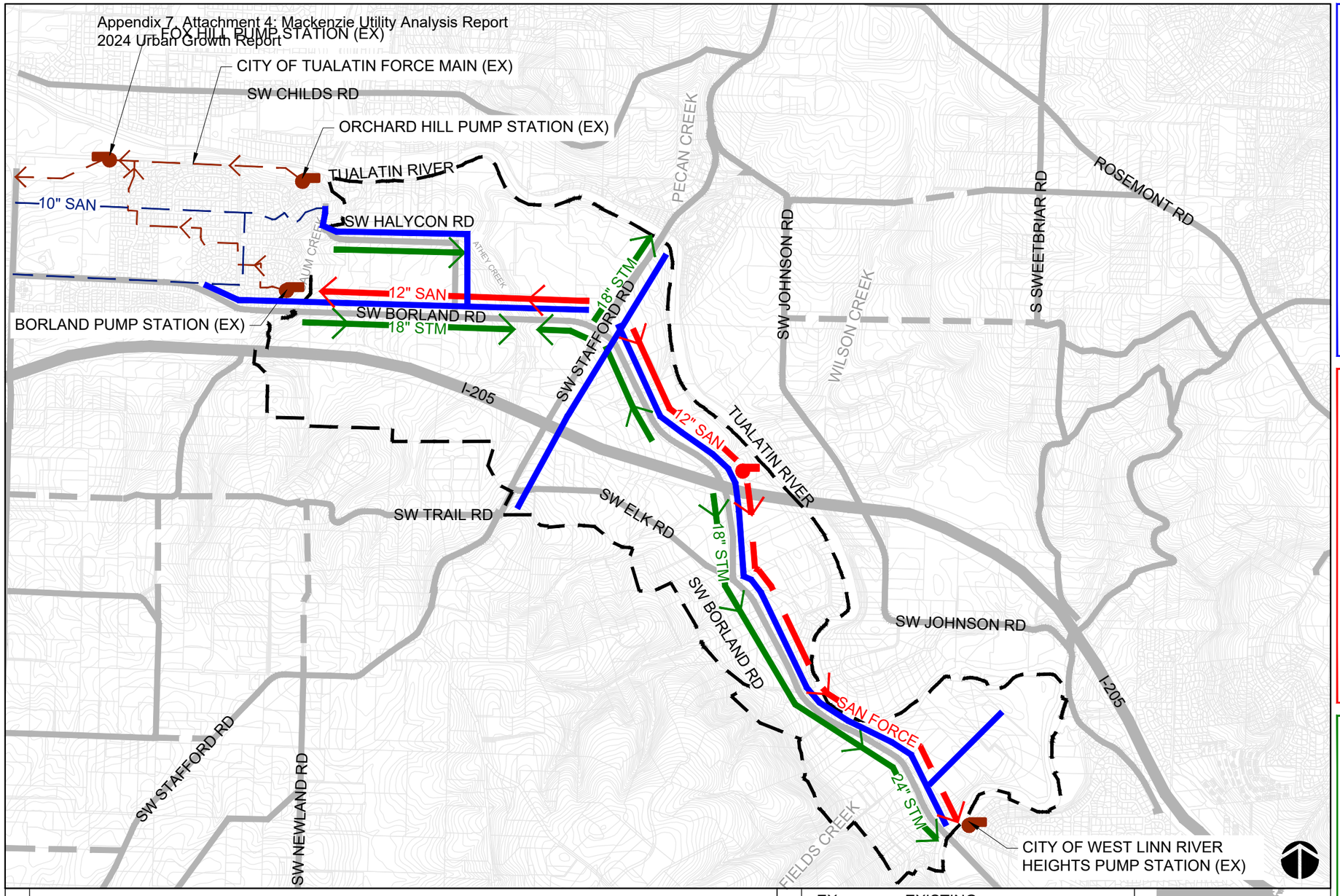
Assessment of the impacts to existing stormwater facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

Tualatin

Existing stormwater facilities with identified capacity issues will experience further issues if not addressed prior to adding URA land to the UGB. Based on topography, the Borland URA would discharge directly to tributaries of the Tualatin River via private outfalls from development areas and public outfalls from roadways and would thus not connect to any of the existing City of Tualatin infrastructure.

West Linn

Existing stormwater facilities with identified capacity issues will experience further issues if not addressed prior to adding Borland URA land to the UGB. Based on topography, the Borland URA could discharge directly to the Tualatin River and thus not connect to or impact any existing City of West Linn stormwater infrastructure.



WATER				
WATER PROVIDER: CITY OF TUALATIN				
PRESSURE ZONE: B				
PROPOSED IMPROVEMENTS				
	ITEM	UNITS	UNIT COST	TOTAL COST
	10" PIPE (LF)	27,300	$350	$9,555,000
	12" PIPE (LF)	0	$400	$0
	16" PIPE (LF)	0	$500	$0
	PUMP STATION (MGD)	0	$5,800,000	$0
	STORAGE RESERVOIR (MG)	2.8	$200,000	$560,000
	TOTAL			$10,115,000

SANITARY				
SANITARY PROVIDER: CITY OF TUALATIN AND/OR CITY OF WEST LINN				
ZONE: NYBERG (TUALATIN), 9D/10A (WEST LINN)				
PROPOSED IMPROVEMENTS				
	ITEM	UNITS	UNIT COST	TOTAL COST
	10" PIPE (LF)	0	$275	$0
	12" PIPE (LF)	8,000	$350	$2,800,000
	15" PIPE (LF)	0	$375	$0
	PUMP STATION (MGD)	1.4	$1,800,000	$2,520,000
	SAN FORCE (LF)	7,600	$310	$2,356,000
	TOTAL			$7,676,000

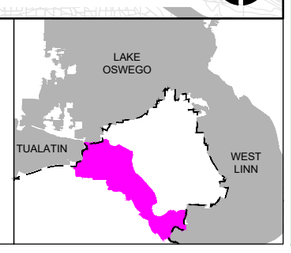
STORM				
STORM PROVIDER: CITY OF TUALATIN, CITY OF WEST LINN				
WATERSHED: FANNO CREEK-TUALATIN RIVER				
SUB-WATERSHED: SAUM CREEK-TUALATIN RIVER				
PROPOSED IMPROVEMENTS				
	ITEM	UNITS	UNIT COST	TOTAL COST
	18" PIPE (LF)	12,600	$400	$5,040,000
	24" PIPE (LF)	6,000	$425	$2,550,000
	30" PIPE (LF)	0	$500	$0
	WATER QUALITY/ DETENTION (SF)	70,750	$150	$10,612,500
	TOTAL			$18,202,500

LEGEND

- RESERVE BOUNDARY
- WATER LINE
- WATER LINE (EX)
- SANITARY LINE
- SANITARY FORCE MAIN
- SANITARY LINE (EX)
- SANITARY PUMP STATION
- SANITARY PUMP STATION (EX)
- STORM LINE

ABBREVIATIONS

EX	EXISTING
LF	LINEAR FEET
MG	MILLION GALLONS
MGD	MILLION GALLONS PER DAY
SF	SQUARE FEET



METRO RESERVES GOAL 14 - UTILITY ANALYSIS MAP

BORLAND

MACKENZIE.

0 500 1000

BROOKWOOD PARKWAY

Water

Brookwood Parkway would most likely be served by the City of Hillsboro based on proximity. Brookwood Parkway is located between the future North Hillsboro service area and an area served by Tualatin Valley Water. The City of Hillsboro Water Master Plan includes the evaluation of distribution system and storage system under both existing and projected future water demand, which includes Brookwood Parkway as a future growth area (FGA).

The City of Hillsboro owns and operates two municipal drinking water systems, City System (primary) and Upper System (secondary), served by wholesale water purchased from Joint Water Commission (JWC). The City also provides wholesale water to City of Cornelius, City of Gaston and LA Water Cooperative. The City of Hillsboro and Tualatin Valley Water District are developing the Willamette Water Suply System (WWSS), a new water supply system from the Willamette River, to address rapid growth in City of Hillsboro City System and City of Cornelius. The expected completion for this project is June 2026. There is also a planned upgrade for the existing JWC Water Treatment Plant.

The following assessment is based on information from City of Hillsboro Water Master Plan, dated June 2019. Full buildout in the Master Plan includes the existing service area, as well as new areas being developed (referred to as “SoHi”, “NoHi”, and “Future Growth Areas (FGA)” and is assumed to occur by 2070.

Assessment of the capacity of existing water facilities to serve areas already inside the UGB.

- Supply – The WWSS has sufficient capacity to meet demands within the existing service area.

- Storage – additional storage of 6.4 MG is needed for areas within the existing UGB to provide the desired level of service during a regional supply outage.

Assessment of the capacity of existing water facilities to serve areas proposed for addition to the UGB.

- Supply – without the WWSS, capacity is insufficient to meet projected buildout demands. The WWSS can likely serve a portion of the additional demands for areas outside the current UGB, however available capacity is dependent on the type of development that occurs as part of the buildout scenario.

- Storage – at a minimum, an additional 17.8 MG of storage is needed for any expansion beyond the current UGB, i.e. Brookwood Parkway URA.

Assessment of the impacts to existing water facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

- Supply – the WWSS is required to provide additional supply for expansion outside the UGB. With full buildout of the WWSS, a total supply (including JWC supply) of 77.95 MGD would be available. The peak daily demand of the existing service area is 45.1 MGD, leaving 32.85 MGD for future expansion outside the UGB. This supply surplus would be sufficient to serve Brookwood Parkway URA assuming other developments did not occur prior that significantly reduce the surplus.

- Storage – Areas outside the existing UGB cannot be served without additional storage capacity.

Sanitary Sewer

The City of Hillsboro and Clean Water Services work together to manage the sanitary sewer system near the Brookwood Parkway URA. The primary point of connection for this URA would likely be a Clean Water Services main in NW Meek Road.

The Master Plan for the Clean Water Services (West Basin, which includes City of Hillsboro) is currently in development. The following assessment is based on information from communication with Clean Water Services Capital Planning Division Manager.

Assessment of the capacity of existing sanitary sewer facilities to serve areas already inside the UGB.

CWS is currently developing the West Basin Master Plan (WBMP) which is anticipated to be completed in early 2025. The WBMP will identify sanitary projects at both the Water Resource Recovery Facilities (WRRFs) and in the conveyance system necessary to accommodate redevelopment of underdeveloped areas within the UGB and green-field development of large areas recently brought into the UGB that are undergoing community planning and/or development.

Much of the conveyance infrastructure required for growing demands within the UGB is anticipated to be constructed privately during the development process and coordinated by CWS and local jurisdictions. The CWS WBMP will identify trunk line projects and pump stations necessary to accommodate growth of these areas; these projects will be incorporated into the CWS long-range capital improvement plan (CIP) at strategic times necessary to meet expected capacity demands. The CWS CIP will be updated and adjusted annually to reflect the latest growth patterns and anticipated timing.

Assessment of the capacity of existing sanitary sewer facilities to serve areas proposed for addition to the UGB.

The CWS WBMP will acknowledge the potential for growth in the Brookwood Parkway URA. Full development of areas inside the UGB does not happen prior to the addition of URA into the UGB; the CWS WBMP will assume there is overlap in the continued development of the UGB while simultaneous development begins in URA added to the UGB.

Assessment of the impacts to existing sanitary sewer facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

The CWS WBMP will address the infrastructure needs in unincorporated areas as well as the partner cities to accommodate planned growth. CWS regularly calibrates, updates, and maintains a hydraulic model that predicts sewer flows under development conditions. The hydraulic model is a key component in the identification of both the magnitude and timing of capital projects to meet growth demands.

Storm

Brookwood Parkway would most likely be served by the City of Hillsboro based on proximity. The Brookwood Parkway URA is included in the planning area of the City of Hillsboro Master Plan and is part of the McKay Creek Basin.

The following assessment is based on information from the City of Hillsboro Stormwater Master Plan, dated 2021. The study area included in the Master Plan is the incorporated City, portions of the UGB where the City has adopted plans for development, and portions of the UGB where the City plans to begin planning in the next several years (including the Brookwood Parkway URA).

City of Hillsboro and Clean Water Services standards require on-site detention for expansion areas identified in the City of Hillsboro Stormwater Master Plan, which includes the Brookwood Parkway URA.

Assessment of the capacity of existing stormwater facilities to serve areas already inside the UGB.

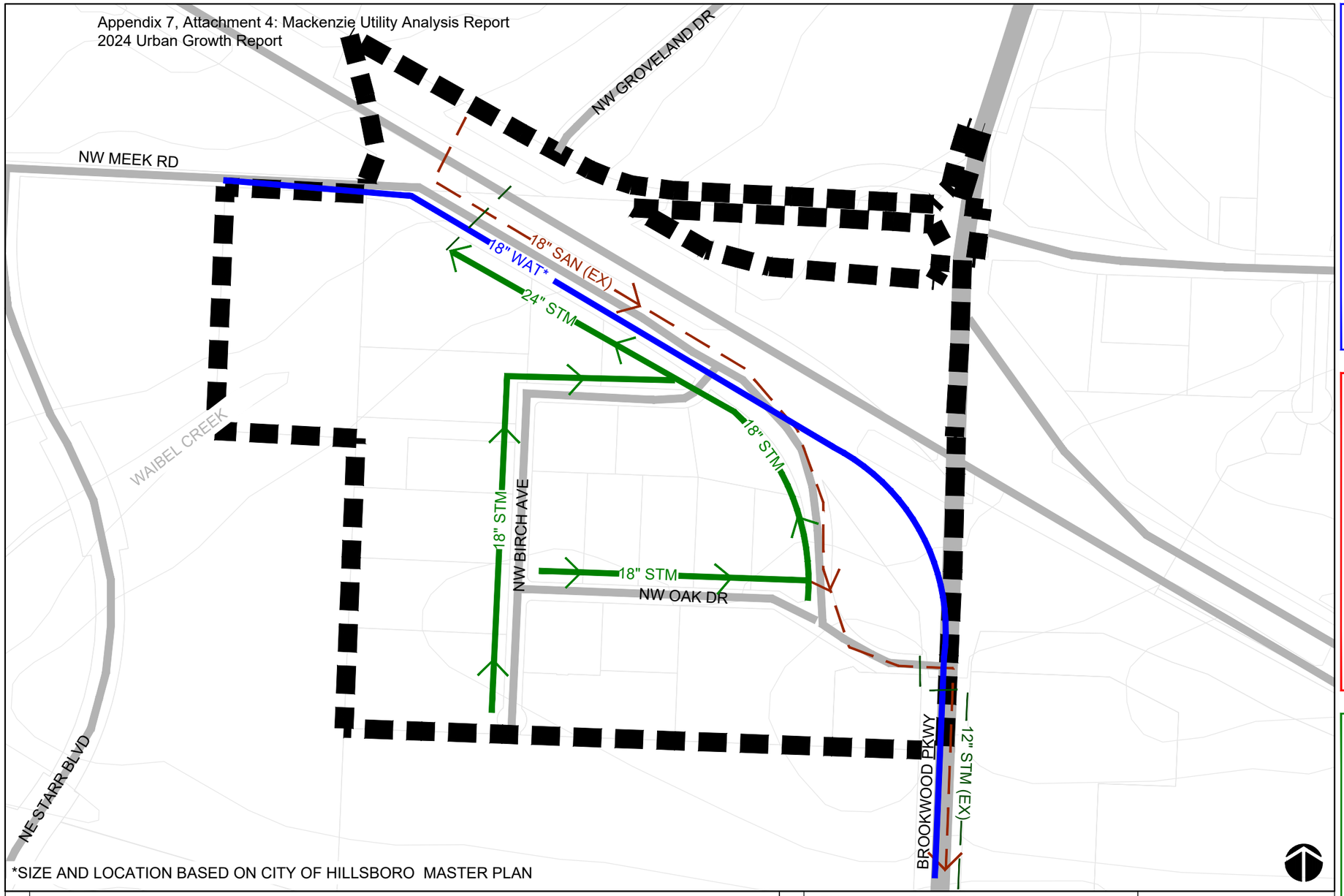
The Master Plan identifies and categorizes 475 known issues in the existing system. Of the 475 issues identified, 14% were related to water quantity, i.e. pipe, outfall and culvert capacity issues. None of the issues are immediately adjacent to the Brookwood Parkway URA.

Assessment of the capacity of existing stormwater facilities to serve areas proposed for addition to the UGB.

Based on topography, the Brookwood Parkway URA would discharge directly to Waibel Creek via private outfalls from development areas and public outfalls from roadways and would thus not connect to any of the existing City of Hillsboro infrastructure.

Assessment of the impacts to existing stormwater facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

Based on topography, the Brookwood Parkway URA would discharge directly to Waibel Creek via private outfalls from development areas and public outfalls from roadways and would thus not connect to or impact any of the existing City of Hillsboro infrastructure.



WATER

WATER PROVIDER: CITY OF HILLSBORO

SERVICE AREA: NORTH HILLSBORO (FUTURE)

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	0	$350	$0
12" PIPE (LF)	0	$400	$0
18" PIPE (LF)	3,125	$650	$2,031,250
PUMP STATION (MGD)	0	$5,800,000	$0
STORAGE RESERVOIR (MG)	0.2	$200,000	$40,000
TOTAL			$2,071,250

SANITARY

SANITARY PROVIDER: CITY OF HILLSBORO/CLEAN WATER SERVICES (CWS)

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	0	$275	$0
12" PIPE (LF)	0	$350	$0
15" PIPE (LF)	0	$375	$0
PUMP STATION (MGD)	0	$1,800,000	$0
SAN FORCE (LF)	0	$310	$0
TOTAL			$0

STORM

STORM PROVIDER: CITY OF HILLSBORO/CLEAN WATER SERVICES (CWS)

WATERSHED: DAIRY CREEK

SUB-WATERSHED: LOWER MCKAY CREEK

PROPOSED IMPROVEMENTS

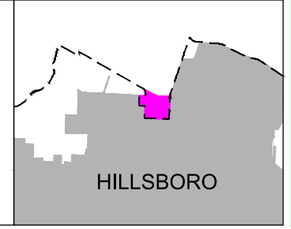
ITEM	UNITS	UNIT COST	TOTAL COST
18" PIPE (LF)	3,000	$400	$1,200,000
24" PIPE (LF)	700	$425	$297,500
30" PIPE (LF)	0	$500	$0
WATER QUALITY & DETENTION	5,150	$150	$772,500
TOTAL			$2,270,000

LEGEND

- RESERVE BOUNDARY
- WATER LINE
- SANITARY LINE (EX)
- STORM LINE

ABBREVIATIONS

EX	EXISTING
LF	LINEAR FEET
MG	MILLION GALLONS
MGD	MILLION GALLONS PER DAY
SF	SQUARE FEET



METRO RESERVES GOAL 14 - UTILITY ANALYSIS MAP

BROOKWOOD PARKWAY

MACKENZIE.

0 150 300

DAMASCUS

Water

The Damascus URA would be served by Sunrise Water Authority as it is currently within their rural area as part of the Sunridge pressure zone.

The following is based on information provided by Sunrise Water Authority District Engineer.

Assessment of the capacity of existing water facilities to serve areas already inside the UGB.

Existing water facilities are able to serve the existing customers.

Assessment of the capacity of existing water facilities to serve areas proposed for addition to the UGB.

Water system improvements would be needed if the Damascus area were to expand by customer addition. Sunrise is planning on serving the future needs of this area as it grows.

Assessment of the impacts to existing water facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

Water system improvements would be needed if the Damascus area were to expand by customer addition, which includes the Damascus URA. The Sunrise Water Authority 20-Year Capital Improvement Plan (dated November 2017) identifies several storage, pumping, transmission line and treatment projects that would be required to serve the Damascus URA without negatively impacting their existing service area.

Sanitary Sewer

The Damascus area within the existing UGB is currently served by private septic systems and there is no existing public sanitary sewer infrastructure. The nearest sanitary district to the Damascus area is Clackamas Water Environment Services (WES) service rate Zone 2.

To serve the Damascus URA with public sanitary sewer infrastructure rather than private septic systems, a sewer trunk line would need to be installed. The closest sanitary sewer point of connection is at the intersection of Highway 212 and Highway 224. The sanitary sewer trunk would likely follow Highway 212 to the Damascus area, resulting in approximately 6 miles of pipe.

Assessment of the capacity of existing sanitary sewer facilities to serve areas already inside the UGB.

There are no existing public sanitary sewer facilities near the Damascus URA.

Assessment of the capacity of existing sanitary sewer facilities to serve areas proposed for addition to the UGB.

There are no existing public sanitary sewer facilities near the Damascus URA.

Assessment of the impacts to existing sanitary sewer facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

There are no existing public sanitary sewer facilities near the Damascus URA.

Storm

According to a Clackamas County Principal Planner, it is currently unknown what municipal stormwater facilities or infrastructure, if any, serve the Damascus area. The nearest adjacent stormwater management area is Water Environment Services (WES) which borders Damascus to the west.

Assessment of the capacity of existing stormwater facilities to serve areas already inside the UGB.

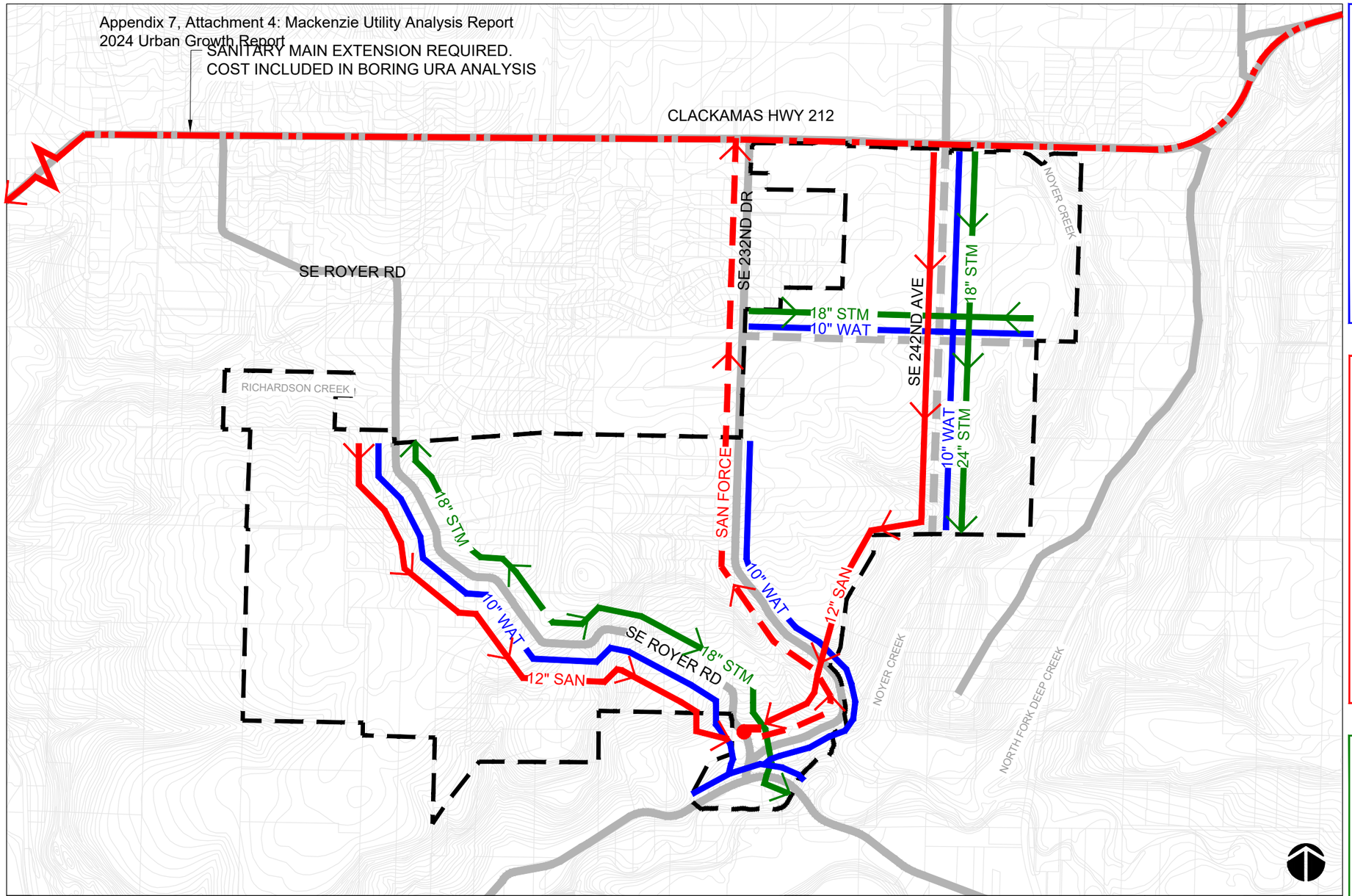
It is currently unknown what municipal stormwater facilities or infrastructure, if any, serve the area in Damascus, Oregon.

Assessment of the capacity of existing stormwater facilities to serve areas proposed for addition to the UGB.

It is currently unknown what municipal stormwater facilities or infrastructure, if any, serve the area in Damascus, Oregon.

Assessment of the impacts to existing stormwater facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

It is currently unknown what municipal stormwater facilities or infrastructure, if any, serve the area in Damascus, Oregon.



WATER

WATER PROVIDER: SUNRISE WATER AUTHORITY

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	23,750	$350	$8,312,500
12" PIPE (LF)	0	$400	$0
16" PIPE (LF)	0	$500	$0
PUMP STATION (MGD)	0	$5,800,000	$0
STORAGE RESERVOIR (MG)	3.9	$200,000	$780,000
TOTAL			$9,092,500

SANITARY

SANITARY PROVIDER: CLACKAMAS COUNTY WATER ENVIRONMENT SERVICES (WES)

RATE ZONE: 2

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	0	$275	$0
12" PIPE (LF)	24,400	$350	$8,540,000
15" PIPE (LF)	0	$375	$0
PUMP STATION (MGD)	3.9	$1,800,000	$7,020,000
SAN FORCE (LF)	9,300	$310	$2,883,000
TOTAL			$18,443,000

STORM

STORM PROVIDER: CLACKAMAS COUNTY

WATERSHED: LOWER CLACKAMAS RIVER

SUB-WATERSHED: NORTH FORK DEEP CREEK

PROPOSED IMPROVEMENTS

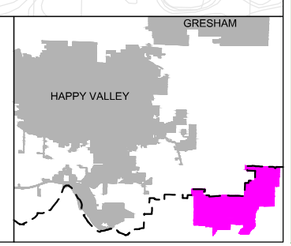
ITEM	UNITS	UNIT COST	TOTAL COST
18" PIPE (LF)	14,100	$400	$5,640,000
24" PIPE (LF)	2,800	$425	$1,190,000
30" PIPE (LF)	0	$500	$0
WATER QUALITY & DETENTION	52,300	$150	$7,845,000
TOTAL			$14,675,000

LEGEND

- RESERVE BOUNDARY
- WATER LINE
- WATER LINE (EX)
- WATER PUMP STATION
- SANITARY LINE
- SANITARY FORCE MAIN
- SANITARY LINE (EX)
- SANITARY EXTENSION FROM BORING URA
- SANITARY PUMP STATION
- STORM LINE
- STORM LINE (EX)

ABBREVIATIONS

EX	EXISTING
LF	LINEAR FEET
MG	MILLION GALLONS
MGD	MILLION GALLONS PER DAY
SF	SQUARE FEET



METRO RESERVES GOAL 14 - UTILITY ANALYSIS MAP

DAMASCUS

MACKENZIE.

0 500 1000

DAVID HILL

Water

David Hill URA would likely be served by the City of Forest Grove as it is included in the City of Forest Grove Master Plan's study area and spans the existing 435 and 540 pressure zones and future 710 and 880 pressure zones. The 435 and 540 pressure zones are supplied by the 1.0 MG David Hill Reservoir, which is served by the David Hill and Watercrest Pump Stations.

The City of Forest Grove's water supply is a combination of City supply and water from the Joint Water Commission (JWC), seasonally dependent. The water treatment plant is City owned and operated and supplies finished water to a City owned 5 MG reservoir.

The following assessment is based on information from City of Forest Grove Water System Master Plan, dated May 2022. In this assessment, future expansion refers to infill development within the existing City limits and select expansion areas, including the David Hill URA. Future development of the David Hill URA is assumed to occur after 2041.

Assessment of the capacity of existing water facilities to serve areas already inside the UGB.

- Supply – the City has sufficient capacity in raw water supply, treatment capacity, and finished water transmission.

- Storage – There is a storage surplus of 0.21 MG for the 435 and 540 pressure zones under current conditions.

- Pump – There is a pump capacity surplus of 373 MG for the Watercrest and David Hill Pump Stations under current conditions.

Assessment of the capacity of existing water facilities to serve areas proposed for addition to the UGB.

- Supply – There will be a supply deficit of 0.20 MG by 2041 and a deficit of 0.55 MG by 2071 for the 435 and 540 pressure zones. The David Hill URA is assumed to be developed after 2041, so this deficit indicates that additional supply will be needed to develop David Hill.

- Storage – System storage for all zones will be deficient in the next five years (from date of Master Plan). The City of Forest Grove Master Plan proposes the addition of a 0.5 MG reservoir to serve the 710 pressure zone.

- Pump – The existing 540 pump stations (David Hill and Watercrest) have sufficient capacity for future expansion.

Assessment of the impacts to existing water facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

- Supply – The City's capital improvement plan has identified several projects related to water supply that would be needed to provide adequate supply to this expansion without negative impacts to existing water systems.
- Storage – Storage for the 435 and 540 pressure zones becomes deficient by 2041 (it is assumed in the Master Plan that David Hill URA development would occur after 2041). Incorporation of the David Hill URA into the UGB is included in the future conditions of the City Master Plan, so additional storage will be required once this occurs. The City has capital improvement projects identified to provide this additional storage once expansion occurs.
- Pump – Without the construction of additional pumps, the Watercrest and David Hill Pump Stations, which serve existing pressure zones 435 and 540 as well as future zones 710 and 880, have a capacity deficit of 163 gpm by 2071. The City's capital improvement plan also identifies an upgrade to the existing Watercrest Pump Station to help serve the David Hill URA.

Sanitary Sewer

City of Forest Grove and Clean Water Services (CWS) are the likely providers for the David Hill URA as it is adjacent to existing Forest Grove service area and sanitary infrastructure. The City of Forest Grove facilities generally flow east through the City toward Clean Water Services trunk line running parallel to Council Creek.

The Master Plan for the Clean Water Services (West Basin) is currently in development. The following assessment is based on information from the City of Forest Grove Wastewater System Master Plan, dated November 2007, the Forest Grove West Side Development – Sanitary Sewer Capacity Memorandum, dated January 2022, the City of Forest Grove Westside Planning Program Refinement Plan, dated August 2017, as well as communication with Clean Water Services Capital Planning Division Manager.

Assessment of the capacity of existing sanitary sewer facilities to serve areas already inside the UGB.

The City of Forest Grove Master Plan analyzes the sanitary sewer conveyance system under existing (2010) demands and identified four areas of immediate concern. The one most closely related to the David Hill URA is the Brooke Street sewer main, is the suggested point of connection for the NW David Hill Road and NW Thatcher Road extensions per the City of Forest Grove Westside Refinement Plan. Modeling suggests some surcharging in the Brooke Street line, indicating a capacity issue.

CWS is currently developing the West Basin Master Plan (WBMP) which is anticipated to be completed in early 2025. The WBMP will identify sanitary projects at both the Water Resource Recovery Facilities (WRRFs) and in the conveyance system necessary to accommodate redevelopment of underdeveloped areas within the UGB and green-field development of large areas recently brought into the UGB that are undergoing community planning and/or development.

Much of the conveyance infrastructure required for growing demands within the UGB is anticipated to be constructed privately during the development process and coordinated by CWS and local jurisdictions. The CWS WBMP will identify trunk line projects and pump stations necessary to accommodate growth of these areas; these projects will be incorporated into the CWS long-range capital improvement plan (CIP) at strategic times necessary to meet expected capacity demands. The CWS CIP will be updated and adjusted annually to reflect the latest growth patterns and anticipated timing.

Assessment of the capacity of existing sanitary sewer facilities to serve areas proposed for addition to the UGB.

The Brooke Street surcharging as described above would become more significant with the development of the David Hill URA. The Westside Refinement Plan suggests that this line be monitored during wet weather flows to further determine capacity issues.

This area is acknowledged as part of the WBMP study area but has not been examined in detail. Sewer planning for this area was contemplated during the previous UGB expansion in northwest Forest Grove. The topography of the area will limit the density of development. Northern areas will contribute to existing sewer lines which have been analyzed and have sufficient capacity. Southern areas will contribute to a different existing trunk sewer system. Downstream trunk sewers have been sized to accommodate residential growth in this area.

Both areas are tributary to the existing 36-inch diameter Council Creek Trunk Sewer which has limited downstream capacity immediately upstream from the Hillsboro Water Resource Recovery Facility (WRRF). Plans are underway to construct capacity relief for the existing downstream deficiency. The existing downstream capacity limitations are expected to be resolved within approximately five years.

Assessment of the impacts to existing sanitary sewer facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

The Brooke Street surcharging as described above would become more significant with the development of the David Hill URA.

The CWS WBMP will address the infrastructure needs in unincorporated areas as well as the partner cities to accommodate planned growth. CWS regularly calibrates, updates, and maintains a hydraulic model that predicts sewer flows under development conditions. The hydraulic model is a key component in the identification of both the magnitude and timing of capital projects to meet growth demands.

The Council Creek Trunk Sewer, which is downstream of the David Hill URA, has limited capacity and planning is currently underway to provide additional capacity that will be needed to serve the David Hill URA without negative impacts to the existing system.

Storm

City of Forest Grove and Clean Water Services are the likely providers for the David Hill URA based on proximity and topography. Stormwater from the David Hill URA generally flows south toward Highway 8 where it would discharge to an unnamed City maintained creek that runs southeast along the City boundary until it merges with Gales Creek near the south end of Forest Grove.

The following assessment is based on information from the City of Forest Grove Storm Drainage Master Plan, dated November 2007.

Assessment of the capacity of existing stormwater facilities to serve areas already inside the UGB.

The City of Forest Grove Master Plan identifies nine capital improvement projects that were determined to be immediate needs to address capacity issues in the existing system based on modeling of the current city zoning and a percentage of basin buildout for the 5-year, 24-hour storm event.

Based on topography the David Hill URA would outfall directly to Gales Creek and would thus not connect to existing City storm infrastructure.

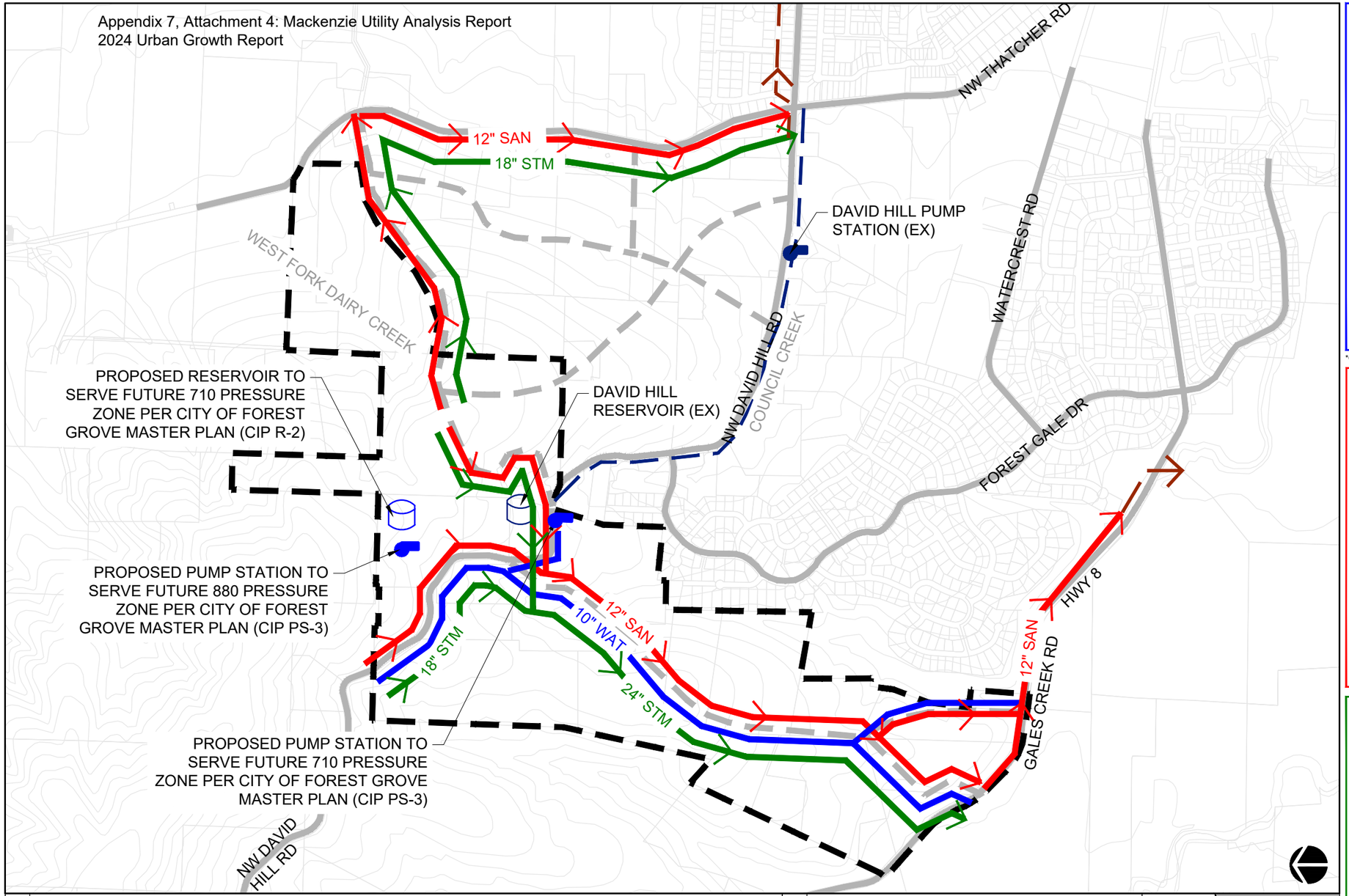
Assessment of the capacity of existing stormwater facilities to serve areas proposed for addition to the UGB.

The City of Forest Grove Master Plan identifies nine capital improvement projects that were determined to be immediate needs to address capacity issues based on modeling the buildout condition for the 25-year, 24-hour storm event.

Based on topography the David Hill URA would outfall directly to Gales Creek and would thus not connect to existing City storm infrastructure.

Assessment of the impacts to existing stormwater facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

Based on topography the David Hill URA would outfall directly to Gales Creek and would thus not connect to or impact existing City storm infrastructure.



WATER PROVIDER: CITY OF FOREST GROVE

PRESSURE ZONE: 435/540 (EXISTING), 710/880 (FUTURE)

WATER — PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	8,370	$350	$2,929,500
12" PIPE (LF)	0	$400	$0
16" PIPE (LF)	0	$500	$0
PUMP STATION (MGD)	*	$5,800,000	$1,750,000
STORAGE RESERVOIR (MG)	0.8	$200,000	$160,000
TOTAL			$4,839,500

*CITY OF FOREST GROVE DOES NOT GIVE A TOTAL STORAGE VOLUME, SO COST IS PER THE MASTER PLAN

SANITARY PROVIDER: CITY OF FOREST GROVE, CLEAN WATER SERVICES (CWS)

SANITARY — PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	0	$275	$0
12" PIPE (LF)	20,250	$350	$7,087,500
15" PIPE (LF)	0	$375	$0
PUMP STATION (MGD)	0	$1,800,000	$0
SAN FORCE (LF)	0	$310	$0
TOTAL			$7,087,500

STORM PROVIDER: CITY OF FOREST GROVE, CLEAN WATER SERVICES (CWS)

WATERSHED: GALES CREEK, DAIRY CREEK

SUB-WATERSHED: LOWER GALES CREEK, COUNCIL CREEK, LOWER WEST FORK DAIRY CREEK

STORM — PROPOSED IMPROVEMENTS

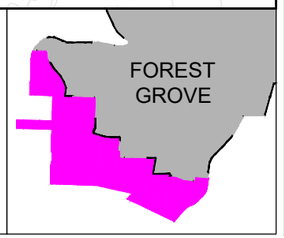
ITEM	UNITS	UNIT COST	TOTAL COST
18" PIPE (LF)	11,000	$400	$4,400,000
24" PIPE (LF)	4,500	$425	$1,912,500
30" PIPE (LF)	0	$500	0
WATER QUALITY/ DETENTION (SF)	24,600	$150	$3,690,000
TOTAL			$10,002,500

LEGEND

- RESERVE BOUNDARY
- WATER LINE
- WATER LINE (EX)
- WATER PUMP STATION
- WATER PUMP STATION (EX)
- WATER RESERVOIR
- WATER RESERVOIR (EX)
- SANITARY LINE
- SANITARY LINE (EX)
- STORM LINE

ABBREVIATIONS

EX	EXISTING
LF	LINEAR FEET
MG	MILLION GALLONS
MGD	MILLION GALLONS PER DAY
SF	SQUARE FEET



METRO RESERVES GOAL 14 - UTILITY ANALYSIS MAP

DAVID HILL

MACKENZIE.

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ELLIGSEN ROAD NORTH

Water

Elligsen Road North URA would likely be served by the City of Wilsonville as it is partially included in their Master Plan study area. According to the City of Wilsonville Water System Master Plan, Elligsen Road North would be part of pressure zones C and D, served by the 'C' Level Reservoir.

The City of Wilsonville's primary supply comes from the Willamette River. There is a single water treatment plant (Willamette River Water Treatment Plant) that serves the City, which is in shared ownership with Tualatin Valley Water District.

The following assessment is based on information from the City of Wilsonville Water System Master Plan, dated September 2012. The Master Plan study area includes the area currently within the UGB plus areas of Clackamas and Washington County Urban Reserve Areas expected to be incorporated into City of Wilsonville, including Elligsen Road North URA. Buildout within the study area is projected to occur by 2036 for non-residential areas and 2045 for residential areas (Wilsonville Southwest is assumed residential in the Master Plan).

Assessment of the capacity of existing water facilities to serve areas already inside the UGB.

- Storage – Per the City Master Plan, there are no known storage issues in the existing system, which consists of four storage reservoirs providing a total of 7.6 MG of effective (usable) storage.
- Pumping – There are two pumping facilities in the distribution system, the Charbonneau Booster Station, and the B-to-C Booster Station. Both facilities have a firm capacity greater than what is anticipated to be needed in the 20-year planning period (as of 2012 report).
- Distribution – peak hour demands can be met with negligible pressure changes from annual average day demand.

Assessment of the capacity of existing water facilities to serve areas proposed for addition to the UGB.

- Storage – estimated required storage by the year 2030 is 17.64 MG, creating a storage deficit of 8.97 MG. Buildout of residential areas (including Elligsen Road North) is not projected to occur until 2045, so additional storage will be needed for its development.
- Pumping – A new pump station will be required to serve future development in the northeast portion of the study area, which includes Elligsen Road North.
- Distribution – the size of existing pipe trunks is adequate for future buildout.

Assessment of the impacts to existing water facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

To provide adequate storage capacity to the study area an additional 8.97 MG of storage capacity will be needed. The City has eight backup wells with a total storage capacity of 6.92 MG, which reduces the 2030 projected storage need to 2.05 MG. The City of Wilsonville is currently in the design phase (construction planned for 2023-2024) for a 3.0 MG storage reservoir located in pressure zone B, with a second reservoir to follow in the future (timeline undefined). The addition of this reservoir will allow for adequate storage capacity to serve current service area as well as the addition of the Elligsen Road North URA into the UGB.

The Zone D Booster Station at C Level Tank is required to provide adequate pumping capacity to serve Elligsen Road North and is identified as a capital improvement project in the Master Plan. Without the addition of this pump, the existing system may experience pump capacity issues.

Sanitary Sewer

The Elligsen Road North URA would likely be served by the City of Wilsonville based on proximity. The majority of the Elligsen Road North Urban Reserve Area is included in the study area of the Master Plan, with the exception of the northeast corner. Elligsen Road North URA falls within the Coffee Creek, Canyon Creek and Boeckman sewer basins. Canyon Creek and Boeckman sewer basins are served by Canyon Creek and Memorial Park pump stations, respectively. There are no pump stations serving the Coffee Creek basin.

Wastewater from the City of Wilsonville is conveyed in a City-owned and operated collection system to the Wilsonville Wastewater Treatment Plant (WWTP).

The following assessment is based on information from the City of Wilsonville Wastewater Collection Master Plan, dated November 2014.

Assessment of the capacity of existing sanitary sewer facilities to serve areas already inside the UGB.

The existing system has no known hydraulic deficiencies for all existing pipe and pump stations.

Assessment of the capacity of existing sanitary sewer facilities to serve areas proposed for addition to the UGB.

Both the Canyon Creek and Memorial Park pump stations require capacity improvements to serve future planning areas. The City of Wilsonville has capital improvement projects identified for both, with an estimated time frame of 6-10 years for Memorial Park and 11-20 years for Canyon Creek (relative to the report dated 2014).

There are also several trunk line extensions required to serve future development areas, including the Elligsen Road North URA. The design and costs for these improvements are included in the Master Plan and are shown on the Utility Analysis Map and included in the cost tables of this report.

Assessment of the impacts to existing sanitary sewer facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

Additional pump capacity and trunk line extensions are needed to serve this URA without negative impacts to existing sanitary sewer infrastructure within the Coffee Creek, Canyon Creek and Boeckman Basins.

Storm

City of Wilsonville is the likely provider for Elligsen Road North URA, as it is located partially within the Boeckman Creek and Coffee Lake Creek Basins and is adjacent to the City service area boundary.

The following assessment is based on information from City of Wilsonville Stormwater Master Plan, dated March 2012.

Assessment of the capacity of existing stormwater facilities to serve areas already inside the UGB.

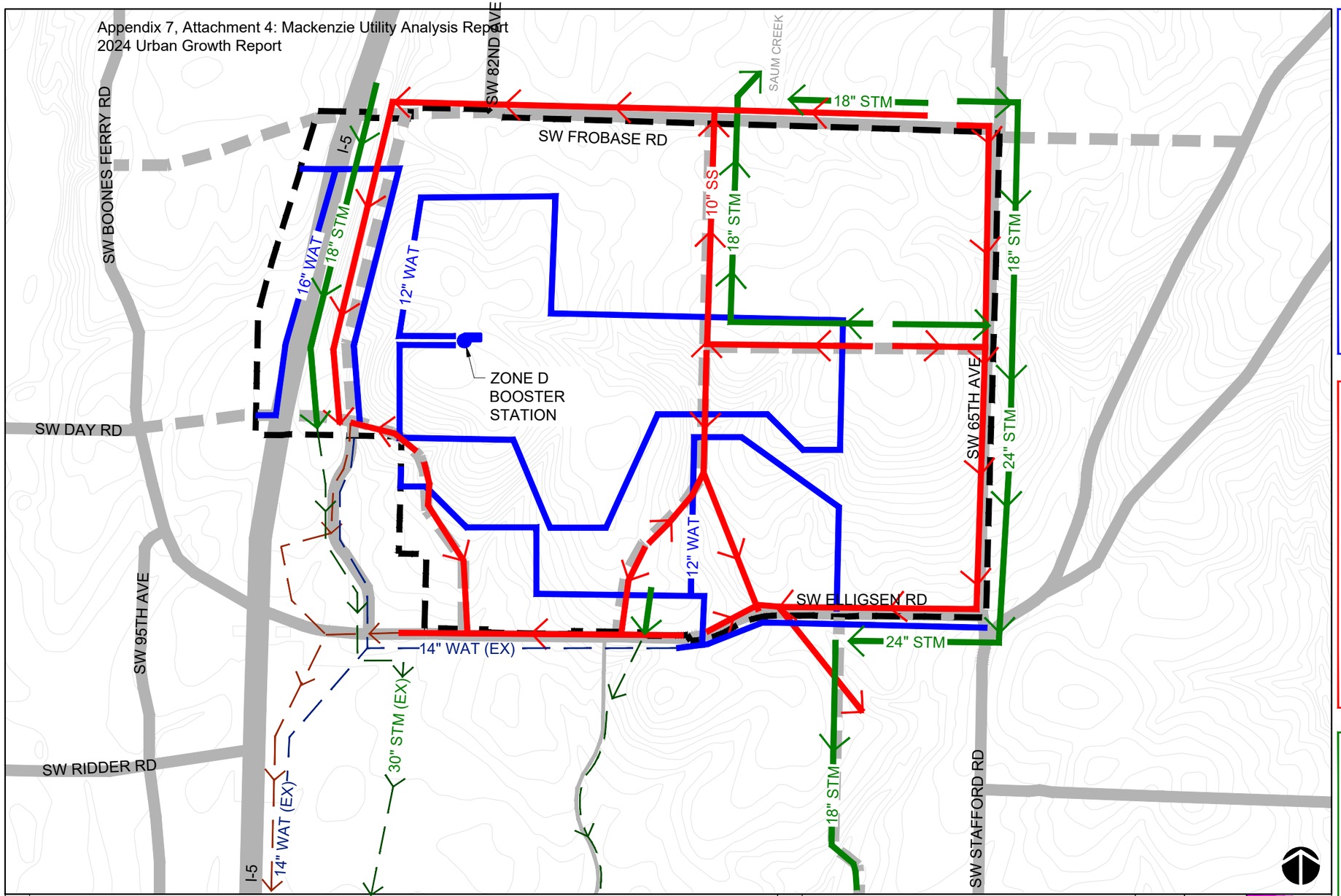
The Master Plan has identified "problem areas" (areas with flooding and evidence of significant erosion) based on observation during a 25-year storm event in 2009. The problem areas are isolated and there are no serious flooding issues under the existing condition.

Assessment of the capacity of existing stormwater facilities to serve areas proposed for addition to the UGB.

City of Wilsonville requires that stormwater management (water quality and flow control) be provided for all new impervious surfaces. Based on topography, portions of the Elligsen Road North URA could outfall directly to a tributary of Boeckman Creek, however the southwest quadrant flows southwest toward Interstate 5. Stormwater from this area would likely connect to existing City infrastructure near Elligsen Road and generally flow south and either outfall to Boeckman Creek or Coffee Lake Creek before flowing south to the Willamette River. The City's assessment of problem areas does not appear to include any stormwater infrastructure between the URA and either Creek.

Assessment of the impacts to existing stormwater facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

The Master Plan does not indicate capacity issues in the stormwater infrastructure that the southwest portion of the site would connect to, however this does not contemplate the addition of stormwater from a portion of this URA. It is unclear whether existing pipes have the capacity to serve the URA if added to the UGB.

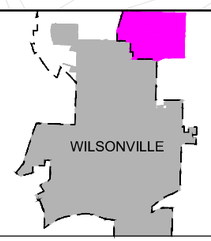


LEGEND

- RESERVE BOUNDARY
- WATER LINE
- WATER LINE (EX)
- WATER PUMP STATION
- SANITARY LINE
- SANITARY LINE (EX)
- STORM LINE
- STORM LINE (EX)

ABBREVIATIONS

EX	EXISTING
LF	LINEAR FEET
MG	MILLION GALLONS
MGD	MILLION GALLONS PER DAY
SF	SQUARE FEET



WATER

WATER PROVIDER: CITY OF WILSONVILLE

PRESSURE ZONE: C/D

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	0	$350	$0
12" PIPE (LF)	25,550	$400	$10,220,000
16" PIPE (LF)	2,800	$500	$1,400,000
PUMP STATION (MGD)	*	$5,800,000	$609,000
STORAGE RESERVOIR (MG)	2.2	$200,000	$440,000
TOTAL			$12,669,000

SANITARY

SANITARY PROVIDER: CITY OF WILSONVILLE

BASIN: COFFEE CREEK/CANYON CREEK/BOECKMAN

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	2,700	$275	$742,500
12" PIPE (LF)	4,300	$350	$1,505,000
15" PIPE (LF)	0	$375	$0
PUMP STATION (MGD)	2.2	$1,800,000	$3,960,000
SAN FORCE (LF)	0	$310	$0
TOTAL			$6,207,500

STORM

STORM PROVIDER: CITY OF WILSONVILLE

WATERSHED: ABERNETHY CREEK-WILLAMETTE RIVER

SUB-WATERSHED: COFFEE LAKE CREEK-WILLAMETTE RIVER

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
18" PIPE (LF)	10,000	$400	$4,000,000
24" PIPE (LF)	6,200	$425	$2,635,000
30" PIPE (LF)	0	$500	0
WATER QUALITY/ DETENTION (SF)	61,350	$150	$9,202,500
TOTAL			$15,837,500

METRO RESERVES GOAL 14 - UTILITY ANALYSIS MAP

ELLIGSEN ROAD NORTH

MACKENZIE.

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ELLIGSEN ROAD SOUTH

Water

Elligsen Road South URA would likely be served by the City of Wilsonville as it is included in their Master Plan study area. According to the Master Plan, Elligsen Road South would be part of pressure zones B and C, served by the Elligsen Reservoirs (two reservoirs with a total capacity of 5 MG) and C Level Reservoir (2 MG capacity) respectively. The Elligsen Reservoirs received water via gravity flow, while the C Level Reservoir receives water via the B to C Booster Station.

The City of Wilsonville's primary supply comes from the Willamette River. There is a single water treatment plant (Willamette River Water Treatment Plant) that serves the City, which is in shared ownership with Tualatin Valley Water District.

The following assessment is based on information from the City of Wilsonville Water System Master Plan, dated September 2012. The Master Plan study area includes the area currently within the UGB plus areas of Clackamas and Washington County Urban Reserve Areas expected to be incorporated into City of Wilsonville, including Elligsen Road South URA. Buildout within the study area is projected to occur by 2036 for non-residential areas and 2045 for residential areas (Elligsen Road South is assumed residential in the Master Plan).

Assessment of the capacity of existing water facilities to serve areas already inside the UGB.

- Storage – Per the City Master Plan, there are no known storage issues in the existing system, which consists of four storage reservoirs providing a total of 7.6 MG of effective (usable) storage.
- Pumping – There are two pumping facilities in the distribution system, the Charbonneau Booster Station, and the B-to-C Booster Station. Both facilities have a firm capacity greater than what is anticipated to be needed in the 20-year planning period (as of 2012 report).
- Distribution – peak hour demands can be met with negligible pressure changes from annual average day demand.

Assessment of the capacity of existing water facilities to serve areas proposed for addition to the UGB.

- Storage – estimated required storage by the year 2030 is 17.64 MG, creating a storage deficit of 8.97 MG. Buildout of residential areas (including Elligsen Road South) is not projected to occur until 2045, so additional storage will be needed for its development.
- Pumping – A pump station will be required to serve future development in the northeast portion of the study area, which includes Elligsen Road South.
- Distribution – Future system infrastructure as shown in the City of Wilsonville master plan is adequately sized for required fire flow and operating pressures.

Assessment of the impacts to existing water facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

To provide adequate storage capacity to the study area an additional 8.97 MG of storage capacity will be needed. The City has eight backup wells with a total storage capacity of 6.92 MG, which reduces the 2030 projected storage need to 2.05 MG. The City of Wilsonville is currently in the design phase (construction planned for 2023-2024) for a 3.0 MG storage reservoir located in pressure zone B, with a second reservoir to follow in the future (timeline undefined). The addition of this reservoir will allow for adequate storage capacity to serve current service area as well as the addition of this URA into the UGB.

The Zone D Booster Station at C Level Tank is required to provide adequate pumping capacity to serve Elligsen Road South and is identified as a capital improvement project in the Master Plan. Without the addition of this pump, the existing system may experience pump capacity issues.

Sanitary Sewer

The Elligsen Road South URA would likely be served by the City of Wilsonville based on proximity. Elligsen Road South is included in the study area of the Master Plan and falls within the Canyon Creek and Boeckman sewer basins. Canyon Creek basin is served by the Canyon Creek Pump Station, and Boeckman basin is served by the Memorial Park Pump Station.

Wastewater from the City of Wilsonville is conveyed in a City-owned and operated collection system to the Wilsonville Wastewater Treatment Plant (WWTP).

The following assessment is based on information from the City of Wilsonville Wastewater Collection Master Plan, dated November 2014. The study area for the Master Plan includes current service area within the UGB and urban reserve areas, which includes Elligsen Road South.

Assessment of the capacity of existing sanitary sewer facilities to serve areas already inside the UGB.

The existing system has no known hydraulic deficiencies for all existing pipe and pump stations.

Assessment of the capacity of existing sanitary sewer facilities to serve areas proposed for addition to the UGB.

Both the Canyon Creek and Memorial Park pump stations require capacity improvements to serve Elligsen Road So. The City of Wilsonville has capital improvement projects identified for both, with an estimated time frame of 6-10 years for Memorial Park and 11-20 years for Canyon Creek (relative to the report dated 2014).

There are also several trunk line extensions required to serve the Elligsen Road South URA. The design and costs for these improvements are included in the Master Plan and are shown on the Utility Analysis Map and included in the cost tables of this report.

Assessment of the impacts to existing sanitary sewer facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

Additional pump capacity and trunk line extensions are needed to serve the Elligsen Road South URA without negative impacts to existing sanitary infrastructure within the Canyon Creek and Boeckman basins.

Storm

City of Wilsonville is the likely provider for Elligsen Road South URA, as it is located primarily within the Boeckman Creek Basin and is adjacent to the City service area boundary.

The following assessment is based on information from City of Wilsonville Stormwater Master Plan, dated March 2012.

Assessment of the capacity of existing stormwater facilities to serve areas already inside the UGB.

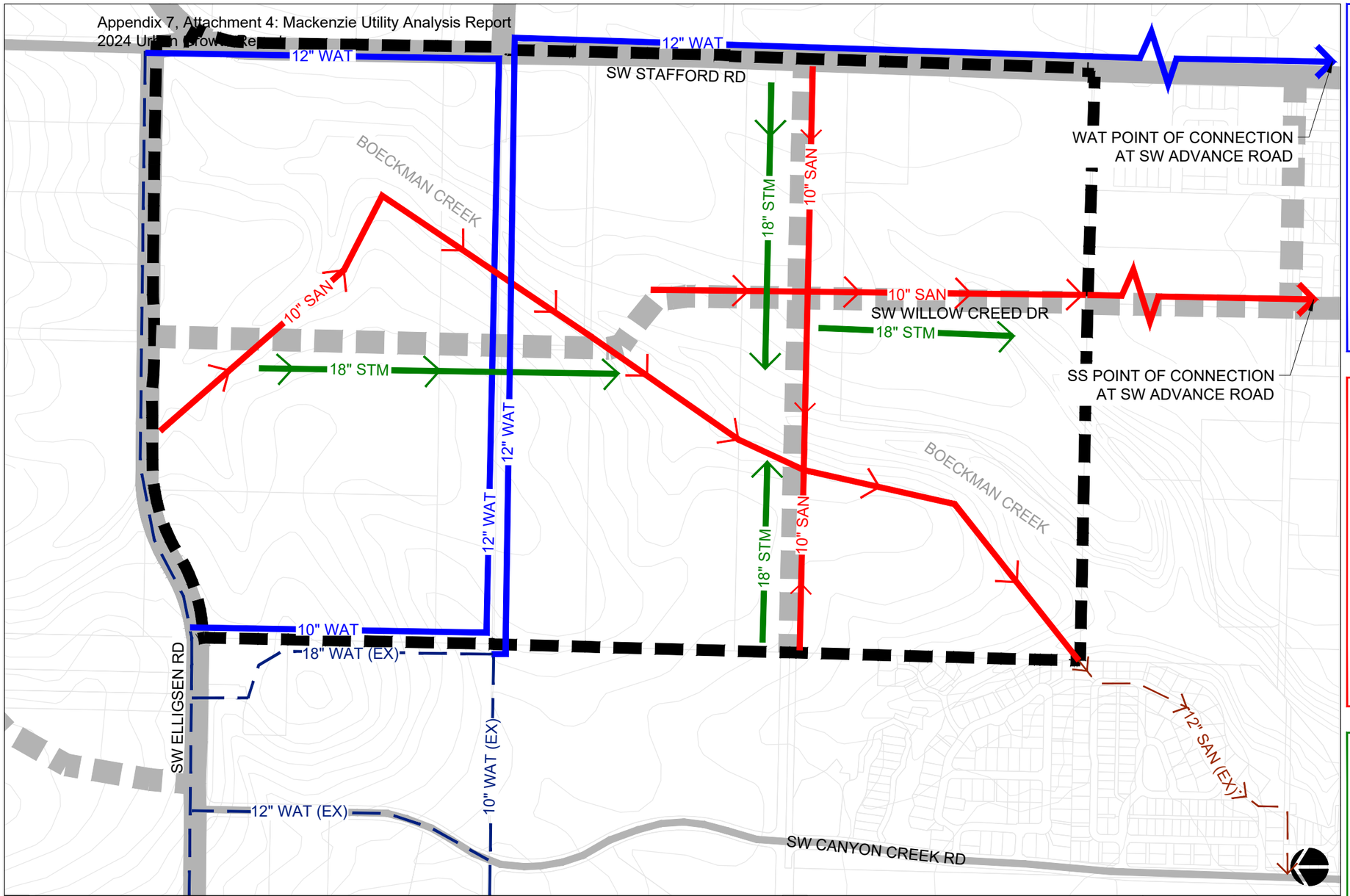
The Master Plan has identified "problem areas" (areas with flooding and evidence of significant erosion) based on observation during a 25-year storm event in 2009. The problem areas are isolated and there are no serious flooding issues under the existing condition.

Assessment of the capacity of existing stormwater facilities to serve areas proposed for addition to the UGB.

City of Wilsonville requires that stormwater management (water quality and flow control) be provided for all new impervious surfaces. Based on topography it seems likely that stormwater management for the development of Elligsen Road South would occur within the development area and outfall directly to Boeckman Creek without connecting to an existing public stormwater system. The City's assessment of problem areas included several areas of observed erosion along Boeckman Creek generally caused by incorrectly constructed or poorly maintained existing outfalls. While it is not the responsibility of Elligsen Road South development to correct these outfalls, any new outfalls should be properly designed and constructed to avoid additional erosion.

Assessment of the impacts to existing stormwater facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

If Elligsen Road South outfalls directly to Boeckman Creek via private outfalls from development areas and public outfalls from roadways, there would be no impacts to existing storm facilities.



WATER

WATER PROVIDER: CITY OF WILSONVILLE

PRESSURE ZONE: B/C

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	1,330	$350	$465,500
12" PIPE (LF)	9,770	$400	$3,908,000
16" PIPE (LF)	0	$500	$0
PUMP STATION (MGD)	0	$5,800,000	$0
STORAGE RESERVOIR (MG)	1.0	$200,000	$200,000
TOTAL			$4,573,500

SANITARY

SANITARY PROVIDER: CITY OF WILSONVILLE

BASIN: CANYON CREEK/BOECKMAN

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	12,600	$275	$3,465,000
12" PIPE (LF)	0	$350	$0
15" PIPE (LF)	0	$375	$0
PUMP STATION (MGD)	1.0	$1,800,000	$1,800,000
SAN FORCE (LF)	0	$310	$0
TOTAL			$5,265,000

STORM

STORM PROVIDER: CITY OF WILSONVILLE

WATERSHED: ABERNETHY CREEK-WILLAMETTE RIVER

SUB-WATERSHED: COFFEE LAKE CREEK-WILLAMETTE RIVER

PROPOSED IMPROVEMENTS

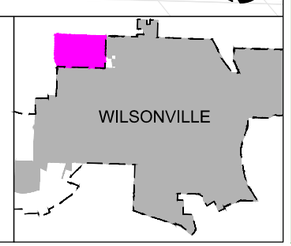
ITEM	UNITS	UNIT COST	TOTAL COST
18" PIPE (LF)	4,600	$400	$1,840,000
24" PIPE (LF)	0	$425	$0
30" PIPE (LF)	0	$500	$0
WATER QUALITY/ DETENTION (SF)	30,200	$150	$4,530,000
TOTAL			$6,370,000

LEGEND

- RESERVE BOUNDARY
- WATER LINE
- WATER LINE (EX)
- SANITARY LINE
- SANITARY LINE (EX)

ABBREVIATIONS

EX	EXISTING
LF	LINEAR FEET
MG	MILLION GALLONS
MGD	MILLION GALLONS PER DAY
SF	SQUARE FEET



METRO RESERVES GOAL 14 - UTILITY ANALYSIS MAP
ELLIGSEN ROAD SOUTH

MACKENZIE.

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GRAHAMS FERRY

Water

Grahams Ferry URA would likely be served by the City of Wilsonville as it is included in their Master Plan study area. According to the Master Plan, Grahams Ferry would be part of pressure zone B which is served by the Elligsen Reservoirs (two reservoirs with a total capacity of 5 MG). The Elligsen Reservoirs received water via gravity flow.

The City of Wilsonville's primary supply comes from the Willamette River. There is a single water treatment plant (Willamette River Water Treatment Plant) that serves the City, which is in shared ownership with Tualatin Valley Water District.

The following assessment is based on information from the City of Wilsonville Water System Master Plan, dated September 2012. The Master Plan study area includes the area currently within the UGB plus areas of Clackamas and Washington County Urban Reserve Areas expected to be incorporated into City of Wilsonville, including Grahams Ferry URA. Buildout within the study area is projected to occur by 2036 for non-residential areas and 2045 for residential areas (Grahams Ferry is assumed residential in the Master Plan).

Assessment of the capacity of existing water facilities to serve areas already inside the UGB.

- Storage – Per the City Master Plan, there are no known storage issues in the existing system, which consists of four storage reservoirs providing a total of 7.6 MG of effective (usable) storage.
- Pumping – There are two pumping facilities in the distribution system, the Charbonneau Booster Station, and the B-to-C Booster Station. Both facilities have a firm capacity greater than what is anticipated to be needed in the 20-year planning period (as of 2012 report).
- Distribution – peak hour demands can be met with negligible pressure changes from annual average day demand.

Assessment of the capacity of existing water facilities to serve areas proposed for addition to the UGB.

- Storage – estimated required storage by the year 2030 is 17.64 MG, creating a storage deficit of 8.97 MG. Buildout of the study area is assumed in the Master Plan to occur in 2036 for non-residential areas and in 2045 for residential areas (Grahams Ferry is included in residential development).
- Pumping – there are no pumping facilities serving pressure zone B. Based on topography, Grahams Ferry could be served by gravity from the Elligsen Reservoirs that serve the rest of pressure zone B.
- Distribution – Future system infrastructure as shown in the City of Wilsonville master plan is adequately sized for required fire flow and operating pressures.

Assessment of the impacts to existing water facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

To provide adequate storage capacity to the study area an additional 8.97 MG of storage capacity will be needed. The City has eight backup wells with a total storage capacity of 6.92 MG, which reduces the 2030 projected storage need to 2.05 MG. The City of Wilsonville is currently in the design phase (construction planned for 2023-2024) for a 3.0 MG storage reservoir located in pressure zone B, with a second reservoir to follow in the future (timeline undefined). The addition of this reservoir will allow for adequate storage capacity to serve current service area as well as the addition of Grahams Ferry URA into the UGB.

Sanitary Sewer

The Grahams Ferry URA would likely be served by the City of Wilsonville based on proximity. Grahams Ferry is included in the study area of the Master Plan and falls within the Villebois sewer basin, which does not contain any public pump stations.

Wastewater from the City of Wilsonville is conveyed in a City-owned and operated collection system to the Wilsonville Wastewater Treatment Plant (WWTP).

The following assessment is based on information from the City of Wilsonville Wastewater Collection Master Plan, dated November 2014.

Assessment of the capacity of existing sanitary sewer facilities to serve areas already inside the UGB.

The existing system has no known hydraulic deficiencies for all existing pipe and pump stations.

Assessment of the capacity of existing sanitary sewer facilities to serve areas proposed for addition to the UGB.

There are no pumps required to serve this URA.

There are also several trunk line extensions required to serve future development areas, including the Grahams Ferry URA. The design and costs for these improvements are included in the Master Plan and are shown on the Utility Analysis Map and included in the cost tables of this report.

Assessment of the impacts to existing sanitary sewer facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

Additional trunk line extensions are needed to serve this URA without negative impacts to existing sanitary infrastructure within the Villebois basin.

Storm

City of Wilsonville is the likely provider for Grahams Ferry URA, as it is located primarily within the Boeckman Creek Basin and is adjacent to the City service area boundary.

The following assessment is based on information from City of Wilsonville Stormwater Master Plan, dated March 2012.

Assessment of the capacity of existing stormwater facilities to serve areas already inside the UGB.

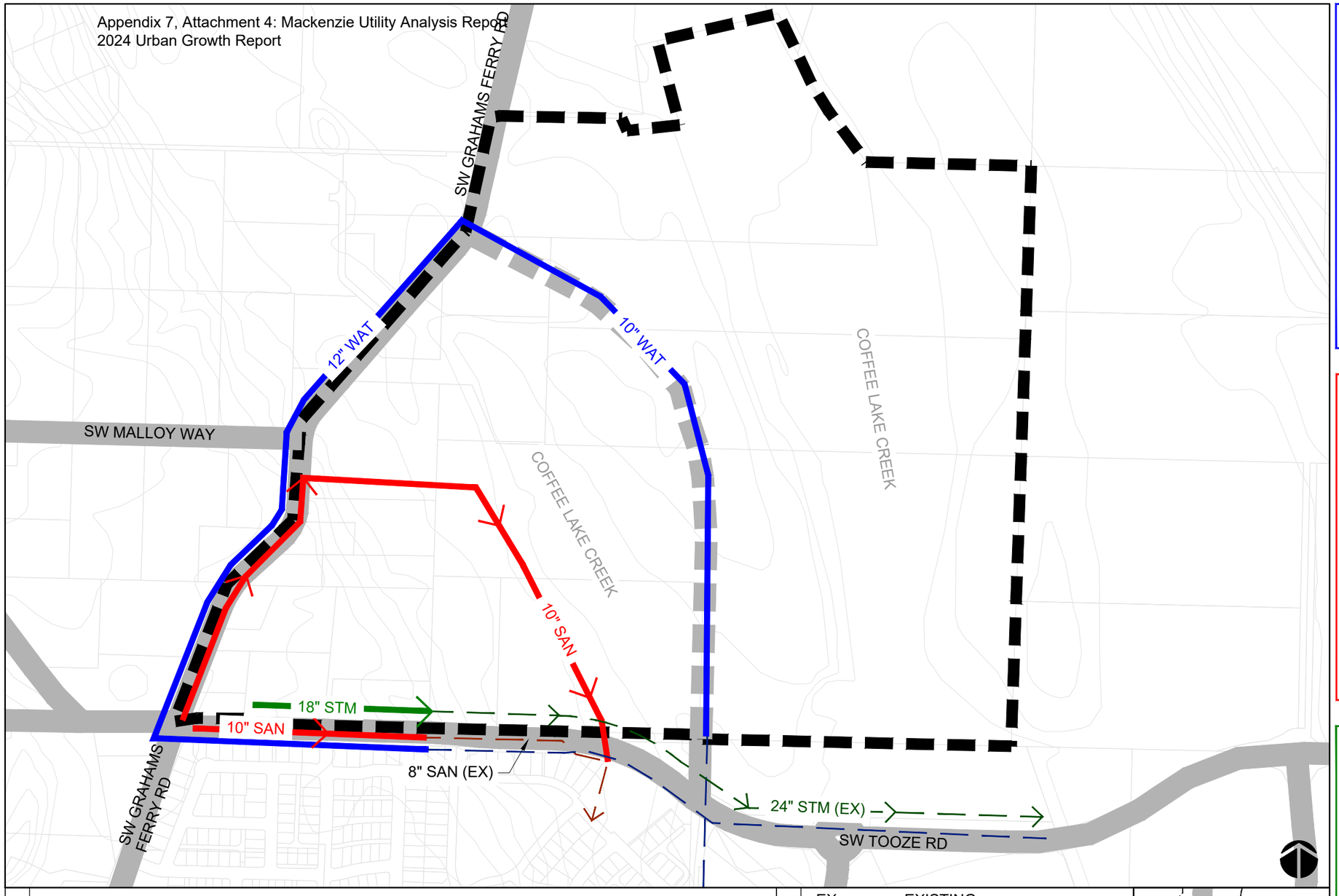
The Master Plan has identified "problem areas" (areas with flooding and evidence of significant erosion) based on observation during a 25-year storm event in 2009. The problem areas are isolated and there are no serious flooding issues under the existing condition.

Assessment of the capacity of existing stormwater facilities to serve areas proposed for addition to the UGB.

City of Wilsonville requires that stormwater management (water quality and flow control) be provided for all new impervious surfaces. Based on topography it seems likely that stormwater management for the development of Grahams Ferry would occur within the development area and outfall directly to Coffee Creek without connecting to an existing public stormwater system. The City's assessment of problem areas did not indicate issues in Coffee Creek downstream of the Grahams Ferry URA.

Assessment of the impacts to existing stormwater facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

If Grahams Ferry outfalls directly to Coffee Creek via private outfalls from development areas and public outfalls from roadways, there would be no impacts to existing storm facilities.



WATER

WATER PROVIDER: CITY OF WILSONVILLE

PRESSURE ZONE: B

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	2,820	$350	$987,000
12" PIPE (LF)	4,000	$400	$1,600,000
16" PIPE (LF)	0	$500	$0
PUMP STATION (MGD)	0	$5,800,000	$0
STORAGE RESERVOIR (MG)	0.5	$200,000	$100,000
TOTAL			$2,687,000

SANITARY

SANITARY PROVIDER: CITY OF WILSONVILLE

ZONE: VILLEBOIS

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	4,500	$275	$1,237,500
12" PIPE (LF)	0	$350	$0
15" PIPE (LF)	0	$375	$0
PUMP STATION (MGD)	0	$1,800,000	$0
SAN FORCE (LF)	0	$310	$0
TOTAL			$1,237,500

STORM

STORM PROVIDER: CITY OF WILSONVILLE

WATERSHED: ABERNETHY CREEK-WILLAMETTE RIVER

SUB-WATERSHED: COFFEE LAKE CREEK-WILLAMETTE RIVER

PROPOSED IMPROVEMENTS

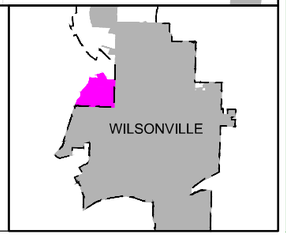
ITEM	UNITS	UNIT COST	TOTAL COST
18" PIPE (LF)	800	$400	$320,000
24" PIPE (LF)	0	$425	$0
30" PIPE (LF)	0	$500	$0
WATER QUALITY/ DETENTION (SF)	18,400	$150	$2,760,000
TOTAL			$3,080,000

LEGEND

- RESERVE BOUNDARY
- WATER LINE
- WATER LINE (EX)
- SANITARY LINE
- SANITARY LINE (EX)
- STORM LINE
- STORM LINE (EX)

ABBREVIATIONS

EX	EXISTING
LF	LINEAR FEET
MG	MILLION GALLONS
MGD	MILLION GALLONS PER DAY
SF	SQUARE FEET



METRO RESERVES GOAL 14 - UTILITY ANALYSIS MAP

GRAHAMS FERRY

MACKENZIE.

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GRESHAM EAST

Water

The City of Gresham is the likely provider for Gresham East URA, as it is located adjacent to the existing City of Gresham city limits and service area boundaries. If the City of Gresham did serve the Gresham East urban reserve, it would most likely become part of the Wheeler service level due to proximity.

The City of Gresham currently receives most of its water supply from Portland Water Bureau's Bull Run conduits. The remainder comes from groundwater through the Rockwood Water Public Utility District (RWPUD). The City of Gresham and RWPUD plan to transition away from purchasing water from PWB to local groundwater supply by the time their contract with the City of Portland expires in 2026. As a result, there are wells at various stages of planning and construction with sufficient capacity to meet projected 2026 maximum daily demand (MDD), with two planned future wells to provide capacity to meet demands through 2050.

The following assessment is based on information from City of Gresham Water System Master Plan, dated March 2022. City of Gresham master planning considers a full build-out condition for land within current service areas, with full build-out being the development to ultimate capacity according to current land use and zoning designations. While master planning does include a few expansions areas (Pleasant Valley and Springwater), Gresham East URA is not one of these.

Assessment of the capacity of existing water facilities to serve areas already inside the UGB.

- Storage – Within the Wheeler service level under existing conditions (2020) the required storage (1.28 MG) is less than the existing effective storage (2.03 MG) resulting in a storage surplus of 0.75 MG.
- Pumping – Under existing (2020) conditions the required pump capacity (670 gpm) for the Wheeler service area is less than the total pump capacity for the Salquist and Powell & Barnes Pump Stations (1,900 gpm) resulting in a surplus of 1,230 gpm.
- Distribution – under existing maximum daily demand conditions, the distribution system maintains an adequate minimum service pressure of at least 35 psi in all service levels.

Assessment of the capacity of existing water facilities to serve areas proposed for addition to the UGB.

- Storage – within the Wheeler service level there is a storage deficit of approximately 0.76 MG by 2050 (not including the urbanization of Gresham East) and the addition of a 2.0 MG reservoir (North Wheeler Reservoir) is recommended to provide storage capacity for future build-out. The addition of the North Wheeler Reservoir would address storage deficiencies in the existing system as a whole, so there is no surplus available to serve the Gresham East URA, and additional storage would likely be needed.
- Pumping – the Wheeler service level is served by the Salquist and Powell & Barnes pump stations, which have a total pump capacity of 1,900 gpm and a required pump capacity of 1,020 gpm for the 2050 building. This leaves a surplus of 880 gpm that is not otherwise allocated in the master plan that has potential to serve the Gresham East URA.

Assessment of the impacts to existing water facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

- Storage – Without consideration of serving the Gresham East URA, there is a predicted future storage deficit for the Wheeler service level. To avoid further storage capacity deficit, additional storage would be needed for the development of the Gresham East URA.
- Pumping – pumping capacity is adequate through the 2050 buildout (does not include Gresham East URA), therefore the City has no plans to add capacity to the system in the near future. Additional pumping capacity will likely be needed to serve the Gresham East URA.
- Distribution – there are two planned mainline improvements in roadways near the Gresham East URA; a 16-inch diameter pipe in SE Orient Drive and a 12-inch diameter pipe in near the southern end of the URA boundary (shown on Utiilty Analysis Map for reference). Both of these service extensions are intended to serve the future Springwater service level and it isn't clear whether they are sized adequately to provide service outside the Springwater expansion area.

Sanitary Sewer

The City of Gresham is the likely provider for Gresham East URA, as it is located adjacent to the existing City of Gresham city limits and service area boundaries. The Gresham East URA would most likely be served by the Kelly Creek basin based on proximity and topography.

The following assessment is based on information from City of Gresham Wastewater Collection System Master Plan, dated June 2020.

Assessment of the capacity of existing sanitary sewer facilities to serve areas already inside the UGB.

The City of Gresham Public Works Standards (2019) specify an RDII design rate of 1,000 gpnad for new systems. The existing flow conditions for the 5-year storm event is 4,070 gpnad, indicating existing capacity deficiencies in the Upper Kelly Creek Basin Trunk.

Assessment of the capacity of existing sanitary sewer facilities to serve areas proposed for addition to the UGB.

The Kelly Creek basin has capacity issues under the 2040 flow condition design storm peak flow without consideration of additional flows from Gresham East URA. There are future trunk improvements recommended to address capacity issues for both existing and future services, however it is unclear whether the improvements provide additional capacity for future expansion outside the existing UGB.

Assessment of the impacts to existing sanitary sewer facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

There are existing capacity issues for both the existing and future Kelly Creek basin for areas currently within the UGB. If the Gresham East URA were added to this basin without appropriate improvements, this would cause further capacity issues, negatively impacting the areas currently served within this basin, particularly as the Gresham East URA is at the upper end of the basin.

Storm

The City of Gresham is the likely provider for Gresham East URA, as it is located adjacent to the existing City of Gresham city limits and parts of the URA are already included in three of the existing stormwater basins: Kelly/Burlingame Creek, Beaver Creek, and Johnson Creek.

The following assessment is based on information from City of Gresham City-wide Stormwater Master Plan, dated June 2022. City master planning includes the build-out of areas within the study area and planning districts - Gresham East URA is not included in these areas.

Assessment of the capacity of existing stormwater facilities to serve areas already inside the UGB.

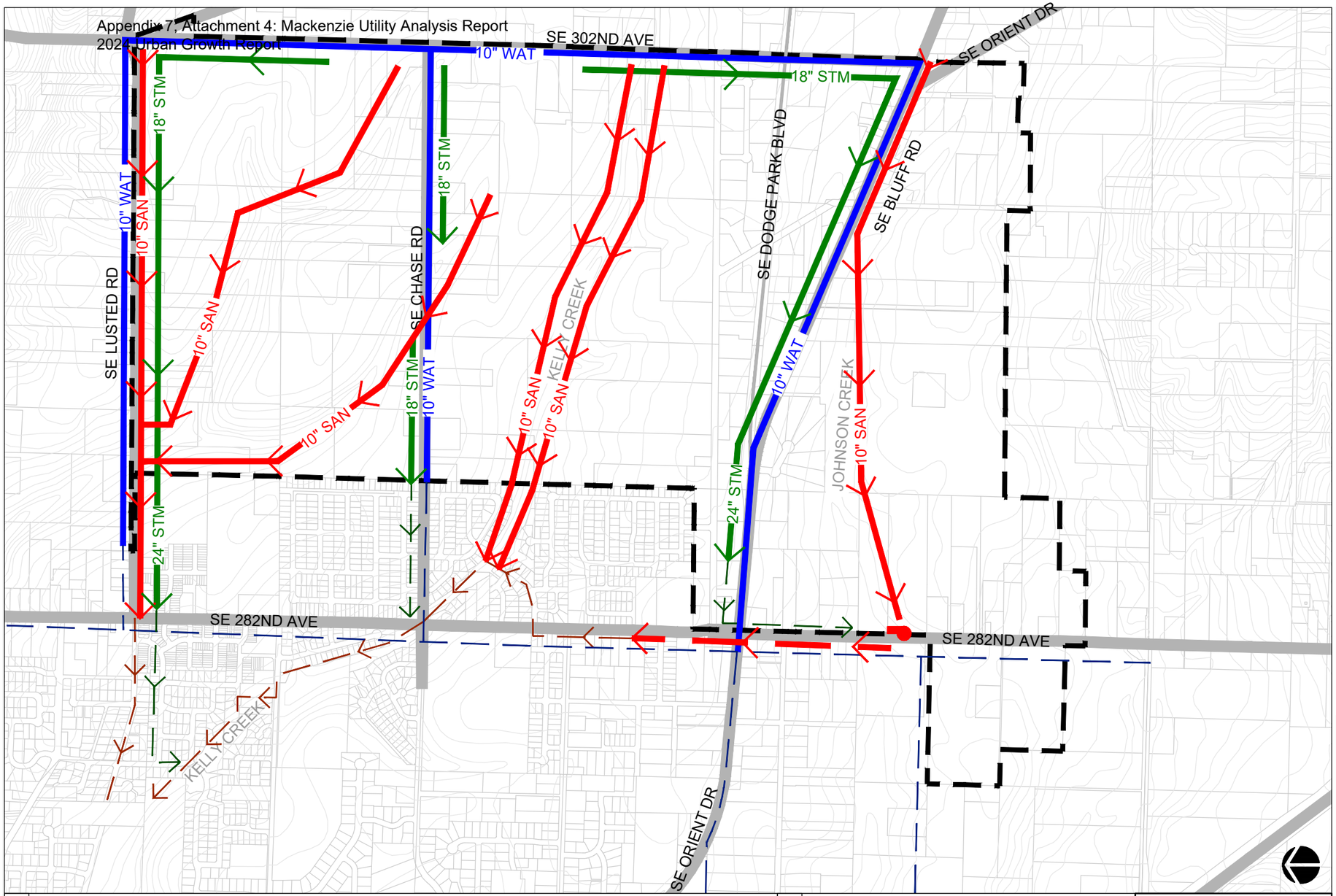
There is no predicted flooding under existing conditions in either the Kelly Creek or Johnson Creek basins for stormwater infrastructure in the area adjacent to Gresham East. The Beaver Creek basin was not modeled as it does not contain a significant amount of infrastructure.

Assessment of the capacity of existing stormwater facilities to serve areas proposed for addition to the UGB.

There is no predicted flooding under future conditions (not including urbanization of Gresham East) in either the Kelly Creek or Johnson Creek basins for stormwater infrastructure in the area adjacent to Gresham East. The Beaver Creek basin was not modeled as it does not contain a significant amount of infrastructure.

Assessment of the impacts to existing stormwater facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

Development/redevelopment of impervious surfaces in the City of Gresham requires on-site stormwater management (water quality and flow control). Gresham East URA contains portions of Johnson Creek, Kelly Creek and Beaver Creek tributary. Based on topography, stormwater could likely be managed and discharge to these waterways without needing connection to public infrastructure. Because flow control would be required by future development, the capacity of the waterways themselves to receive stormwater from the URA should be adequate.

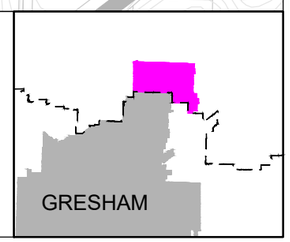


LEGEND

- RESERVE BOUNDARY
- WATER LINE
- WATER LINE (EX)
- SANITARY LINE
- SANITARY FORCE MAIN
- SANITARY LINE (EX)
- SANITARY PUMP STATION
- STORM LINE
- STORM LINE (EX)

ABBREVIATIONS

EX	EXISTING
LF	LINEAR FEET
MG	MILLION GALLONS
MGD	MILLION GALLONS PER DAY
SF	SQUARE FEET



WATER

WATER PROVIDER: CITY OF GRESHAM

PRESSURE ZONE: WHEELER

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	21,130	$350	$7,395,500
12" PIPE (LF)	0	$400	$0
16" PIPE (LF)	0	$500	$0
PUMP STATION (MGD)	0	$5,800,000	$0
STORAGE RESERVOIR (MG)	3.1	$200,000	$620,000
TOTAL			$8,015,500

SANITARY

SANITARY PROVIDER: CITY OF GRESHAM

BASIN: KELLY CREEK

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	29,000	$275	$7,975,000
12" PIPE (LF)	0	$350	$0
15" PIPE (LF)	0	$375	$0
PUMP STATION (MGD)	3.1	$1,800,000	$5,580,000
SAN FORCE (LF)	2,300	$310	$713,000
TOTAL			$14,268,000

STORM

STORM PROVIDER: CITY OF GRESHAM

WATERSHED: LOWER SANDY RIVER, JOHNSON CREEK

SUB-WATERSHED: BEAVER CREEK-SANDY RIVER, UPPER JOHNSON CREEK

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
18" PIPE (LF)	11,100	$400	$4,440,000
24" PIPE (LF)	5,800	$425	$2,465,000
30" PIPE (LF)	0	$500	$0
WATER QUALITY/ DETENTION (SF)	51,300	$150	$7,695,000
TOTAL			$14,600,000

METRO RESERVES GOAL 14 - UTILITY ANALYSIS MAP

GRESHAM EAST

MACKENZIE.

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HENRICI

Water

The Henrici URA would likely be served by Clackamas River Water (CRW) as it is included in the existing planning area as part of the Beavercreek pressure zone. The Beavercreek pressure zone is supplied by the Beavercreek Reservoirs which are served by the Glen Oak Pump Station.

Clackamas River Water (South System) receives water from the South Fork Water Board (SFWB), with future plans to construct a backbone connecting the south system to the north system and the CRW water treatment plant.

The following assessment is based on information from Clackamas River Water - Water System Master Plan, South System, dated April 2019. The Master Plan considers its planning area the area CRW plans to serve by the end 2038, and the service area as the area that CRW may serve beyond 2039. The Henrici URA is included in the CRW existing service area and planning area. Future demand projections presented in the Master Plan are based on Equivalent Housing Units (EHUs) within pressure zones.

Assessment of the capacity of existing water facilities to serve areas already inside the UGB.

- Storage – Under current conditions (2019), there is a storage capacity deficit of 0.31 MG in the Beavercreek Reservoirs.
- Pumping – Under current conditions (2019), within the Beavercreek pressure zone, there is a pumping capacity surplus of 508 gpm.
- Distribution – under current conditions there is a segment of distribution line identified with high head loss within the Henrici URA area of Beavercreek, indicating deficient pipe capacity.

Assessment of the capacity of existing water facilities to serve areas proposed for addition to the UGB.

- Storage – there is a storage capacity surplus of 0.34 MG in the Beavercreek Reservoirs under future projections (2038).
- Pumping – there is a pumping capacity surplus of 80 gpm in the Beavercreek service area under future projections (2038).
- Distribution – under future projections (2038) there is a portion of distribution line identified with high head loss within the Henrici URA area of Beavercreek.

Assessment of the impacts to existing water facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

- Pumping – future projections (2038) indicate a pumping surplus of 80 gpm, however this is less than predicted demand for the Henrici URA. Without additional pumping capacity, existing pump capacity will be exceeded.
- Storage – future projections (2038) indicate a storage surplus of 0.34 MG, however this is less than predicated demand for the Henrici URA. Without additional storage, existing storage capacity will be exceeded.

Sanitary Sewer

Henrici URA would likely be served by City of Oregon City based on proximity. Based on topography, it appears the Henrici URA would flow west toward the existing Clackamas County Water Environment Services (WES) Newell Creek Interceptor in Highway 213.

Wastewater from Oregon City flows to the Tri-City Sewer District (TCSD) trunks, interceptors and eventually the Tri-City Water Pollution Control Plant.

The following assessment is based on information from City of Oregon City Sanitary Sewer Master Plan, dated November 2014, and the Sanitary Sewer System Master Plan for Water Environment Services, dated January 2019.

Assessment of the capacity of existing sanitary sewer facilities to serve areas already inside the UGB.

Surcharging (ranging from minor to severe) exists throughout the existing City collection system. There are also capacity deficiencies in several locations in the WES system.

Two of the twelve existing pump stations (Settler's Point and Cook Street) have existing peak flows that exceed their firm capacity.

Assessment of the capacity of existing sanitary sewer facilities to serve areas proposed for addition to the UGB.

The Clackamas County WES Master Plan identifies hydraulic deficiencies in the existing system (which includes the Newell Creek Interceptor) during the design storm event, mostly from high rainfall derived infiltration and inflow (RDI/I).

There are no pump stations currently serving or required to serve pressure zone B, which includes Henrici.

Assessment of the impacts to existing sanitary sewer facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

The Clackamas County WES Master Plan identifies a capital improvement project to increase the size of the Newell Creek Interceptor, however it does not provide an estimate for what the increased capacity is or whether a surplus exists for future expansion. Additional capacity of the Newell Creek Interceptor could be required to serve the Henrici URA to reduce impacts to areas already inside the UGB.

Storm

City of Oregon City is the likely provider for Henrici URA, as it is located within the Beaver Basin and is adjacent to the City service area boundary. The Beaver Basin does not contain any existing stormwater infrastructure and based on topography generally flows south away from City limits toward Beaver Creek, which flows west and outfalls to the Willamette River.

Generally, the City's topographic high point is at the center of the City and receiving waters are on all sides of the city. Because of this, much of the existing infrastructure are small, dispersed pipes and culverts rather than larger trunk lines.

The following assessment is based on information from Oregon City Stormwater Master Plan, dated July 2019. The study area for the Master Plan covers drainage areas to the following receiving water bodies: Abernathy Creek, the Clackamas River, Beaver Creek and the Willamette River.

Assessment of the capacity of existing stormwater facilities to serve areas already inside the UGB.

The Master Plan identifies capacity issues within the modeled basins (the Beaver Basin was not modeled as it does not contain any existing infrastructure). Two of the modeled basins were determined to contain the most problem areas; the John Adams Basin is described as generally undersized, and the South End Basin was described as an inefficient system with flooding during the 2-year storm event.

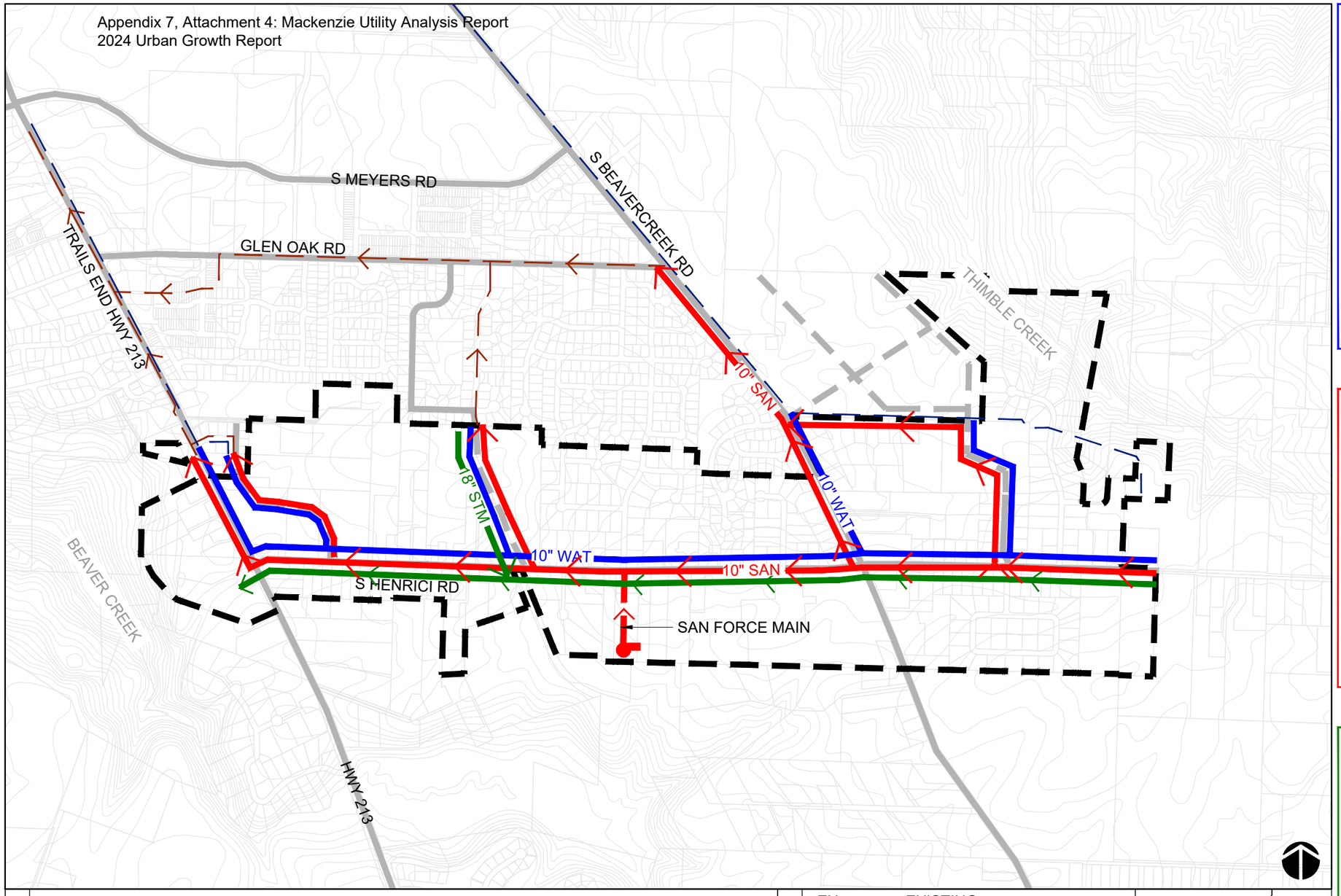
Assessment of the capacity of existing stormwater facilities to serve areas proposed for addition to the UGB.

There are several problem areas (as defined by the Master Plan) under existing conditions for infrastructure downstream of the URA connections points. Adding stormwater from areas outside the UGB will likely contribute to these existing problems and potentially cause additional problem areas if they are not addressed.

Assessment of the impacts to existing stormwater facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

Capital improvement projects to address capacity issues described above are presented in the Master Plan. Completion of these projects is required to provide adequate capacity to serve the study area (which includes the Beaver Basin as it drains to Beaver Creek) during a 25-year storm event.

Based on topography the Henrici URA would likely outfall directly to Beaver Creek and would thus not connect to or impact existing City storm infrastructure. The addition of the Henrici URA to the UGB would thus have no impacts to existing stormwater facilities.



WATER

WATER PROVIDER: CLACKAMAS RIVER WATER (CRW)

PRESSURE ZONE: BEAVERCREEK

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	14,790	$350	$5,176,500
12" PIPE (LF)	0	$400	$0
16" PIPE (LF)	0	$500	$0
PUMP STATION (MGD)	1.5	$5,800,000	$8,700,000
STORAGE RESERVOIR (MG)	1.5	$200,000	$300,000
TOTAL			$14,176,500

SANITARY

SANITARY PROVIDER: CITY OF OREGON CITY

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	18,600	$275	$5,115,000
12" PIPE (LF)	0	$350	$0
15" PIPE (LF)	0	$375	$0
PUMP STATION (MGD)	0.3	$1,800,000	$540,000
SAN FORCE (LF)	670	$310	$207,700
TOTAL			$5,862,700

STORM

STORM PROVIDER: CITY OF OREGON CITY

WATERSHED: ABERNETHY CREEK-WILLAMETTE RIVER

OUTFALL: BEAVER CREEK, ABERNETHY CREEK

PROPOSED IMPROVEMENTS

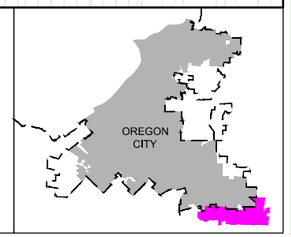
ITEM	UNITS	UNIT COST	TOTAL COST
18" PIPE (LF)	1,400	$400	$560,000
24" PIPE (LF)	0	$425	$0
30" PIPE (LF)	0	$500	$0
WATER QUALITY/ DETENTION (SF)	39,700	$150	$5,955,000
TOTAL			$6,515,000

LEGEND

- RESERVE BOUNDARY
- WATER LINE
- WATER LINE (EX)
- WATER PUMP STATION
- SANITARY LINE
- SANITARY FORCE MAIN
- SANITARY LINE (EX)
- SANITARY PUMP STATION
- STORM LINE

ABBREVIATIONS

EX	EXISTING
LF	LINEAR FEET
MG	MILLION GALLONS
MGD	MILLION GALLONS PER DAY
SF	SQUARE FEET



METRO RESERVES GOAL 14 - UTILITY ANALYSIS MAP

HENRICI

MACKENZIE.

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HOLCOMB

Water

The Holcomb URA would likely be served by Clackamas River Water (CRW) and is included in the existing planning area as part of the Holcomb and Redland pressure zones. The Holcomb pressure zone is supplied by the Hunter Heights Reservoir and Barlow Crest Reservoirs (both served by the Barlow Crest Pump Station) and the Redland pressure zone is supplied by the Redland Reservoir (served by the Redland Pump Station).

Clackamas River Water (South System) receives water from the South Fork Water Board (SFWB), with future plans to construct a backbone connecting the south system to the north system and the CRW water treatment plant.

The following assessment is based on information from Clackamas River Water - Water System Master Plan, South System, dated April 2019. The Master Plan considers its planning area the area CRW plans to serve by the end 2038, and the service area as the area that CRW may serve beyond 2039. The Holcomb URA is included in the CRW existing service area and planning area. Future demand projections presented in the Master Plan are based on Equivalent Housing Units (EHUs) within pressure zones.

Assessment of the capacity of existing water facilities to serve areas already inside the UGB.

- Storage – Under current conditions (2019), within the Redland service area, there is a storage capacity surplus of 0.76 MG and within the Hunter Heights service area there is a storage capacity surplus of 0.33 MG.
- Pumping – Under current conditions (2019), within the Redland service area, there is a pumping capacity surplus of 898 gpm and within the Hunter Heights service area, there is a pumping capacity deficit of 615 gpm.

Assessment of the capacity of existing water facilities to serve areas proposed for addition to the UGB.

- Storage – there is a storage capacity surplus of 0.59 MG in the Redland service area, and a slight deficit of 0.02 MG in the Holcomb Service area under future projections (2038).
- Pumping – there is a pumping capacity surplus of 301 gpm in the Redland service area, and a deficit of 619 gpm in the Hunter Heights service area, under future projections (2038).

Assessment of the impacts to existing water facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

- Storage – there is an overall surplus for storage capacity under future projections, which includes the development of Holcomb URA. Based on this surplus, there should be no negative impacts to nearby areas already inside the UGB as a result of developing Holcomb URA.
- Pumping – there is an overall deficit for pumping capacity under future projections, therefore additional pumping capacity will be needed to develop this URA.

Sanitary Sewer

The Holcomb URA would likely be served by the City of Oregon City and Clackamas County Water Environment Services (WES) based on proximity. Based on topography, the Holcomb URA generally flows south and intercepts the existing WES Country Village Interceptor in South Redland Road.

Wastewater from Oregon City flows to the Tri-City Sewer District (TCSD) trunks, interceptors and eventually the Tri-City Water Pollution Control Plant which are owned and operated by WES.

The following assessment is based on information from City of Oregon City Sanitary Sewer Master Plan, dated November 2014, and the Sanitary Sewer System Master Plan for Water Environment Services, dated January 2019.

Assessment of the capacity of existing sanitary sewer facilities to serve areas already inside the UGB.

Both the Oregon City Master Plan and the WES Master Plan identify segments of the conveyance system that are predicted to surcharge or flood during the design storm event. The Country Village Interceptor does not appear to have any predicted surcharging or flooding under existing conditions which indicates it has sufficient capacity to serve areas already inside the UGB.

Assessment of the capacity of existing sanitary sewer facilities to serve areas proposed for addition to the UGB.

The Country Village Interceptor in Redland Road does not extend far enough to serve the Holcomb URA. The City of Oregon City Master Plan includes a capital improvement project to extend this interceptor east, far enough to serve the Holcomb URA. The area immediately west of Holcomb is currently undeveloped and identified in Oregon City Master Plan as the Park Place Concept Area – it is not clear whether the proposed Country Village Interceptor extension is sized with enough capacity to serve both the Park Place Concept Area and Holcomb URA.

There are no pump stations currently required downstream of the Holcomb URA.

Assessment of the impacts to existing sanitary sewer facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

The City of Oregon City Master Plan includes a capital improvement project to extend the Country Village Interceptor, but it is not clear whether the proposed extension is sized with enough capacity to serve both the Park Place Concept Area and Holcomb URA. Additional capacity of the Country Village Interceptor could be required to serve the Holcomb URA to reduce impacts to areas already inside the UGB.

Storm

City of Oregon City is the likely provider for Holcomb URA, as it is located within the Abernathy Basin and is adjacent to the City service area boundary. The Abernathy Basin has very little existing stormwater infrastructure. Based on topography, the Holcomb URA generally flows south toward Redland Road. The south end of Holcomb URA is adjacent to Holcomb Creek, which discharges to Abernathy Creek south of Redland Road. Abernathy Creek runs west until it outfalls to the Willamette River.

Generally, the City's topographic high point is at the center of the City and receiving waters are on all sides of the City. Because of this, much of the existing infrastructure are small, dispersed pipes and culverts rather than larger trunk lines.

The following assessment is based on information from Oregon City Stormwater Master Plan, dated July 2019. The study area for the Master Plan covers drainage areas to the following receiving water bodies: Abernathy Creek, the Clackamas River, Beaver Creek and the Willamette River.

Assessment of the capacity of existing stormwater facilities to serve areas already inside the UGB.

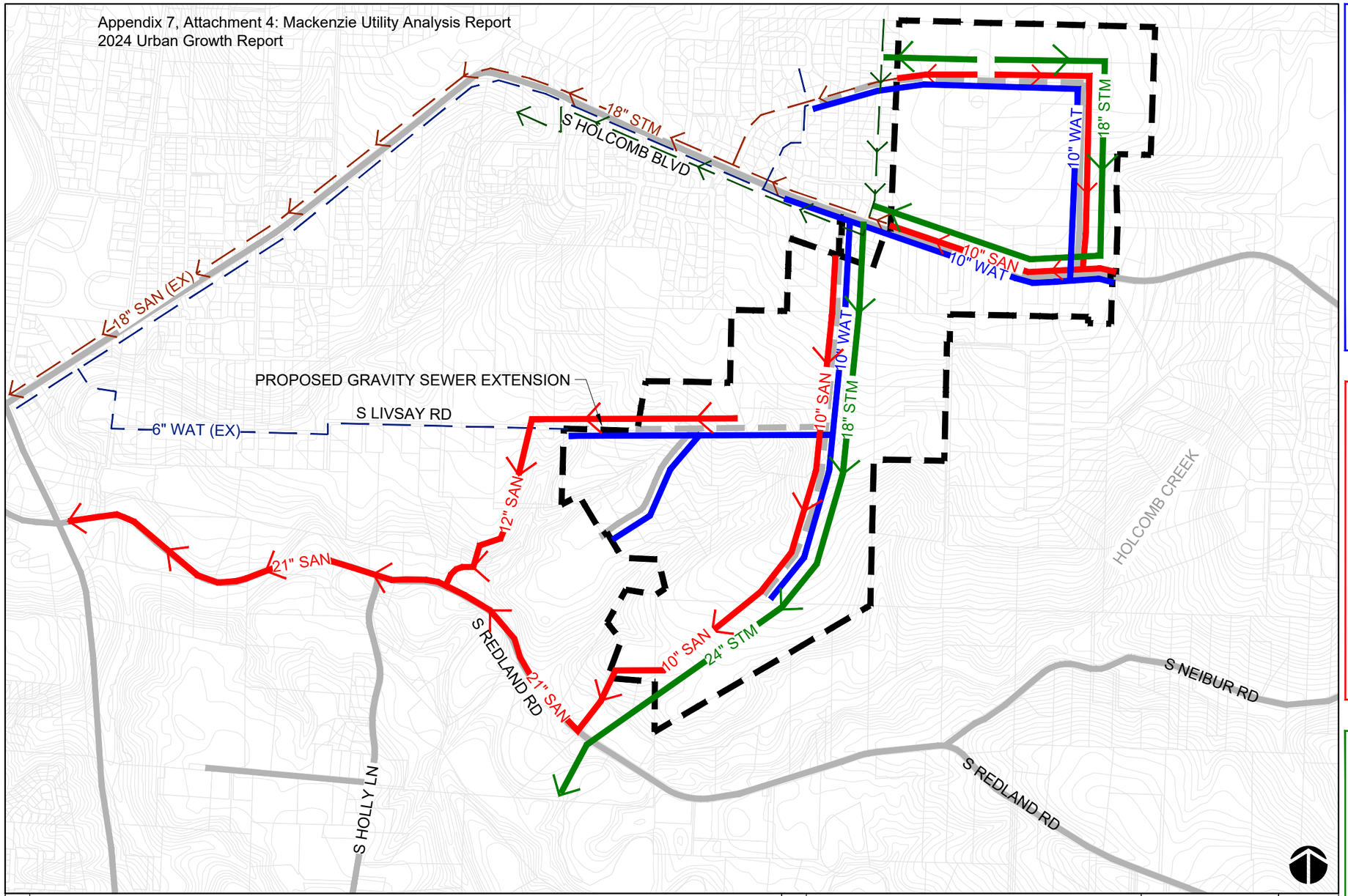
The Master Plan identifies capacity issues within the modeled basins (the Beaver Basin was not modeled as it does not contain any existing infrastructure). Two of the modeled basins were determined to contain the most problem areas; the John Adams Basin is described as generally undersized, and the South End Basin was described as an inefficient system with flooding during the 2-year storm event.

Assessment of the capacity of existing stormwater facilities to serve areas proposed for addition to the UGB.

Capital improvement projects to address capacity issues described above are presented in the Master Plan. Completion of these projects is required to provide adequate capacity to serve the study area (which includes the Abernathy Basin as it drains to Abernathy Creek) during a 25-year storm event.

Assessment of the impacts to existing stormwater facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

Based on topography the Holcomb URA would likely outfall directly to Holcomb Creek (which flows to Abernathy Creek) and would thus not connect to existing City storm infrastructure. The addition of the Holcomb URA to the UGB would thus have no impacts to existing stormwater facilities.



WATER

WATER PROVIDER: CLACKAMAS RIVER WATER (CRW)

PRESSURE ZONE: REDLAND & HOLCOMB

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	14,450	$350	$5,057,500
12" PIPE (LF)	0	$400	$0
15" PIPE (LF)	0	$500	$0
PUMP STATION (MGD)	1.1	$5,800,000	$6380000
STORAGE RESERVOIR (MG)	1.1	$200,000	$220,000
TOTAL			$11,657,500

SANITARY

SANITARY PROVIDER: CITY OF OREGON CITY/
CLACKAMAS RIVER WATER (CRW)

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	10,800	$275	$2,970,000
12" PIPE (LF)	3,600	$350	$1,260,000
21" PIPE (LF)	3,800	$425	$1,615,000
PUMP STATION (MGD)	0	$1,800,000	$0
SAN FORCE (LF)	0	$310	0
TOTAL			$5,845,000

STORM

STORM PROVIDER: CITY OF OREGON CITY

WATERSHED: ABERNETHY CREEK-WILLAMETTE RIVER

SUB-WATERSHED: ABERNETHY CREEK

PROPOSED IMPROVEMENTS

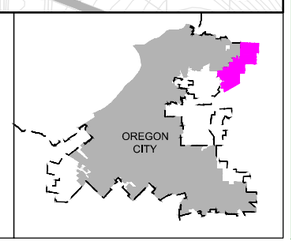
ITEM	UNITS	UNIT COST	TOTAL COST
18" PIPE (LF)	7,000	$400	$2,800,000
24" PIPE (LF)	4,000	$425	$1,700,000
30" PIPE (LF)	0	$500	$0
WATER QUALITY/ DETENTION (SF)	19,750	$150	$2,962,500
TOTAL			$7,462,500

LEGEND

- RESERVE BOUNDARY
- WATER LINE
- WATER LINE (EX)
- SANITARY LINE
- SANITARY LINE (EX)
- STORM LINE
- STORM LINE (EX)

ABBREVIATIONS

EX	EXISTING
LF	LINEAR FEET
MG	MILLION GALLONS
MGD	MILLION GALLONS PER DAY
SF	SQUARE FEET



METRO RESERVES GOAL 14 - UTILITY ANALYSIS MAP
HOLCOMB

MACKENZIE.

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HOLLY LANE – NEWELL CREEK CANYON

Water

The Holly Lane – Newell Creek Canyon URA would like be served by Clackamas River Water (CRW) and City of Oregon City as it falls partially within CRW Beavercreek pressure zone and partially adjacent to Oregon City Intermediate and Upper zones. The Intermediate Zone is supplied by the Barlow Crest Reservoir (served by the Hunter Avenue Pump Station) and the Mountainview Reservoir (served by the Division Street Pump Station, which is owned/operated by SFWB). The Upper Zone is served by the Henrici Reservoir (gravity fed) and Boynton Reservoir (gravity fed or manually pumped for fire flow and emergency flow only).

Both CRW (South System) and Oregon City receive water from the South Fork Water Board (SFWB), with future plans to construct a backbone connecting the south system to the north system and the CRW water treatment plant. Oregon City conveys treated water via a 30" transmission line and SFWB Division Street Pump Station or 42" transmission line and the City Hunter Avenue Pump Station. SFWB also provides water to Clackamas River Water (CRW) and the City of West Linn, so their demands are considered in overall analysis.

The following assessment is based on information from City of Oregon City Water Distribution System Master Plan, dated January 2012 and Clackamas River Water - Water System Master Plan, South System, dated April 2019. The CRW Master Plan considers its planning area the area CRW plans to serve by the end 2038, and the service area as the area that CRW may serve beyond 2039. The Holly Lane – Newell Creek Canyon URA is partially included in the CRW existing service area and planning area. Future demand projections presented in the Master Plan are based on Equivalent Housing Units (EHUs) within pressure zones.

Assessment of the capacity of existing water facilities to serve areas already inside the UGB.

Clackamas River Water

- Storage – there is a storage capacity deficit of 0.31 mg in the Beavercreek service area under current conditions (2019).
- Pumping – there is a pumping capacity surplus of 508 gpm in the Beavercreek service area under current conditions (2019).

Oregon City

- Storage – the Boynton, Henrici, Mountainview (No. 1 and No. 2), and Barlow Crest Reservoirs have c combined surplus of 4.99 MG under existing conditions.
- Pumping – the Mountainview and Hunter Avenue Pump Stations have a combined surplus of 4,463 gpm of pumping capacity under existing conditions.
- Distribution – peak hour flows and maximum day demands plus fire flow can be delivered within an acceptable pressure under existing conditions.

Assessment of the capacity of existing water facilities to serve areas proposed for addition to the UGB.

Clackamas River Water

- Storage – there is a storage capacity surplus of 0.34 MG in the Beavercreek service area under future projections (2038).
- Pumping – there is a pumping capacity surplus of 80 gpm in the Beavercreek service area under future projections (2038).

Oregon City

Buildout conditions are within the Oregon City existing UGB only and do not include expansion into any of the URA areas.

- Storage – Boyton, Henrici, and Mountainview (No. 2) Reservoirs have a combined storage surplus of 0.38 MG, Mountainview (No. 1) Reservoir has a storage deficit of 2.41 MG, and Barlow Crest has a storage deficit of 1.75 MG under buildout conditions.
- Pumping – The Mountainview Pump Station has a pumping capacity surplus of 236 gpm, the Hunter Avenue Pump Station has a pumping capacity surplus of 248 gpm and the Barlow Crest Pump Station has a pumping capacity deficit of 874 gpm under buildout conditions.
- Distribution – Due to undersized pipes, there are areas where available fire flow was less than the required fire flow under a maximum day demand plus fire flow analysis.

Assessment of the impacts to existing water facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

Clackamas River Water

There is an overall surplus for both storage and pumping capacity under future projections, which partially includes the development of Holly Lane – Newell Creek Canyon URA. Based on this surplus, there should be no negative impacts to nearby areas already inside the UGB as a result of developing Holly Lane – Newell Creek Canyon URA.

Oregon City

Storage, pumping and distribution systems have capacity issues under future planning conditions, which does not include the development of Holly Lane – Newell Creek Canyon URA. Addition of this URA to the UGB would cause further capacity deficits if additional storage, pumping and upsizing of pipes did not occur as part of development.

Sanitary Sewer

The Holly Lane – Newell Creek Canyon URA would likely be served by City of Oregon City and Clackamas County Water Environment Services (WES) based on proximity. Based on topography, it appears the Holly Lane – Newell Creek Canyon URA would flow east and west and connect to the existing Clackamas County Water Environment Services (WES) Newell Creek Interceptor in Highway 213.

Wastewater from Oregon City flows to the Tri-City Sewer District (TCSD) trunks, interceptors and eventually the Tri-City Water Pollution Control Plant.

The following assessment is based on information from City of Oregon City Sanitary Sewer Master Plan, dated November 2014 and the Sanitary Sewer System Master Plan for Water Environment Services, dated January 2019.

Assessment of the capacity of existing sanitary sewer facilities to serve areas already inside the UGB.

Both the Oregon City Master Plan and the WES Master Plan identify segments of the conveyance system that are predicted to surcharge or flood during the design storm event. The Newell Creek Interceptor south of Redland Road has predicted surcharging or flooding under existing conditions which indicates it does not have sufficient capacity to serve areas already inside the UGB.

Assessment of the capacity of existing sanitary sewer facilities to serve areas proposed for addition to the UGB.

There are existing capacity issues in the Newell Creek Interceptor which indicates it does not have the capacity to serve areas proposed for addition to the UGB.

There are no pump stations currently required downstream of the Holly Lane – Newell Creek Canyon URA.

Assessment of the impacts to existing sanitary sewer facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

The City of Oregon City Master Plan includes a capital improvement project to upsize a portion of the Newell Creek Interceptor south of Redland Road, but it is not clear how much additional capacity this will provide or whether it could serve the Holly Lane – Newell Creek Canyon URA specifically. Additional capacity of the Newell Creek Interceptor could be required to serve the Holly Lane – Newell Creek Canyon URA.

Storm

City of Oregon City is the likely provider for Holly Lane – Newell Creek Canyon URA, as it is located primarily within the Newell Basin and is adjacent to the City service area boundary.

Generally, the City's topographic high point is at the center of the City and receiving waters are on all sides of the City. Because of this, much of the existing infrastructure are small, dispersed pipes and culverts rather than larger trunk lines.

This URA is generally divided into two sections – area east of Highway 213 and area west of Highway 213. On both the west and east side of Highway 213 there are tributaries of Newell Creek which are generally the low points within this URA. Newell Creek runs north and flows into Abernathy Creek, which runs west until it outfalls to the Willamette River.

Assessment of the capacity of existing stormwater facilities to serve areas already inside the UGB.

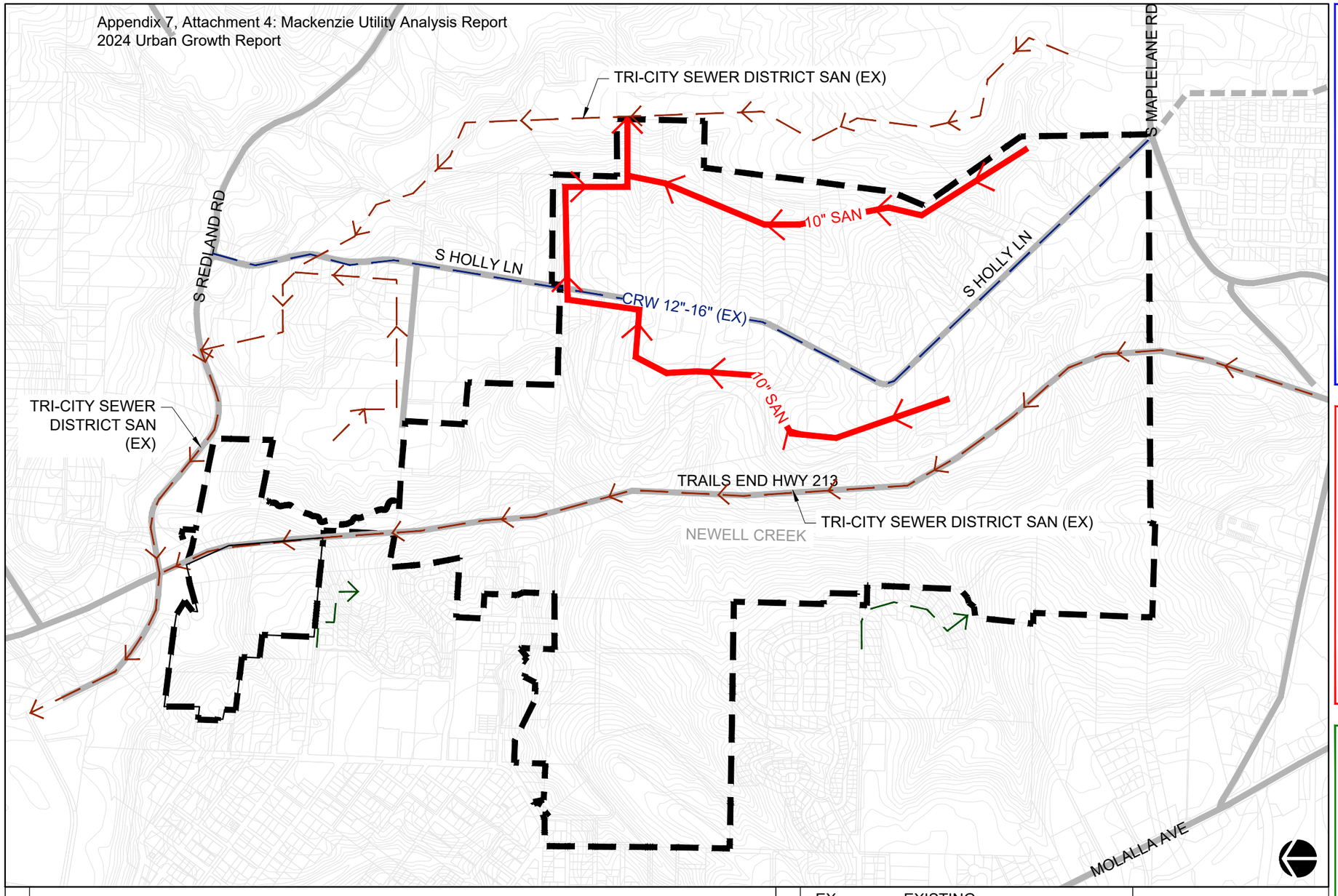
The Master Plan identifies capacity issues within the modeled basins. Two of the modeled basins were determined to contain the most problem areas; the John Adams Basin is described as generally undersized, and the South End Basin was described as an inefficient system with flooding during the 2-year storm event.

Assessment of the capacity of existing stormwater facilities to serve areas proposed for addition to the UGB.

Capital improvement projects to address capacity issues described above are presented in the Master Plan. Completion of these projects is required to provide adequate capacity to serve the study area (which includes the Newell Basin as it drains to Abernathy Creek) during a 25-year storm event.

Assessment of the impacts to existing stormwater facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

Based on this topography, this URA would likely outfall directly to Newell Creek and would thus not connect to existing City storm infrastructure. The addition of the Holly Lane – Newell Creek Canyon URA to the UGB would thus have no impacts to existing stormwater facilities.



WATER

WATER PROVIDER: CITY OF OREGON CITY/ CLACKAMAS RIVER WATER (CRW)

PRESSURE ZONE: INTERMEDIATE AND UPPER (OREGON CITY) / BEAVERCREEK (CRW)

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	0	$350	$0
12" PIPE (LF)	0	$400	$0
15" PIPE (LF)	0	$500	$0
PUMP STATION (MGD)	0.4	$5,800,000	$2,320,000
STORAGE RESERVOIR (MG)	0.4	$200,000	$80,000
TOTAL			$2,400,000

SANITARY

SANITARY PROVIDER: CITY OF OREGON CITY

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	10,500	$275	$2,887,500
12" PIPE (LF)	0	$350	$0
15" PIPE (LF)	0	$375	$0
PUMP STATION (MGD)	0	$1,800,000	$0
SAN FORCE (LF)	0	$310	$0
TOTAL			$2,887,500

STORM

STORM PROVIDER: CITY OF OREGON CITY

WATERSHED: ABERNETHY CREEK-WILLAMETTE RIVER

SUB-WATERSHED: ABERNETHY CREEK

PROPOSED IMPROVEMENTS

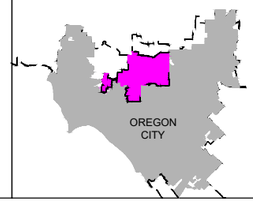
ITEM	UNITS	UNIT COST	TOTAL COST
18" PIPE (LF)	0	$400	$0
24" PIPE (LF)	0	$425	$0
30" PIPE (LF)	0	$500	$0
WATER QUALITY/ DETENTION (SF)	19,400	$150	$2,910,000
TOTAL			$2,910,000

LEGEND

- RESERVE BOUNDARY
- WATER LINE (EX)
- SANITARY LINE
- SANITARY LINE (EX)

ABBREVIATIONS

EX	EXISTING
LF	LINEAR FEET
MG	MILLION GALLONS
MGD	MILLION GALLONS PER DAY
SF	SQUARE FEET



METRO RESERVES GOAL 14 - UTILITY ANALYSIS MAP
HOLLY LANE - NEWELL CREEK CANYON

MACKENZIE.

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I-5 EAST

Water

The I-5 East URA would most likely be served by the City of Tualatin based on proximity and would be part of the B and C pressure zones. Pressure zone B is served by two storage reservoirs, a 2.2 MG reservoir (B-1) and 2.8 MG reservoir (B-2) which were previously supplied by the Martinazzi and Boones Ferry Pump Stations. Both of these pump stations have reached the end of their usable lives and do not currently operate, and pressure zone B is now supplied by the Boones Ferry flow control valve/pressure reducing valve. Pressure zone C is served by a 0.8 MG reservoir (C-1) which is supplied by the Norwood Pump Station.

The City of Tualatin's sole source of water is treated water purchased from Portland Water Bureau. Water is delivered through a 36-inch supply line from the Washington County Supply Line.

The following assessment is based on information from City of Tualatin Water System Master Plan, dated March 2023. The City of Tualatin existing service area includes areas within City limits and areas within the UGB at the time of the Master Plan. The study area of the Master Plan includes the existing service area as well as planned expansion areas, which does not include I-5 East URA.

Assessment of the capacity of existing water facilities to serve areas already inside the UGB.

- Storage – there is a storage surplus of 0.19 MG for service area B and a surplus of 0.51 MG for service area C under current (2020) conditions.
- Pumping – Under normal pumping conditions, the Norwood Pump Station (serving pressure zone C) has a surplus capacity of 1.33 MGD under existing conditions. The Martinazzi and Boones Ferry Pump Stations (serving pressure zone B) have reached the end of their usable lives and do not currently operate.
- Distribution – There are existing industrial deficiencies in the B service area and residential deficiencies in the C service area. Existing transmission line capacity is also deficient in both B and C levels.

Assessment of the capacity of existing water facilities to serve areas proposed for addition to the UGB.

Buildout conditions in the City of Tualatin Master Plan include the existing service area and defined expansion areas, of which I-5 East is not included.

- Storage – there is a storage deficit of 1.0 MG for service area B and a deficit of 0.32 MG for service area C under buildout conditions.
- Pumping – Under normal pumping conditions, the Norwood Pump Station (serving pressure zone C) has a surplus capacity of 0.58 MGD under buildout conditions.
- Distribution – new customers requiring large fire flows in the B level service are required to install fire flow pumps. Further development within the C level will result in the system not being able to meet demand without pumping during fire flow or increased transmission. Additional distribution line capacity will be required to develop this URA.

Assessment of the impacts to existing water facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

- Storage – while there is a storage surplus under existing conditions, there is a deficit under the full buildout condition. Assuming adding I-5 East URA to the UGB would occur after full buildout of the areas already within the UGB, incorporation of I-5 East would cause a greater deficit without the addition or expansion of storage facilities.
- Pumping – after full buildout, the Norwood Pump Station (serving pressure zone C) has a capacity surplus (0.58 MGD, which could potentially serve the I-5 East URA. The Martinazzi and Boones Ferry Pump Stations (serving pressure zone B) both require upgrades to be operational.
- Distribution – transmission line improvements are identified in the Master Plan capital improvement projects. These improvements would provide resiliency to the existing water system as well as additional capacity to serve future growth outside the Master Plan study area.

Sanitary Sewer

The I-5 East URA would most likely be served by the City of Tualatin based on proximity. Based on topography, the I-5 East URA flows primarily north where it could connect to the existing City of Tualatin system by either crossing I-205 to the west (Martinazzi Basin) or the north (Nyberg Basin). If it connected to in the Nyberg Basin, it would be served by the Saum Creek Pump Station, which connects to a CWS owned 24-inch pipe that heads west toward the Lower Tualatin Interceptor.

The City of Tualatin's sewage is treated at the Durham Advanced Wastewater Treatment Facility (AWWTF) which is owned and operated by Clean Water Services. Clean Water Services is also responsible for gravity sewers over 24-inches in size, pump stations and force mains.

The following assessment is based on information from City of Tualatin Sewer Master Plan, dated August 2019 and the Clean Water Services East Basin 2019 Master Plan Project, dated June 2021.

Assessment of the capacity of existing sanitary sewer facilities to serve areas already inside the UGB.

Eight of the nine existing CWS owned pump stations have surplus capacity under existing conditions and are therefore adequately serving areas within the existing UGB.

Under existing conditions (2017) there are pipe capacity issues identified in the Teton and Tualatin Reservoir Basins. These capacity issues did not result in any recommended capital improvement projects as they were not identified as they did not qualify as high priority based on the Master Plan deficiency rankings.

Assessment of the capacity of existing sanitary sewer facilities to serve areas proposed for addition to the UGB.

Buildout conditions in the City of Tualatin Master Plan include infill of the existing service area as well as two planning areas (does not include I-5 East URA). If the I-5 East URA connected to the City of Tualatin system to the north (Nyberg Basin), it would be served by the Saum Creek Pump Station. The City of Tualatin Master Plan indicates that there is a proposed project that would increase the capacity of the Saum Creek Pump Station but does not specify what the increased capacity is or whether the entire capacity increase is needed for the buildout condition. If the I-5 East URA connected to the City of Tualatin system to the west (Martinazzi Basin), there is no pump station currently serving that basin.

Under buildout conditions, six of the eight basins contain pipe with deficient capacity. Both the Nyberg and Martinazzi Basins contain pipe with deficient capacity under buildout conditions, therefore it can be assumed that the existing sanitary sewer pipes do not have the capacity to serve the I-5 East URA.

Assessment of the impacts to existing sanitary sewer facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

If the I-5 East URA connected to the City of Tualatin system to the north (Nyberg Basin), it is unclear whether the proposed capacity increase to the Saum Creek Pump Station would have the capacity to serve the I-5 East URA. There are pipe deficiencies in both the Martinazzi and Nyberg basins under buildout conditions, which does not include the I-5 East URA. The addition of the I-5 East URA to either of these basins would further contribute to these deficiencies and increased pipe capacity will likely be needed to serve its development.

Storm

The I-5 East URA would most likely be served by the City of Tualatin based on proximity and topography. Based on topography the I-5 East URA generally flows toward Saum Creek which flows north/south through the URA. Saum Creek flows north until it crosses under Interstate 205 where it continues east/north until it reaches the Tualatin River.

The majority of the City of Tualatin drainage basins discharge to the Tualatin River and its tributaries, including Nyberg Creek, Hedges Creek, Cummins Creek, and Saum Creek. The City's infrastructure consists of more small dispersed systems that discharge to these receiving waters rather than large trunk lines.

The following assessment is based on information from the City of Tualatin Stormwater Master plan, dated April 2019.

Assessment of the capacity of existing stormwater facilities to serve areas already inside the UGB.

The Master Plan identifies capacity issues related to modeled future flows through the existing system and does not specifically address the capacity of the existing system related to existing flows. However, hydraulic modeling summarized in the Master Plan indicates that within modeled areas, full development would result in minimal or no increase to future flows, therefore it can be assumed that identified capacity issues are related to existing flows and not future flows. Capacity issues were identified at six locations, none of which are in the Saum Creek Basin.

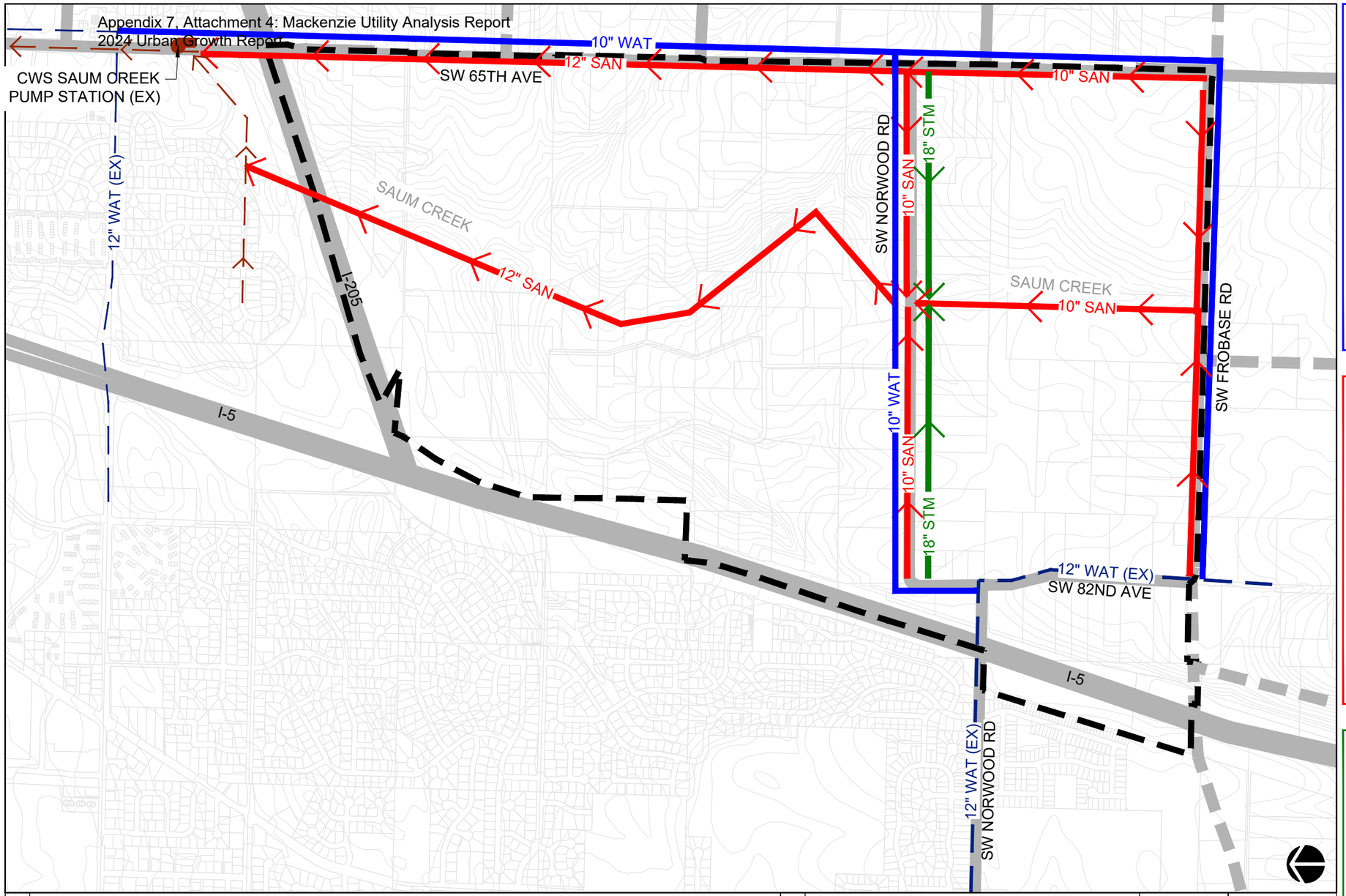
Based on topography, the I-5 East URA would discharge directly to Saum Creek via private outfalls from development areas and public outfalls from roadways and would thus not connect to any of the existing City of Tualatin infrastructure.

Assessment of the capacity of existing stormwater facilities to serve areas proposed for addition to the UGB.

The same capacity issues identified in the Master Plan for existing conditions are problematic when considering serving areas outside the existing service area and should be corrected based on proposed capital improvement projects prior to serving additional area. Capacity issues do not exist in every basin so necessary improvements are dependent on the location of the proposed development area. The I-5 East URA is within the Saum Creek Basin which does not have any identified capacity related issues.

Assessment of the impacts to existing stormwater facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

Existing stormwater facilities with identified capacity issues will experience further issues if not addressed prior to adding URA land to the UGB. Based on topography, the I-5 East URA would discharge directly to Saum Creek via private outfalls from development areas and public outfalls from roadways and would thus not connect to any of the existing City of Tualatin infrastructure, therefore existing facilities would not be impacted.



WATER

WATER PROVIDER: CITY OF TUALATIN

PRESSURE ZONE: B/C

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	19,300	$350	$6,755,000
12" PIPE (LF)	0	$400	$0
16" PIPE (LF)	0	$500	$0
PUMP STATION (MGD)	2.5	$5,800,000	$14,500,000
STORAGE RESERVOIR (MG)	2.5	$200,000	$500,000
TOTAL			$21,755,000

SANITARY

SANITARY PROVIDER: CITY OF TUALATIN

BASIN: NYBERG OR MARTINAZZI

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	14,200	$275	$3,905,000
12" PIPE (LF)	12,000	$350	$4,200,000
15" PIPE (LF)	0	$375	$0
PUMP STATION (MGD)	2.5	$1,800,000	$4,500,000
SAN FORCE (LF)	0	$310	$0
TOTAL			$12,605,000

STORM

STORM PROVIDER: CITY OF TUALATIN

WATERSHED: FANNO CREEK-TUALATIN RIVER

SUB-WATERSHED: SAUM CREEK-TUALATIN RIVER

PROPOSED IMPROVEMENTS

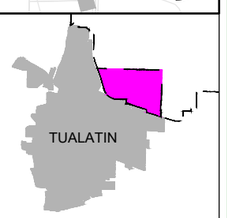
ITEM	UNITS	UNIT COST	TOTAL COST
18" PIPE (LF)	4,500	$400	$1,800,000
24" PIPE (LF)	0	$425	$0
30" PIPE (LF)	0	$500	$0
WATER QUALITY/ DETENTION (SF)	17,650	$150	$2,647,500
TOTAL			$4,447,500

LEGEND

- RESERVE BOUNDARY
- WATER LINE
- WATER LINE (EX)
- SANITARY LINE
- SANITARY LINE (EX)
- SANITARY PUMP STATION (EX)
- STORM LINE

ABBREVIATIONS

EX	EXISTING
LF	LINEAR FEET
MG	MILLION GALLONS
MGD	MILLION GALLONS PER DAY
SF	SQUARE FEET



METRO RESERVES GOAL 14 - UTILITY ANALYSIS MAP

I-5 EAST

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MAPLELANE

Water

The Maplelane URA would likely be served by Clackamas River Water (CRW) as it is included in the existing CRW planning area as part of the Henrici pressure zone. The Henrici pressure zone is supplied by the Beavercreek pressure zone (served by the Henrici Reservoirs). There is currently no pump station required to serve the Henrici pressure zone.

Clackamas River Water (South System) receives water from the South Fork Water Board (SFWB), with future plans to construct a backbone connecting the south system to the north system and the CRW water treatment plant.

The following assessment is based on information from Clackamas River Water - Water System Master Plan, South System, dated April 2019. The Master Plan considers its planning area the area CRW plans to serve by the end 2038, and the service area as the area that CRW may serve beyond 2039. A majority of the Maplelane URA is included in the CRW existing service area and planning area. Future demand projections presented in the Master Plan are based on Equivalent Housing Units (EHUs) within pressure zones.

Assessment of the capacity of existing water facilities to serve areas already inside the UGB.

Under current conditions (2019), the Henrici Reservoirs have a storage capacity surplus of 0.29 MG indicating there is adequate storage capacity to serve areas already inside the UGB.

Assessment of the capacity of existing water facilities to serve areas proposed for addition to the UGB.

Under future projections (2038) there is a storage capacity surplus of 0.60 MG in the Henrici Reservoirs, thus there is additional capacity available to serve areas proposed for addition to the UGB, depending on their demand.

Assessment of the impacts to existing water facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

There is an overall surplus for storage capacity under future projections, however it is not an adequate surplus to serve the entire Maplelane URA. Additional storage capacity will be needed to develop this URA without causing a deficit for the existing system.

Sanitary Sewer

Maplelane URA would likely be served by Oregon City based on proximity. Based on topography, it appears the Maplelane URA would flow east away from existing Oregon City and Clackamas County sanitary infrastructure. It will therefore need to be pumped west to join the existing City of Oregon City infrastructure located in Beavercreek Road, which flows to the Clackamas County Water Environment Services (WES) Newell Creek Interceptor located in Highway 213.

Wastewater from Oregon City flows to the Tri-City Sewer District (TCSD) trunks, interceptors and eventually the Tri-City Water Pollution Control Plant.

The following assessment is based on information from City of Oregon City Sanitary Sewer Master Plan, dated November 2014.

Assessment of the capacity of existing sanitary sewer facilities to serve areas already inside the UGB.

Surcharging (ranging from minor to severe) exists throughout the existing City collection system. There are also capacity deficiencies in several locations in the WES system.

Two of the twelve existing pump stations (Settler's Point and Cook Street) have existing peak flows that exceed their firm capacity.

Assessment of the capacity of existing sanitary sewer facilities to serve areas proposed for addition to the UGB.

There are existing capacity issues in the Newell Creek Interceptor which indicates it does not have the capacity to serve areas proposed for addition to the UGB.

There are no pump stations currently required downstream of the Maplelane URA.

Assessment of the impacts to existing sanitary sewer facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

The Clackamas County WES Master Plan identifies a capital improvement project to increase the size of the Newell Creek Interceptor, however it does not provide an estimate for what the increased capacity is or whether a surplus exists for future expansion. Additional capacity of the Newell Creek Interceptor could be required to serve the Maplelane URA to reduce impacts to areas already inside the UGB.

Storm

City of Oregon City is the likely provider for Maplelane URA, as it is located within the Abernathy and Thimble Basins and is adjacent to the City service area boundary. Based on topography, the Maplelane URA generally flows east towards tributaries of the Abernathy Creek, which eventually runs west and outfalls to the Willamette River. Topography suggests that this URA would likely outfall directly to Abernathy Creek and would thus not connect to existing City storm infrastructure.

Generally, the City's topographic high point is at the center of the City and receiving waters are on all sides of the City. Because of this, much of the existing infrastructure are small, dispersed pipes and culverts rather than larger trunk lines.

The following assessment is based on information from Oregon City Stormwater Master Plan, dated July 2019. The study area for the Master Plan covers drainage areas to the following receiving water bodies: Abernathy Creek, the Clackamas River, Beaver Creek and the Willamette River.

Assessment of the capacity of existing stormwater facilities to serve areas already inside the UGB.

The Master Plan identifies capacity issues within the modeled basins. Two of the modeled basins were determined to contain the most problem areas; the John Adams Basin is described as generally undersized, and the South End Basin was described as an inefficient system with flooding during the 2-year storm event.

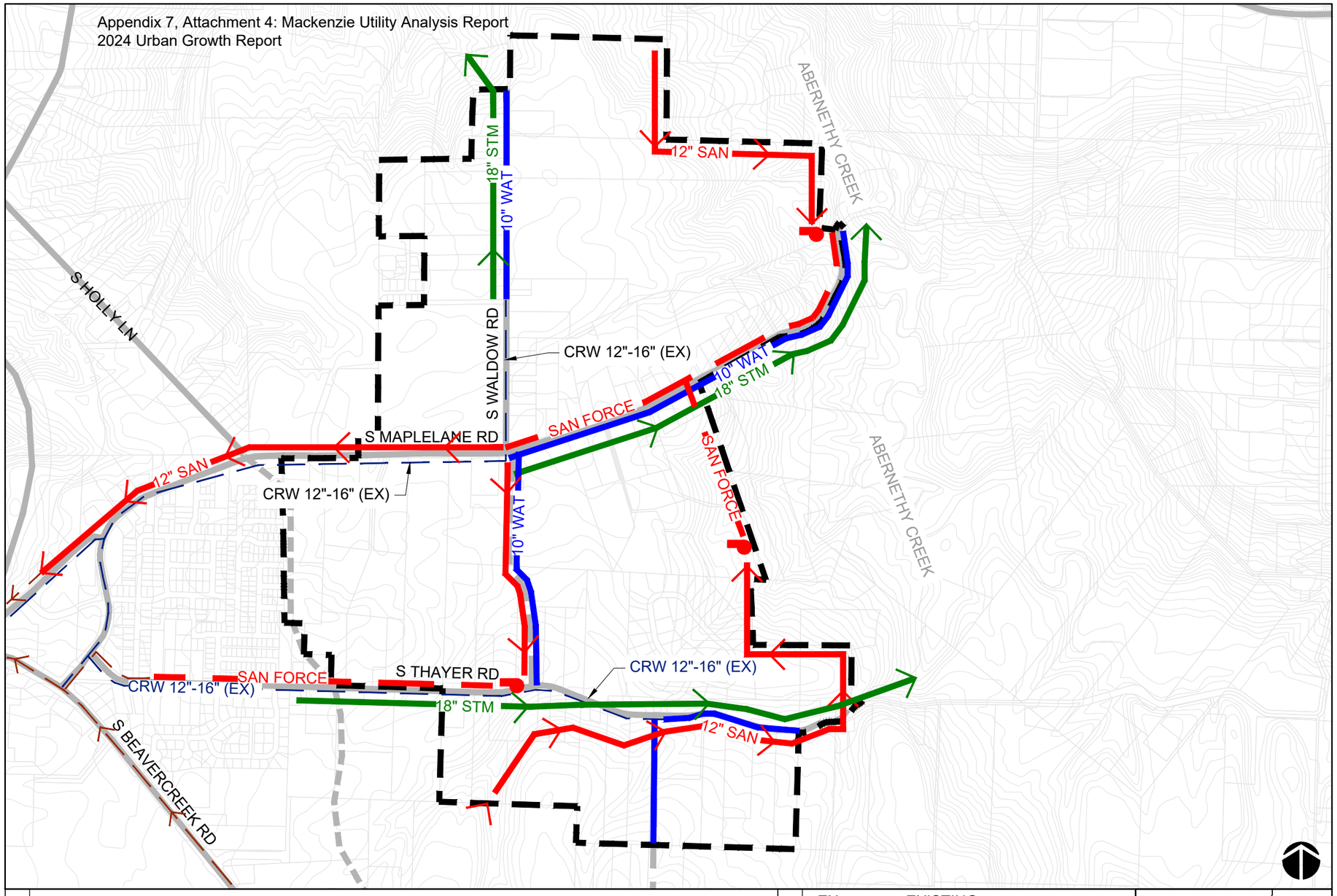
Assessment of the capacity of existing stormwater facilities to serve areas proposed for addition to the UGB.

There are several problem areas (as defined by the Master Plan) under existing conditions for infrastructure downstream of the URA connections points. Adding stormwater from areas outside the UGB will likely contribute to these existing problems and potentially cause additional problem areas if they are not addressed.

Assessment of the impacts to existing stormwater facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

Capital improvement projects to address capacity issues described above are presented in the Master Plan. Completion of these projects is required to provide adequate capacity to serve the study area (which includes the Thimble and Abernathy Basins as they drain to Abernathy Creek) during a 25-year storm event.

Based on topography the Maplelane URA would likely outfall directly to Abernathy Creek and would thus not connect to existing City storm infrastructure. The addition of the Maplelane URA to the UGB would thus have no impacts to existing stormwater facilities.



WATER

WATER PROVIDER: CLACKAMAS RIVER WATER (CRW)

PRESSURE ZONE: HENRICI

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	10,400	$350	$3,640,000
12" PIPE (LF)	0	$400	$0
15" PIPE (LF)	0	$500	$0
PUMP STATION (MGD)	0	$5,800,000	$0
STORAGE RESERVOIR (MG)	1.7	$200,000	$340,000
TOTAL			$3,980,000

SANITARY

SANITARY PROVIDER: CITY OF OREGON CITY

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	0	$275	$0
12" PIPE (LF)	15,500	$350	$5,425,000
15" PIPE (LF)	0	$375	$0
PUMP STATION (MGD)	1.7	$1,800,000	$3,060,000
SAN FORCE (LF)	8,500	$310	$2,635,000
TOTAL			$11,120,000

STORM

STORM PROVIDER: CITY OF OREGON CITY

WATERSHED: ABERNETHY CREEK-WILLAMETTE RIVER

SUB-WATERSHED: ABERNETHY CREEK

PROPOSED IMPROVEMENTS

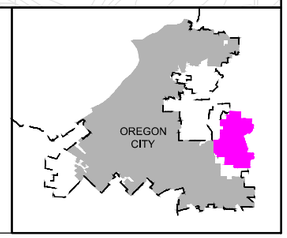
ITEM	UNITS	UNIT COST	TOTAL COST
18" PIPE (LF)	12,200	$400	$4,880,000
24" PIPE (LF)	0	$425	$0
30" PIPE (LF)	0	$500	$0
WATER QUALITY/ DETENTION (SF)	32,250	$150	$4,837,500
TOTAL			$9,717,500

LEGEND

- RESERVE BOUNDARY
- WATER LINE
- WATER LINE (EX)
- SANITARY LINE
- SANITARY FORCE MAIN
- SANITARY LINE (EX)
- SANITARY PUMP STATION
- STORM LINE

ABBREVIATIONS

EX	EXISTING
LF	LINEAR FEET
MG	MILLION GALLONS
MGD	MILLION GALLONS PER DAY
SF	SQUARE FEET



METRO RESERVES GOAL 14 - UTILITY ANALYSIS MAP

MAPLELANE

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NORWOOD

Water

The Norwood URA would most likely be served by the City of Tualatin based on proximity and would be part of the B pressure zone. Pressure zone B is served by two storage reservoirs, a 2.2 MG reservoir (B-1) and 2.8 MG reservoir (B-2) which were previously supplied by the Martinazzi and Boones Ferry Pump Stations. Both pump stations have reached the end of their usable lives and do not currently operate. Pressure zone B is now supplied by the Boones Ferry flow control valve/pressure reducing valve.

The City of Tualatin's sole source of water is treated water purchased from Portland Water Bureau. Water is delivered through a 36-inch supply line from the Washington County Supply Line.

The following assessment is based on information from City of Tualatin Water System Master Plan, dated March 2023. Buildout conditions in the City of Tualatin Master Plan include the existing service area and defined expansion areas, of which Norwood is not included.

Assessment of the capacity of existing water facilities to serve areas already inside the UGB.

- Storage – there is a storage surplus of 0.19 MG for service area B under current (2020) conditions.
- Distribution – There are existing industrial deficiencies in the B service. Existing transmission line capacity is also deficient.

Assessment of the capacity of existing water facilities to serve areas proposed for addition to the UGB.

- Storage – there is a storage deficit of 1.0 MG for service area B under buildout conditions. Additional areas outside the current UGB could not be served without increasing storage capacity.
- Distribution – there are existing flow deficiencies within service area B, which can be corrected by upsizing pipes. To serve areas proposed for addition to the UGB, it is likely these undersized pipes will need to be addressed.

Assessment of the impacts to existing water facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

- Storage – while there is a storage surplus under existing conditions, there is a deficit under the full buildout condition. Assuming adding Norwood URA to the UGB would occur after full buildout of the areas already within the UGB, incorporation of Norwood would cause a greater deficit without the addition or expansion of storage facilities.
- Distribution – without addressing undersized pipes, the number and severity of the existing flow deficiencies could increase if URA land were added to the UGB.

Sanitary Sewer

The Norwood URA would most likely be served by the City of Tualatin based on proximity. Based on topography, the Norwood URA flows primarily north where it would cross I-205 and join the existing City of Tualatin sewer system in the Nyberg Basin. Norwood URA would likely be served by the Borland Pump Station, which connects to a CWS owned 24-inch pipe that heads west toward the Lower Tualatin Interceptor.

The City of Tualatin's sewage is treated at the Durham Advanced Wastewater Treatment Facility (AWWTF) which is owned and operated by Clean Water Services. Clean Water Services is also responsible for gravity sewers over 24-inches in size, pump stations and force mains.

The following assessment is based on information from City of Tualatin Sewer Master Plan, dated August 2019 and the Clean Water Services East Basin 2019 Master Plan Project, dated June 2021.

Assessment of the capacity of existing sanitary sewer facilities to serve areas already inside the UGB.

- The Borland Pump Station has a surplus of 155 gpm under existing conditions.
- There are no modeled pipe deficiencies (based on HGL criteria outlined in the Master Plan) in the Nyberg basin under existing conditions.

Assessment of the capacity of existing sanitary sewer facilities to serve areas proposed for addition to the UGB.

Buildout conditions in the City of Tualatin Master Plan include infill of the existing service area as well as two planning areas (does not include I-5 East URA).

- The Borland Pump Station has surplus capacity under existing conditions, however it is not clear in either the City of Tualatin or Clean Water Services Master Plans whether it has capacity under buildout conditions.
- The Nyberg basin contains deficient pipe (based on HGL criteria outlined in the Master Plan) under buildout conditions.

Assessment of the impacts to existing sanitary sewer facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

- It is unclear whether the Borland Pump Station has the capacity to serve additional area.
- There are pipe deficiencies in the Nyberg basin under buildout conditions. The addition of the Norwood URA would further contribute to these deficiencies.

Storm

The Norwood URA would most likely be served by the City of Tualatin based on proximity. Based on topography, the Norwood URA would discharge directly to Saum Creek via private outfalls from development areas and public outfalls from roadways and would thus not connect to any of the existing City of Tualatin infrastructure.

The majority of the City of Tualatin drainage basins discharge to the Tualatin River and its tributaries, including Nyberg Creek, Hedges Creek, Cummins Creek, and Saum Creek. The City's infrastructure consists of more small dispersed systems that discharge to these receiving waters rather than large trunk lines.

The following assessment is based on information from the City of Tualatin Stormwater Master plan, dated April 2019.

Assessment of the capacity of existing stormwater facilities to serve areas already inside the UGB.

The Master Plan identifies capacity issues related to modeled future flows through the existing system and does not specifically address the capacity of the existing system related to existing flows. However, hydraulic modeling summarized in the Master Plan indicates that within modeled areas, full development would result in minimal or no increase to future flows, therefore it can be assumed that identified capacity issues are related to existing flows and not future flows. Capacity issues were identified at six locations, none of which are in the Saum Creek Basin.

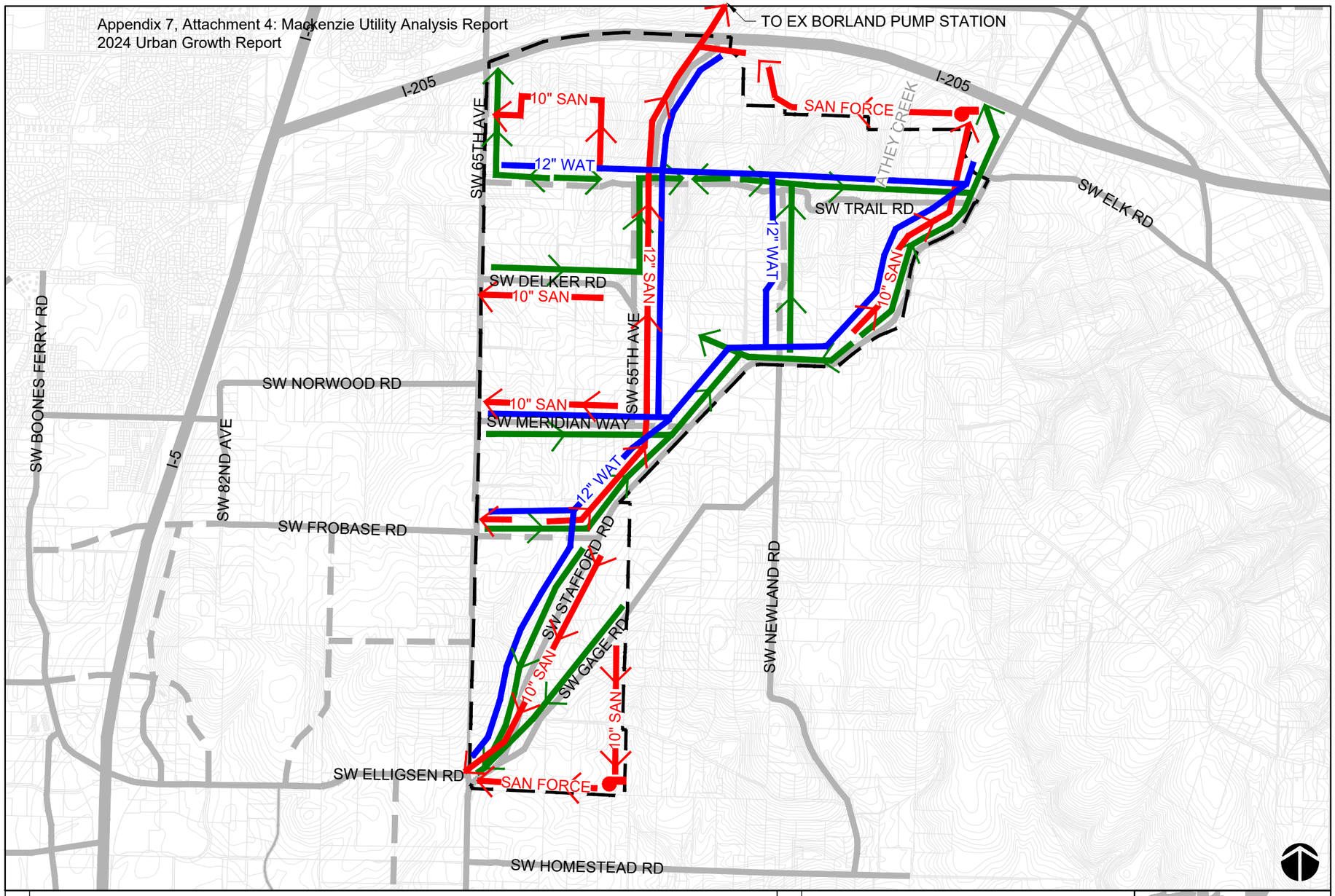
Based on topography, the Norwood URA would discharge directly to Saum Creek via private outfalls from development areas and public outfalls from roadways and would thus not connect to any of the existing City of Tualatin infrastructure.

Assessment of the capacity of existing stormwater facilities to serve areas proposed for addition to the UGB.

The same capacity issues identified in the Master Plan for existing conditions are problematic when considering serving areas outside the existing service area and should be corrected based on proposed capital improvement projects prior to serving additional area. Capacity issues do not exist in every basin so necessary improvements are dependent on the location of the proposed development area. The Norwood URA is within the Saum Creek Basin which does not have any identified capacity related issues.

Assessment of the impacts to existing stormwater facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

Existing stormwater facilities with identified capacity issues will experience further issues if not addressed prior to adding URA land to the UGB. Based on topography, the Norwood URA would discharge directly to Saum Creek via private outfalls from development areas and public outfalls from roadways and would thus not connect to any of the existing City of Tualatin infrastructure.



WATER

WATER PROVIDER: CITY OF TUALATIN

PRESSURE ZONE: SERVICE AREA B (NEAREST)

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	38,600	$350	$13,510,000
12" PIPE (LF)	0	$400	$0
15" PIPE (LF)	0	$500	$0
PUMP STATION (MGD)	0	$5,800,000	$0
STORAGE RESERVOIR (MG)	5.4	$200,000	$1,080,000
TOTAL			$14,590,000

SANITARY

SANITARY PROVIDER: CITY OF TUALATIN

BASIN: NYBERG

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	19,800	$275	$5,445,000
12" PIPE (LF)	10,800	$350	$3,780,000
15" PIPE (LF)	0	$375	$0
PUMP STATION (MGD)	0.8	$1,800,000	$1,440,000
SAN FORCE (LF)	7,300	$310	$2,263,000
TOTAL			$12,928,000

STORM

STORM PROVIDER: CLEAN WATER SERVICES (CWS)

WATERSHED: FANNO CREEK-TUALATIN RIVER

SUB-WATERSHED: SAUM CREEK-TUALATIN RIVER

PROPOSED IMPROVEMENTS

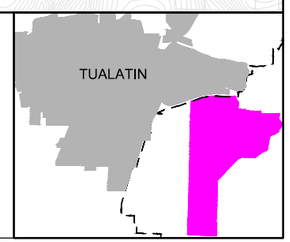
ITEM	UNITS	UNIT COST	TOTAL COST
18" PIPE (LF)	17,700	$400	$7,080,000
24" PIPE (LF)	15,000	$425	$6,375,000
30" PIPE (LF)	10,000	$500	$5,000,000
WATER QUALITY/ DETENTION (SF)	123,900	$150	$18,585,000
TOTAL			$37,040,000

LEGEND

- RESERVE BOUNDARY
- WATER LINE
- WATER LINE (EX)
- WATER PUMP STATION
- SANITARY LINE
- SANITARY FORCE MAIN
- SANITARY LINE (EX)
- SANITARY PUMP STATION
- STORM LINE
- STORM LINE (EX)

ABBREVIATIONS

EX	EXISTING
LF	LINEAR FEET
MG	MILLION GALLONS
MGD	MILLION GALLONS PER DAY
SF	SQUARE FEET



METRO RESERVES GOAL 14 - UTILITY ANALYSIS MAP

NORWOOD

MACKENZIE.

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ROSA

Water

Rosa would most likely be served by the City of Hillsboro based on proximity. Rosa is located south of the existing City System service area and west of the future South Hillsboro service area and is included in the Master Plan as a future growth area (FGA). The Master Plan includes the evaluation of distribution system and storage system under both existing and projected future water demand, which includes future growth areas (FGA).

The City of Hillsboro owns and operates two municipal drinking water systems, City System (primary) and Upper System (secondary), served by wholesale water purchased from Joint Water Commission (JWC). The City also provides wholesale water to City of Cornelius, City of Gaston and LA Water Cooperative. The City of Hillsboro and Tualatin Valley Water District are developing the Willamette Water Suply System (WWSS), a new water supply system from the Willamette River, to address rapid growth in City of Hillsboro City System and City of Cornelius. The expected completion for this project is June 2026. There is also a planned upgrade for the existing JWC Water Treatment Plant.

The following assessment is based on information from City of Hillsboro Water Master Plan, dated June 2019.

Assessment of the capacity of existing water facilities to serve areas already inside the UGB.

- Supply – The WWSS has sufficient capacity to meet demands within the existing service area.
- Storage – additional storage of 6.4 MG is needed for areas within the existing UGB to provide the desired level of service during a regional supply outage.
- Distribution – with the exception of some locations with dead-end pipe segments smaller than 6-inches in diameter, the required fire flow is available City-wide. The system transmission capacity is also generally good.

Assessment of the capacity of existing water facilities to serve areas proposed for addition to the UGB.

- Supply – without the WWSS, capacity is insufficient to meet projected buildout demands within the current UGB. The WWSS can likely serve a portion of the additional demands for areas outside the current UGB, however available capacity is dependent on the type of development that occurs.
- Storage – an additional 17.8 MG of storage is needed for expansion beyond the current UGB, i.e. to serve the Rosa URA.

Assessment of the impacts to existing water facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

- Supply – the WWSS is required to provide additional supply for expansion outside the UGB. With full buildout of the WWSS, a total supply (including JWC supply) of 77.95 MGD would be available. The peak daily demand of the existing service area is 45.1 MGD, leaving 32.85 MGD for future expansion outside the UGB. This is sufficient supply to serve the Rosa URA.

- Storage – Areas outside the existing UGB cannot be served without additional storage capacity.

Sanitary Sewer

Rosa URA would likely be served by the City of Hillsboro and Clean Water Services who work together to manage the sanitary sewer system near the Rosa URA. The primary point of connection for this URA would likely be a City of Hillsboro sanitary main located in SE River Road, which connects to a Clean Water Services pump station near the intersection of SE River Road and SE David Road.

The Master Plan for the Clean Water Services (West Basin, which includes City of Hillsboro) is currently in development. The following assessment is based on information from communication with Clean Water Services Capital Planning Division Manager.

Assessment of the capacity of existing sanitary sewer facilities to serve areas already inside the UGB.

CWS is currently developing the West Basin Master Plan (WBMP) which is anticipated to be completed in early 2025. The WBMP will identify sanitary projects at both the Water Resource Recovery Facilities (WRRFs) and in the conveyance system necessary to accommodate redevelopment of underdeveloped areas within the UGB and green-field development of large areas recently brought into the UGB that are undergoing community planning and/or development.

Much of the conveyance infrastructure required for growing demands within the UGB is anticipated to be constructed privately during the development process and coordinated by CWS and local jurisdictions. The CWS WBMP will identify trunk line projects and pump stations necessary to accommodate growth of these areas; these projects will be incorporated into the CWS long-range capital improvement plan (CIP) at strategic times necessary to meet expected capacity demands. The CWS CIP will be updated and adjusted annually to reflect the latest growth patterns and anticipated timing.

Assessment of the capacity of existing sanitary sewer facilities to serve areas proposed for addition to the UGB.

The CWS WBMP will acknowledge the potential for growth in the Rosa URA. Full development of areas inside the UGB does not happen prior to the addition of URAs into the UGB; the CWS WBMP will assume there is overlap in the continued development of the UGB while simultaneous development begins in URAs added to the UGB.

Clean Water Services has indicated that it is likely the development of Rosa URA would require a new pump station that would pump directly to the Rock Creek WRRF.

Assessment of the impacts to existing sanitary sewer facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

The CWS WBMP will address the infrastructure needs in unincorporated areas as well as the partner cities to accommodate planned growth. CWS regularly calibrates, updates, and maintains a hydraulic model that predicts sewer flows under development conditions. The hydraulic model is a key component in the identification of both the magnitude and timing of capital projects to meet growth demands.

Because CWS plans to pump the Rosa URA directly to the Rock Creek WRRF via a new pump station, there won't be negative impacts to the existing sanitary sewer facilities.

Storm

The Rosa URA would be served by the City of Hillsboro and Clean Water Services. Rosa is included in the planning area of the City of Hillsboro Master Plan as part of the Tualatin River Basin. The Tualatin River basin drains directly to the Tualatin River or indirectly through smaller creeks including Gordon Creek and Butternut Creek.

The following assessment is based on information from the City of Hillsboro Stormwater Master Plan, dated 2021. The study area included in the Master Plan is the incorporated City, portions of the UGB where the City has adopted plans for development, and portions of the UGB where the City plans to begin planning in the next several years (including the Rosa URA).

Assessment of the capacity of existing stormwater facilities to serve areas already inside the UGB.

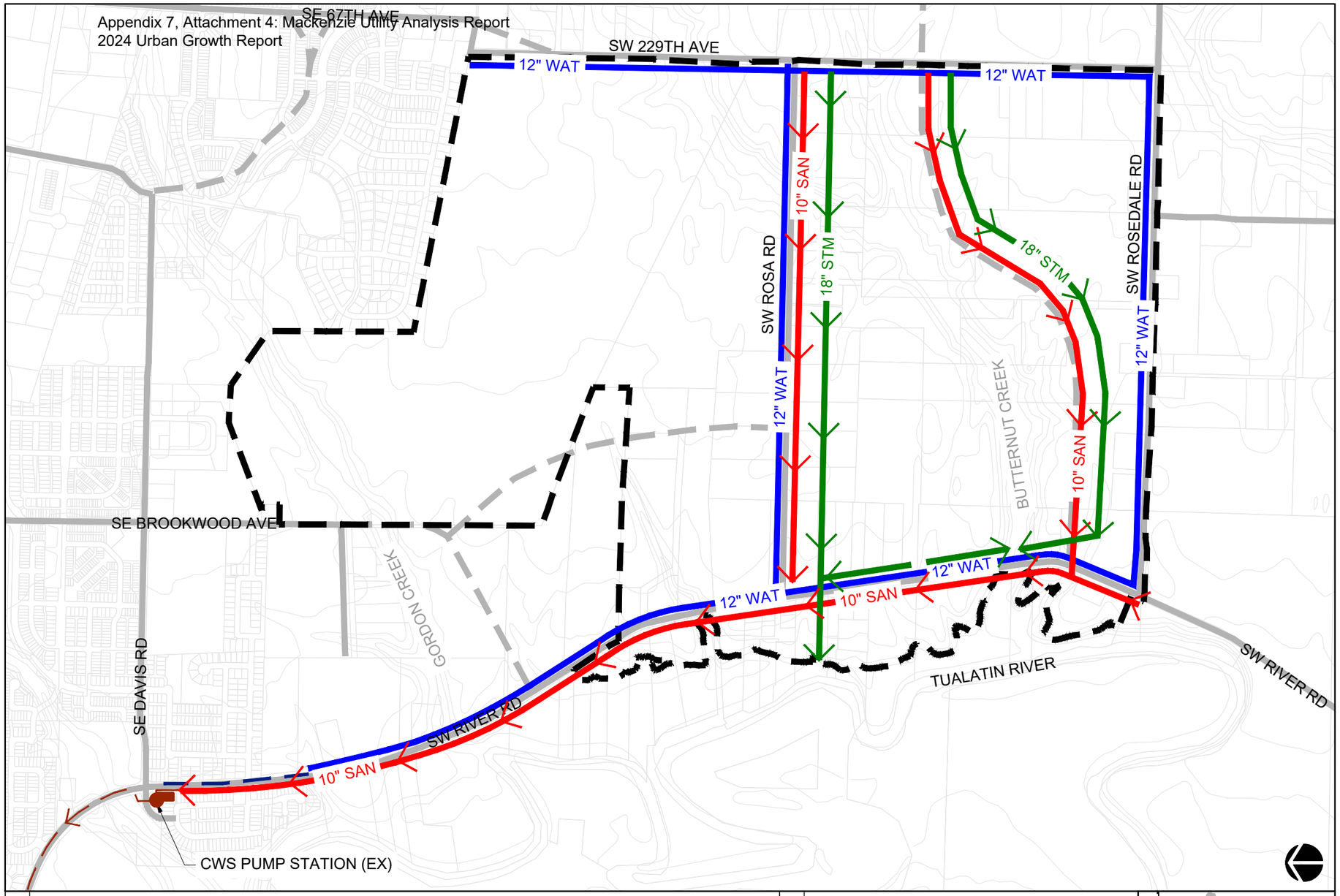
The Master Plan discusses currently undeveloped areas as expected to be provided with adequately sized conveyance and stormwater treatment by private development as it occurs. These appropriately sized stormwater facilities would presumably discharge directly to Gordon Creek or Butternut Creek and would not impact the capacity of existing stormwater infrastructure.

Assessment of the capacity of existing stormwater facilities to serve areas proposed for addition to the UGB.

The Master Plan discusses currently undeveloped areas as expected to be provided with adequately sized conveyance and stormwater treatment by private development as it occurs. These appropriately sized stormwater facilities would presumably discharge directly to Gordon Creek or Butternut Creek and would not impact the capacity of existing stormwater infrastructure.

Assessment of the impacts to existing stormwater facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

City of Hillsboro and Clean Water Services standards require on-site detention for expansion areas identified in the City of Hillsboro Stormwater Master Plan, which includes the Rosa URA. Based on topography, the Rosa URA would discharge directly to Butternut Creek or Gordon Creek via private outfalls from development areas and public outfalls from roadways and would thus not connect to any of the existing City of Hillsboro infrastructure. CWS expects that stormwater will be treated and detained on development sites so that there are no negative impacts to Butternut Creek.



WATER

WATER PROVIDER: HILLSBORO WATER DISTRICT

PRESSURE ZONE: MAIN (FUTURE)

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	0	$350	$0
12" PIPE (LF)	23,600	$400	$9,440,000
16" PIPE (LF)	0	$500	$0
PUMP STATION (MGD)	0	$5,800,000	$0
STORAGE RESERVOIR (MG)	1.4	$200,000	$280,000
TOTAL			$9,720,000

SANITARY

SANITARY PROVIDER: CLEAN WATER SERVICES

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	18,800	$275	$5,170,000
12" PIPE (LF)	0	$350	$0
15" PIPE (LF)	0	$375	$0
PUMP STATION (MGD)	1.4	$1,800,000	$2,520,000
SAN FORCE (LF)	0	$310	$0
TOTAL			$7,690,000

STORM

STORM PROVIDER: CITY OF HILLSBORO

WATERSHED: ROCK CREEK-TUALATIN RIVER

SUB-WATERSHED: DAVIS CREEK-TUALATIN RIVER

PROPOSED IMPROVEMENTS

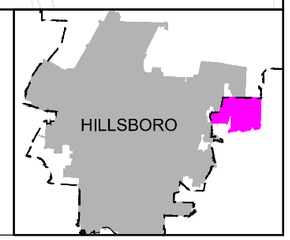
ITEM	UNITS	UNIT COST	TOTAL COST
18" PIPE (LF)	7,500	$400	$3,000,000
24" PIPE (LF)	5,200	$425	$2,210,000
30" PIPE (LF)	0	$500	$0
WATER QUALITY/ DETENTION (SF)	62,500	$150	$9,375,000
TOTAL			$14,585,000

LEGEND

- RESERVE BOUNDARY
- WATER LINE
- WATER LINE (EX)
- SANITARY LINE
- SANITARY LINE (EX)
- SANITARY PUMP STATION (EX)
- STORM LINE

ABBREVIATIONS

EX	EXISTING
LF	LINEAR FEET
MG	MILLION GALLONS
MGD	MILLION GALLONS PER DAY
SF	SQUARE FEET



METRO RESERVES GOAL 14 - UTILITY ANALYSIS MAP

ROSA

MACKENZIE.

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ROSEMONT

Water

The Rosemont URA would likely be served by the City of West Linn based on proximity and would be part of the Rosemont pressure zone. The Rosemont pressure zone is served by the Rosemont Reservoir which is filled by the Horton Pump Station and View Drive Pump Station.

The primary water source for City of West Linn is from the South Fork Water Board (SFWB) water treatment plant located in Oregon City, with an emergency supply from City of Lake Oswego Water Treatment Plant.

The following assessment is based on information from City of West Linn Water System Master Plan, dated November 2008. The buildout scenario in the City of West Linn Master Plan is defined as saturation development of all land within the existing UGB that the City has determined to be economically and physically developable.

Assessment of the capacity of existing water facilities to serve areas already inside the UGB.

- Supply – Under normal (non-emergency) conditions, there is a supply deficit of 3.8 MG in the Rosemont pressure zone.
- Storage – under normal (non-emergency) conditions there is not currently a storage deficit in the Rosemont pressure zone.
- Distribution – Master Plan modeling analysis revealed deficiencies during fire flow events under existing conditions in all six pressure zones.

Assessment of the capacity of existing water facilities to serve areas proposed for addition to the UGB.

- Supply – under normal (non-emergency) conditions there is a deficit of 3.4 MG for the saturation development (build-out) scenario in the Rosemont pressure zone.
- Storage – under normal (non-emergency) conditions there is no storage deficit for the saturation development scenario in the Rosemont pressure zone.
- Pumping – The Master Plan identifies a deficiency in pumping capacity to the Rosemont pressure zone under buildout conditions.
- Distribution – Master Plan modeling analysis revealed deficiencies during fire flow events under saturation development conditions in all six pressure zones.

Assessment of the impacts to existing water facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

- Supply/Storage – the Master Plan proposes the construction of a new reservoir and booster pump station to supply the Rosemont pressure zone and address its current deficiency. The reservoir, Bland Reservoir No. 2, would have a capacity of 0.3 MG and be located adjacent to the existing Bland Reservoir near Crestview Drive. The booster station would have a pumping capacity of 1,800 gpm. According to City of West Linn Public Works website, this project applied for a conditional use permit in 2012 and was appealed. Based on aerial imagery it does not appear the project was constructed. It is unclear from the Master Plan whether these improvements would provide surplus capacity that could be used to serve Rosemont URA.
- Pumping – The Master Plan recommends the construction of a third pump station to serve the Rosemont pressure zone.
- Distribution – approximately 79,000 feet of piping improvements were identified in the Master Plan as needing to be completed to address deficiencies in existing and saturation development scenarios. Ten of the projects are within the Rosemont pressure zone.

Sanitary Sewer

Rosemont URA would likely need to be served by the City of West Linn for sanitary sewer based on proximity and topography. The site generally flows west/southwest away from existing City sanitary infrastructure and toward currently undeveloped land. Assuming the land south of the URA were not developed prior to the development of Rosemont, a pump would be required to connect sanitary sewer from this URA to existing City infrastructure. This connection would likely occur within Basin 9E.

At the downstream end of the City of West Linn sanitary system as Clackamas County Water Environment Services (WES) owned pumps and force mains. Sanitary ultimately gets pumped to the Tri-City Water Resource Recovery Facility (WRRF) located on the east side of the Willamette River. The Rosemont site would be part of the WES Willamette Basin which flows to the Willamette Pump Station, then the West Linn Interceptor.

The following assessment is based on information from City of West Linn Sanitary Sewer Master Plan Update, dated September 2019, and the Sanitary Sewer System Master Plan for Water Environment Services, dated January 2019. The study area of the Master Plan is the existing service area, which coincides with both the City limits and UGB.

Assessment of the capacity of existing sanitary sewer facilities to serve areas already inside the UGB.

The City Master Plan has identified potential system capacity deficiencies for modeled pipes both the existing and buildout scenarios. There are no deficiencies identified in the City system downstream of the Rosemont URA connection point under existing conditions.

The existing WES system has the capacity to convey both the dry weather flow and groundwater infiltration associated with winter conditions.

Assessment of the capacity of existing sanitary sewer facilities to serve areas proposed for addition to the UGB.

The buildout scenario in the West Linn Master Plan assumes all properties within the study area will be developed and connected to the sanitary sewer collection system, including decommissioning of private septic systems and connecting them to the City's collection system.

The City Master Plan has identified potential system capacity deficiencies for modeled pipes both the existing and buildout scenarios. There are three deficiencies identified in the City system downstream of the Rosemont URA connection point under buildout conditions. They occur downstream in the sanitary system near the Willamette River.

The WES Master Plan identifies hydraulic deficiencies for future dry weather flow, groundwater infiltration and rainfall derived infiltration and inflow.

Assessment of the impacts to existing sanitary sewer facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

Whether the development of the Rosemont URA would cause capacity issues to the existing City sanitary sewer system or WES facilities is dependent on the timing of its development and other development in and around the City.

The WES Master Plan identifies an expansion of the existing Treatment Plant within the 2020-2040 timeframe, taking it from its existing 78.3 MGD capacity to 104 MGD capacity.

Storm

The Rosemont URA would most likely be served by the City of West Linn, as it is adjacent to their existing City Limits and falls mostly within the Fritchie Creek watershed. Tributaries of Fritchie Creek originate in the Rosemont URA and flow southwest toward the Willamette River. Based on topography, the Rosemont URA could discharge directly to the Fritchie Creek tributaries and thus not connect to any existing City of West Linn stormwater infrastructure.

The following assessment is based on information from the City of West Linn Storm Drainage Master Plan, dated September 2019.

Assessment of the capacity of existing stormwater facilities to serve areas already inside the UGB.

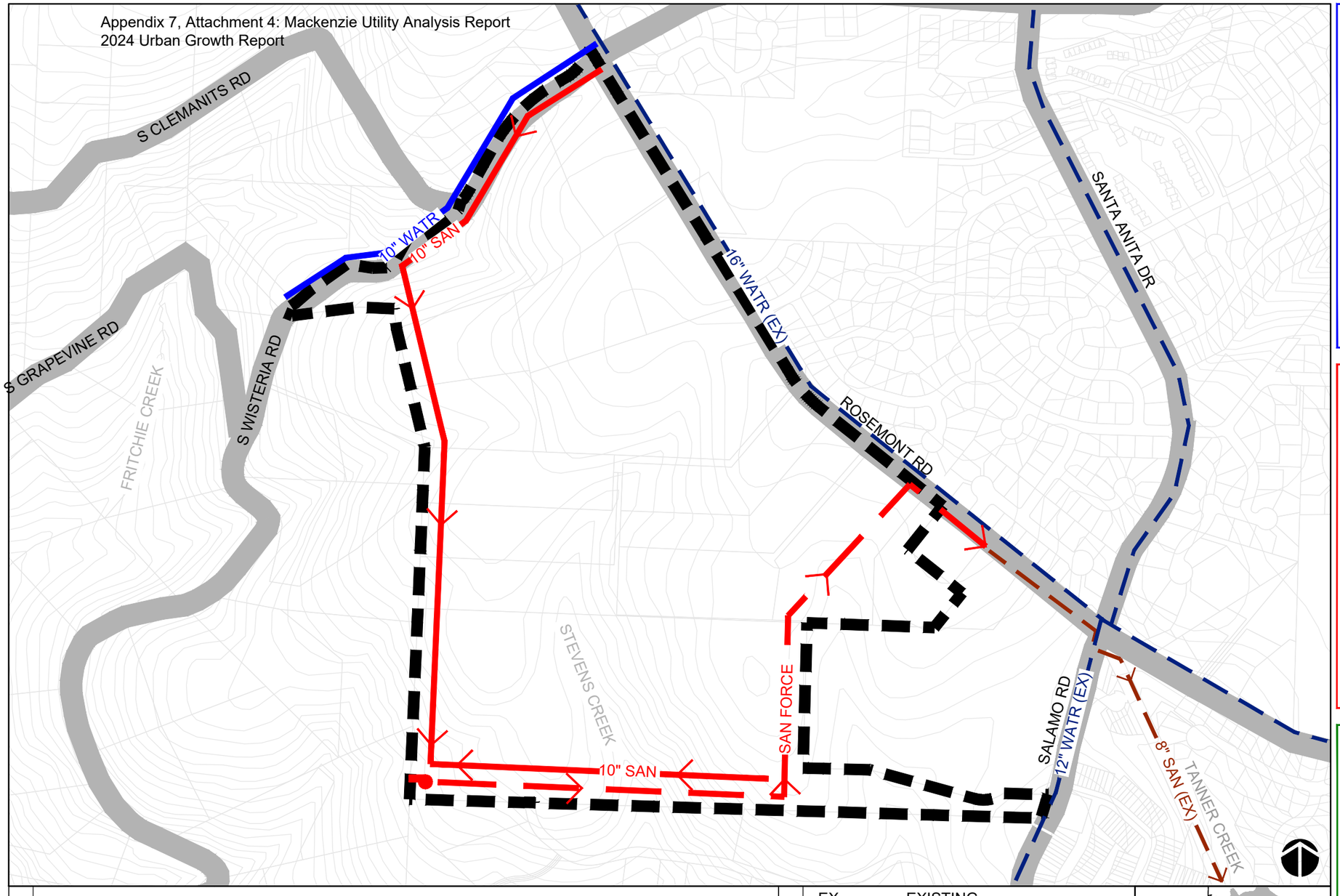
The Master Plan identifies capacity issues related to modeled future flows through the existing system and does not specifically address the capacity of the existing system related to existing flows. However, hydraulic modeling summarized in the Master Plan indicates that within modeled areas, full development would result in minimal or no increase to future flows, therefore it can be assumed that identified capacity issues are related to existing flows and not future flows. There are four high priority capital improvement projects recommended in the Master Plan to address capacity related issues, all of which occur at the downstream end of the stormwater system near the Willamette River.

Assessment of the capacity of existing stormwater facilities to serve areas proposed for addition to the UGB.

The same capacity issues identified in the Master Plan for the existing service area are problematic when considering serving additional areas and should be corrected based on proposed capital improvement projects prior to serving additional area. Capacity issues do not exist in every basin so necessary improvements are dependent on the location of the proposed development area. The Rosemont URA is within the Fritchie Creek Basin which has limited existing stormwater infrastructure and does not have any identified capacity related issues.

Assessment of the impacts to existing stormwater facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

Existing stormwater facilities with identified capacity issues will experience further issues if not addressed prior to adding URA land to the UGB. Based on topography, the Rosemont URA could discharge directly to the Fritchie Creek tributaries and thus not connect to any existing City of West Linn stormwater infrastructure.



WATER

WATER PROVIDER: CITY OF WEST LINN

PRESSURE ZONE: ROSEMONT

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	1,900	$350	$665,000
12" PIPE (LF)	0	$400	$0
16" PIPE (LF)	0	$500	$0
PUMP STATION (MGD)	0.5	$5,800,000	$2,900,000
STORAGE RESERVOIR (MG)	0.5	$200,000	$100,000
TOTAL			$3,665,000

SANITARY

SANITARY PROVIDER: CITY OF WEST LINN/CLACKMAS COUNTY WATER ENVIRONMENT SERVICES (WES)

BASIN: 9E

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	5,200	$275	$1,430,000
12" PIPE (LF)	0	$350	$0
15" PIPE (LF)	0	$375	$0
PUMP STATION (MGD)	0.5	$1,800,000	$900,000
SAN FORCE (LF)	3600	$310	$1,116,000
TOTAL			$3,446,000

STORM

STORM PROVIDER: CITY OF WEST LINN

WATERSHED: TUALATIN RIVER

SUB-WATERSHED: FRITCHIE CREEK-TUALATIN RIVER

PROPOSED IMPROVEMENTS

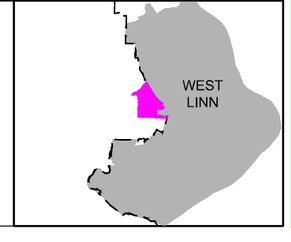
ITEM	UNITS	UNIT COST	TOTAL COST
18" PIPE (LF)	0	$400	$0
24" PIPE (LF)	0	$425	$0
30" PIPE (LF)	0	$500	$0
WATER QUALITY/ DETENTION (SF)	10,200	$150	$1,530,000
TOTAL			$1,530,000

LEGEND

- RESERVE BOUNDARY
- WATER LINE
- WATER LINE (EX)
- SANITARY LINE
- SANITARY FORCE MAIN
- SANITARY LINE (EX)
- SANITARY PUMP STATION

ABBREVIATIONS

EX	EXISTING
LF	LINEAR FEET
MG	MILLION GALLONS
MGD	MILLION GALLONS PER DAY
SF	SQUARE FEET



METRO RESERVES GOAL 14 - UTILITY ANALYSIS MAP

ROSEMONT

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SHERWOOD NORTH

Water

Sherwood North URA would most likely be served by the City of Sherwood based on proximity as it is falls along the northern limits of the City of Sherwood proposed 2034 water service area. The Sherwood North URA would most likely become part of the 380 pressure zone, which is served by the Sunset Reservoir. There are no pumps serving the 380 pressure zone.

Most of City water is supplied by the Willamette River Water Treatment Plan (WRWTP), located in the City of Wilsonville, with the remainder coming from four groundwater wells within City limits (back-up supply).

The following assessment is based on information from City of Sherwood Water System Master Plan, dated May 2015. The study area of the Master Plan includes the current City limits as well as three expansion areas (which does not include Sherwood North).

Assessment of the capacity of existing water facilities to serve areas already inside the UGB.

- Supply – supply from WRWTP is sufficient to meet maximum daily demand and existing City groundwater wells provide an effective emergency supply.
- Storage – adequate to meet existing service area demands.
- Pumping – adequate to meet existing service area demands.
- Distribution Piping – sufficient for providing adequate fire flow capacity to commercial, industrial, and residential customers.

Assessment of the capacity of existing water facilities to serve areas proposed for addition to the UGB.

The Master Plan defines buildout as when all vacant, developable land within the planning area has been developed to the maximum zoning density with some allowance for in-fill of existing developed properties. Improvements recommended in capital improvement projects are sized for the buildout scenario. The buildout scenario does not include the development of Sherwood North URA.

- Supply – An additional 1 MGD is required for the 20 year and 4 MGD is needed for buildout for areas within the City of Sherwood 2034 water service area, thus the existing water supply is not sufficient for the development of Sherwood North URA.
- Storage – the buildout condition causes a deficit of 0.61 MG within the 380 pressure zone.
- Pumping – There are no pump stations needed in the 380 pressure zone.
- Distribution – very few deficiencies exist for either existing or projected future (buildout) MDD conditions. No additional deficiencies were identified under peak hour demand conditions.

Assessment of the impacts to existing water facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

- Supply – Capital improvement projects identified for the existing WRWTP would increase capacity from the current 5 MGD to 15 MGD, however this capacity would be shared with City of Wilsonville. To address long-term supply needs, City of Sherwood plans to pursue a purchase of an additional 5 MGD from WRWTP and to expand the WRWTP facilities which would secure them an additional 10 MGD. These projects would provide the additional capacity needed to meet the full buildout demand with some remaining capacity that could potentially serve the Sherwood North URA, depending on timing of its development and other future development within and around the City.
- Distribution - Large diameter mains will be needed to provide sufficient fire flow capacity for areas outside the current City water service area. There are capital improvement projects planned to serve potential growth outside the UGB, but they do not address Sherwood North URA.

Sanitary Sewer

Sherwood North URA would likely be served by City of Sherwood and Clean Water Services (CWS), as they have an Intergovernmental Agreement to serve the Sherwood area. The City of Sherwood is responsible for gravity piping up to 24-inch diameter, and CWS is responsible for gravity piping 24-inch diameter and greater, wastewater treatment, and the public sewage pump station. Sherwood North URA would be part of the City of Sherwood Cedar Creek and Rock Creek basins based on proximity.

The following assessment is based on information from City of Sherwood Sanitary Sewer Master Plan dated September 2016, and Clean Water Services East Basin Master Plan Project, dated June 2021. The Master Plan Study Area includes the current City limits and two expansion areas, which does not include the Sherwood South URA.

Assessment of the capacity of existing sanitary sewer facilities to serve areas already inside the UGB.

- Distribution – There are zero significant hydraulic deficiencies in the existing system.
- Pumping – The existing Sherwood Pump Station and 18-inch force main (CWS owned) have adequate capacity to serve the existing peak flow rate of 4.7 MGD (pump station capacity is 6.6 MGD and force main capacity is 9.1 MGD).

Assessment of the capacity of existing sanitary sewer facilities to serve areas proposed for addition to the UGB.

Buildout conditions are defined in the Master Plan as full development with sanitary sewer service of all vacant parcels within the UGB. Under buildout conditions the following deficiencies exist:

- Capacity of Sherwood Trunk and Rock Creek Trunk (CWS owned)
- Capacity of the Sherwood Pump Station (CWS owned) - peak build-out flow rate is 7.3 MGD, capacity is 6.6 MGD

Assessment of the impacts to existing sanitary sewer facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

Because deficiencies already exist for both the distribution system and the existing pump station under buildout conditions for areas within the UGB, there is not a capacity to serve URA land without negative impacts to areas already inside the UGB. Incorporating Sherwood North URA into the UGB would require upgrades to both the distribution system and pump capacity.

The City of Sherwood and CWS both have capital improvement projects planned to address capacity issues as described above. It is not clear from either Master Plan whether these improvements include any excess capacity for additional future expansion (beyond the Brookman Concept Area and Tonquin Employment Area).

Storm

City of Sherwood is the likely provider for Sherwood North URA, as it is located within the Chicken Creek and Rock Creek basins and adjacent to the City service area boundary. CWS does not appear based on GIS mapping to have any storm infrastructure near this URA.

The following assessment is based on information from City of Sherwood Stormwater Master Plan, dated September 2016.

Assessment of the capacity of existing stormwater facilities to serve areas already inside the UGB.
The existing conveyance system contains a number of locations that were determined to be at moderate or high risk of flooding. Regional water quality and quantity facilities are adequately sized per the standards used at the time of their design.

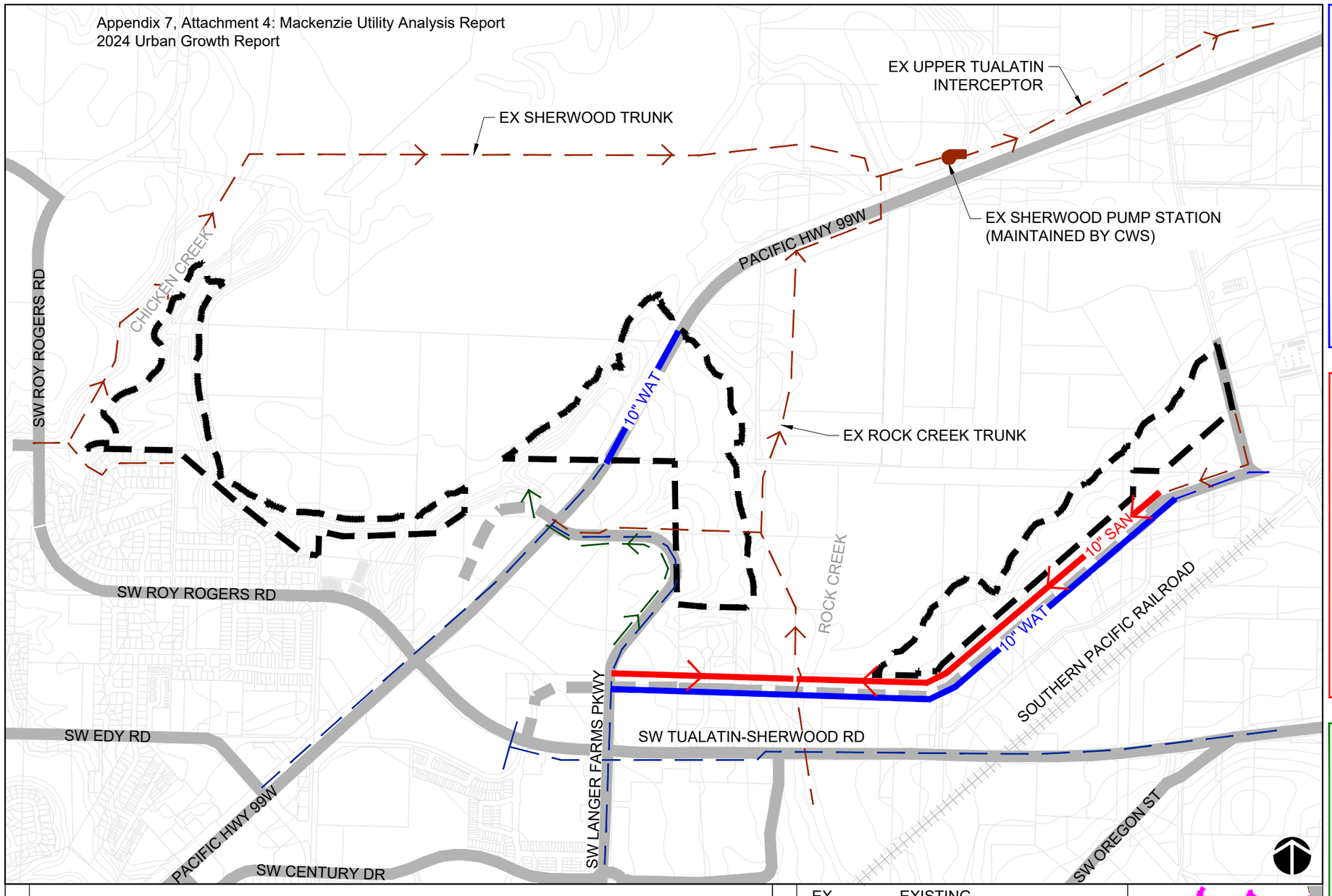
Assessment of the capacity of existing stormwater facilities to serve areas proposed for addition to the UGB.

If the proposed area is near a conveyance system that has been identified as having a flooding risk, pipes may need to be upsized to serve additional areas.

The Master Plan does not indicate whether regional water quality and quantity facilities have capacity to serve additional area. Based on topography within the Sherwood North URA, stormwater from developed areas could likely outfall directly to Chicken Creek, Rock Creek and their tributaries. Per CWS and City of Sherwood stormwater standards for new development, water quality and quantity would be provided on private property before outfalling to these water bodies, thus the existing storm facilities would not be impacted by the development of Sherwood North.

Assessment of the impacts to existing stormwater facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

Based on topography within the Sherwood North URA, stormwater from developed areas could likely outfall directly to Chicken Creek, Rock Creek and their tributaries. Per CWS and City of Sherwood stormwater standards for new development, water quality and quantity would be provided on private property before outfalling to these water bodies, thus the existing storm facilities would not be impacted by the development of Sherwood North.



WATER

WATER PROVIDER: CITY OF SHERWOOD

PRESSURE ZONE: 380

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	7,200	$350	$2,520,000
12" PIPE (LF)	0	$400	$0
16" PIPE (LF)	0	$500	$0
PUMP STATION (MGD)	0	$5,800,000	$0
STORAGE RESERVOIR (MG)	0.3	$200,000	$60,000
TOTAL			$2,580,000

SANITARY

SANITARY PROVIDER: CITY OF SHERWOOD

BASIN: CEDAR CREEK/ROCK CREEK

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	5,600	$275	$1,540,000
12" PIPE (LF)	0	$350	$0
15" PIPE (LF)	0	$375	$0
PUMP STATION (MGD)	0.3	$1,800,000	$540,000
SAN FORCE (LF)	0	$310	$0
TOTAL			$2,080,000

STORM

STORM PROVIDER: CITY OF SHERWOOD

WATERSHED: TUALATIN RIVER

SUB-WATERSHED: ROCK CREEK, CHICKEN CREEK

PROPOSED IMPROVEMENTS

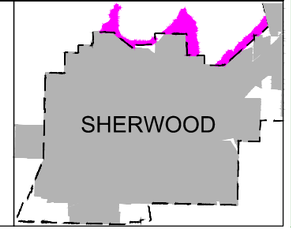
ITEM	UNITS	UNIT COST	TOTAL COST
18" PIPE (LF)	0	$400	$0
24" PIPE (LF)	0	$425	$0
30" PIPE (LF)	0	$500	$0
WATER QUALITY/ DETENTION (SF)	4,700	$150	$705,000
TOTAL			$705,000

LEGEND

- RESERVE BOUNDARY
- WATER LINE
- WATER LINE (EX)
- SANITARY LINE
- SANITARY LINE (EX)
- SANITARY PUMP STATION (EX)
- STORM LINE (EX)

ABBREVIATIONS

EX	EXISTING
LF	LINEAR FEET
MG	MILLION GALLONS
MGD	MILLION GALLONS PER DAY
SF	SQUARE FEET



METRO RESERVES GOAL 14 - UTILITY ANALYSIS MAP

SHERWOOD NORTH

MACKENZIE.

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SHERWOOD SOUTH

Water

Sherwood South URA would most likely be served by the City of Sherwood based on proximity as it is falls along the southern limits of the City of Sherwood proposed 2034 water service area (south of the proposed Brookman Annexation). The Sherwood South URA would most likely become part of the 380 and 400 pressure zone. The 400 pressure zone is served by the Sunset Reservoir and there are no pumps serving the 380 pressure zone.

Most of City water is supplied by the Willamette River Water Treatment Plan (WRWTP), located in the City of Wilsonville, with the remainder coming from four groundwater wells within City limits (back-up supply).

The following assessment is based on information from City of Sherwood Water System Master Plan, dated May 2015. The study area of the Master Plan includes the current City limits as well as three expansion areas (which does not include Sherwood South.

Assessment of the capacity of existing water facilities to serve areas already inside the UGB.

- Supply – supply from WRWTP is sufficient to meet maximum daily demand and existing City groundwater wells provide an effective emergency supply.
- Storage – adequate to meet existing service area demands.
- Pumping – adequate to meet existing service area demands.
- Distribution Piping – sufficient for providing adequate fire flow capacity to commercial, industrial and residential customers.

Assessment of the capacity of existing water facilities to serve areas proposed for addition to the UGB.

The Master Plan defines buildout as when all vacant, developable land within the planning area has been developed to the maximum zoning density with some allowance for in-fill of existing developed properties. Improvements recommended in capital improvement projects are sized for the buildout scenario. The buildout scenario does not include the development of Sherwood South URA.

- Supply – An additional 1 MGD is required for the 20 year and 4 MGD is needed for buildout for areas within the City of Sherwood 2034 water service area.
- Storage – the buildout condition causes a deficit of 0.61 MG within the 380 pressure zone.
- Pumping – There are no pump stations needed in the 380 pressure zone. The firm capacity of the Sunset Pump Station (serving pressure zone 400) allows for future buildout with zero surplus or deficit. Any area outside the planning area added to the the 400 pressure zone will therefore need to increase the capacity of the Sunset Pump Station.
- Distribution – very few deficiencies exist for either existing or projected future MDD conditions. No additional deficiencies were identified under peak hour demand conditions.

Assessment of the impacts to existing water facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

- Supply – Capital improvement projects identified for the existing WRWTP would increase capacity from the current 5 MGD to 15 MGD, however this capacity would be shared with City of Wilsonville. To address long-term supply needs, City of Sherwood plans to pursue a purchase of an additional 5 MGD from WRWTP and to expand the WRWTP facilities which would secure them an additional 10 MGD. These projects would provide the additional capacity needed to meet the full build-out demand with some remaining capacity that could potentially serve the Sherwood South URA, depending on timing of its development and other future development within and around the City.
- Storage – adding Sherwood South URA to the UGB would cause a storage deficit in the 380 and 400 pressure zones.
- Pumping – The Sunset Pump Station, which serves the 400 pressure zone, has the capacity for the full buildout condition, however this does not include the Sherwood South URA. There is zero surplus after full build-out, so the development of Sherwood South would cause a deficit in pumping capacity.
- Distribution - Large diameter mains will be needed to provide sufficient fire flow capacity for areas outside the current City water service area. There are capital improvement projects planned to serve potential growth outside the UGB, but they do not address Sherwood South URA.

Sanitary Sewer

Sherwood South URA would likely be served by City of Sherwood and Clean Water Services (CWS), as they have an Intergovernmental Agreement to serve the Sherwood area. The City of Sherwood is responsible for gravity piping up to 24-inch diameter, and CWS is responsible for gravity piping 24-inch diameter and greater, wastewater treatment, and the public sewage pump station. Sherwood South URA would be part of the City of Sherwood Cedar Creek basin based on proximity.

The following assessment is based on information from City of Sherwood Sanitary Sewer Master Plan dated September 2016, and Clean Water Services East Basin Master Plan Project, dated June 2021. Future expansion areas identified in the Master Plan do not include the Sherwood South URA.

Assessment of the capacity of existing sanitary sewer facilities to serve areas already inside the UGB.

- Distribution – There are zero significant hydraulic deficiencies in the existing system.
- Pumping – The existing Sherwood Pump Station and 18-inch force main (CWS owned) have adequate capacity to serve the existing peak flow rate of 4.7 MGD (pump station capacity is 6.6 MGD and force main capacity is 9.1 MGD).

Assessment of the capacity of existing sanitary sewer facilities to serve areas proposed for addition to the UGB.

Buildout conditions are defined in the Master Plan as full development with sanitary sewer service of all vacant parcels within the UGB. Under buildout conditions the following deficiencies exist:

- Capacity of Sherwood Trunk and Rock Creek Trunk (CWS owned)
- Capacity of the Sherwood Pump Station (CWS owned) - peak build-out flow rate is 7.3 MGD, capacity is 6.6 MGD

Assessment of the impacts to existing sanitary sewer facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

Because deficiencies already exist for both the distribution system and the existing pump station under build-out conditions for areas within the UGB, there is not a capacity to serve URA land without negative impacts to areas already inside the UGB. Incorporating Sherwood South URA into the UGB would require upgrades to both the distribution system and pump capacity.

The City of Sherwood and CWS both have capital improvement projects planned to address capacity issues as described above. It is not clear from either Master Plan whether these improvements include any excess capacity for additional future expansion (beyond the Brookman Concept Area and Tonquin Employment Area).

Storm

City of Sherwood is the likely provider for Sherwood South URA, as it is located within the Cedar Creek basin and adjacent to the City service area boundary. CWS does not appear based on GIS mapping to have any storm infrastructure near this URA.

The following assessment is based on information from City of Sherwood Stormwater Master Plan, dated September 2016.

Assessment of the capacity of existing stormwater facilities to serve areas already inside the UGB.

The existing conveyance system contains a number of locations that were determined to be at moderate or high risk of flooding. Regional water quality and quantity facilities are adequately sized per the standards used at the time of their design.

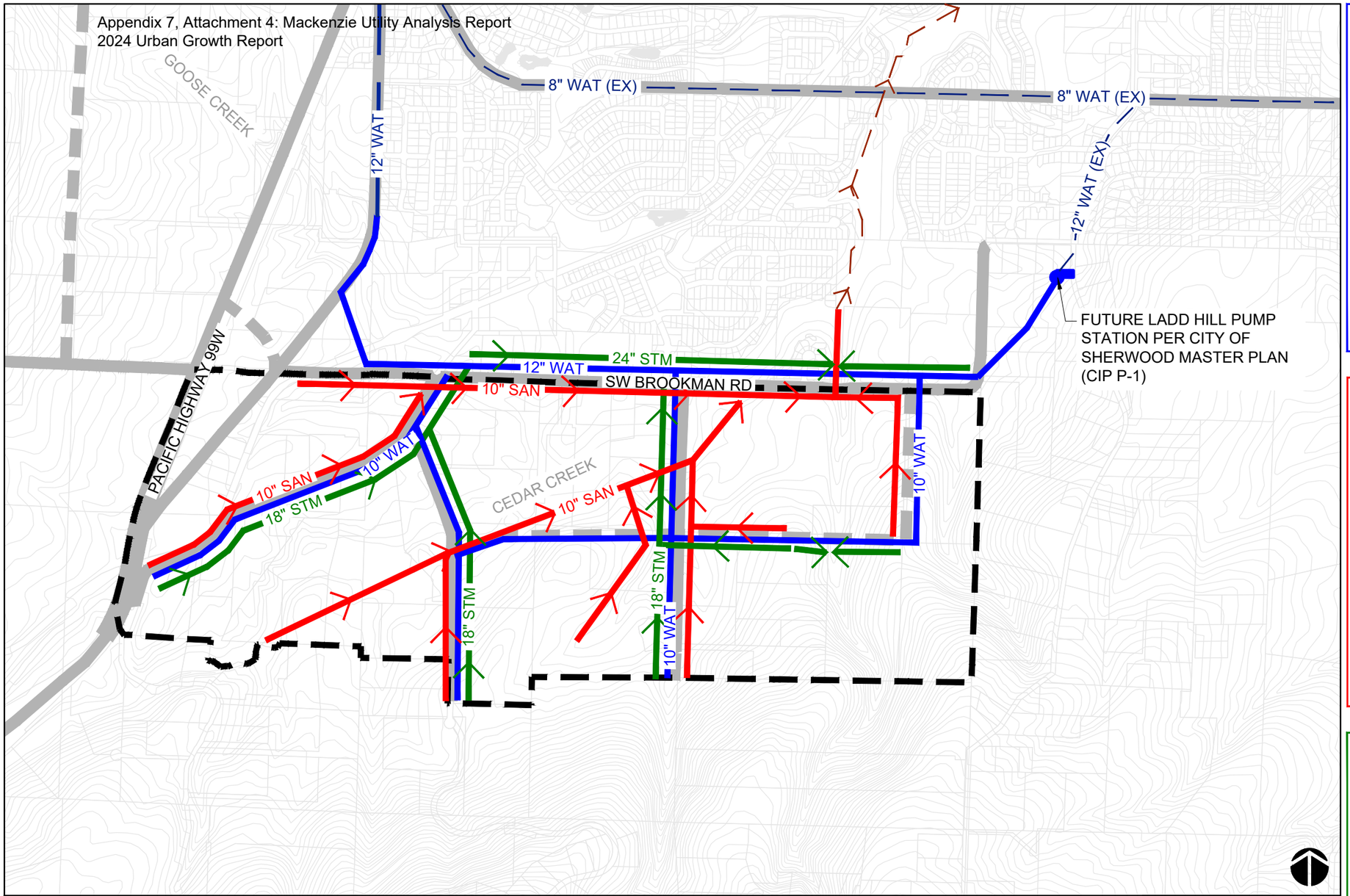
Assessment of the capacity of existing stormwater facilities to serve areas proposed for addition to the UGB.

If the proposed area is near a conveyance system that has been identified as having a flooding risk, pipes may need to be upsized to serve additional areas.

The Master Plan does not indicate whether regional water quality and quantity facilities have capacity to serve additional area. Based on topography within the Sherwood South URA, stormwater from developed areas could likely outfall directly to Cedar Creek and its tributaries. Per CWS and City of Sherwood stormwater standards for new development, water quality and quantity would be provided on private property before outfalling to these water bodies, thus the existing storm facilities would not be impacted by the development of Sherwood South.

Assessment of the impacts to existing stormwater facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

Based on topography within the Sherwood South URA, stormwater from developed areas could likely outfall directly to Cedar Creek and its tributaries. Per CWS and City of Sherwood stormwater standards for new development, water quality and quantity would be provided on private property before outfalling to these water bodies, thus the existing storm facilities would not be impacted by the development of Sherwood South.



WATER

WATER PROVIDER: CITY OF SHERWOOD

PRESSURE ZONE: 380/400

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	14,100	$350	$4,935,000
12" PIPE (LF)	8,300	$400	$3,320,000
16" PIPE (LF)	0	$500	$0
PUMP STATION (MGD)	2.3	$5,800,000	$13,340,000
STORAGE RESERVOIR (MG)	1.0	$200,000	$200,000
TOTAL			$21,795,000

SANITARY

SANITARY PROVIDER: CITY OF SHERWOOD

BASIN: CEDAR CREEK

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	21,000	$275	$5,775,000
12" PIPE (LF)	0	$350	$0
15" PIPE (LF)	0	$375	$0
PUMP STATION (MGD)	0	$1,800,000	$0
SAN FORCE (LF)	0	$310	$0
TOTAL			$5,775,000

STORM

STORM PROVIDER: CITY OF SHERWOOD

WATERSHED: CHICKEN CREEK-TUALATIN RIVER

SUB-WATERSHED: CEDAR CREEK

PROPOSED IMPROVEMENTS

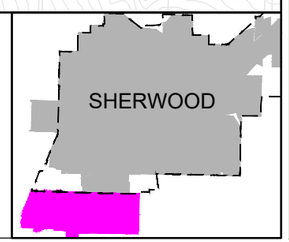
ITEM	UNITS	UNIT COST	TOTAL COST
18" PIPE (LF)	10,000	$400	$4,000,000
24" PIPE (LF)	5,200	$425	$2,210,000
30" PIPE (LF)	0	$500	$0
WATER QUALITY/ DETENTION (SF)	43,750	$150	$6,562,500
TOTAL			$12,772,500

LEGEND

- RESERVE BOUNDARY
- WATER LINE
- WATER LINE (EX)
- WATER PUMP STATION
- SANITARY LINE
- SANITARY LINE (EX)
- SANITARY PUMP STATION
- STORM LINE

ABBREVIATIONS

EX	EXISTING
LF	LINEAR FEET
MG	MILLION GALLONS
MGD	MILLION GALLONS PER DAY
SF	SQUARE FEET



METRO RESERVES GOAL 14 - UTILITY ANALYSIS MAP
SHERWOOD SOUTH

MACKENZIE.

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SHERWOOD WEST

Water

Sherwood West URA would most likely be served by the City of Sherwood as it is included in the City of Sherwood Master Plan proposed 2034 water service area. The Sherwood West URA would be part of the existing pressure zones 380 (supplied by the Sunset Reservoir) and 455 and proposed pressure zones 475 and 630. There are no pumps serving the 380 pressure zone and the 455 pressure zone is served by the Wyndham Ridge Pump Station. The Sunset Reservoir supplies water for the existing 380 pressure zone and future 475 pressure zone. The Kruger Reservoir supplies water for the existing 455 pressure zone and future 630 pressure zone.

Most of City water is supplied by the Willamette River Water Treatment Plan (WRWTP), located in the City of Wilsonville, with the remainder coming from four groundwater wells within City limits (back-up supply).

The following assessment is based on information from City of Sherwood Water System Master Plan, dated May 2015.

Assessment of the capacity of existing water facilities to serve areas already inside the UGB.

- Supply – supply from WRWTP is sufficient to meet maximum daily demand and existing City groundwater wells provide an effective emergency supply.
- Storage – adequate to meet existing service area demands.
- Pumping – adequate to meet existing service area demands.
- Distribution Piping – sufficient for providing adequate fire flow capacity to commercial, industrial and residential customers.

Assessment of the capacity of existing water facilities to serve areas proposed for addition to the UGB.

- Supply – An additional 1 MGD is required for the 20 year and 4 MGD is needed for buildout for areas within the City of Sherwood 2034 water service area which includes Sherwood West. Because Sherwood West is included in the buildout scenario, the additional 4 MGD (or some portion of) is needed for its development.
- Storage – Per the Master Plan, which includes Sherwood West URA, both the Kruger and Sunset Reservoirs have adequate capacity to meet storage criteria through the 2034 buildout.
- Pumping – There are no pump stations needed in the 380 pressure zone. Firm capacity of the Wyndham Ridge Pump Station for the buildout scenario (which includes Sherwood West) exceeds the required capacity. A future pump station (Edy Road Pump Station) is required to serve the future 475 pressure zone and is included in the Master Plan.
- Distribution – very few deficiencies exist for either existing or projected future MDD conditions. No additional deficiencies were identified under peak hour demand conditions.

Assessment of the impacts to existing water facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

- Supply – Capital improvement projects identified for the existing WRWTP would increase capacity from the current 5 MGD to 15 MGD, however this capacity would be shared with City of Wilsonville. To address long-term supply needs, City of Sherwood plans to pursue a purchase of an additional 5 MGD from WRWTP and to expand the WRWTP facilities which would secure them an additional 10 MGD. These projects would provide the additional capacity needed to meet the full build-out demand with some remaining capacity that could potentially serve the Sherwood North URA, depending on timing of its development and other future development within and around the City.
- Storage – adding Sherwood West URA to the UGB would cause a storage deficit in both the Sunset and Kruger Reservoir during the full build-out condition.
- Pumping – There are no pump stations needed in the 380 pressure zone. Firm capacity of the Wyndham Ridge Pump Station for the buildout scenario (which includes Sherwood West) exceeds the required capacity. A future pump station (Edy Road Pump Station) is required to serve the future 475 pressure zone and is included in the Master Plan.
- Distribution - Large diameter mains will be needed to provide sufficient fire flow capacity for areas outside the current City water service area. There are capital improvement projects planned to serve potential growth outside the UGB, but they do not address Sherwood West URA.

Sanitary Sewer

Sherwood West URA would likely be served by the City of Sherwood and Clean Water Services (CWS), as they have an Intergovernmental Agreement to serve the Sherwood area. The City of Sherwood is responsible for gravity piping up to 24-inch diameter, and CWS is responsible for gravity piping 24-inch diameter and greater, wastewater treatment, and the public sewage pump station. Sherwood South URA would be part of the City of Sherwood Cedar Creek basin based on proximity.

The following assessment is based on information from City of Sherwood Sanitary Sewer Master Plan dated September 2016, and Clean Water Services East Basin Master Plan Project, dated June 2021.

Assessment of the capacity of existing sanitary sewer facilities to serve areas already inside the UGB.

- Distribution – There are zero significant hydraulic deficiencies in the existing system.
- Pumping – The existing Sherwood Pump Station and 18-inch force main (CWS owned) have adequate capacity to serve the existing peak flow rate of 4.7 MGD (pump station capacity is 6.6 MGD and force main capacity is 9.1 MGD).

Assessment of the capacity of existing sanitary sewer facilities to serve areas proposed for addition to the UGB.

Under buildout conditions (which includes the Sherwood West URA) the following deficiencies exist:

- Capacity of Sherwood Trunk and Rock Creek Trunk (CWS owned)
- Capacity of the Sherwood Pump Station (CWS owned) - peak build-out flow rate is 7.3 MGD, capacity is 6.6 MGD

Assessment of the impacts to existing sanitary sewer facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

Because deficiencies already exist for both the distribution system and the existing pump station under buildout conditions for areas within the UGB, there is not a capacity to serve URA land without negative impacts to areas already inside the UGB. Incorporating Sherwood West URA into the UGB would require upgrades to both the distribution system and pump capacity.

The City of Sherwood and CWS both have capital improvement projects planned to address capacity issues as described above. It is not clear from either Master Plan whether these improvements include any excess capacity for additional future expansion (beyond the Brookman Concept Area and Tonquin Employment Area).

Storm

City of Sherwood is the likely provider for Sherwood West URA, as it is located within the Cedar Creek and Chicken Creek basins and adjacent to the City service area boundary. CWS does not appear based on GIS mapping to have any storm infrastructure near this URA.

The following assessment is based on information from City of Sherwood Stormwater Master Plan, dated September 2016.

Assessment of the capacity of existing stormwater facilities to serve areas already inside the UGB.

The existing conveyance system contains a number of locations that were determined to be at moderate or high risk of flooding. Regional water quality and quantity facilities are adequately sized per the standards used at the time of their design.

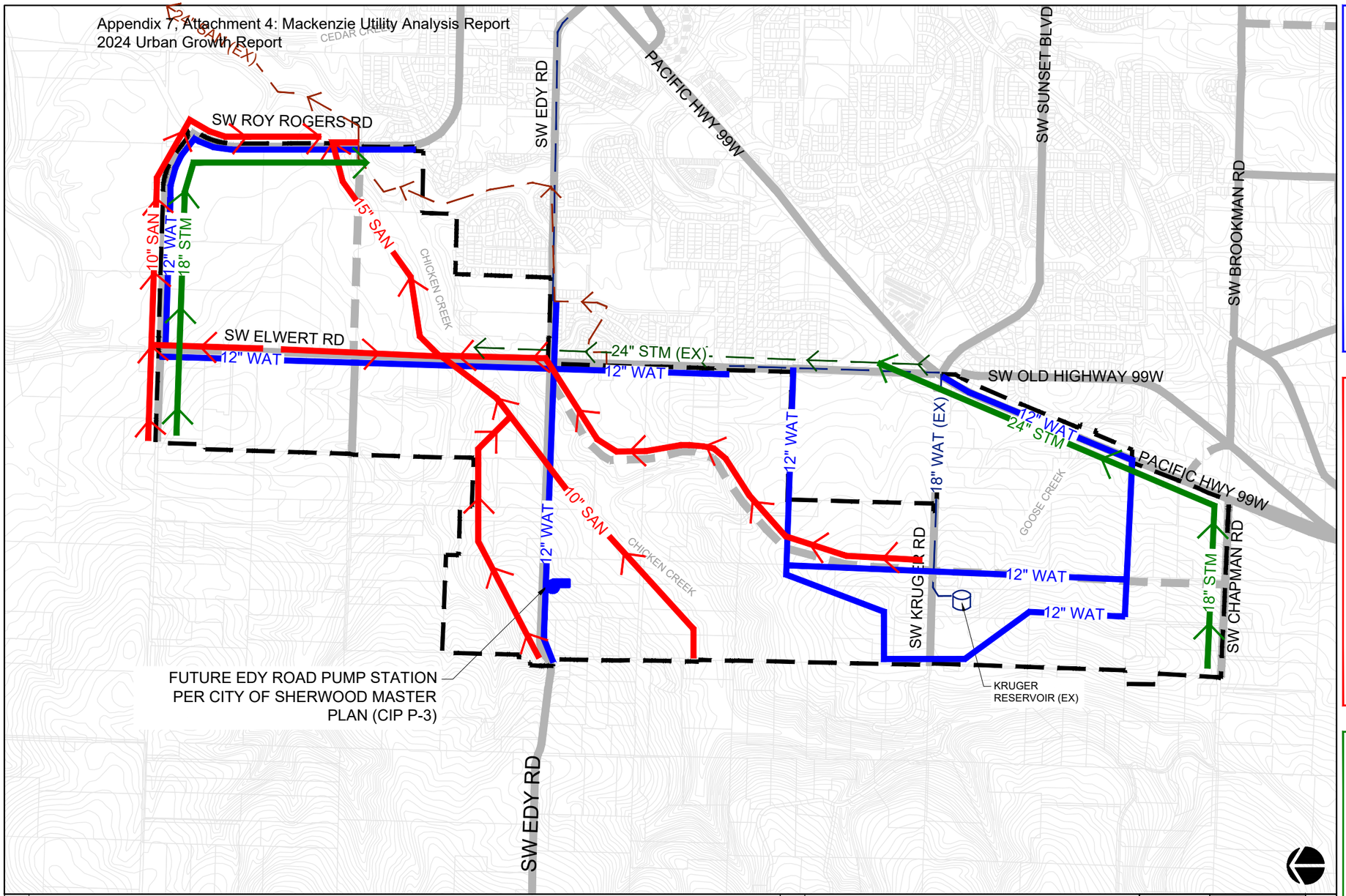
Assessment of the capacity of existing stormwater facilities to serve areas proposed for addition to the UGB.

If the proposed area is near a conveyance system that has been identified as having a flooding risk, pipes may need to be upsized to serve additional areas.

The Master Plan does not indicate whether regional water quality and quantity facilities have capacity to serve additional area. Based on topography within the Sherwood West URA, stormwater from developed areas could likely outfall directly to Chicken Creek. Per CWS and City of Sherwood stormwater standards for new development, water quality and quantity would be provided on private property before outfalling to these water bodies, thus the existing storm facilities would not be impacted by the development of Sherwood West.

Assessment of the impacts to existing stormwater facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

Based on topography within the Sherwood West URA, stormwater from developed areas could likely outfall directly to Chicken Creek. Per CWS and City of Sherwood stormwater standards for new development, water quality and quantity would be provided on private property before outfalling to these water bodies, thus the existing storm facilities would not be impacted by the development of Sherwood West.



WATER

WATER PROVIDER: CITY OF SHERWOOD

PRESSURE ZONE: 380/455 (EXISTING), 475/630 (FUTURE)

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	0	$350	$0
12" PIPE (LF)	36,550	$400	$14,620,000
16" PIPE (LF)	0	$500	$0
PUMP STATION (MGD)	2.3	$5,800,000	$13,340,000
STORAGE RESERVOIR (MG)	3.9	$200,000	$780,000
TOTAL			$28,740,000

SANITARY

SANITARY PROVIDER: CITY OF SHERWOOD

BASIN: CEDAR CREEK

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	2,800	$275	$770,000
12" PIPE (LF)	0	$350	$0
15" PIPE (LF)	3,700	$375	$1,387,500
PUMP STATION (MGD)	3.9	$1,800,000	$7,020,000
SAN FORCE (LF)	0	$310	$0
TOTAL			$9,177,500

STORM

STORM PROVIDER: CITY OF SHERWOOD

BASIN: CHICKEN CREEK-TUALATIN RIVER

OUTFALL: CHICKEN CREEK, GOOSE CREEK

PROPOSED IMPROVEMENTS

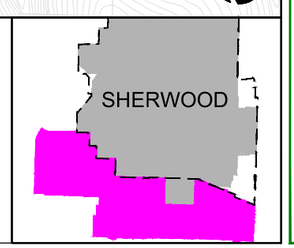
ITEM	UNITS	UNIT COST	TOTAL COST
18" PIPE (LF)	8,100	$400	$3,240,000
24" PIPE (LF)	4,000	$425	$1,700,000
30" PIPE (LF)	0	$500	$0
WATER QUALITY/ DETENTION (SF)	90,950	$150	$13,642,500
TOTAL			$18,582,500

LEGEND

- RESERVE BOUNDARY
- WATER LINE
- WATER LINE (EX)
- WATER PUMP STATION
- WATER RESERVOIR (EX)
- SANITARY LINE
- SANITARY LINE (EX)
- STORM LINE

ABBREVIATIONS

EX	EXISTING
LF	LINEAR FEET
MG	MILLION GALLONS
MGD	MILLION GALLONS PER DAY
SF	SQUARE FEET



METRO RESERVES GOAL 14 - UTILITY ANALYSIS MAP

SHERWOOD WEST

MACKENZIE.

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STAFFORD

Water

The Stafford URA would likely be served by both City of West Linn and City of Lake Oswego based on proximity. Stafford is adjacent to the City of West Linn Horton, Rosemont, and Willamette pressure zones, and is adjacent to the City of Lake Oswego service area including small portions of the URA which fall adjacent to the Rivergrove Water District and Skylands Water Cooperative.

The City of Lake Oswego's water source is the Clackamas River. In 2017 construction of five new major water facilities was completed in partnership with the City of Tigard to increase capacity of drinking water from the Clackamas River to Lake Oswego and Tigard. The construction included a new river intake pump station in Gladstone, a water treatment plan in West Linn, a 3.5 MG reservoir in Lake Oswego and a pump station in Tigard as well as more than 10 miles of large diameter backbone piping. The new Lake Oswego-Tigard Water Partnership water service area includes a portion of the Stafford URA in its plans for buildout.

The primary water source for City of West Linn is from the South Fork Water Board (SFWB) water treatment plant located in Oregon City, with an emergency supply from City of Lake Oswego Water Treatment Plant. Stafford URA would likely be part of the City of West Linn Horton, Rosemont, and Willamette pressure zones based on proximity. The City of West Linn does not include the Stafford URA in their master planning study areas.

The following assessment is based on information from City of West Linn Water System Master Plan, dated November 2008 and City of Lake Oswego Water Management and Conservation Plan, dated January 2010 and information from the Lake Oswego-Tigard Water Partnership.

Assessment of the capacity of existing water facilities to serve areas already inside the UGB.

Lake Oswego

Based on the City of Lake Oswego Master Plan, during the peak season, City of Lake Oswego supply intake, treatment plant and transmission mains must all operate at maximum installed capacity but can meet existing peak demands (note this is before the improvements as described above were completed).

West Linn

- Supply – Under normal (non-emergency) conditions, current demand is 8.6 MG and capacity is 9.5 MG, resulting in a surplus of 0.9 MG.

- Storage – Under normal (non-emergency) conditions storage capacity is adequate.

Assessment of the capacity of existing water facilities to serve areas proposed for addition to the UGB.

Lake Oswego

Based on the City of Lake Oswego Master Plan, during the peak season, City of Lake Oswego supply intake, treatment plant and transmission mains must all operate at maximum installed capacity to meet existing peak demands. The Master Plan has not been updated since the construction of the facilities outlined above, which were to provide additional capacity. It is not clear whether those improvements provided any surplus capacity that could be used for the development of Stafford URA.

West Linn

- Supply – Under normal (non-emergency) conditions there is a supply deficit of 1 MGD for the saturation development scenario.
- Storage – There is a 0.8 MG storage deficit in the Willamette pressure zone, a 0.7 MG storage deficit in the Horton pressure zone, and a 0.8 MG storage deficit in the Rosemont pressure zone under saturation development conditions.

Assessment of the impacts to existing water facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

Lake Oswego

It is not clear whether the improvements to the existing City of Lake Oswego water infrastructure provided any surplus capacity that could be used for the development of Stafford URA. The ability of the Lake Oswego-Tigard Water Partnership to serve Stafford without negative impacts to the existing system is also dependent on timing on development.

West Linn

Under saturation development conditions in the City of West Linn, there are both supply and storage deficits. If the Stafford URA were developed, additional sources of supply and storage would be required to not create further deficits for the existing system.

Sanitary Sewer

Based on proximity and topography, Stafford URA would likely be served by the City of West Linn and/or City of Lake Oswego for sanitary sewer.

The portion of the Stafford URA that slopes toward Lake Oswego basins has been included in the Master Plan future flow (the Master Plan calculates this as approximately 22% of the total URA area). Based on topography, connection points to the City of Lake Oswego infrastructure would be in SW Childs Road (in the Canal basin) and SW Stafford Road (in the South Shore basin).

The remaining area of the Stafford URA generally flows south/southwest toward Interstate 205 where it would likely connect to the City of West Linn existing infrastructure at the Johnson Pump Station located near SW Johnson Road and Interstate 205.

The following assessment is based on information from City of West Linn Sanitary Sewer Master Plan Update, dated September 2019, the City of Lake Oswego Wastewater Master Plan, dated March 2013, and the 2019 Amendment to the City of Lake Oswego Wastewater Master Plan, dated February 2020.

Assessment of the capacity of existing sanitary sewer facilities to serve areas already inside the UGB.

Lake Oswego

Several deficiencies are identified for the 25-year storm event under existing conditions. These deficiencies are all downstream of the likely point of connection and generally occur in large diameter trunk lines. The Master Plan recommends improvement projects to address these deficiencies.

West Linn

The gravity sewer line downstream of the Johnson Pump Station (likely connection point for Stafford URA) has two identified deficiencies, i.e. system capacity issues that may cause backwatering in the collection system, under existing conditions.

Assessment of the capacity of existing sanitary sewer facilities to serve areas proposed for addition to the UGB.

Lake Oswego

Several deficiencies are identified for the 25-year storm event under buildout conditions. A cluster of deficiencies occur in the Canal Trunk and L5 Trunk directly downstream of the likely point of connection at SW Childs Road. Very few deficiencies are identified in the system downstream of the SW Stafford Road point of connection. Without correction, these deficiencies will experience further negative impacts if flows from the Stafford URA are added.

West Linn

The gravity sewer line downstream of the Johnson Pump Station (likely connection point for Stafford URA) has two identified deficiencies, i.e. system capacity issues that may cause backwatering in the collection system, under buildout conditions. Without correction, these deficiencies will experience further negative impacts if flows from the Stafford URA are added.

Assessment of the impacts to existing sanitary sewer facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

Lake Oswego

Because deficiencies already exist in the sanitary infrastructure downstream of the Stafford URA assumed point of connection, additional flow from this URA will cause further negative impacts if pipe sizes aren't increased.

West Linn

The gravity sewer line downstream of the Johnson Pump Station (likely connection point for Stafford URA) has two identified deficiencies, i.e. system capacity issues that may cause backwatering in the collection system, under both existing and buildout conditions. Additional flow from this URA will cause further negative impacts if pipe sizes aren't increased.

Storm

Stafford URA would likely be served by the City of West Linn and City of Lake Oswego for stormwater based on proximity and topography. A majority of the Stafford URA flows south/southwest toward the Tualatin River and would likely not need to connect to any existing City infrastructure.

Assessment of the capacity of existing stormwater facilities to serve areas already inside the UGB.

Because the Stafford URA is outside both City of West Linn and City of Lake Oswego City limits, existing stormwater infrastructure does not appear to exist in this area. Based on topography, a majority of the Stafford URA flows south/southwest toward the Tualatin River and new stormwater infrastructure within the URA would likely outfall directly to the river and not need to connect to any existing City infrastructure.

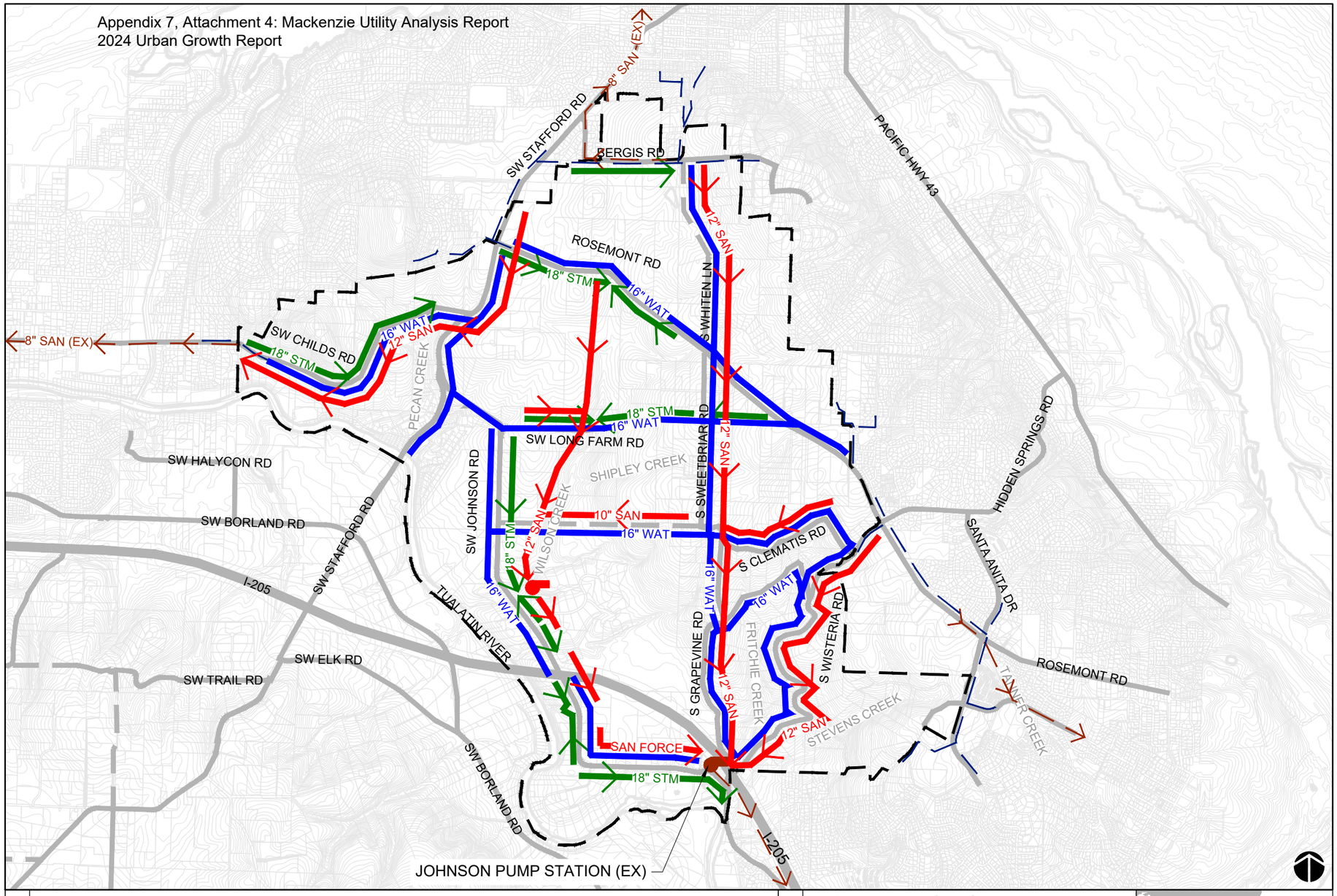
Assessment of the capacity of existing stormwater facilities to serve areas proposed for addition to the UGB.

Because the Stafford URA is outside both City of West Linn and City of Lake Oswego City limits, existing stormwater infrastructure does not appear to exist in this area. Based on topography, a majority of the Stafford URA flows south/southwest toward the Tualatin River and new stormwater infrastructure within the URA would likely outfall directly to the river and not need to connect to any existing City infrastructure.

Assessment of the impacts to existing stormwater facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

Because the Stafford URA is outside both City of West Linn and City of Lake Oswego City limits, existing stormwater infrastructure does not appear to exist in this area. Based on topography, a majority of the Stafford URA flows south/southwest toward the Tualatin River and new stormwater infrastructure within the URA would likely outfall directly to the river and not need to connect to any existing City infrastructure.

Appendix 7, Attachment 4: Mackenzie Utility Analysis Report
2024 Urban Growth Report



WATER

WATER PROVIDER: WEST LINN / LAKE OSWEGO

PRESSURE ZONE: HORTON/ROSEMONT/WILLAMETTE (WEST LINN) , N/A (LAKE OSWEGO)

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	0	$350	$0
12" PIPE (LF)	0	$400	$0
16" PIPE (LF)	71,000	$500	$35,500,000
PUMP STATION (MGD)	0	$5,800,000	$0
STORAGE RESERVOIR (MG)	6.2	$200,000	$1,240,000
TOTAL			$36,740,000

SANITARY

SANITARY PROVIDER: WEST LINN / LAKE OSWEGO

BASIN: 2B (WEST)/3A/3D (WEST LINN), MARYLHURST (LAKE OSWEGO)

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	4,700	$275	$1,292,500
12" PIPE (LF)	38,800	$350	$13,580,000
15" PIPE (LF)	0	$375	$0
PUMP STATION (MGD)	1.0	$1,800,000	$1,800,000
SAN FORCE (LF)	6,000	$310	$1,860,000
TOTAL			$18,532,500

STORM

STORM PROVIDER: WATER ENVIRONMENT SERVICES

BASIN: TUALATIN RIVER, OSWEGO LAKE

OUTFALL: PECAN CREEK, WILSON CREEK, FRITCHIE CREEK

PROPOSED IMPROVEMENTS

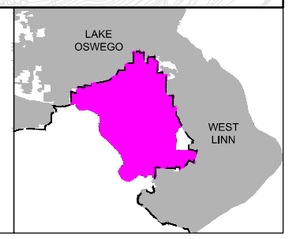
ITEM	UNITS	UNIT COST	TOTAL COST
18" PIPE (LF)	27,200	$400	$10,880,000
24" PIPE (LF)	0	$425	$0
30" PIPE (LF)	0	$500	$0
WATER QUALITY/ DETENTION (SF)	153,850	$150	$23,077,500
TOTAL			$33,957,500

LEGEND

- RESERVE BOUNDARY
- WATER LINE
- WATER LINE (EX)
- SANITARY LINE
- SANITARY FORCE MAIN
- SANITARY LINE (EX)
- SANITARY PUMP STATION
- STORM LINE

ABBREVIATIONS

EX	EXISTING
LF	LINEAR FEET
MG	MILLION GALLONS
MGD	MILLION GALLONS PER DAY
SF	SQUARE FEET



METRO RESERVES GOAL 14 - UTILITY ANALYSIS MAP

STAFFORD

MACKENZIE.

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TONQUIN

Water

Tonquin URA would most likely be served by the City of Sherwood based on proximity as it is falls along the eastern limits of the City of Sherwood 2034 proposed water service area. Based on proximity, the Tonquin URA would most likely become part of the 380 pressure zone, which is served by the Sunset Reservoir. There are no pumps serving the 380 pressure zone.

Most of City water is supplied by the Willamette River Water Treatment Plan (WRWTP), located in the City of Wilsonville, with the remainder coming from four groundwater wells within City limits (back-up supply).

The following assessment is based on information from City of Sherwood Water System Master Plan, dated May 2015. The study area of the Master Plan includes the current City limits as well as three expansion areas (which does not include Tonquin URA).

Assessment of the capacity of existing water facilities to serve areas already inside the UGB.

- Supply – supply from WRWTP is sufficient to meet maximum daily demand and existing City groundwater wells provide an effective emergency supply.
- Storage – adequate to meet existing service area demands.
- Pumping – adequate to meet existing service area demands.
- Distribution Piping – sufficient for providing adequate fire flow capacity to commercial, industrial and residential customers.

Assessment of the capacity of existing water facilities to serve areas proposed for addition to the UGB.

The Master Plan defines buildout as when all vacant, developable land within the planning area has been developed to the maximum zoning density with some allowance for in-fill of existing developed properties. Improvements recommended in capital improvement projects are sized for the buildout scenario. The buildout scenario does not include the development of Tonquin URA.

- Supply – An additional 1 MGD is required for the 20 year and 4 MGD is needed for build-out for areas within the City of Sherwood 2034 water service area, thus the existing water supply is not sufficient for the development of Tonquin URA.
- Storage – the buildout condition causes a deficit of 0.61 MG at the Sunset Reservoir, therefore there is not available capacity to serve areas outside the UGB.
- Pumping – There are no pump stations needed in the 380 pressure zone.
- Distribution – very few deficiencies exist for either existing or projected future (buildout) MDD conditions. No additional deficiencies were identified under peak hour demand conditions.

Assessment of the impacts to existing water facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

- Supply – Capital improvement projects identified for the existing WRWTP would increase capacity from the current 5 MGD to 15 MGD, however this capacity would be shared with City of Wilsonville. To address long-term supply needs, City of Sherwood plans to pursue a purchase of an additional 5 MGD from WRWTP and to expand the WRWTP facilities which would secure them an additional 10 MGD. These projects would provide the additional capacity needed to meet the full build-out demand with some remaining capacity that could potentially serve the Tonquin URA, depending on timing of its development and other future development within and around the City.
- Storage – Depending on when the Tonquin URA was developed in relation to other development projects within the 380 pressure zone, storage in the Sunset Reservoir may be insufficient.
- Pumping – There are no pump stations needed in the 380 pressure zone.
- Distribution - Large diameter mains will be needed to provide sufficient fire flow capacity for areas outside the current City water service area. There are capital improvement projects planned to serve potential growth outside the UGB, but they do not address Tonquin URA.

Sanitary Sewer

Tonquin URA would likely be served by City of Sherwood and Clean Water Services (CWS), as they have an Intergovernmental Agreement to serve the Sherwood area. The City of Sherwood is responsible for gravity piping up to 24-inch diameter, and CWS is responsible for gravity piping 24-inch diameter and greater, wastewater treatment, and the public sewage pump station. Tonquin URA would be part of the City of Sherwood Rock Creek basin based on proximity.

The following assessment is based on information from City of Sherwood Sanitary Sewer Master Plan dated September 2016, and Clean Water Services East Basin Master Plan Project, dated June 2021. The Master Plan Study Area includes the current City limits and two expansion areas, which does not include the Tonquin URA.

Assessment of the capacity of existing sanitary sewer facilities to serve areas already inside the UGB.

- Distribution – There are zero significant hydraulic deficiencies in the existing system.
- Pumping – The existing Sherwood Pump Station and 18-inch force main (CWS owned) have adequate capacity to serve the existing peak flow rate of 4.7 MGD (pump station capacity is 6.6 MGD and force main capacity is 9.1 MGD).

Assessment of the capacity of existing sanitary sewer facilities to serve areas proposed for addition to the UGB.

Buildout conditions are defined in the Master Plan as full development with sanitary sewer service of all vacant parcels within the UGB. Under buildout conditions the following deficiencies exist:

- Capacity of Sherwood Trunk and Rock Creek Trunk (CWS owned)
- Capacity of the Sherwood Pump Station (CWS owned) - peak build-out flow rate is 7.3 MGD, capacity is 6.6 MGD

Assessment of the impacts to existing sanitary sewer facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

Because deficiencies already exist for both the distribution system and the existing pump station under buildout conditions for areas within the UGB, there is not a capacity to serve URA land without negative impacts to areas already inside the UGB. Incorporating Tonquin URA into the UGB would require upgrades to both the distribution system and pump capacity.

The City of Sherwood and CWS both have capital improvement projects planned to address capacity issues as described above. It is not clear from either Master Plan whether these improvements include any excess capacity for additional future expansion (beyond the Brookman Concept Area and Tonquin Employment Area).

Storm

City of Sherwood is the likely provider for Tonquin URA, as it is located within the Rock Creek basin and adjacent to the City service area boundary. CWS does not appear based on GIS mapping to have any storm infrastructure near this URA.

The following assessment is based on information from City of Sherwood Stormwater Master Plan, dated September 2016.

Assessment of the capacity of existing stormwater facilities to serve areas already inside the UGB.

The existing conveyance system contains a number of locations that were determined to be at moderate or high risk of flooding. Regional water quality and quantity facilities are adequately sized per the standards used at the time of their design.

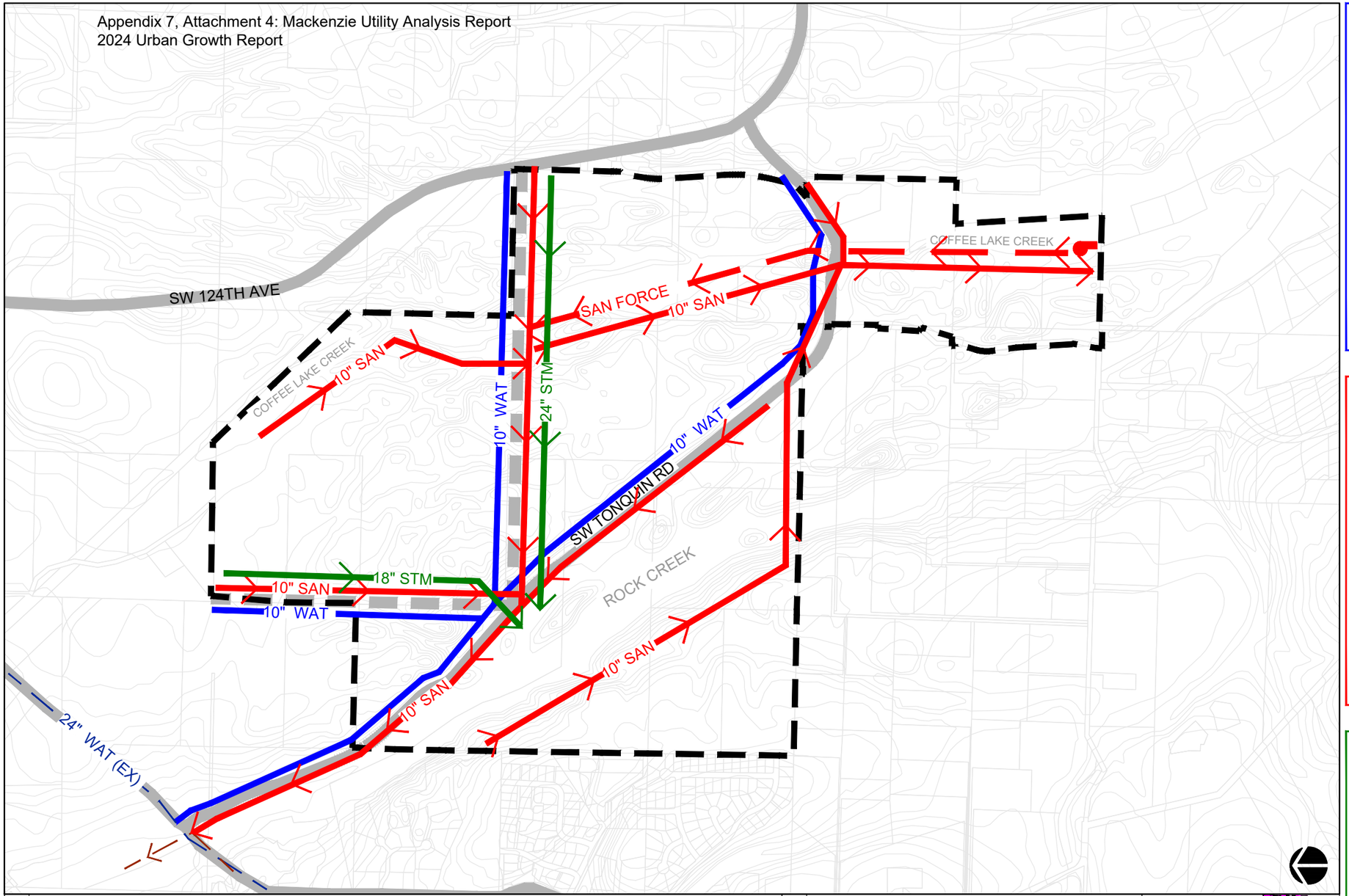
Assessment of the capacity of existing stormwater facilities to serve areas proposed for addition to the UGB.

If the proposed area is near a conveyance system that has been identified as having a flooding risk, pipes may need to be upsized to serve additional areas.

The Master Plan does not indicate whether regional water quality and quantity facilities have capacity to serve additional area. Based on topography within the Tonquin URA, stormwater from developed areas could likely outfall directly to Rock Creek and its tributaries. Per CWS and City of Sherwood stormwater standards for new development, water quality and quantity would be provided on private property before outfalling to these water bodies, thus the existing storm facilities would not be impacted by the development of Tonquin.

Assessment of the impacts to existing stormwater facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

Based on topography within the Tonquin URA, stormwater from developed areas could likely outfall directly to Rock Creek. Per CWS and City of Sherwood stormwater standards for new development, water quality and quantity would be provided on private property before outfalling to these water bodies, thus the existing storm facilities would not be impacted by the development of Tonquin.



WATER

WATER PROVIDER: CITY OF SHERWOOD

PRESSURE ZONE: 380

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	15,110	$350	$5,288,500
12" PIPE (LF)	0	$400	$0
16" PIPE (LF)	0	$500	$0
PUMP STATION (MGD)	0	$5,800,000	$0
STORAGE RESERVOIR (MG)	0.8	$200,000	$160,000
TOTAL			$5,448,500

SANITARY

SANITARY PROVIDER: CITY OF SHERWOOD

BASIN: ROCK CREEK

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	27,800	$275	$7,645,000
12" PIPE (LF)	0	$350	$0
15" PIPE (LF)	0	$375	$0
PUMP STATION (MGD)	0.3	$1,800,000	$540,000
SAN FORCE (LF)	5,000	$310	$1,550,000
TOTAL			$9,735,000

STORM

STORM PROVIDER: CITY OF SHERWOOD

WATERSHED: FANNO CREEK-TUALATIN RIVER

SUB-WATERSHED: ROCK CREEK

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
18" PIPE (LF)	2,900	$400	$1,160,000
24" PIPE (LF)	3,900	$425	$1,657,500
30" PIPE (LF)	0	$500	$0
WATER QUALITY/ DETENTION (SF)	28,200	$150	$4,230,000
TOTAL			$7,047,500

LEGEND

- RESERVE BOUNDARY
- WATER LINE
- WATER LINE (EX)
- SANITARY LINE
- SANITARY FORCE MAIN
- SANITARY LINE (EX)
- SANITARY PUMP STATION
- STORM LINE

ABBREVIATIONS

EX	EXISTING
LF	LINEAR FEET
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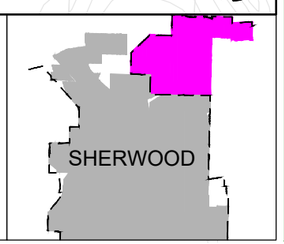

METRO RESERVES GOAL 14 - UTILITY ANALYSIS MAP

TONQUIN

MACKENZIE.

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WILSONVILLE SOUTHWEST

Water

Wilsonville Southwest URA would likely be served by the City of Wilsonville as it is included in their Master Plan study area. According to the Master Plan, Wilsonville Southwest would be part of pressure zone B which is served by the Elligsen Reservoirs (two reservoirs with a total capacity of 5 MG). The Elligsen Reservoirs received water via gravity flow.

The City of Wilsonville's primary supply comes from the Willamette River. There is a single water treatment plant (Willamette River Water Treatment Plant) that serves the City which is in shared ownership with Tualatin Valley Water District.

The following assessment is based on information from the City of Wilsonville Water System Master Plan, dated September 2012. The Master Plan study area includes the area currently within the UGB plus areas of Clackamas and Washington County Urban Reserve Areas expected to be incorporated into City of Wilsonville, which includes Wilsonville Southwest URA. Buildout within the study area is projected to occur by 2036 for non-residential areas and 2045 for residential areas (Wilsonville Southwest is assumed non-residential in the Master Plan).

Assessment of the capacity of existing water facilities to serve areas already inside the UGB.

- Storage – Per the City Master Plan, there are no known storage issues in the existing system, which consists of four storage reservoirs providing a total of 7.6 MG of effective (usable) storage.
- Pumping – There are two pumping facilities in the distribution system, the Charbonneau Booster Station, and the B-to-C Booster Station. Both facilities have a firm capacity greater than what is anticipated to be needed in the 20-year planning period (as of 2012 report).
- Distribution – peak hour demands can be met with negligible pressure changes from annual average day demand.

Assessment of the capacity of existing water facilities to serve areas proposed for addition to the UGB.

- Storage – estimated required storage by the year 2030 is 17.64 MG, creating a storage deficit of 8.97 MG. Buildout of non-residential areas (including Elligsen Road North) is not projected to occur until 2036, so additional storage will be needed for its development.
- Pumping – there are no pumping facilities serving pressure zone B. Based on topography, Wilsonville Southwest could be served by gravity from the Elligsen Reservoirs that serve the rest of pressure zone B.
- Distribution – Future system infrastructure as shown in the City of Wilsonville master plan is adequately sized for required fire flow and operating pressures.

Assessment of the impacts to existing water facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

To provide adequate storage capacity to the study area an additional 8.97 MG of storage capacity will be needed. The City has eight backup wells with a total storage capacity of 6.92 MG, which reduces the 2030 projected storage need to 2.05 MG. The City of Wilsonville is currently in the design phase (construction planned for 2023-2024) for a 3.0 MG storage reservoir located in pressure zone B, with a second reservoir to follow in the future (timeline undefined). The addition of this reservoir will allow for adequate storage capacity to serve current service area as well as the addition of this URA into the UGB.

Sanitary Sewer

The Wilsonville Southwest URA would likely be served by the City of Wilsonville based on proximity.

Wastewater from the City of Wilsonville is conveyed in a City-owned and operated collection system to the Wilsonville Wastewater Treatment Plant (WWTP).

The following assessment is based on information from the City of Wilsonville Wastewater Collection Master Plan, dated November 2014. Grahams Ferry is included in the study area of the Master Plan and falls within the Wood School sewer basin, which is served by the Corral Creek, Rivergreen and Moreys Landing Pump Stations.

Assessment of the capacity of existing sanitary sewer facilities to serve areas already inside the UGB.

The existing system has zero hydraulic deficiencies for all existing pipe and pump stations.

Assessment of the capacity of existing sanitary sewer facilities to serve areas proposed for addition to the UGB.

There are no capacity of other existing issues with any of the three pumps that may serve this URA, however they are all reaching the end of their useful service and the City has identified capital improvement projects to rehabilitate them within the next 20 years. Based on topography, a new pump station will be required to connect sanitary lines for Wilsonville Southwest URA to the existing public sewer system. This pump station is identified in the City of Wilsonville Wastewater Master Plan and is shown on the Utility Analysis Map.

Assessment of the impacts to existing sanitary sewer facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

Besides non-capacity related improvements to the Corral Creek and Rivergreen Pump Stations as discussed above, there are no downstream capacity issues identified by the Master Plan.

Storm

Wilsonville Southwest URA would likely be served by the City of Wilsonville as it is located primarily within the Boeckman Creek Basin and is adjacent to the City service area boundary.

The following assessment is based on information from City of Wilsonville Stormwater Master Plan, dated March 2012.

Assessment of the capacity of existing stormwater facilities to serve areas already inside the UGB.

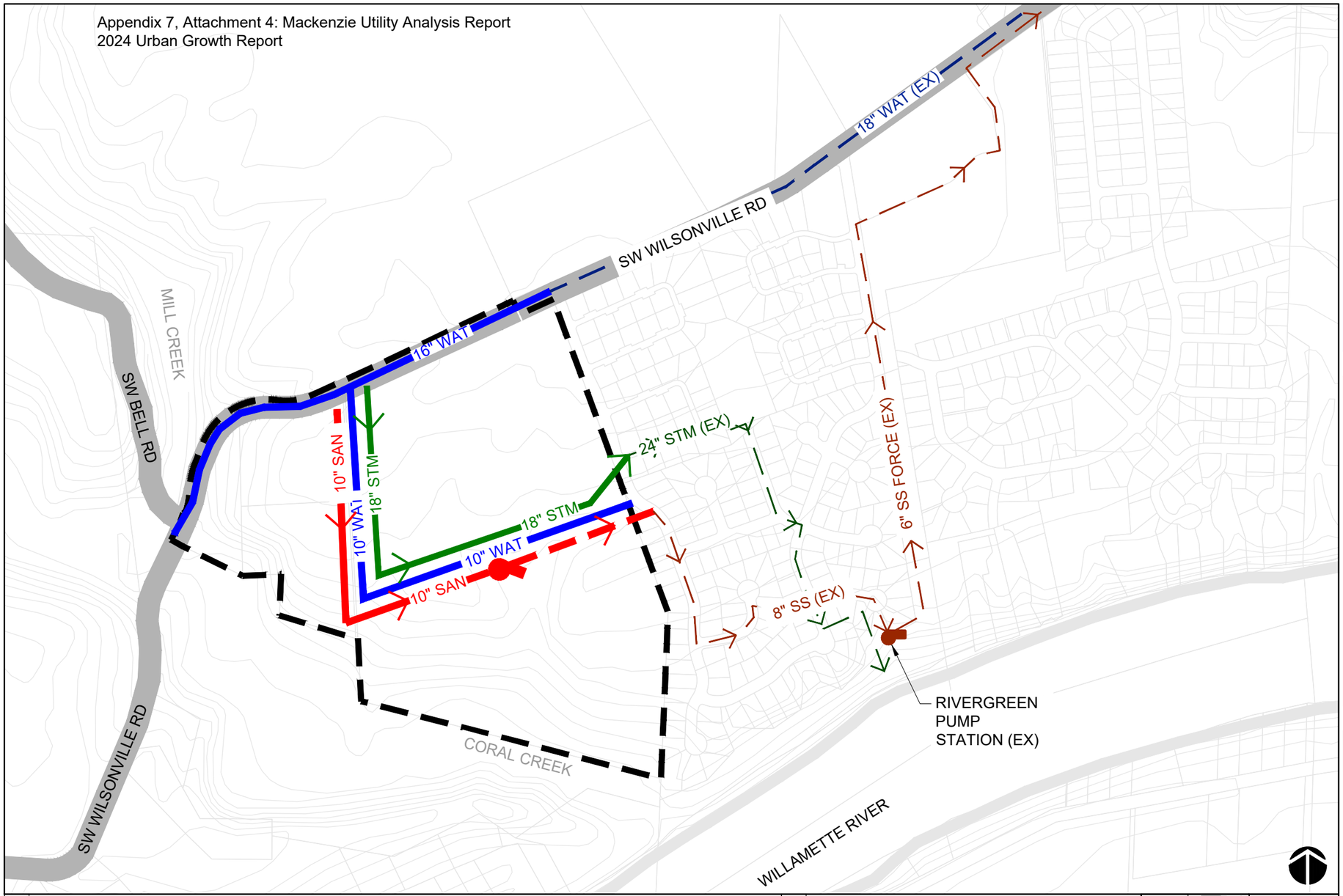
The Master Plan has identified "problem areas" (areas with flooding and evidence of significant erosion) based on observation during a 25-year storm event in 2009. The problem areas are isolated and there are no serious flooding issues under the existing condition.

Assessment of the capacity of existing stormwater facilities to serve areas proposed for addition to the UGB.

City of Wilsonville requires that stormwater management (water quality and flow control) be provided for all new impervious surfaces. Based on topography it seems likely that stormwater management for the development of Wilsonville Southwest would occur within the development area and outfall directly to Corral Creek, which drains directly to the Willamette River without connecting to an existing public stormwater system. The Master Plan does not indicate any problem areas in the short portion of Corral Creek between the Wilsonville Southwest URA and the Willamette River.

Assessment of the impacts to existing stormwater facilities that serve nearby areas already inside the UGB as a result of adding URA land to the UGB.

If Wilsonville Southwest outfalls directly to Corral Creek via private outfalls from development areas and public outfalls from roadways, there would be no impacts to existing storm facilities.



WATER

WATER PROVIDER: CITY OF WILSONVILLE

PRESSURE ZONE: B

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	2,300	$350	$805,000
12" PIPE (LF)	0	$400	$0
16" PIPE (LF)	2,200	$500	$1,100,000
PUMP STATION (MGD)	0	$5,800,000	$0
STORAGE RESERVOIR (MG)	0.1	$200,000	$20,000
TOTAL			$1,925,000

SANITARY

SANITARY PROVIDER: CITY OF WILSONVILLE

BASIN: WOOD SCHOOL

PROPOSED IMPROVEMENTS

ITEM	UNITS	UNIT COST	TOTAL COST
10" PIPE (LF)	1,650	$275	$453,750
12" PIPE (LF)	0	$350	$0
15" PIPE (LF)	0	$375	$0
PUMP STATION (MGD)	0.1	$1,800,000	$180,000
SAN FORCE (LF)	690	$310	$213,900
TOTAL			$847,650

STORM

STORM PROVIDER: CITY OF WILSONVILLE

WATERSHED: ABERNETHY CREEK-WILLAMETTE RIVER

SUB-WATERSHED: CORRAL CREEK

PROPOSED IMPROVEMENTS

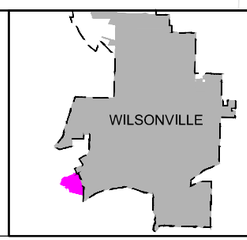
ITEM	UNITS	UNIT COST	TOTAL COST
18" PIPE (LF)	2,300	$400	$920,000
24" PIPE (LF)	0	$425	$0
30" PIPE (LF)	0	$500	$0
WATER QUALITY/ DETENTION (SF)	5,800	$150	$870,000
TOTAL			$1,790,000

LEGEND

- RESERVE BOUNDARY
- WATER LINE
- WATER LINE (EX)
- SANITARY LINE
- SANITARY FORCE MAIN
- SANITARY LINE (EX)
- SANITARY PUMP STATION
- SANITARY PUMP STATION (EX)
- STORM LINE
- STORM LINE (EX)

ABBREVIATIONS

EX	EXISTING
LF	LINEAR FEET
MG	MILLION GALLONS
MGD	MILLION GALLONS PER DAY
SF	SQUARE FEET



METRO RESERVES GOAL 14 - UTILITY ANALYSIS MAP

WILSONVILLE SOUTHWEST

MACKENZIE.

0 500 1000