



Existing Conditions Report

Basalt Creek Planning Area

October 2014



Table of Contents

Table of Contents.....	1
List of Figures.....	3
List of Tables.....	6
I. Introduction.....	7
Planning Area Boundaries.....	9
II. Local & Regional Planning Context.....	10
Current Zoning.....	10
Existing Land Uses.....	11
Adjacent Land Uses.....	12
Regional Plans and Regulatory Requirements.....	16
Local Plans.....	19
Area Plans.....	24
III. Natural and Historic Resources.....	26
Natural Features.....	26
Regulatory Framework for Conserving Natural Resources.....	33
Cultural and Historic Resources.....	37
IV. Public Facilities.....	38
Schools.....	38
Parks.....	39
Libraries.....	39
Fire.....	39
Police.....	40
V. Commercial, Industrial & Residential Real Estate Markets.....	41
Industrial and Office Market.....	41
Housing Market.....	43
Retail/Commercial Market.....	43
Industrial and Office Market Conditions.....	43

Tualatin and Wilsonville’s Economic Positioning and Goals	49
Target Industry Clusters	50
Sub-Regional Context	52
Established Employment Areas	53
Planned Employment Areas.....	53
Employment Strengths and Challenges	53
Housing Market Analysis	54
Recent Housing Development.....	56
Retail/Commercial Market Analysis.....	57
VI. Infrastructure.....	59
Policy Guidance on Infrastructure.....	59
Stormwater Infrastructure.....	59
Wastewater Infrastructure	60
Potable Water Infrastructure	62
VII. Transportation	72
Motor Vehicle System.....	72
Motor Vehicle Operations.....	76
Basalt Creek Transportation Refinement Plan Projects	78
East-West Connector Considerations	78
Pedestrian and Bicycle System	80
Transit System	81
VIII. Land Capacity Analysis	86
Methodology.....	86
Buildable Lands.....	86
Hard Constraints	86
Land Supply.....	94
Land Supply Findings	99
Land Capacity.....	100

List of Figures

Figure 1 Basalt Creek planning area, City of Wilsonville and City of Tualatin boundaries. Source: Fregonese Associates 2014..... 8

Figure 2 Planning area “islands,” Coffee Creek Correctional Facility and Horizon High School campus. Source: Fregonese Associates 2014..... 9

Figure 3 Existing land use in the Basalt Creek planning area. Source: Fregonese Associates, RLIS 2014. 10

Figure 4 Locations of major businesses and residential areas in the Basalt Creek planning area. Source: Fregonese Associates, RLIS, Google Maps 2014. 11

Figure 5 Existing Housing Units and Employment in the Basalt Creek planning area Source: Fregonese Associates, ESRI Business Analyst 2010. 12

Figure 6 Land Uses Adjacent to Basalt Creek planning area. Source: Fregonese Associates, RLIS 2014..... 13

Figure 7 Aerial image of the Horizon High School Campus (30 acres), just outside of the planning area. Source: Fregonese Associates 2014..... 14

Figure 8 Aerial image of Coffee Creek Correctional Facility (108 acres). Source: Fregonese Associates 2014..... 14

Figure 9 Planning and employment areas near the Basalt Creek planning area. Source: Fregonese Associates, Cities of Tualatin and Wilsonville 2014..... 15

Figure 10 Transportation Analysis Zones (TAZs) covering the Basalt Creek planning area Source: Fregonese Associates, RLIS 2014. 19

Figure 11 Projects identified in the Basalt Creek Transportation Refinement Plan (TRP). 20

Figure 12 Proposed Trail Alignment from Metro’s Ice Age Tonquin Trail Master Plan, 2013. 27

Figure 13 Basalt Creek planning area in the context of the Middle Willamette and Tualatin River Watersheds. Source: Fregonese Associates, RLIS 2014. 28

Figure 14 Hydrologic Classification of Soils in the Basalt Creek planning area. Source: Fregonese Associates, USDA Soil Survey 2014. 29

Figure 15 Natural, Underground and Intermittent Streams in Basalt Creek planning area. Source: Fregonese Associates, RLIS, City of Wilsonville field survey 2014. 31

Figure 16 Wetlands in Basalt Creek planning area. Source: Fregonese Associates, RLIS, City of Wilsonville field survey 2014. 31

Figure 17 FEMA 1% annual chance flood event area in the Basalt Creek planning area. Source: Fregonese Associates, RLIS 2014, FEMA 2007. 32

Figure 18 Title 3 lands (116 acres; 14% of total area) in Basalt Creek planning area. Source: Fregonese Associates, RLIS 2014. 33

Figure 19 Title 13 lands in the Basalt Creek planning area (431 acres total, 51% of total area). Source: Fregonese Associates, RLIS 2014..... 34

Figure 20: The Carlon Schoolhouse. Source: Martinazzi, Loyce. Tualatin Life Newspaper August 19, 2014..... 37

Figure 21 Schools, libraries and parks near the Basalt Creek planning area. Source: Fregonese Associates, RLIS 2014. 38

Figure 22 Fire station locations and service area boundaries near the Basalt Creek planning area. Source: Fregonese Associates, RLIS 2014.	39
Figure 23 Photo of planning area: Grahams Ferry Road, looking north into the Basalt Creek planning area. Source: Leland Consulting Group 2014.	41
Figure 24 Market Analysis Area for the Basalt Creek area. Source: Leland Consulting Group, 2014.	42
Figure 25 Title 4 Industrial and Other Employment Areas in Portland Metro Area. Source: Metro 2014.	44
Figure 26 Industrial Development, Tualatin and Wilsonville, 1980 to 2014. Source: CoStar, Leland Consulting Group, 2014.	45
Figure 27 Office Development, Tualatin and Wilsonville, 1980 to 2014. Source: CoStar, Leland Consulting Group, 2014.	46
Figure 28 Example of typical building with a mix of office space and warehouse/distribution space.	48
Figure 29 Example of typical flex industrial building, located in Tualatin.	48
Figure 30 Mentor Graphics Headquarters Office Building in Wilsonville.	48
Figure 31 Lam Research Facility, Tualatin. Photo credit: Tualatin Chamber.	52
Figure 32 Major TRP road projects in relationship to the Basalt Creek planning area and planned areas nearby Source: Fregonese Associates 2014.	52
Figure 33 Existing Stormwater Infrastructure and Drainage Area near the Basalt Creek planning area Source: CH2M Hill, 2014.	65
Figure 34 Map of Existing Wastewater Infrastructure near the Basalt Creek planning area. Source: CH2M Hill 2014.	68
Figure 35 Map of existing potable water infrastructure and water pressure zones in and near Basalt Creek planning area. Source: CH2M Hill 2014.	70
Figure 36 2010 Existing PM Hour Traffic Volumes by intersection in planning area. Source: DKS Associates 2014.	73
Figure 37 2035 Future PM Hour Traffic Volumes by intersection planning area. Source: DKS Associates 2014.	74
Figure 38 Basalt Creek planning area TAZ Structure. Source: DKS Associates 2014.	75
Figure 39 Basalt Creek Transportation Refinement Plan (TRP)	80
Figure 40 Transit service boundaries for TriMet and SMART in and around Basalt Creek area.	81
Figure 41 Existing Pedestrian system in Basalt Creek planning area. Source: DKS Associates 2014.	83
Figure 42 Existing bicycle system in Basalt Creek planning area. Source: DKS Associates 2014.	84
Figure 43 Existing transit system in Basalt Creek planning area. Source: DKS Associates 2014.	85
Figure 44 Map showing classification of slopes by steepness in the Basalt Creek planning area. Source: Fregonese Associates, RLIS 2014.	89
Figure 45 Slopes over 25% in the Basalt Creek planning area. Source: Fregonese Associates, RLIS 2014.	90
Figure 46 Slope stability in the Basalt Creek planning area. Source: Fregonese Associates, RLIS 2014.	90

Figure 47 Infrastructure constraints in the Basalt Creek planning area. Source: Fregonese Associates, RLIS 2014 92

Figure 48 Road constraints in the Basalt Creek planning area. Source: Fregonese Associates, RLIS 2014 92

Figure 49 Map of development constraints (excluding roads) in the Basalt Creek planning area. 93

Figure 50 Map of all constrained area (hard constraints) in the Basalt Creek planning area. Source: Fregonese Associates, RLIS 2014..... 94

Figure 51 Graphic illustration of four-step methodology for analyzing land supply. Source: Fregonese Associates 2014..... 95

Figure 52 Map of existing land uses inside Basalt Creek planning area. Source: Fregonese Associates, RLIS 2014 96

Figure 53 Vacant and Developed land as identified by Metro data. Source: Fregonese Associates, RLIS 2014 97

Figure 54 Map of Vacant and Developed land identified via visual survey in Basalt Creek planning area. Source: Fregonese Associates, RLIS 2014 97

Figure 55 Vacant, Stable and Redevelopable Land in the Basalt Creek planning area, as identified by combining Metro data and visual survey data. Source: Fregonese Associates, RLIS 2014..... 98

Figure 56 Final Map of Vacant, Stable and Redevelopable Land in the Basalt Creek planning area, as identified by combining Metro data, visual survey data, and local input from property owners. Source: Fregonese Associates, RLIS, local property owner input 2014..... 99

Figure 57 Sequence of maps illustrating the data and steps used to determine the total acreage of developable land in the Basalt Creek planning area. Source: Fregonese Associates 2014..... 101

List of Tables

Table 1 Employment and Housing Forecast 2010-2035. Source: Metro 2014. 18

Table 2 Descriptions of Hydrologic Soil Classifications from Figure 14. Source: USDA Soil Survey 2014. 30

Table 3 Vegetated Corridor Widths Adjacent to the Sensitive Area Where Activity is Not Redevelopment. Source: Clean Water Services Design and Construction Standards, Chapter 3. 35

Table 4 Metro Water Quality Resource Area Slope Calculations. Source: Metro 2014..... 36

Table 5 Attributes of Industrial and Office Development in Tualatin and Wilsonville. Source: CoStar, Leland Consulting Group 2014. SF: Square feet; FAR: Floor area ratio, the ratio of a building’s size in square feet (or gross building area) to the size of the piece of land upon which it is built. 47

Table 6 Current Office Market Summary, Portland Metro Region. Source: CoStar, Leland 2014. 49

Table 7 Relevant Economic Development Plans. Source: Cities of Tualatin and Wilsonville. 49

Table 8 Demographic Summary of the Basalt Creek planning area. Source: ESRI Business Analyst, Leland Consulting Group. 2014 Data except where noted..... 55

Table 9 Demographic Summary of the Basalt Creek planning area (Continued). Source: ESRI Business Analyst, Leland Consulting Group. 2014 Data except where noted. 55

Table 10 Demographic Summary of the Basalt Creek planning area (Continued). Source: ESRI, Leland Consulting Group. 2014 data except where noted. 56

Table 11 Residential Development in Tualatin and Wilsonville by Housing Type. Sources: HUD; City of Wilsonville, New Home Trends, Leland Consulting Group. Due to data availability, Table 12 shows housing built in Tualatin between 2004 and 2014; and permits issued in Wilsonville between 2000 and 2012. 57

Table 12 Potential Points of Connection to Existing Stormwater Facilities for the Basalt Creek planning area. Source: CH2M Hill 2014. 66

Table 13 Potential Points of Connection to Existing Wastewater Systems for the Basalt Creek planning area. Source: CH2M Hill 2014. 69

Table 14 City of Tualatin Water System—Existing Pressure Zones. Source: CH2M Hill 2014..... 71

Table 15 City of Wilsonville Water System—Existing Pressure Zones. Source: CH2M Hill 2014. 71

Table 16 Basalt Creek planning area Estimated PM Peak Hour Trips. Source: DKS, Metro. 75

Table 17 P.M. Peak Hour Motor Vehicle Operations. Source: DKS Associates, Metro 2014. 76

Table 18 Comparing Housing and Employment Forecasts for 2025 in the Basalt Creek planning area. Source: Metro 2014. 77

Table 19 Basalt Creek Refinement Action Plan 79

Table 20 Comparing methodologies for buffering natural resources between Clean Water Services and Metro’s Title 3/City of Wilsonville. Source: Fregonese Associates, Clean Water Services, City of Wilsonville and Metro 2014..... 87

I. Introduction

In the Metro region, areas brought into the Urban Growth Boundary are required to have a land use and transportation Concept Plan. The intent of the Concept Plan is to provide a roadmap for the development of the area consistent with state, regional and local land use planning laws. This Existing Conditions report is the first step in the development of the Concept Plan for the Basalt Creek planning area. It includes detailed information on the existing landscape, regulatory, infrastructure, social and economic conditions within and relevant to the planning area.

The information presented in this Report provides the foundation from which to understand development capacity within the planning area, and the regulatory context in which development will occur. Here, analysis paints a quantitative picture of future growth potential, and identifies both opportunities and constraints for development of the area, using the regulatory framework as a guide.

This Report will inform land use and transportation decisions related to the Basalt Creek planning area, and provide the basis for the Concept Plan. The report is organized into eight sections (including introduction):

II. Local and Regional Planning Context

Summarizes regional and local plans that influence the planning area. These plans also include regulatory requirements related to land development and provide an explanation of the area’s regional role, as well as the constraints guiding the location of future development.

III. Natural and Historic Resources

Summarizes the natural and environmental features of the area and identifies historic or cultural resources within the planning area. This section provides a context for how environmental features might shape development in the planning area as both amenities and constraints.

IV. Public Facilities

Summarizes school, fire, library, park and police resources within or adjacent to the planning area. This information will inform decisions about additional resources that may be needed within the planning area to support projected growth.

V. Commercial, Industrial and Residential Real Estate Markets

Analyzes the existing markets for employment and residential development relevant to the planning area. This section provides a foundation for understanding future real estate demand to inform the development of a land use plan that can accommodate projected growth and promote economic development.

VI. Infrastructure

Provides a detailed assessment of water, sewer and stormwater infrastructure capacity relevant to the planning area. This information provides a foundation for developing an infrastructure plan that is integrated with the existing system and provides efficient and cost effective solutions to serve the area.

VII. Transportation

This section describes information on projects planned and under development within the planning area and provides an overview of the transportation planning that has been completed to date. This section describes the transportation framework from which to build the local network as part of the Concept Plan.

VIII. Land Capacity Analysis

The land capacity analysis is a quantitative and spatial analysis of the planning area that implements the regulatory framework and identifies infrastructure and transportation constraints. This analysis provides the canvas on which to paint the Concept Plan.

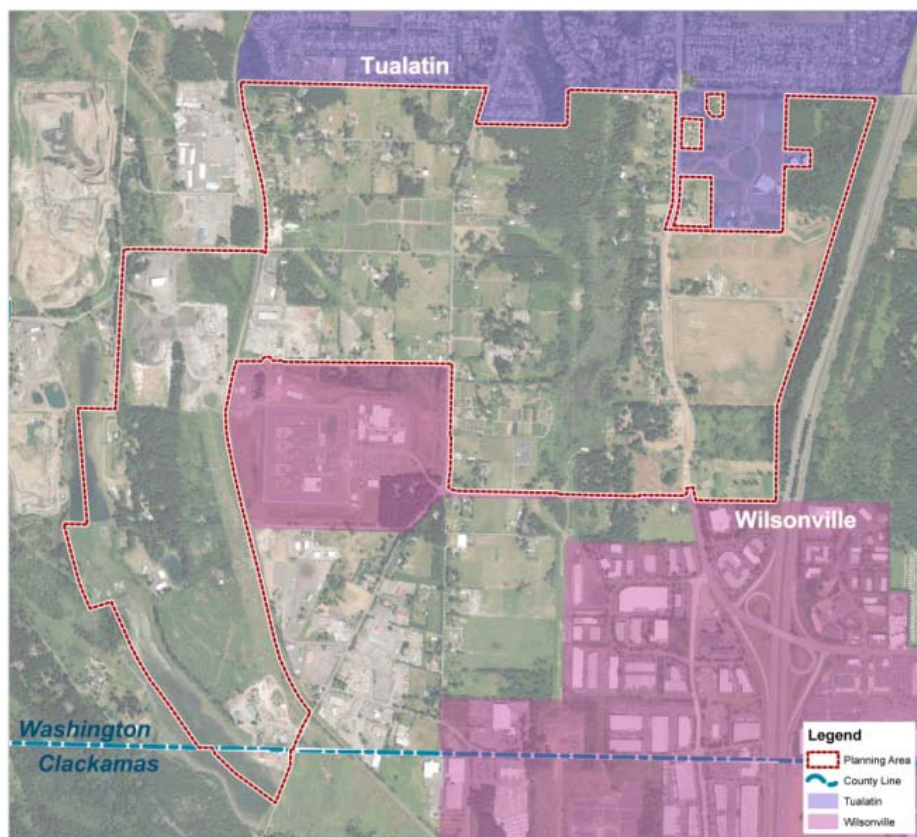


Figure 1 Basalt Creek planning area, City of Wilsonville and City of Tualatin boundaries. Source: Fregonese Associates 2014.

Planning Area Boundaries

The Basalt Creek planning area consists of 847 acres between the cities of Tualatin (to the north) and Wilsonville (to the south). It is primarily within Washington County, with a very small portion in the southwest corner located in Clackamas County (Figure 1).

The planning area is irregularly shaped, with a “finger” that extends southward from the western side. Generally referred to as the West Railroad area, this portion is divided from the rest of the study area by the Portland and Western Railroad (PNWR) and the Coffee Creek Correctional Facility. The majority of the Basalt Creek planning area is generally bounded by Norwood and Helenius Roads to the north, I-5 to the east, Coffee Lake Creek to the west, and Day Road to the south until it reaches Coffee Creek Correctional Facility, where the boundary turns north on Graham’s Ferry and then westward again on Clay Road.

The southern residential communities in Tualatin and Horizon High School are not included in the study area. However, three large noncontiguous parcels in the area around Horizon High School are included in the planning area, as they are privately owned (Figure 2).

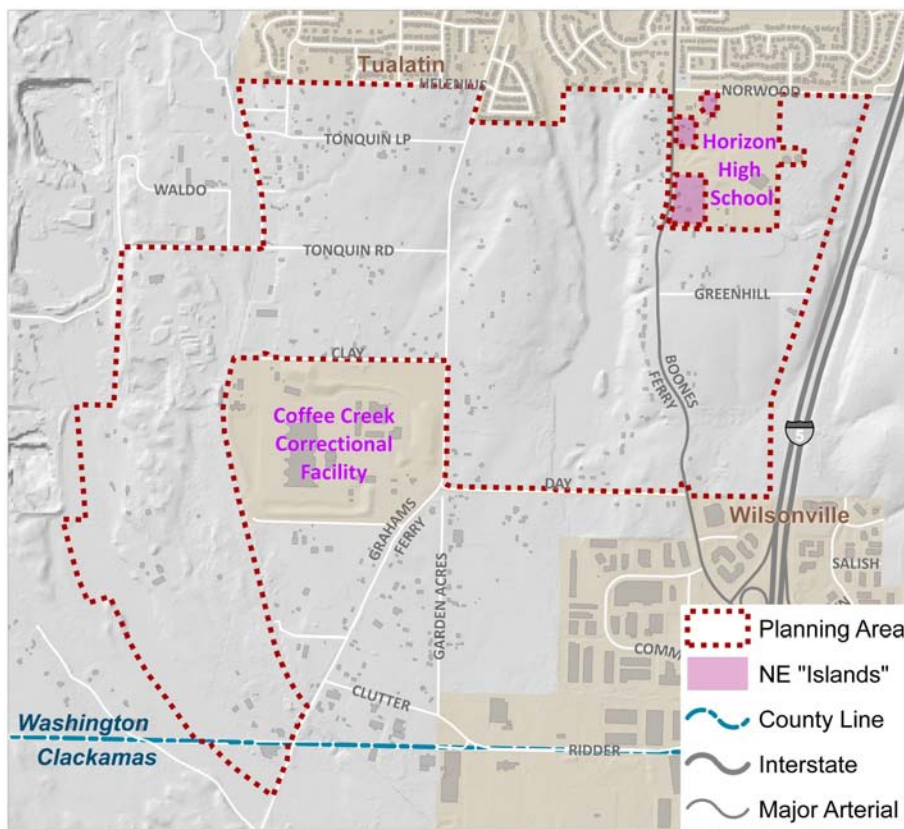


Figure 2 Planning area “islands,” Coffee Creek Correctional Facility and Horizon High School campus. Source: Fregonese Associates 2014.

II. Local & Regional Planning Context

Current Zoning

The majority of the Basalt Creek planning area falls within Washington County and is zoned as Future Development 20-Acre District (FD20). This interim designation was applied to the area following inclusion in the UGB (2004), through Washington County Ordinance No. 671 (2007). This designation will apply until the final Concept Plan is approved and Comprehensive Plan designations for the Basalt Creek area are adopted by each jurisdiction. The FD20 zoning designation is intended to encourage retention of existing land uses until these steps are complete. FD20 restricts subdivision of existing parcels into tax lots smaller than 20 acres.¹

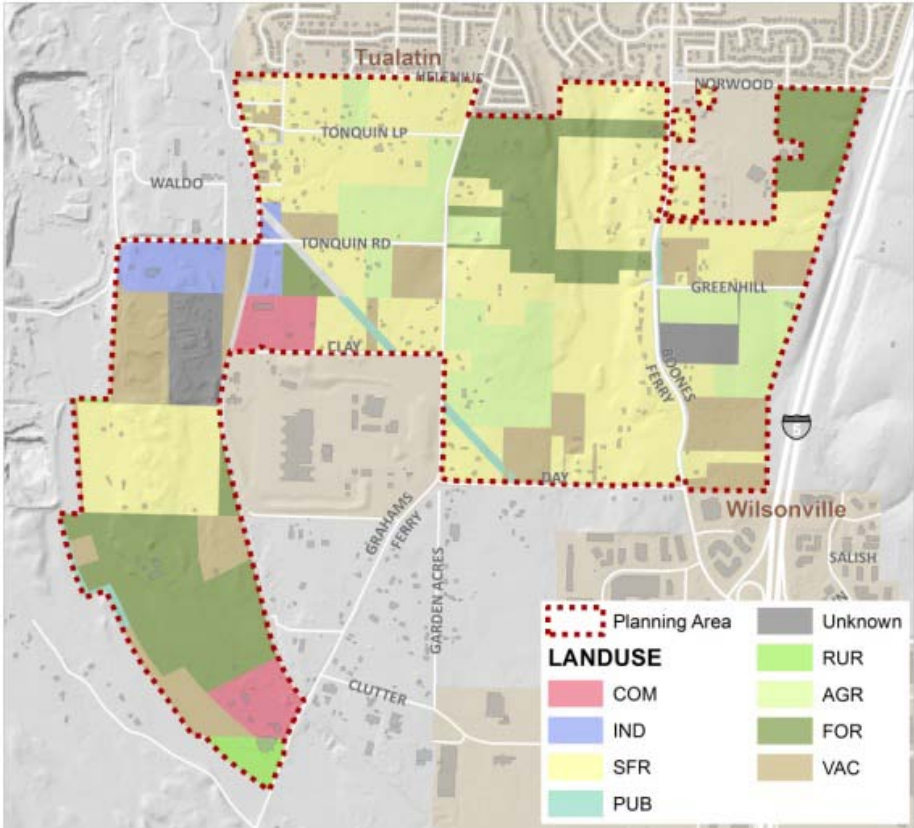


Figure 3 Existing land use in the Basalt Creek planning area. Source: Fregonese Associates, RLIS 2014.

Each jurisdiction (Tualatin and Wilsonville) has a property owner-initiated annexation process, so changes to current zoning will happen at the time of annexation, on a parcel-by-parcel basis. A very small area (7.8 acres), in the southwest corner of the planning area falls within unincorporated Clackamas County (Figure 1), and is zoned as Rural Residential Farm Forest 5-Acre District (RRFF5).

¹ For a full description of allowed and prohibited uses in the FD-20 zone see the Washington County Community Development Code Section 308.

Existing Land Uses

The primary existing land uses in Basalt Creek are rural agriculture, industrial and some rural residential consisting of low-density single-family housing (Figure 3). There are substantial areas of agricultural uses, including nurseries (such as Chick-a-Dee Gardens Nursery), landscaping supply (Pro Gro, in the furthest southwest corner of the planning area) and blueberry farms, among others. Existing industrial land users include gravel quarries and cement manufacturing (Knife River Corporation) in the northwest corner (Figure 4).

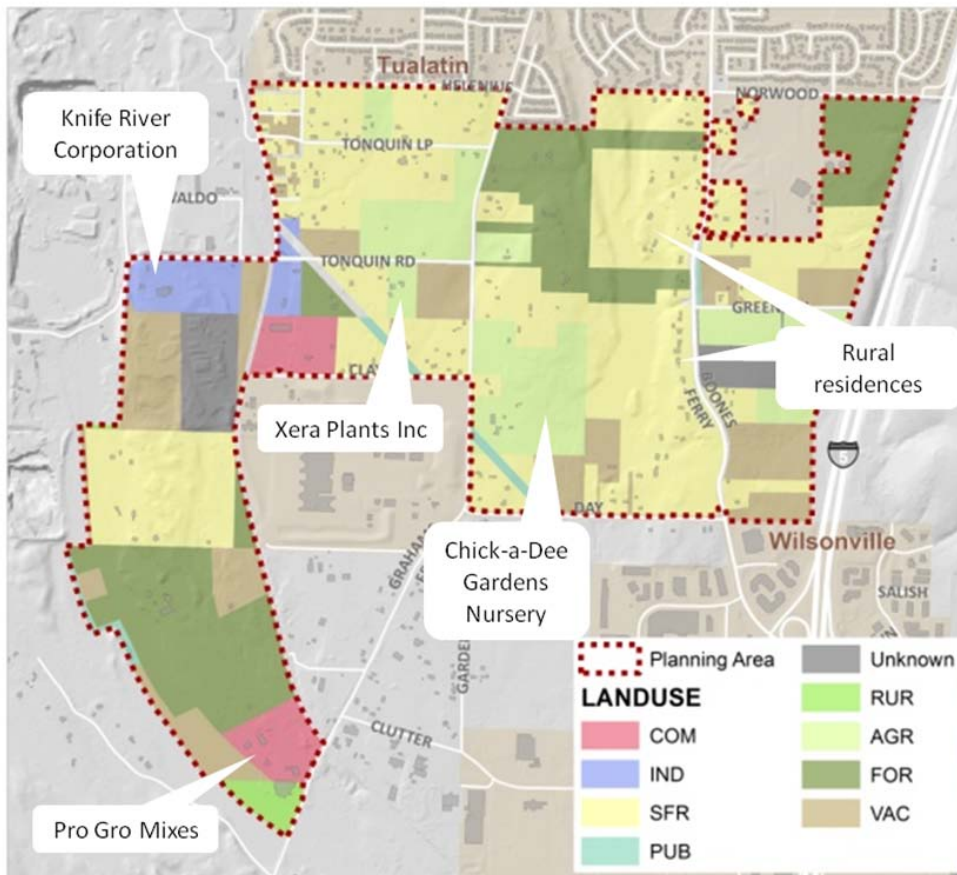


Figure 4 Locations of major businesses and residential areas in the Basalt Creek planning area. Source: Fregonese Associates, RLIS, Google Maps 2014.

Currently, 239 people live in the area in 90 single-family housing units, and 258 employees work in the area (Figure 5). The existing housing in the Basalt Creek area is detached single-family on large lots. Several single family homes are located on the eastern edge of the Basalt Creek ravine along Boones Ferry Road.

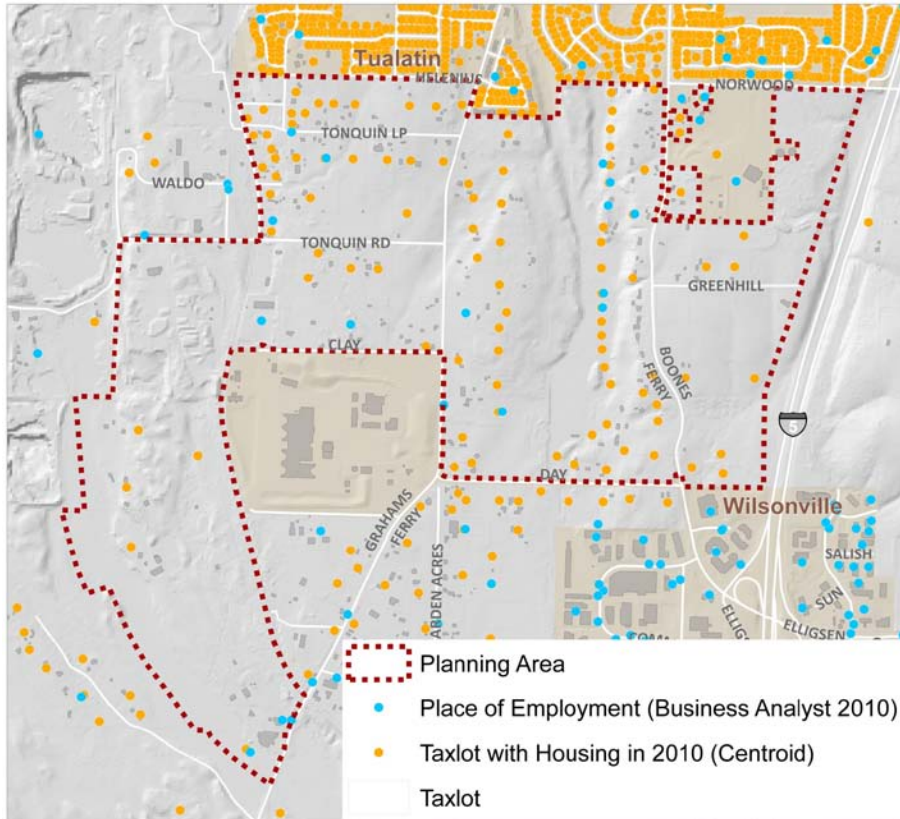


Figure 5 Existing Housing Units and Employment in the Basalt Creek planning area Source: Fregonese Associates, ESRI Business Analyst 2010.

Adjacent Land Uses

The planning area is bounded to the north by Tualatin residential neighborhoods, to the south by commercial and industrial uses, I-5 to the east, and to the west by Coffee Lake Creek, wetland habitat, and rural and industrial lands (Figure 6).

The southernmost residential neighborhoods of Tualatin, including recently-built subdivisions such as Victoria Gardens, are located to the north. These neighborhoods are comprised primarily of high-quality, detached, single-family homes. Also to the north is the 30-acre campus of Horizon High School. The campus is bordered on three of its sides by the planning area (Figure 7). To the west, the planning area is bordered by unincorporated portions of Washington County (within the Southwest Tualatin Concept Plan area) and active quarries--including the Knife River Corporation quarry and asphalt plant, which falls partially in the planning area along Western Railroad. Further west of the Southwest Tualatin Concept Plan area is the Tonquin Employment Plan area which falls within the City of Sherwood's urban planning area (though not yet fully annexed). Most of this land is undeveloped or vacant.

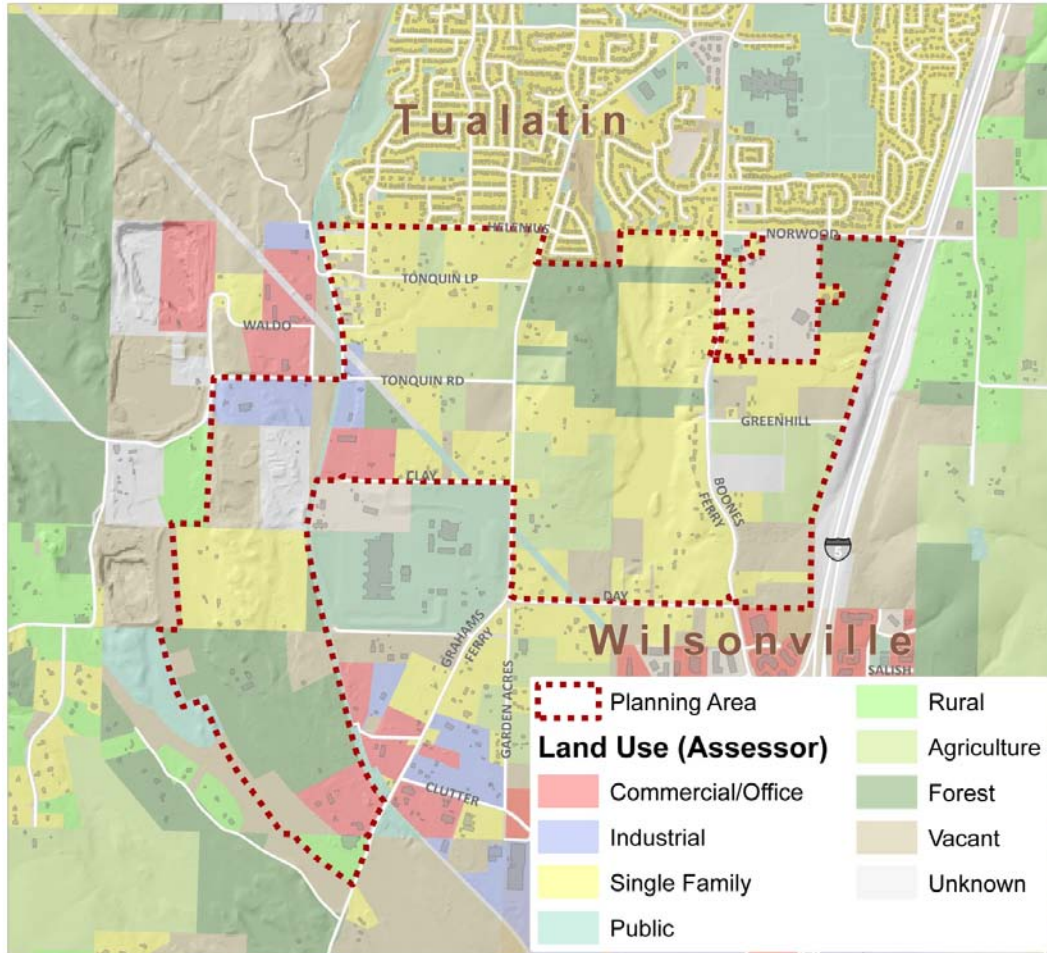


Figure 6 Land Uses Adjacent to Basalt Creek planning area. Source: Fregonese Associates, RLIS 2014.

South of the planning area are commercial, office and industrial uses located within the City of Wilsonville. Also adjacent to the southern border of the planning area is Coffee Creek Correctional Facility (Figure 8). This is a state-owned correctional facility with 1,250 female inmates, and a fluctuating small number of male inmates (around 400) undergoing intake until they are transferred to another facility. The Correctional Facility employs 435 people with day and nighttime shifts comprising a 24-hour workforce.²

South of the Correctional Facility, also abutting the planning area, along the south side of Day Road, is the Coffee Creek planning area, for which the City adopted a Master Plan for industrial development. Figure 9 shows the Basalt Creek planning area and its geographic relationship to the Coffee Creek, Southwest Tualatin and Tonquin Employment planning areas. Figure 9 also shows existing commercial and industrial and employment areas.

² Reynolds, Vicki. Public Information Officer for Coffee Creek Correctional Facility. Personal communication, July 2nd, 2014.



Figure 7 Aerial image of the Horizon High School Campus (30 acres), just outside of the planning area. Source: Fregonese Associates 2014.

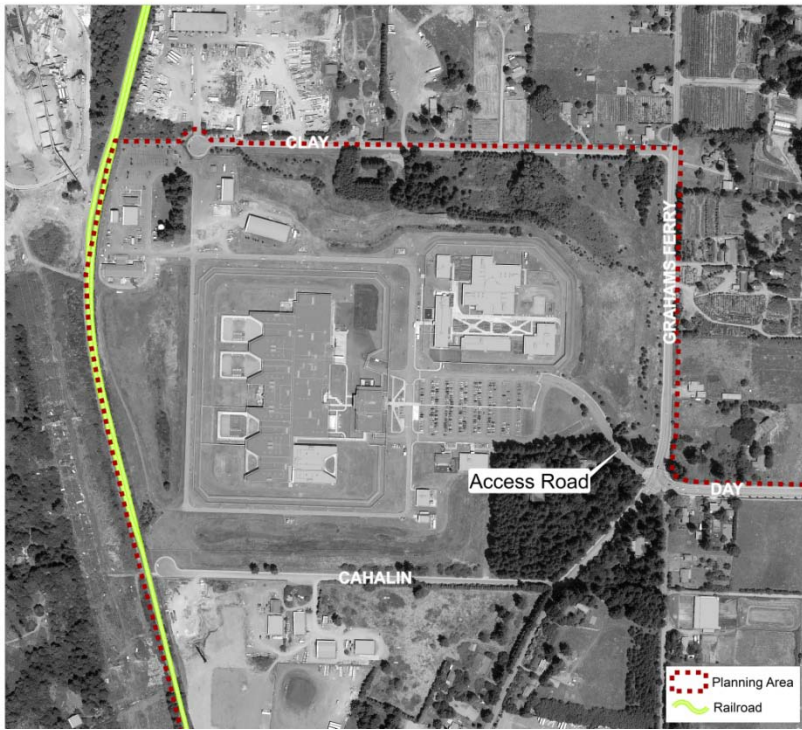


Figure 8 Aerial image of Coffee Creek Correctional Facility (108 acres). Source: Fregonese Associates 2014.

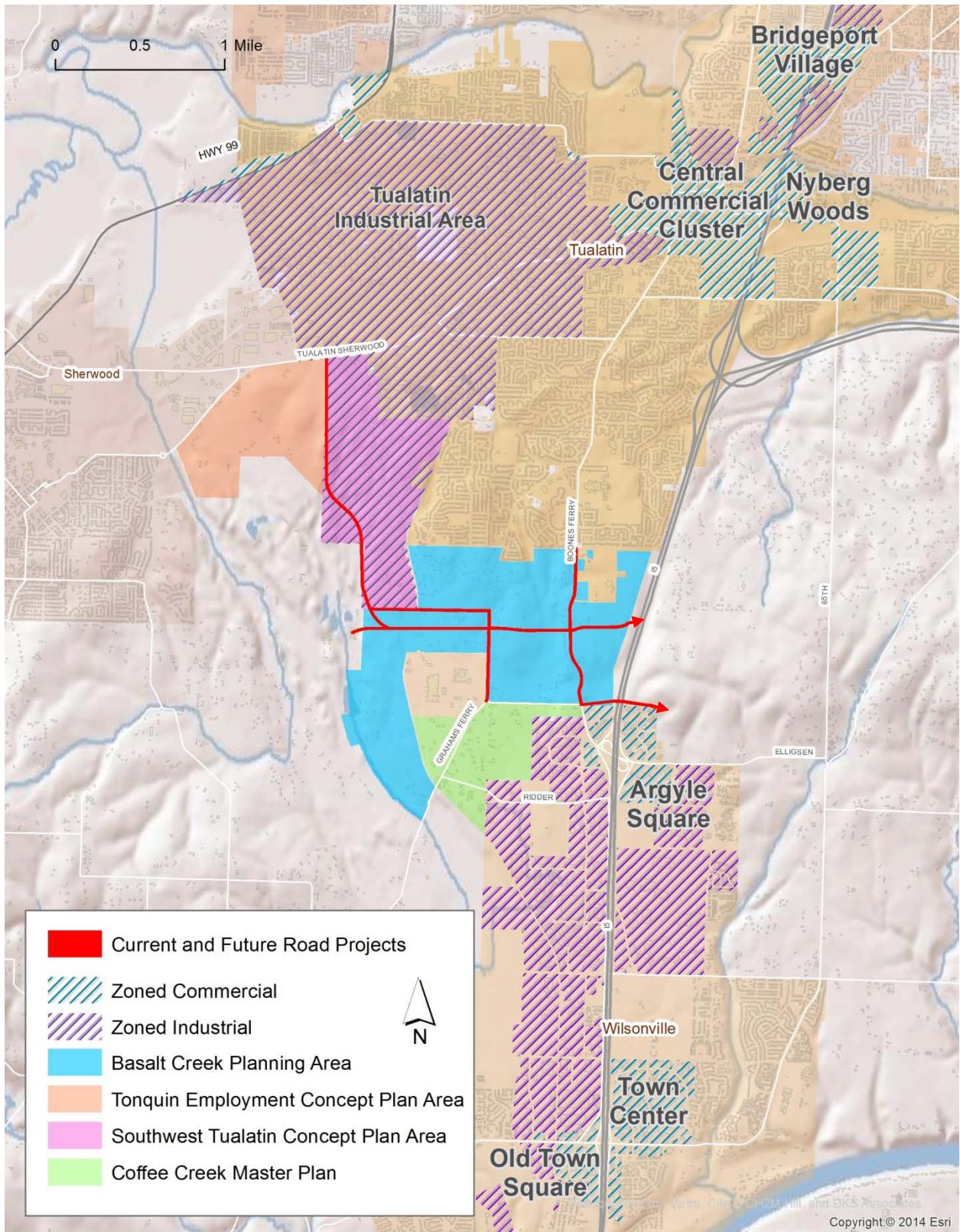


Figure 9 Planning and employment areas near the Basalt Creek planning area. Source: Fregonese Associates, Cities of Tualatin and Wilsonville 2014.

Regional Plans and Regulatory Requirements

The 25 cities and three counties within the Portland Metropolitan Area share a single Urban Growth Boundary (UGB), administered by the Metro Regional Government. As required by state law, Metro assesses its Urban Growth Boundary every five years to determine whether it includes sufficient land to accommodate 20 years of development for residential, commercial, and industrial uses. In 2002 Metro passed Ordinance No. 02-696B, expanding the UGB by over 20,000 acres to accommodate forecasted increases in housing and jobs through the year 2022. This brought land around Damascus, Oregon City, Tualatin, Wilsonville, Beaverton and Hillsboro into the UGB.

In reviewing the 2002 expansion ordinance, the Land Conservation and Development Commission (LCDC) found that “the Council added capacity to the UGB but did not add sufficient capacity to accommodate the full need for land for industrial use.” In 2003 the LCDC ordered the Metro Council to add capacity to the UGB for the unmet portion of industrial land needs. Metro evaluated land adjacent to the UGB to determine which land would be most suitable for industrial employment. In 2004 the Council released an appendix to the 2002 Urban Growth Report that included an Employment Land Need Analysis for the years 2002-2022, in addition to an Industrial Land Alternative Analysis Study. These studies were used to identify additional industrial lands to be included in the 2004 ordinance.

Criteria used by the Council to determine suitability of land for industrial uses included soil classification (with a preference for lowest suitability farmlands), earthquake hazard, slope steepness, and parcel size (with a preference for larger parcel size). Among those lands deemed suitable, further factors to identify Industrial Areas and Regionally Significant Industrial Areas included: distribution (area serves to support industrial land for major regional transportation facilities), service (availability and access to specialized utilities), access (within two miles of I5, I-205, I-84, State Route 224), proximity (located within close proximity of existing like uses) and primary use (predominately industrial uses).³

Two areas of land identified in the 2004 ordinance as good candidates for industrial development now comprise the Basalt Creek planning area. In Ordinance 04-1040B, these two areas are referred to as the Coffee Creek (partial) and Tualatin study areas. The main section of the Basalt Creek area (identified in the 2004 ordinance as the Tualatin study area) was identified as suitable for industrial development due to its proximity to the I-5 corridor, and to an existing industrial area (in Wilsonville). In addition, portions of the area are relatively flat. The ordinance notes that, due to these characteristics, “...the Tualatin study area is most suitable for warehousing and distribution, among other industrial uses.”⁴

At the time of the Ordinance’s adoption, two major concerns were identified that resulted in additional conditions being placed upon the planning area: First, residents expressed concerns about compatibility between Tualatin’s southern neighborhoods and the proposed industrial uses in the planning area. Secondly, the cities of Tualatin and Wilsonville desired to preserve the opportunity to choose an

³ A detailed description of the methodology used for identifying Industrial Land can be found in Exhibits D and E to Ordinance No. 04-1040B, an Industrial Land Alternative Analysis Study (a 2004 addendum to Metro’s 2002 Urban Growth Report).

⁴ Metro Ordinance No. 04-1040B Exhibit G P17

alignment for the I-5/99W connector as the southern portion of the alignment passes through the Tualatin study area. In response to these concerns the Metro Council extended the deadline for Title 11 planning. The revised deadline called for Title 11 Concept Planning to occur within two years following the final alignment for the I-5/99W connector or within seven years, whichever was shorter.⁵

It is further stated in the 2004 ordinance (in response to the community concerns about transitions from residential to industrial lands) that so long as the South Alignment of the connector falls close to the one shown on the 2040 growth concept map it will serve as a buffer between the residential development to the north and industrial development to the south. Within the Ordinance a special section dedicated to specific conditions for particular areas states that “If the selected right of way for the connector follows the approximate course of the ‘South Alignment’ as shown in the Regional 2040 Growth Concept map...the portion of the Tualatin Area that lies north of the right of way shall be designated ‘outer neighborhood’ on the Growth Concept map; the portion that lies south shall be designated ‘industrial.’ The ordinance further states, “The government responsible for Title 11 planning shall consider using the I-5/99W connector as a boundary between the city limits of the City of Tualatin and the City of Wilsonville in this area.”⁶

As defined in the Metro Regional Framework Plan, a designation of “outer neighborhood” describes areas outlying cities that are primarily residential, relatively further from employment and shopping areas than other residential areas, and have larger lot sizes and lower population densities than inner neighborhoods.⁷

The Metro Regional Framework Plan describes the industrial designation as “an area set aside for industrial activities. Supporting commercial and related uses may be allowed, provided they are intended to serve the primary industrial users. Residential development shall not be considered a supporting use, nor shall retail users whose market area is substantially larger than the industrial area be considered supporting uses.”⁸

As stated in the 2004 Ordinance, the planning timeline for the Basalt Creek area was extended to allow for the planning of the I-5/99W Connector. The I-5/99W Connector Study recommended an alternative that spreads east-west traffic across three smaller arterials rather than a single expressway. Although specific alignments for these arterials were not defined, the eastern end of the Southern Arterial was generally located within the Basalt Creek planning area, south of Tonquin Road. The Basalt Creek Transportation Refinement Plan (TRP) established the specific alignment for this arterial (now referred

⁵ Metro Ordinance No. 04-1040B Exhibit F P2. The relative complexity of planning for this area (due to its equidistance from two cities, and the regional infrastructure improvements being considered in and around Basalt Creek) led Metro to grant an extension for compliance, moving the deadline from 2012 to September 2016 (through a Urban Growth Management Functional Plan compliance request).

⁶ Metro Ordinance No. 04-1040B P3

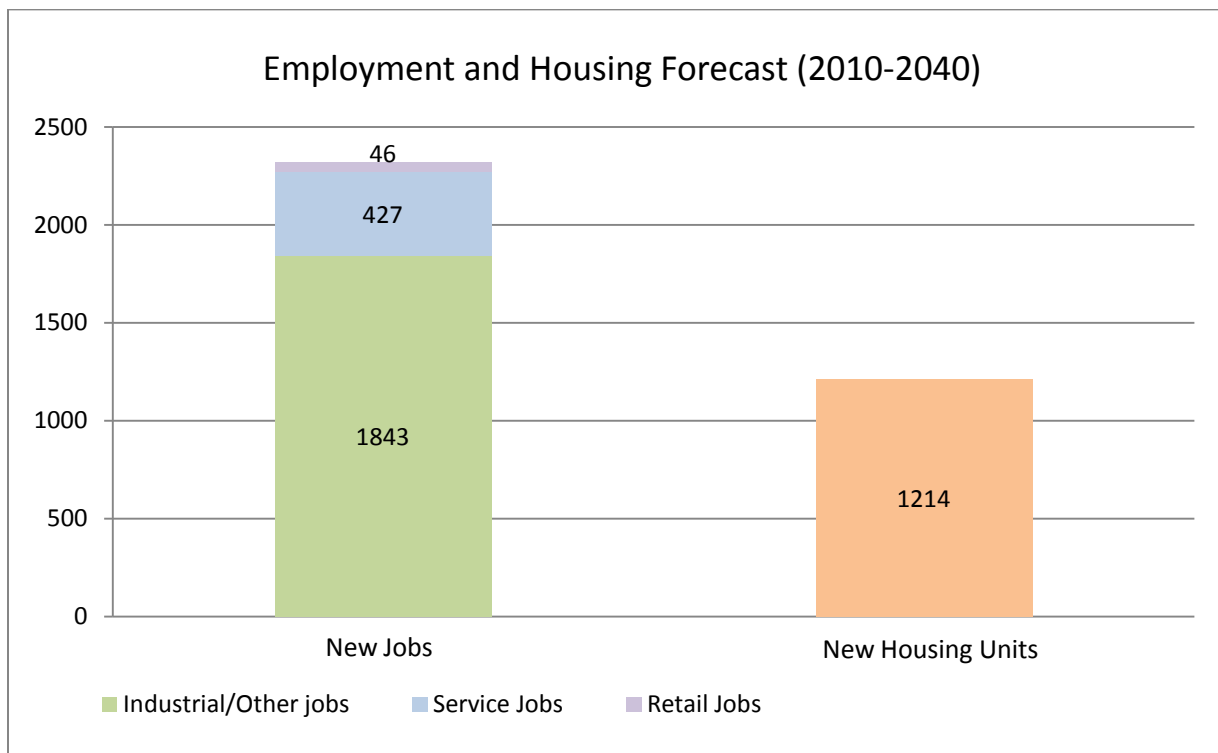
⁷ Metro Regional Framework Plan Appendix G-J Glossary P369

⁸ Metro Regional Framework Plan Appendix G-J Glossary P366

to as the East-West Connector). The TRP was completed in 2013 and several priority projects were adopted in the 2010 Regional Transportation Plan.⁹

The current 2040 Growth Concept Map identifies the Basalt Creek planning area as industrial, but the ordinance does provide some flexibility to include housing in the planning area. Table 1 summarizes the most recent forecast estimate (the Gamma Version) for the Basalt Creek planning area at the Transportation Analysis Zone (TAZ) level. An older forecast (the Beta Version), upon which the Basalt Creek Transportation Refinement Plan (TRP) was based, projected somewhat higher employment levels by 2035. Both forecasts will be used in concept planning for the Basalt Creek area, with the forecasts serving as “sideboards,” representing the high and low ends of the range of households and jobs the area may need to accommodate. The geographical units used for the forecasts are called Transportation Analysis Zones (TAZs). The boundaries and identification numbers of TAZs changed between the Beta (older) and Gamma (newer) forecast, and are both depicted on the map in Figure 10.

Table 1 Employment and Housing Forecast 2010-2035. Source: Metro 2014.



⁹ An update to the Regional Transportation Plan (RTP) was published July 18th, 2014. Because the analysis for this report was completed before that date, 2014 RTP updates are not considered here. The updated Regional Transportation Plan can be accessed here: <http://www.oregonmetro.gov/regional-transportation-plan>

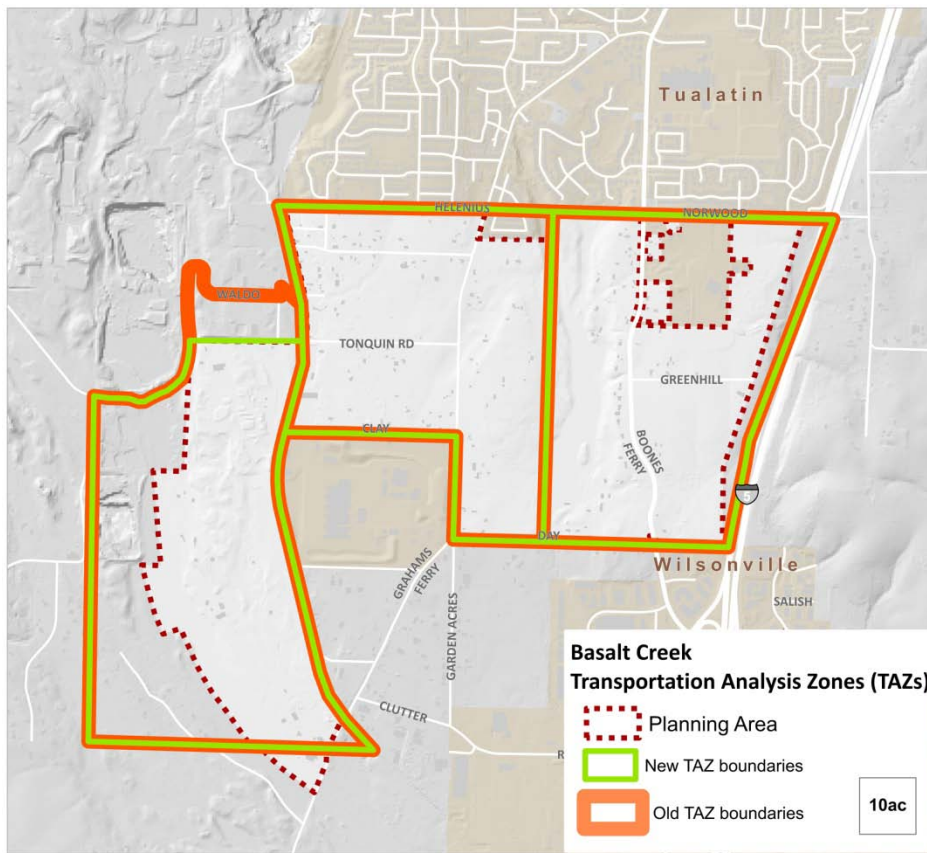


Figure 10 Transportation Analysis Zones (TAZs) covering the Basalt Creek planning area Source: Fregonese Associates, RLIS 2014.

Local Plans

The following section provides a brief summary of local plans, focused on identifying the policies and goals relevant to the Basalt Creek planning area. Within these plans are goals and policies for transportation, land use planning and economic development. These will be used to guide the development of the concept plan and comprehensive plan recommendations.

Joint Plans

Basalt Creek Transportation Refinement Plan (2013)

This plan was a joint effort between the Cities of Tualatin and Wilsonville, Washington County, and Metro. The primary purpose of the Refinement Plan is to establish a major transportation connection from Tualatin-Sherwood Rd to I-5 in North Wilsonville through the Basalt Creek planning area. This connection was identified as a regional transportation priority in order to connect and provide access to existing and future hubs of industrial land uses.

Through the Refinement Plan process, an alignment was established for what is, for now, being referred to as the East-West Connector (Project 11, Figure 11). It is intended to be a new major arterial with five

lanes and vehicle access limited to three intersections – 124th Avenue (anticipating a southward extension of 124th to Tonquin Road in the near future, see Projects 1 and 10 in Figure 11), Graham’s Ferry Road and Boones Ferry Road. Tonquin Road (Project 2 in Figure 11) will be improved but left as a parallel three-lane property-access road.

While the primary focus of the Refinement Plan was establishing the alignment of the aforementioned East-West Connector, it includes recommendations for an additional 17 transportation investments broken into short, medium, and long term phases. These include improvements to Grahams Ferry Road, Boones Ferry Road, and Day Road to adequately meet the need for improved regional freight mobility.

Improvements to the section of Boones Ferry Road between Norwood and Day Roads have already been completed. This new roadway includes bike lanes and sidewalks. These projects combined with the East-West Connector provide the foundation for a robust transportation network and ensure the Elligsen Road interchange will function at a high level. The project to extend 124th Avenue is in the design phase, with an estimated completion date of December 2016.

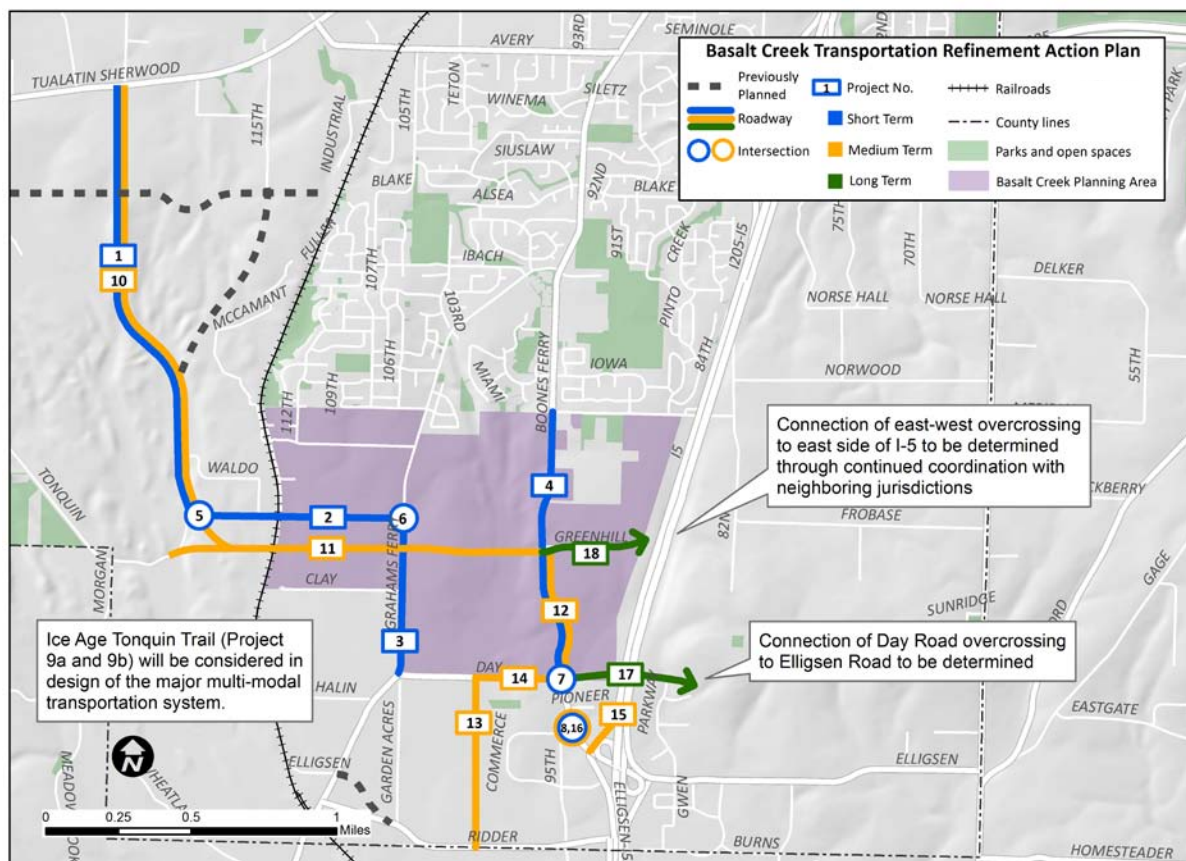


Figure 11 Projects identified in the Basalt Creek Transportation Refinement Plan (TRP).

Wilsonville

Transportation System Plan (2013)

The TSP integrates goals to reduce vehicle collision rates, decrease VMT (vehicle miles travelled) per capita, and minimize vehicle delays for truck trips per capita. Other objectives include significantly increasing connectivity for walking and biking trips. Policy 27 of the plan states an intention to “upgrade and/or complete the street network on the west side of I-5, including Coffee Creek and Basalt Creek areas, to serve the warehousing, distribution, and other industrial uses located there.” The TSP proposes widening of Grahams Ferry Road if called for by the Basalt Creek Transportation Refinement Plan.

Economic Development Strategy (2012)

This document was an update to a 2007 Economic Opportunities Analysis. The Strategy was produced to guide City investments and regulations as well as supporting efforts from the private sector. The resulting recommendations are long-term strategies oriented toward deliberative, balanced, efficient and fair economic development. These include: prioritizing land use and infrastructure planning, balancing economic development with quality of life, and treating all businesses fairly (whether they are new or established). The Strategy reviews factors impacting the Wilsonville economy, which will also have a substantial impact on economic development in the Basalt Creek planning area. Some of these include: regional and interstate accessibility; vacant land base; a balance between the number of jobs and available housing units, and local industry clusters. Actions from the Strategy include workforce development, promoting infill development and redevelopment, and streamlining the development code and permitting process, among others.

Parks & Recreation Master Plan (2007)

The goal of the Parks and Recreation Master Plan is to promote “active and passive recreation opportunities in a safe, accessible, and comprehensive system of facilities, parks, trails and open spaces to support the recreational interests of citizens of all ages.” The plan calls for implementation of the Ice Age Tonquin Trail Master Plan in partnership with Metro, the Cities of Sherwood and Tualatin, and Washington County.

Water System Master Plan Update (2012)

This update of the 2002 Water System Plan encompasses Wilsonville’s network of water pipelines, storage tanks, valves and hydrants. Its objective is to assure that good quality public facilities and services are available with adequate (but not excessive) capacity to meet community needs, serving all urban development within the incorporated City limits. In anticipation of future development, industrial demand estimates were increased by 25% to reflect potential redevelopment, infill, and higher-use water customers within existing structures. The planning process resulted in the creation and utilization of a “highly accurate and dynamic hydraulic model” of the water system that can be used to quickly investigate potential system impacts from new users. The plan does not specifically address the Basalt Creek planning area, though it includes the adjacent area on the south side of Day Road.

Stormwater Master Plan (2012)

This plan aims to implement a stormwater program that supports quality of life and meets regulatory requirements. It includes cross section illustrations of streetscape improvements recommended to mitigate stormwater issues. Stormwater patterns in the Basalt Creek planning area will impact stormwater management in Wilsonville, as Basalt Creek discharges into the Coffee Lake Creek wetlands west of the railroad, approximately midway between SW Freeman Drive and SW Boeckman Road. This plan notes that Basalt Creek overtops its banks during moderate storm events, flooding the parking lot along the western side of the Commerce Circle Business Park. Construction of a wetland for stormwater detention is a proposed flooding mitigation measure. The recommended location is at the crossing of Day Road over Basalt Creek, to provide temporary storage for increased runoff from future industrial development north of Day Road and decrease flooding around Commerce Circle.

Tualatin

Tualatin Tomorrow Vision and Strategic Action Plan (2014)

This Plan puts forth a vision for Tualatin in 2030. The plan includes an I-5/99W Connector to separate long-haul and regional commercial–industrial and commuter traffic from local traffic on Tualatin-Sherwood Road. Strategy TTC13 is to increase regional transit linkages (bus and rail, for example) with the cities of Sherwood, Lake Oswego, and Portland.

City Council Goals (2013-2015, updated Feb. 2014)

Basalt Creek is specifically mentioned in Goal #8 of this City Council goals document, which is to “expand opportunities for vibrant parks and recreational facilities including greenway trails and bike/pedestrian trails.” Sub-goal 8.4 is to “plan and preserve natural resources through the Basalt Creek Concept Plan,” with the Community Development and Community Services Departments identified as playing leading roles in achieving this goal. Other goals include: a connected, informed and engaged citizenry, enhanced transportation options, and an expanded tax base strengthened through smart, balanced growth.

Transportation System Plan Update (2014)

This update to the 2001 TSP includes seven project goals: access and mobility, safety, vibrant community, equity, economy, health and the environment, and feasible implementation. It includes recommendations to serve the varying needs of transit riders, bicyclists, pedestrians, freight traffic, and drivers. The Basalt Creek area was included within the Tualatin planning area boundary and thus is considered in this plan’s recommendations. The plan includes findings from the Basalt Creek Transportation Refinement Plan and includes the widening of Boones Ferry Road south of Norwood (now complete), the southward extension of 124th Avenue, and the upgrade of Grahams Ferry Road from a minor to major collector. It proposes looking for a potential shared use park-and-ride location in south Tualatin to expand transit access for residents of that area, which would also be useful for future residents of the northern part of the Basalt Creek planning area.

The TSP also includes adding more bus pullouts along Boones Ferry Road, possibly extending into the Basalt Creek planning area. The bike/pedestrian map indicates the addition of a multiuse path across the northern portion of the Basalt Creek planning area. WES service enhancements are also explored, including the possibility of extending the line south of Wilsonville, adding more frequent service, and construction of an additional WES station in the south of Tualatin (near the Basalt Creek planning area). The TSP also discusses possible expansion of the Tualatin Shuttle program.

[Linking Tualatin Market Study \(2012\)](#)

As part of the Linking Tualatin project a market study was prepared that outlines current and anticipated market conditions impacting viable development forms in the north part of the City. It covers housing, retail, office and industrial/flex space market conditions and demand projections. This study should be considered in planning for Basalt Creek because it is in the same general market area. This study also lists viable near-to-mid-term development forms,, which may also be appropriate for Basalt Creek. Key conclusions of the study include:

- The Primary Market Area (City of Tualatin) can expect continued growth in residential, retail, office and industrial uses
- The lower rents achievable in a suburban setting will limit some of the development types that the market is likely to bring into the area.
- Significant increases in density can be achieved without greatly raising construction costs.

[Economic Development Strategic Plan](#)

This plan describes a high-level strategy to direct local economic development efforts in the City of Tualatin. It recognizes priorities for infrastructure development and quality of life addressed by other master plans, in addition to identifying important industry clusters. The Plan recommends approaches to retain and expand existing businesses as well as attract new businesses. The five target industry clusters identified include: advanced manufacturing; health care and related businesses; corporate and business services; food processing, distribution and wholesale; wood, paper, printing and related businesses.

[Water Master Plan \(2013\)](#)

The Water Master Plan was a comprehensive analysis of the City of Tualatin’s water system. The plan covers Tualatin’s network of water pipelines, storage tanks, valves and hydrants. Its purpose is to identify system deficiencies, determine future water distribution system supply requirements, and recommend water system facility improvements that correct existing deficiencies and provide future system expansion. The Plan did not anticipate the Basalt Creek planning area, as concept planning and determination of the city limit boundary had not been complete. At the time of its writing, it was expected that the Water Master Plan would be updated in the future to include Basalt Creek.

Sanitary Sewer Master Plan (2014)

The 2014 Sanitary Sewer Master Plan is currently on hold until completion of the Basalt Creek planning process. It will provide a comprehensive analysis of the city's sanitary sewer system, including Tualatin's network of gravity & force main lines and pump stations. Its purpose is to identify system deficiencies, determine future collection system requirements, and recommend sanitary sewer system facility improvements that correct existing deficiencies and provide future system expansion.

Area Plans

Coffee Creek Master Plan (2007)

The Coffee Creek planning area is comprised of 216 acres to the south of the Basalt Creek area. It has been designated by Metro as a Regionally Significant Industrial Area (RSIA) and includes strict limits on the amount and size of retail, service, residential and office uses allowed to be developed there. Forecasts in the Plan suggest that between 1,736 and 1,890 jobs could be added to the area between 2006 and 2026, with over 90% identified as industrial.

No parcels in the planning area have been annexed yet; Wilsonville's process is property-owner initiated and the area has seen little development since the Plan's adoption. The City has identified form-based code as a tool to streamline the development process and is creating a Form Based Code (FBC) and pattern book to apply to the Coffee Creek area.¹⁰ More information about how new infrastructure in the Coffee Creek and Basalt Creek planning areas might be coordinated, see Section V: Infrastructure.

Southwest Tualatin Concept Plan (2010)

The Southwest Tualatin Concept Plan (SWCP) is a guide for the industrial development of a 614-acre area (448 net buildable acres) located outside the city south of SW Tualatin-Sherwood Road and generally between SW 115th and 124th Avenues. The Southwest Tualatin area is adjacent to and directly west of the Basalt Creek planning area, and is adjacent to/east of the Tonquin Employment Area. It extends south to Tonquin Road and is located in the vicinity of the Tigard Sand and Gravel quarry. A portion of the area was designated a Regionally Significant Industrial Area (RSIA) by Metro in 2004, with the assumption that it would be developed with a mix of light industrial and high-tech uses in a campus-like setting. The Concept Plan estimates that 3,500 new jobs will be located in the area by the year 2035 (2010 forecast).¹¹

Currently there is no water or sewer infrastructure in this planning area. However, the City of Tualatin Water and Sewer Master Plans both include the Concept Plan area in the hydraulic modeling and capital improvement project (CIP) identification. Recommended improvements include:

¹⁰ City of Wilsonville Community Development Department webpage: <http://www.ci.wilsonville.or.us/594/Light-Industrial-Form-Based-Code>. Retrieved August 21st, 2014.

¹¹ This number is slightly smaller than the result from Metro's model, which forecast in 2005 that 3,735 new jobs would be added to the area by 2035.

Water

- A new Level A reservoir (CIP Project R-1) and pipeline projects (P-6 and P-16)
- 13,000 linear feet of 16-inch-diameter pipe to provide a looped water supply

Sewer

- A new 24-inch pipeline located in Tualatin-Sherwood Road, extending from the Concept Plan area/URA easterly to SW Avery Street;
- Increase existing 12- to 21-inch pipe to 18-inch and 36-inch pipeline extending from near the SW Tualatin Sherwood Road/SW Avery Street intersection to the existing Bluff/Cipole Trunk
- Upsize existing trunk line pipe diameters.

Stormwater

- New conveyance system along roadways
- Facility(ies) to treat and detain (if necessary) site development runoff

The sequencing of infrastructure construction will be coordinated with the timing of development in the area, as well as with the Basalt Creek planning area.

Tonquin Employment Area Concept Plan (2010)

This planning area is comprised of 300 acres designated industrial land northwest of (but not adjacent to) the Basalt Creek planning area. It is bounded on its eastern edge by the future 124th Avenue extension. It was added to the UGB in 2004 and will be annexed to the City of Sherwood on a case-by-case, property owner-initiated basis. Creation of an Employment Industrial Zone is proposed to implement this plan. The regional employment forecast projects the addition of 2,290 more jobs during the next 20 years, 83% being industrial and 17% a mix of retail, commercial, services and office.

III. Natural and Historic Resources

The purpose of this section is to describe the natural and historic resources in the planning area, as well as the regulatory framework through which they may be protected, conserved or mitigated for.

Natural Features

The Basalt Creek planning area is named for the creek flowing north to south through the area, eventually draining into the Willamette River. Basalt Creek has alternatively been known as Seeley's Creek and Tappin Creek. The area primarily drains into the Willamette River; a small area in the northeast corner drains into the Tualatin River.

The general character of the area's landscape was shaped by the Glacial Lake Missoula Ice Age floods, a series of cataclysmic floods that formed the Columbia River Gorge and the Willamette Valley during the last Ice Age. Remains from the Ice Age floods that can be seen in and around the Basalt Creek planning area include glacial erratic, scablands, kolk ponds, flood channels and ripple marks. Today, the area has been described as being "comprised of upland prairie fragments, and oak and madrone woodlands. Rare wildflowers are found near basalt hummocks (scablands) to the west of the planning area, and rare reptiles (pond turtles) and amphibians (northern red-legged frogs) live in the kolk ponds."¹²

In 2009, federal legislation was passed to create the National Park Service's Ice Age Flood National Geologic Trail in order to bring the dramatic story of the Ice Age Floods to the public's attention. The Trail is intended to be a network of marked touring routes extending across parts of Montana, Idaho, Washington and Oregon, with several special interpretive centers located across the region. This federal legislation will help bring funding and tourism to local trails that will be a part of the region-wide Ice Age Trail network. Metro's Ice Age Tonquin Trail Master Plan provides a framework for local and regional jurisdictions to embark on trail implementation efforts. The proposed trail alignments show about 22 miles of trails connected through Tualatin, Wilsonville and Sherwood, and includes a several-mile section traversing the Basalt Creek planning area (Figure 12).

¹² Ice Age Tonquin Master Plan, 2012 P24:
http://www.oregonmetro.gov/sites/default/files/tonquin_trail_master_plan.pdf

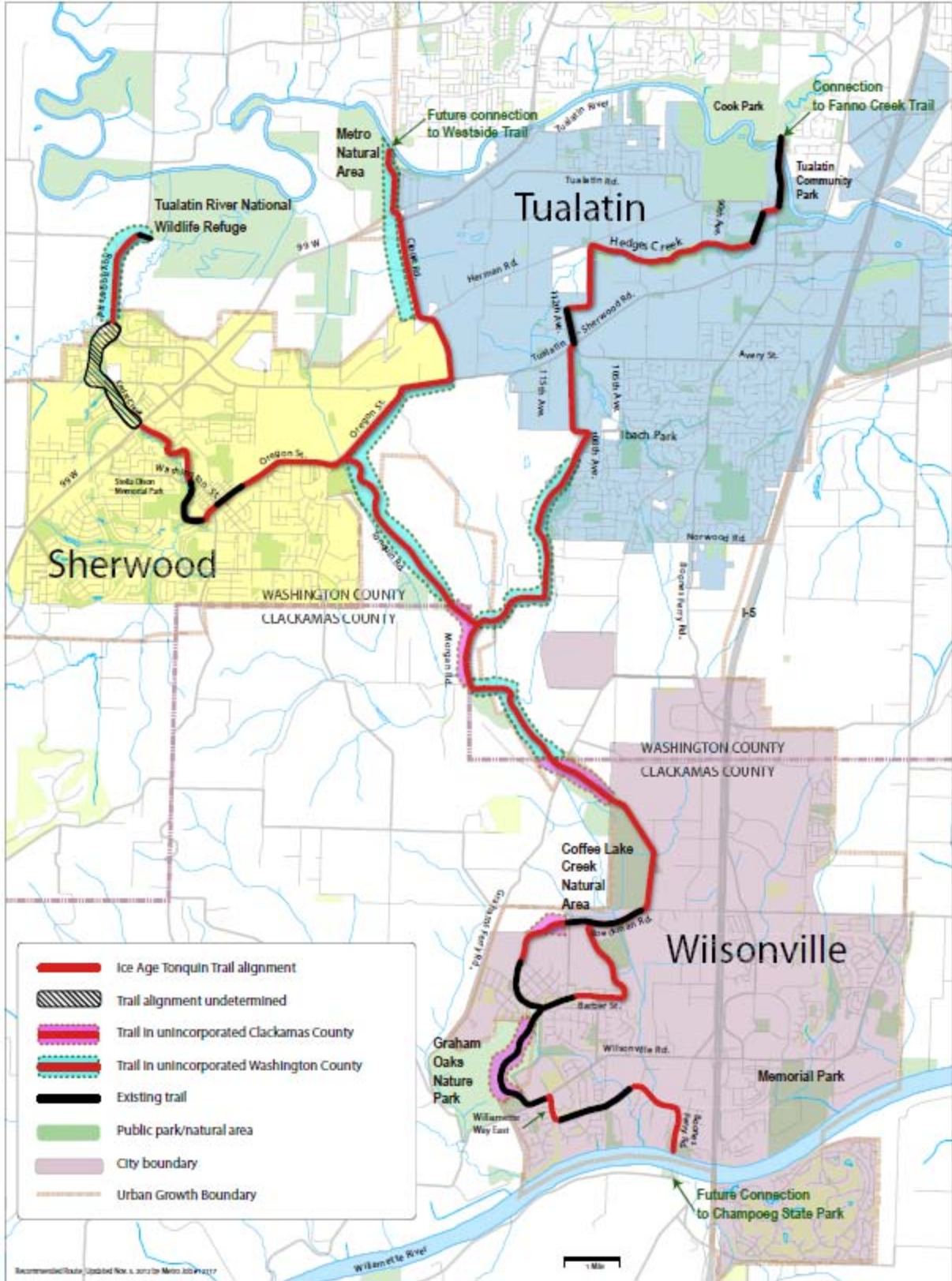


Figure 12 Proposed Trail Alignment from Metro’s Ice Age Tonquin Trail Master Plan, 2013.

Groundwater Hydrology

The Basalt Creek planning area falls primarily in the Middle Willamette Sub Basin, with a very small section in the northeast corner falling in the Tualatin Sub Basin (Figure 13). Within the Middle Willamette Sub Basin, the planning area is predominately in the Abernethy Creek Watershed (the small portion in the Tualatin Sub Basin is in the Fanno Creek Watershed). Abernethy Creek flows for approximately 16 miles through the hills east and north of Oregon City, joining the Willamette River from the east. The total drainage area of Abernethy Creek is 30 square miles.¹³

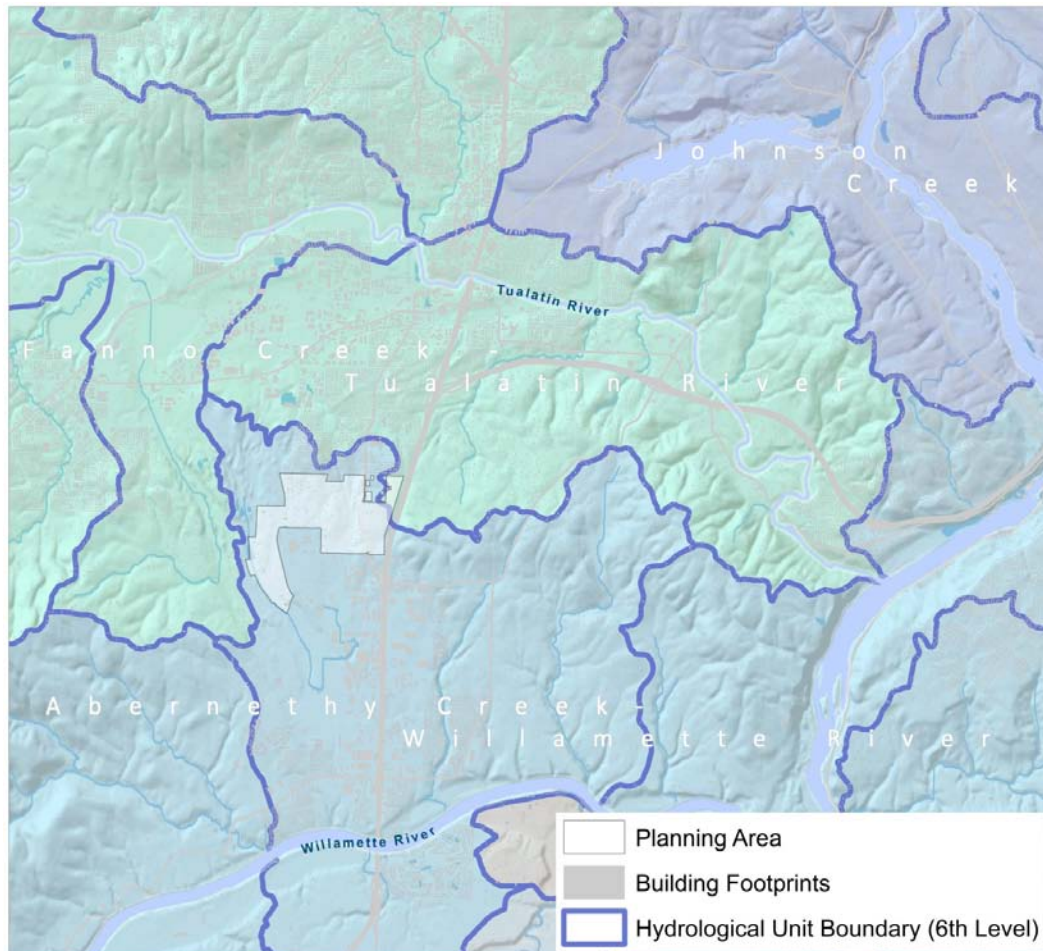


Figure 13 Basalt Creek planning area in the context of the Middle Willamette and Tualatin River Watersheds. Source: Fregonese Associates, RLIS 2014.

Soils

Hydrologic soils are assigned a letter designation of A, B, C or D, based on the rate of water transmission through the soil, or how well the soil drains. Class A soils have the best infiltration and drainage. Class B soils will infiltrate water into the soil somewhat quickly and drain marginally well. They have a lower

¹³ Flood Insurance Study for Clackamas County, Oregon, Vol. 1 (2008)
<http://oregonriskmap.com/index.php/mappingtools/all-downloads/pdf/37-clackamas-co-fis-vol1/file>

runoff potential. Class C soil infiltrates fairly poorly and drains poorly. Class D soils infiltrate water into the soil very slowly and have correspondingly high runoff potential. There is no Class A soil in the planning area (Figure 14). Well-drained soils comprise 85% of the area and 13% of the area is comprised of poorly draining soils. The remaining 1.7% is split between moderately well- and somewhat-poorly drained soils.

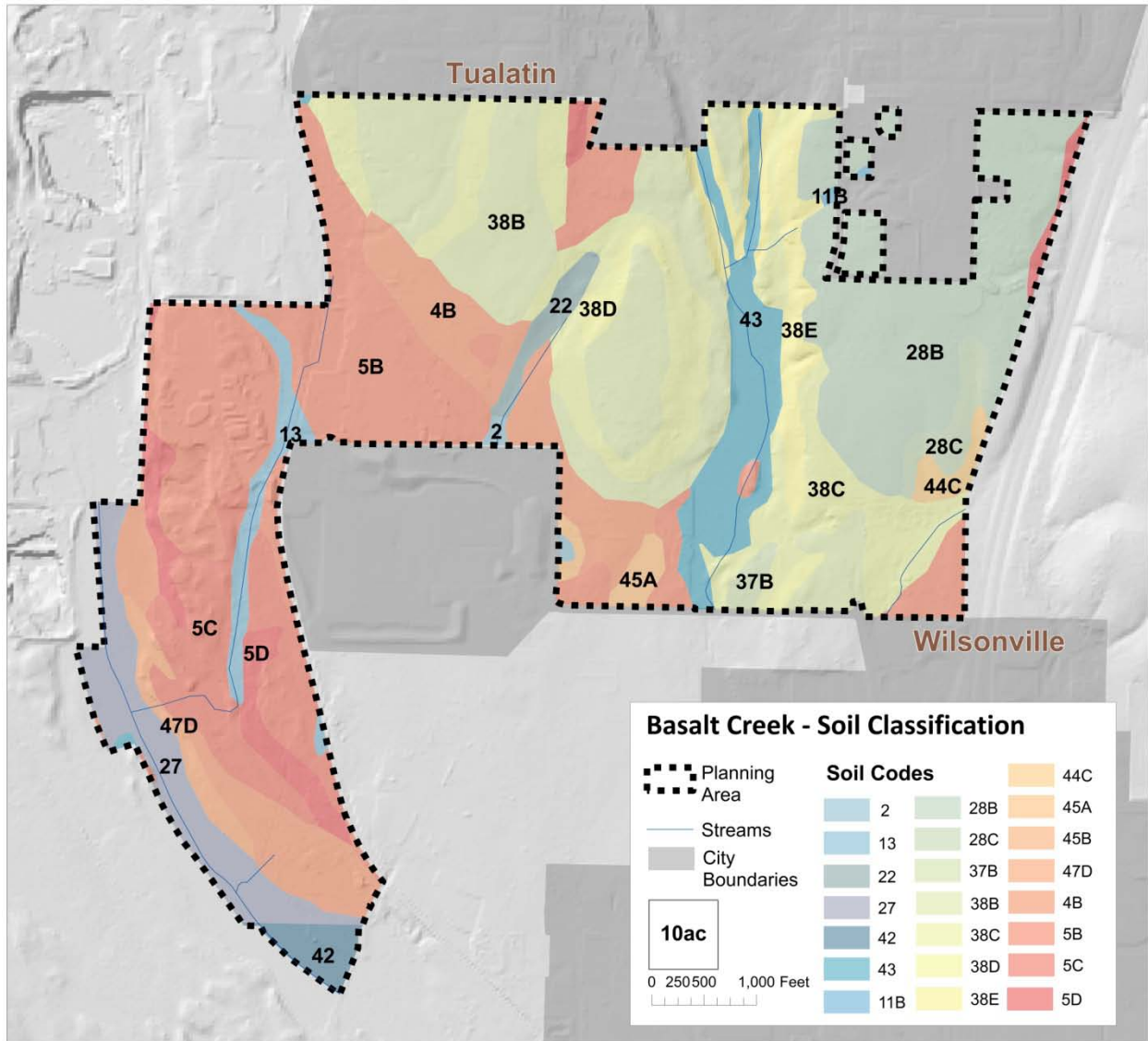






















Figure 14 Hydrologic Classification of Soils in the Basalt Creek planning area. Source: Fregonese Associates, USDA Soil Survey 2014.

Table 2 Descriptions of Hydrologic Soil Classifications from Figure 14. Source: USDA Soil Survey 2014.

Map Symbol	Soil Code	Soil Description	Acres	% of Planning Area	Drainage
	2	Amity silt loam	1.9	0.2%	Somewhat poorly drained
	13	Cove silty clay loam	15.2	1.8%	Poorly drained
	22	Huberly silt loam	8.2	1.0%	Poorly drained
	42	Humaquepts, ponded	7.5	0.9%	Poorly drained
	43	Wapato silty clay loam	41	4.8%	Poorly drained
	11B	Cornelius and Kinton silt loams, 2 to 7 percent slopes	0.9	0.1%	Moderately well-drained
	28B	Laurelwood silt loam, 3 to 7 percent slopes	109	12.9%	Well-drained
	28C	Laurelwood silt loam, 7 to 12 percent slopes	10.4	1.2%	Well-drained
	37B	Quatama loam, 3 to 7 percent slopes	4	0.5%	Moderately well-drained
	38B	Saum silt loam, 2 to 7 percent slopes	131.5	15.5%	Well-drained
	38C	Saum silt loam, 7 to 12 percent slopes	102.7	12.1%	Well-drained
	38D	Saum silt loam, 12 to 20 percent slopes	12.1	1.4%	Well-drained
	38E	Saum silt loam, 20 to 30 percent slopes	30.1	3.6%	Well-drained
	44C	Willamette silt loam, 7 to 12 percent slopes	5.7	0.7%	Well-drained
	45A	Woodburn silt loam, 0 to 3 percent slopes	7.2	0.9%	Moderately well-drained
	47D	Xerochrepts-Rock outcrop complex	10.3	1.2%	Well-drained
	4B	Briedwell silt loam, 0 to 7 percent slopes	50.2	5.9%	Well-drained
	5B	Briedwell stony silt loam, 0 to 7 percent slopes	148.7	17.6%	Well-drained
	5C	Briedwell stony silt loam, 7 to 12 percent slopes	55.1	6.5%	Well-drained
	5D	Briedwell stony silt loam, 12 to 20 percent slopes	25.9	3.1%	Well-drained
	Subtotals		839.4	99.1%	

Streams and Wetlands

There are two main streams running through the planning area – Basalt Creek (also known as Seeley’s Creek or Tappin Creek) and an unnamed, intermittent creek to the west. Coffee Lake Creek forms the western boundary of the planning area (Figure 15).

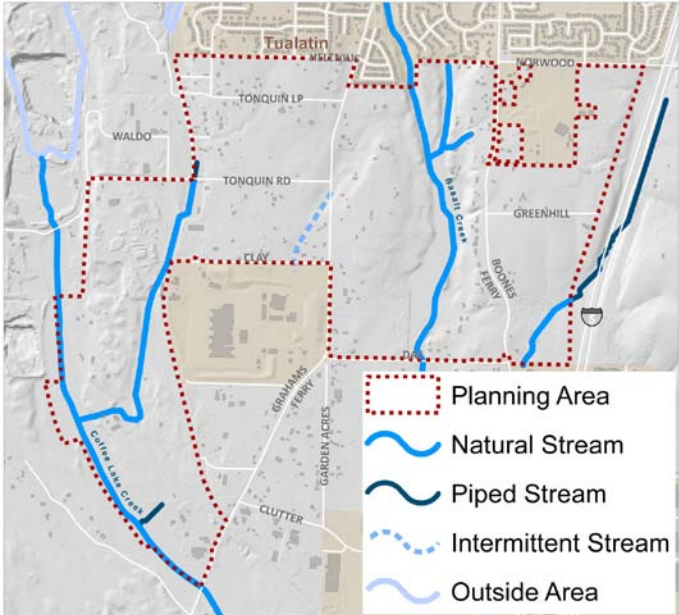


Figure 15 Natural, Underground and Intermittent Streams in Basalt Creek planning area. Source: Fregonese Associates, RLIS, City of Wilsonville field survey 2014.

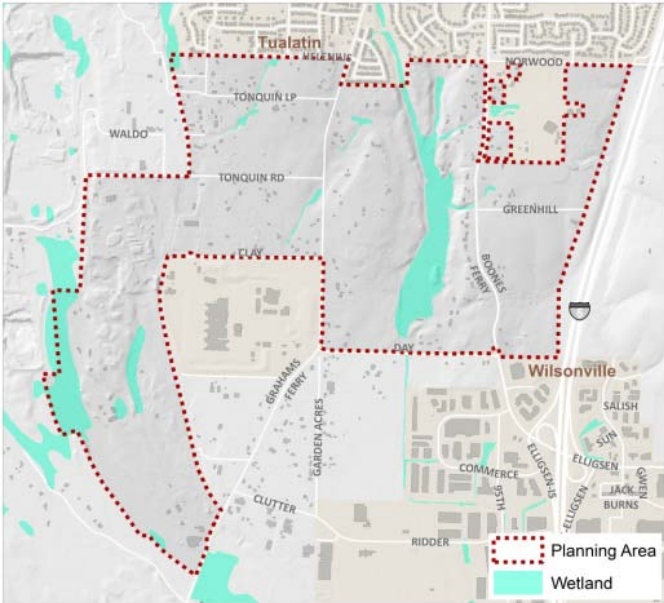


Figure 16 Wetlands in Basalt Creek planning area. Source: Fregonese Associates, RLIS, City of Wilsonville field survey 2014.

Through a combination of RLIS data and field work by the City of Wilsonville it has been determined that there are 11,478 feet of natural streams, 8,157 feet of underground streams and 1,402 feet of intermittent streams in the planning area.¹⁴ In the plan area there are 69 acres of wetlands (8% of the planning area (Figure 16), including 49 acres of open water.

Floodplain

On the western border of the planning area (Figure 17) there are 53 acres of land (6% of the area) around Coffee Lake Creek that are within the 1% annual chance flood event area, as designated by the Federal Emergency Management Agency (FEMA) in a 2005 revision of the Washington County Flood Insurance Study (FIS).¹⁵ The small portion of the planning area within Clackamas County is unaffected by the 1% annual chance flood event area, as identified in the Clackamas County FIS (2008).¹⁶

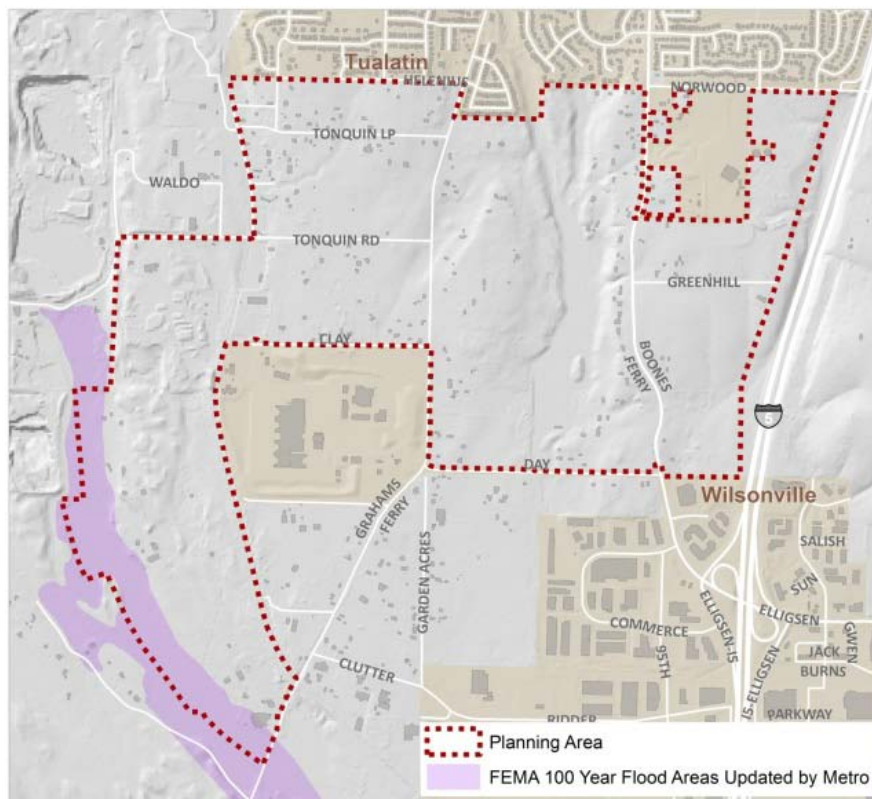


Figure 17 FEMA 1% annual chance flood event area in the Basalt Creek planning area. Source: Fregonese Associates, RLIS 2014, FEMA 2007.

¹⁴ Data sources: RLIS, Wetland Delineation Report for proposed Boones Ferry widening, additional wetlands digitized by FA based on 2013 and 2012 (leaf free) aerials.

¹⁵ In 2005 the original 1980 FIS study was revised to incorporate new floodplain data for Ash Creek, Fanno Creek and Summer Creek in the unincorporated areas of Washington County in response to the largest flood event to occur since 1980, the November 1996 flood along Fanno Creek. Source:

<http://www.oregonriskmap.com/index.php/mappingtools/all-downloads/pdf/174-washington-co-fis-2005-part1/file>

¹⁶ FIS for Clackamas County, Oregon, 2008.

Regulatory Framework for Conserving Natural Resources

Oregon Land Use Goal 5: Natural Resources, Scenic and Historic Areas, and Open Spaces

The purpose of Goal 5 is to protect natural resources and conserve scenic and historic areas and open spaces. It directs local governments to adopt programs that will protect natural resources and conserve scenic, historic, and open space resources for present and future generations. In the Metro region Titles 3 and 13 of Metro's Urban Growth Management Functional Plan provides a regional framework for local governments to implement Goal 5.

Metro Title 3: Water Quality, Flood Management and Fish and Wildlife Conservation

Metro's Title 3 requires local jurisdictions to limit or mitigate the impact of development activities on Water Quality and Flood Management Areas which include wetlands and riparian areas. In 2001 Metro conducted a regional inventory of wetlands and riparian areas protected by Title 3.

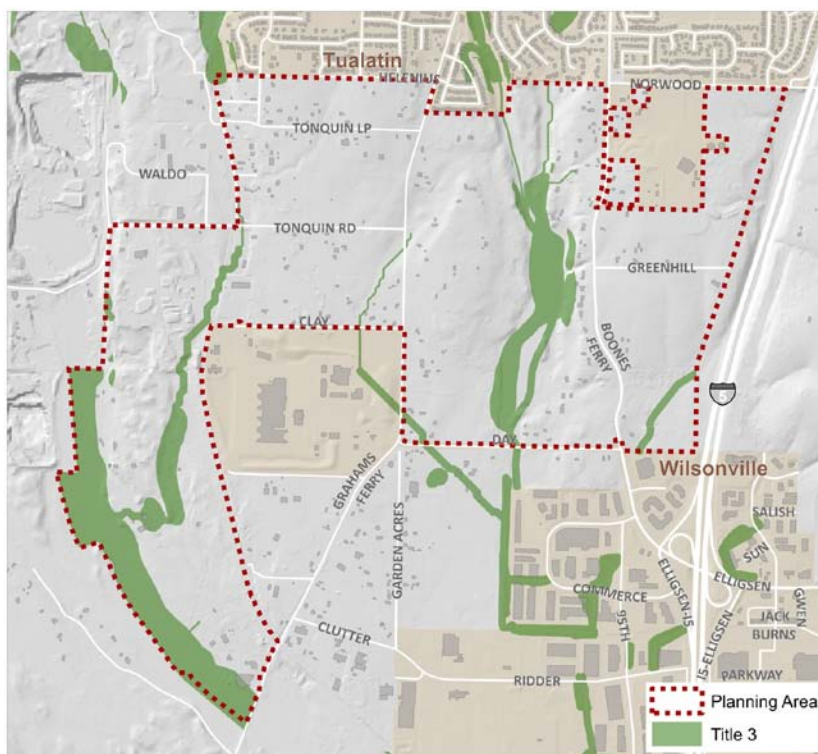


Figure 18 Title 3 lands (116 acres; 14% of total area) in Basalt Creek planning area. Source: Fregonese Associates, RLIS 2014.

There are 116 acres of land in the Basalt Creek planning area that have been designated by Metro as Water Quality and Flood Management Areas under Title 3 (Figure 18). These lands are restricted for development and buffered by a vegetated corridor (the width of which is determined by factors described in the Natural Resources section of this document). Any development within the vegetated

corridor must be mitigated by environmental restoration and/or stormwater retention and water quality measures, as determined by the performance standards described in Metro’s Title 3. Both the City of Wilsonville and Clean Water Services have local ordinances in place that go beyond the level of conservation required by Title 3 and so existing local standards from each City would likely apply upon annexation of a planning area property into either Wilsonville or Tualatin.

Metro Title 13 – Nature in Neighborhoods

Title 13 is a policy requiring local jurisdictions to protect and encouraging them to restore a continuous ecologically viable streamside corridor system integrated with upland wildlife habitat and the urban landscape. In 2001 Metro conducted a regional habitat inventory and identified the location and health of fish and wildlife habitat based on different sets of criteria for waterside, riparian and upland habitat. These areas were named Habitat Conservation Areas (HCAs).

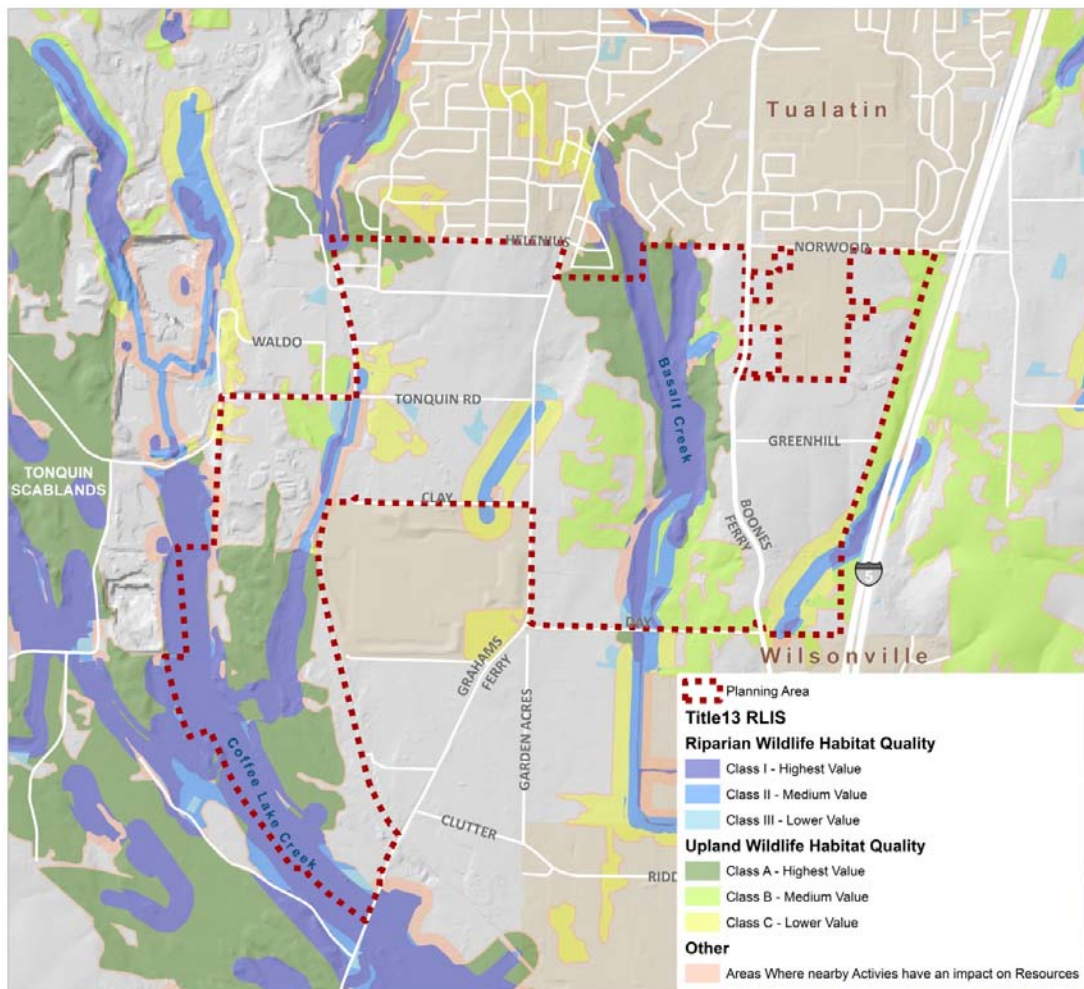


Figure 19 Title 13 lands in the Basalt Creek planning area (431 acres total, 51% of total area).¹⁷ Source: Fregonese Associates, RLIS 2014.

¹⁷ Note that most of these lands, other than Classes I and II of Riparian Habitat, can still accommodate some level of development.

Development is not restricted in HCAs on land that was brought into the UGB before December 28, 2005¹⁸. However, it is strongly encouraged that HCAs are taken into consideration during the concept planning process. Development in areas designated as protected under Title 13 in the Basalt Creek area is generally discouraged. If development does take place incorporation of low impact design and mitigation strategies to maintain the functionality of these important ecological areas will be important.

In the planning area there are 130 acres designated as Riparian Wildlife Habitat Class I, 31 acres designated as Class II, and 7 acres Class III. In addition, 103 acres are designated as Upland Wildlife Habitat Class A, 72 acres are Class B, and 37 acres are Class C (Figure 19). Designated impact areas comprise 52 acres.

Washington County Comprehensive Plan – Rural/Natural Resource Element

No land within the planning area is identified by the Washington County Comprehensive Plan as a Significant Natural Resource. The nearest Significant Natural Resource area is comprised of the Tonquin Scablands, to the west of Coffee Lake Creek.

Clean Water Services Design & Construction Standards (2007)

Clean Water Services (CWS) is the regional agency that manages stormwater in the urban areas of the Tualatin River Watershed, including the entire City of Tualatin. CWS holds a regional National Pollutant Discharge Elimination System (NPDES) storm water permit. *Chapter 3: Sensitive Areas and Vegetated Corridors* describes the methodology used by CWS to determine mitigation requirements in sensitive areas such as vegetated corridors surrounding streams and wetland habitat.

Table 3 Vegetated Corridor Widths Adjacent to the Sensitive Area Where Activity is Not Redevelopment. Source: Clean Water Services Design and Construction Standards, Chapter 3.

Sensitive Area Type	Width: Slope < 25%	Width: Slope ≥ 25%
Existing or created wetlands:		
< 0.5 acres and isolated	25 ft	Variable from 25-200 ft
< 0.5 acres and isolated	50 ft	Variable from 50-200 ft
≥ 0.5 acres	50 ft	Variable from 50-200 ft
Natural lakes, ponds, and in-stream impoundments	50 ft	Variable from 50-200 ft
Springs:		
Intermittent flow	0	15 ft.
Perennial flow	50 ft.	Variable from 50-200 ft
Intermittent Streams draining:		
< 10 acres	0	0
≥ 10 to < 50 acres	15 ft	Variable from 50-200 ft
≥ 50 to < 100 acres	25 ft	Variable from 50-200 ft
≥ 100 acres	50 ft	Variable from 50-200 ft
Perennial Streams:		
Other than Tualatin River	50 ft	Variable from 50-200 ft
Tualatin River	125 ft	Variable from 50-200 ft

¹⁸ Metro Title 13: Nature in Neighborhoods 2007, S3.07 P85.

These standards exceed the level of conservation required by Metro’s Title 3 (Table 3). Permitted development must comply with CWS’s Design and Construction Standards & Service Provider Letters (SPLs) for impacts to vegetated corridors.

City of Wilsonville – Significant Resource Overlay Zone (SROZ)

Within the City of Wilsonville, the Significant Resource Overlay Zone (SROZ) includes floodplains, wetlands, and riparian corridors around significant resources and upland habitat, as well as vegetated corridors around areas designated as Significant Resources. Impact areas are generally considered to be the areas within 25 feet of a Significant Resource area. Development is allowed in portions of the SROZ (i.e. upland forests), but can only be permitted through review of a Significant Resource Impact Report (SRIR). An SRIR is a report that delineates specific resource boundaries and analyzes the impacts of development within mapped significant resource areas.¹⁹ A table comparing these methodologies can be found in Section VIII: *Land Capacity Analysis*.

Table 4 Metro Water Quality Resource Area Slope Calculations. Source: Metro 2014.

Protected Water Feature Type	Slope Adjacent to Protected Water Feature	Starting Point for Measurements from Water Feature	Width of Vegetated Corridor (Setback)
Primary Protected Water Features	< 25%	Edge of bankful flow or 2-year storm level; Delineated edge of Title 3 wetland	50 ft
Primary Protected Water Features	≥ 25% for 150 ft or more	Edge of bankful flow or 2-year storm level; Delineated edge of Title 3 wetland	200 ft
Primary Protected Water Features	≥ 25% for less than 150 ft	Edge of bankful flow or 2-year storm level; Delineated edge of Title 3 wetland	Distance from starting point of measurement to top of ravine (break in ≥ 25% slope), plus 50 ft
Secondary Protected Water Features	< 25%	Edge of bankful flow or 2-year storm level; Delineated edge of Title 3 wetland	15 ft
Secondary Protected Water Features	≥ 25%	Edge of bankful flow or 2-year storm level; Delineated edge of Title 3 wetland	50 ft

¹⁹ Full requirements for an SRIR can be found in Section 4.139.05 of the Wilsonville Zoning Code (pp. B-133 - 138). Section 4.139 also outlines mitigation standards for development encroaching on an Impact Area or Significant Resource Overlay Zone as well as development activities that would trigger a Class I or II Administrative Review Process, in addition to a list of special provisions.

Cultural and Historic Resources

In addition to the unique geologic history of the Basalt Creek area, community members have identified the old Carlon Schoolhouse (Figure 20) as being historically significant. Off Grahams Ferry Road, behind Chick-a-Dee Nursery and not far from Day Road, the structure has often been overlooked as an important historic school that was used in the late 1800s, up until just before the first Tualatin schools. In 1939, the Carlon School District consolidated with Tualatin. It is still in good condition, maintained through a foundation.²⁰



Figure 20: The Carlon Schoolhouse. Source: Martinazzi, Loyce. Tualatin Life Newspaper August 19, 2014.

²⁰ Addington, Yvonne, Board Member of Tualatin Historical Society. Email communication, August 19th, 2014.

IV. Public Facilities

Schools

The study area falls within the Sherwood School District (88J), which has an estimated enrollment of 5,158 and includes four elementary schools, two middle schools, Sherwood High School, and Sherwood Charter School (Figure 21).

The planning area is near Tualatin High School, one of two high schools in the Tigard Tualatin School District. The district includes three middle schools and ten elementary schools. It serves 12,363 students overall. Horizon Christian High School (private) has 160 students enrolled on their campus with a vision of serving up to a 1,000 students in the future.²¹

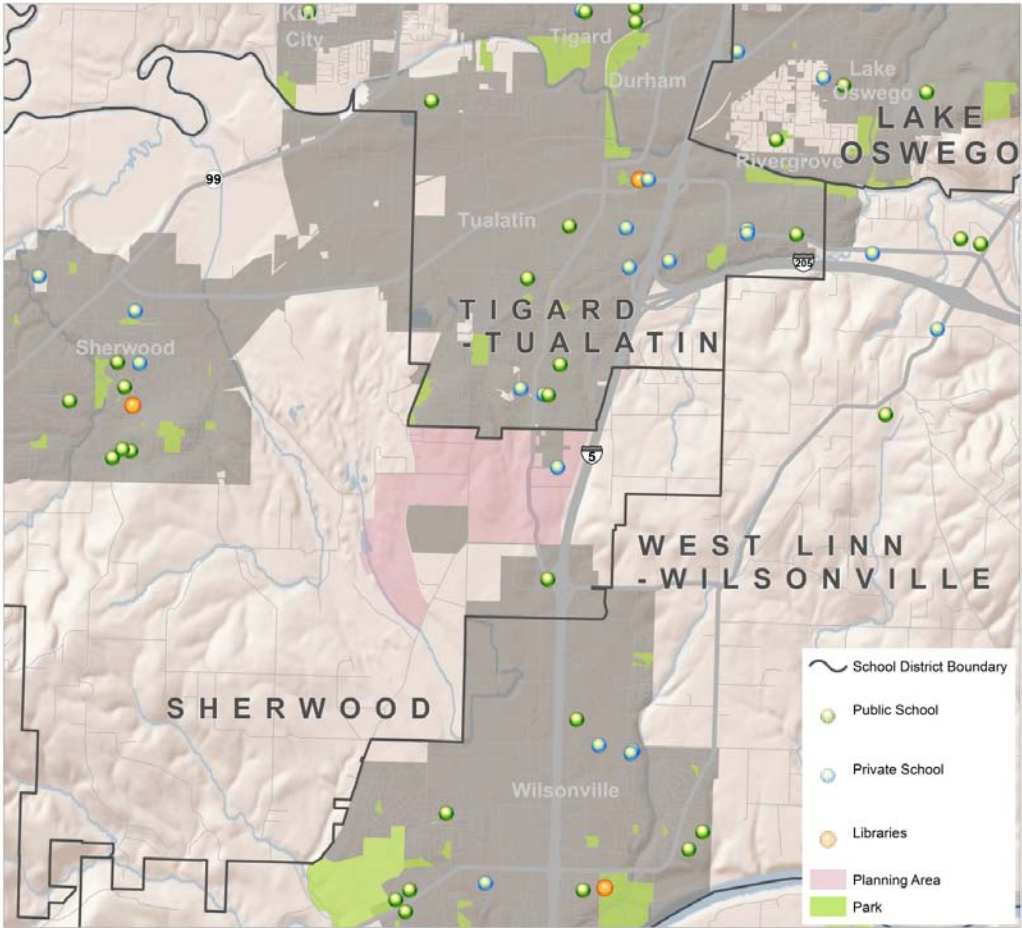


Figure 21 Schools, libraries and parks near the Basalt Creek planning area. Source: Fregonese Associates, RLIS 2014.

²¹ Levasa, Roger. Director of Development for Horizon Church. Personal communication July 31st, 2014.

Parks

Wilsonville Parks owns and maintains 16 different public parks. City of Tualatin Parks and Recreation owns and maintains 9 different parks (Figure 21).

Libraries

There are three libraries in the general vicinity of the planning area (Figure 21): the Tualatin Public Library located at 18878 SW Martinazzi Avenue, serving 24,420 residents, the Wilsonville Public Library located at 8200 SW Wilsonville Road, and the Sherwood Public Library at 22560 SW Pine Street, which serves 17,579 residents.

Fire

There are three Tualatin Valley Fire & Rescue (TVF&R) stations in general proximity of the Basalt Creek area (Stations 33, 34, 52). The TVF&R training center is just west of the planning area boundary (Figure 22).

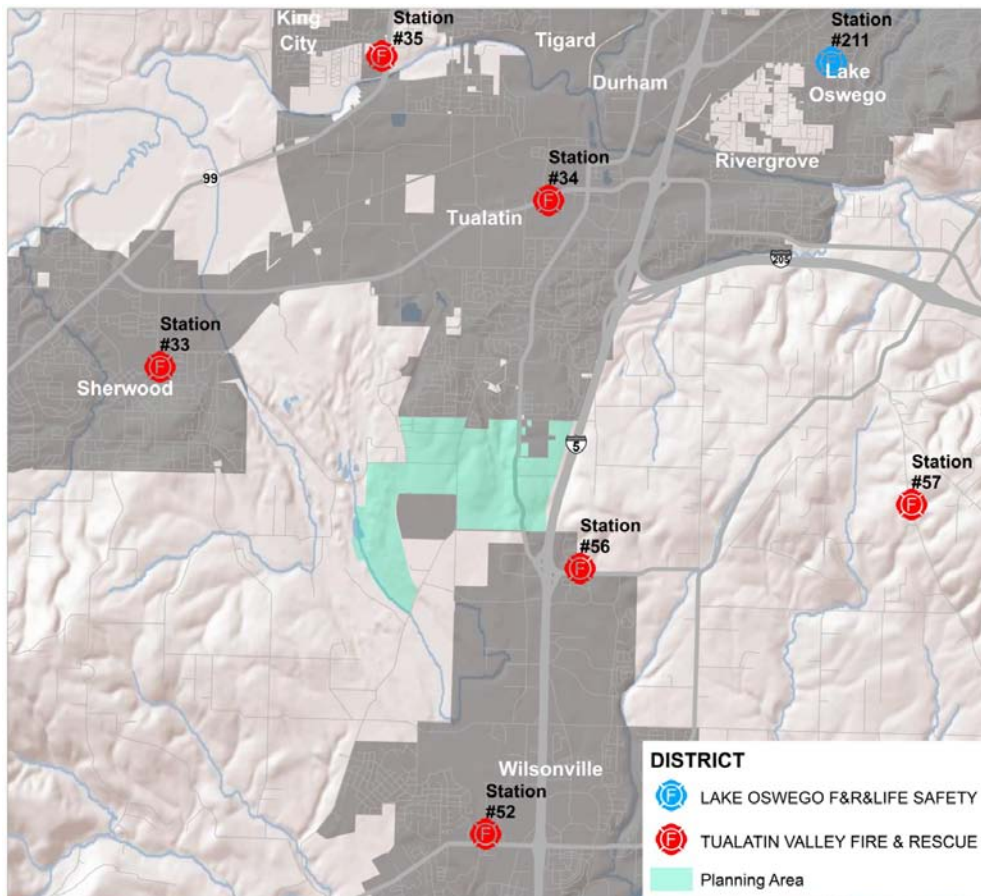


Figure 22 Fire station locations and service area boundaries near the Basalt Creek planning area. Source: Fregonese Associates, RLIS 2014.

Police

Currently the Washington County Sheriff's Office provides law enforcement services in the Basalt Creek planning area. The Washington County Sheriff's Department and Jail are located about twenty miles from the planning area, in downtown Hillsboro.

Wilsonville contracts with the Clackamas County Sheriff's Office to provide law enforcement services to the City. The contract makes certain special services available to the City as well, including its detectives division, hazardous materials team, special investigations unit and traffic team. It also provides the city with a dedicated chief of police, school resource officer, and detective, in addition to 15 deputies. The Clackamas County Jail facility is located about 20 miles east of Wilsonville, in Oregon City.

The Tualatin Police serve the area inside the city's limits. The police department consists of 38 sworn officers and an additional 8.5 professional staff members providing administrative support.²² The department includes a detective unit, police services unit, school resource unit, Honor Guard (volunteer-based), park rangers, police reserves and a traffic team. The Tualatin Police Department does not have a facility to hold prisoners, and utilizes the Washington County Jail in Hillsboro.

²² Tualatin Police Department Website: <http://www.tualatinoregon.gov/police/police-services-unit> retrieved July 31st, 2014.

V. Commercial, Industrial & Residential Real Estate Markets

The purpose of this section is to provide a picture of existing real estate market conditions and the outlook for office, residential, and retail development in Basalt Creek and adjacent areas.



Figure 23 Photo of planning area: Grahams Ferry Road, looking north into the Basalt Creek planning area. Source: Leland Consulting Group 2014.

Industrial and Office Market

Basalt Creek is located near the center of one of the region's largest clusters of employment land, which includes existing developed areas in the cities of Tualatin, Wilsonville, and Sherwood, as well as the planned future employment areas of Southwest Tualatin, Tonquin, and Coffee Creek). A market area was defined for this report so results can be compared with future analysis (Figure 24). The market area includes the cities of Tualatin, Wilsonville, and Sherwood, as well as some surrounding areas.

The Metro Regional Government projects rapid employment growth of 2.3% annually for the market area through 2035—about 40% faster than the employment growth in the overall region (1.7%). This pattern indicates that ongoing business expansion and job creation is expected for these three cities, comprising a large portion of the southwestern metropolitan area.

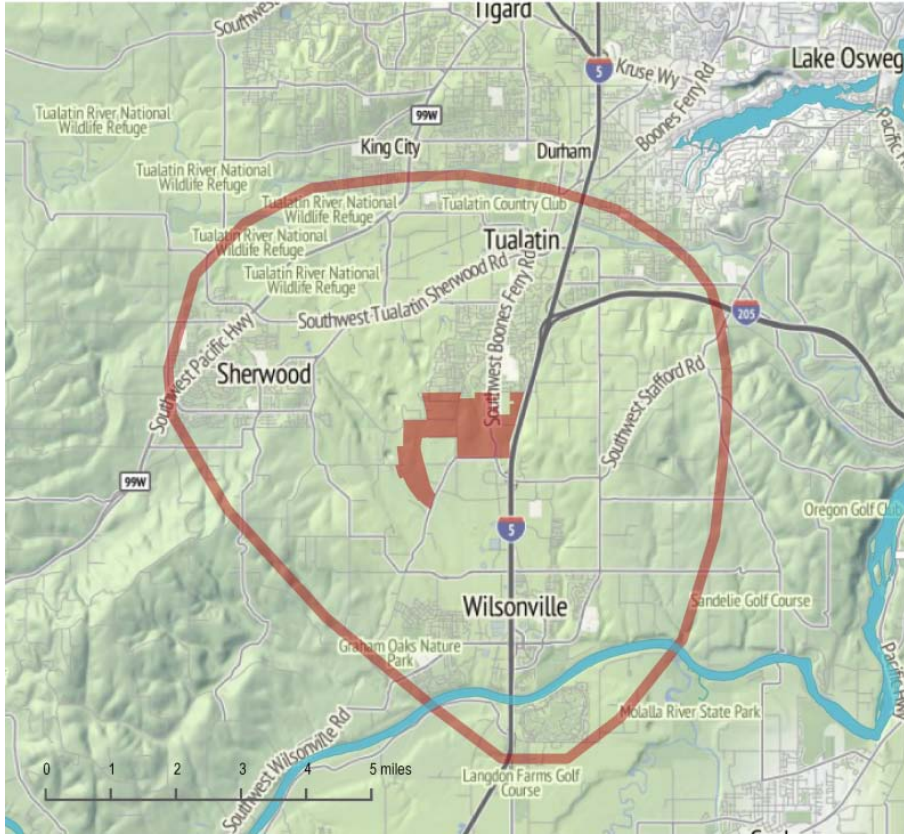


Figure 24 Market Analysis Area for the Basalt Creek area. Source: Leland Consulting Group, 2014.

Tualatin and Wilsonville have independently identified a series of industry clusters in which the two cities are already highly competitive, and in which they expect future significant business and job growth. These include advanced manufacturing, corporate and professional services, health care and related fields, and other specific industrial clusters such as food processing and light manufacturing. Leading organizations within these clusters include Lam Research, Legacy Meridian Park Medical Center, the Oregon Institute of Technology, Mentor Graphics, and Xerox Corporation. Businesses in these categories would be well-suited to locate in the Basalt Creek planning area.

Both Tualatin and Wilsonville have seen significant industrial and office development during the past three decades. Development peaked during the 1990’s and has slowed following the recession; however, industrial development in particular is expected to resume and accelerate in coming years due to a desire to “onshore” jobs (bring employment back from overseas), shorten supply chains, and take advantage of lower domestic costs in some industries. Between 1980 and 2014, the cities of Tualatin and Wilsonville saw on average over 400,000 square feet of industrial and office building development annually, and 56.6 acres of industrial and office land development annually. The amount of industrial development (including warehousing, production, flexible office/industrial space, etc.) in both cities is significantly larger (more than seven times) than the amount of office development. This general dynamic is expected to persist for the foreseeable future.

Building types vary significantly within the market area: some industrial facilities contain more than 200,000 square feet of building area, while many other small office and industrial flex spaces are less than 20,000 square feet in size. The floor area ratio (FAR) of most buildings, however, generally falls within the range of 0.2 to 0.4, which generally indicates one- to three-story buildings with large areas for parking and/or freight movement. A small number of office buildings have higher FARs up to about 1.0, which indicates more dense buildings and some structured parking.

Going forward, employment development in the Basalt Creek area will benefit from a number of competitive advantages. These include its direct access to I-5, superior to other employment areas in the region; access to I-205, Highway 217, arterial roads, and transit service; a growing and educated workforce; and established and expanding industry clusters.

Housing Market

Basalt Creek's location is also an asset for residential development for housing: the planning area is immediately south of several South Tualatin residential neighborhoods, which contain attractive parks, street trees, and schools. The market area's current demographics are encouraging for new housing development. When compared to the Portland Metropolitan Area overall, this market area has a higher percentage of family households, larger households, higher household and per capita incomes, residents with college degrees, and residents who work in white collar jobs.

Retail/Commercial Market

There are already several major regional and sub-regional retail nodes located to the north and south of the planning area—at Bridgeport Village, central Tualatin, and in Wilsonville. Thus any commercial space built in Basalt Creek will most likely serve primarily local residents and employees. These larger centers are located at I-5 interchanges. Retail in the Basalt Creek area would not have this same advantage. Whereas regional retail is anchored by fashion, consumer electronics, entertainment, and furniture/household goods, neighborhood retail is typically anchored by grocery stores, pharmacies and restaurants, and supplemented by other local goods and services.

Industrial and Office Market Conditions

Regional Employment Context

As discussed in *Section I: Local and Regional Planning Context*, Basalt Creek is contiguous with a number of other employment and industrial areas in the southwestern part of the Portland Metropolitan Region, including those in the cities of Tualatin, Wilsonville, and Sherwood. Viewed together, these areas comprise one of the largest industrial and employment clusters in the region, comparable in size to the agglomeration in northern Hillsboro (though smaller than the employment lands near Portland International Airport).

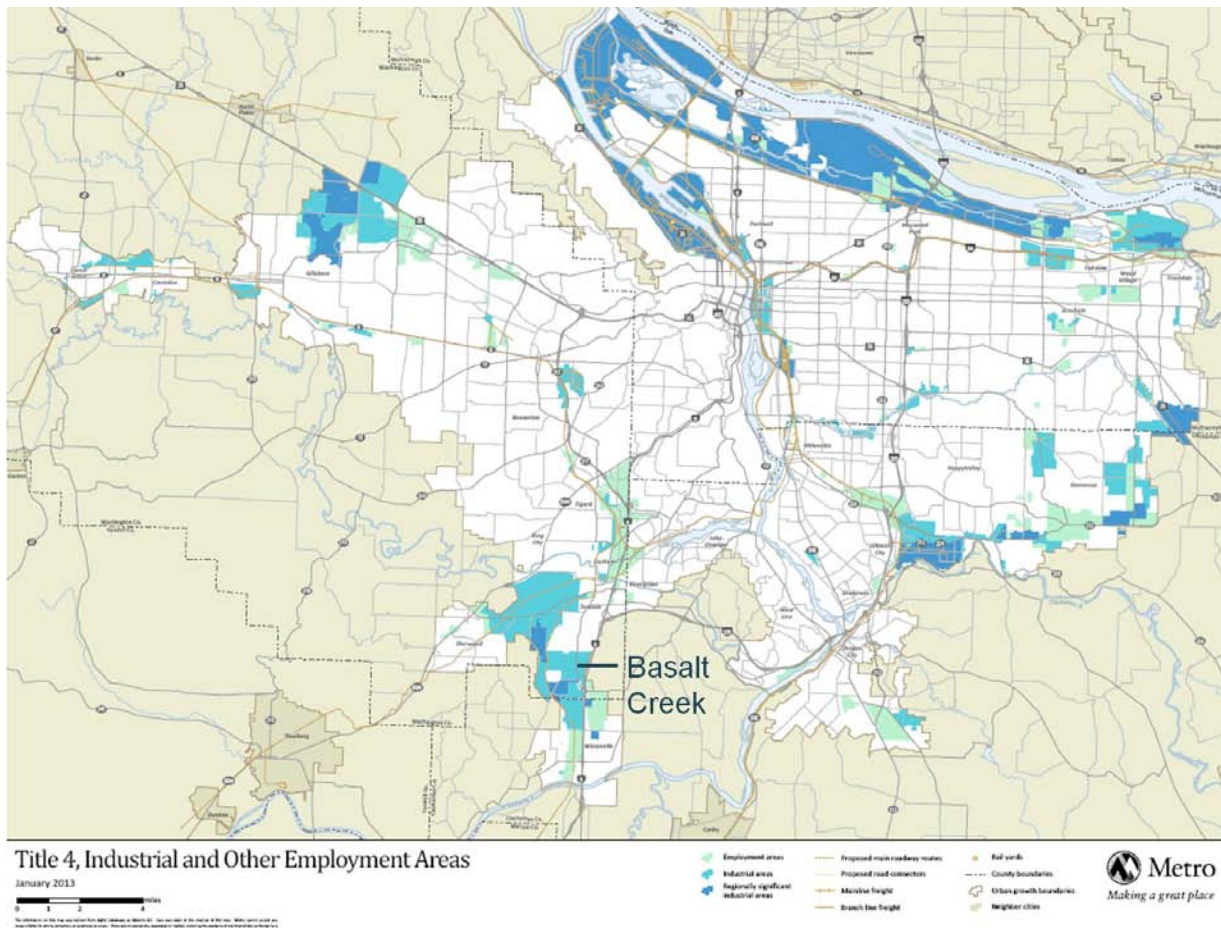


Figure 25 Title 4 Industrial and Other Employment Areas in Portland Metro Area. Source: Metro 2014.

A major feature and competitive advantage of this “Southwest Metro” employment cluster in general--and the Basalt Creek area in particular--is its immediate access to I-5, the west coast’s most important transportation route (Figure 25). Via I-5, the Basalt Creek area is closely connected to downtown Portland, numerous Willamette Valley communities, and major metropolitan areas in Washington and California. Interstate-205 and Highway 217 are also close by and easily accessible from the area. These freeway connections are a major benefit for industrial users (for whom distribution is an important site selection factor) and office-based businesses (which require access for their clients, suppliers, workforce, and collaborators).

Industrial and Office Development, 1980 to 2014

Figure 26 and Figure 27 below show the pace of industrial and office development in the cities of Tualatin and Wilsonville beginning in 1980. The vertical columns represent the building area (square feet) of development within each of the two cities in a given year, while the dashed line is a longer-term trend line, showing a five-year rolling average of built area for both cities combined. These historical

development trends are one data set that shapes expectations for future employment development in both cities and the Basalt Creek planning area.

Since 1980, both cities have seen considerably more industrial development than office development. Over this 34-year period, an average of 340,000 square feet of industrial space and 67,000 square feet of office space has been built in the two cities combined. Thus, the amount of industrial development has been about five times as great as office development.

Industrial Development, Tualatin and Wilsonville, 1980 - 2014

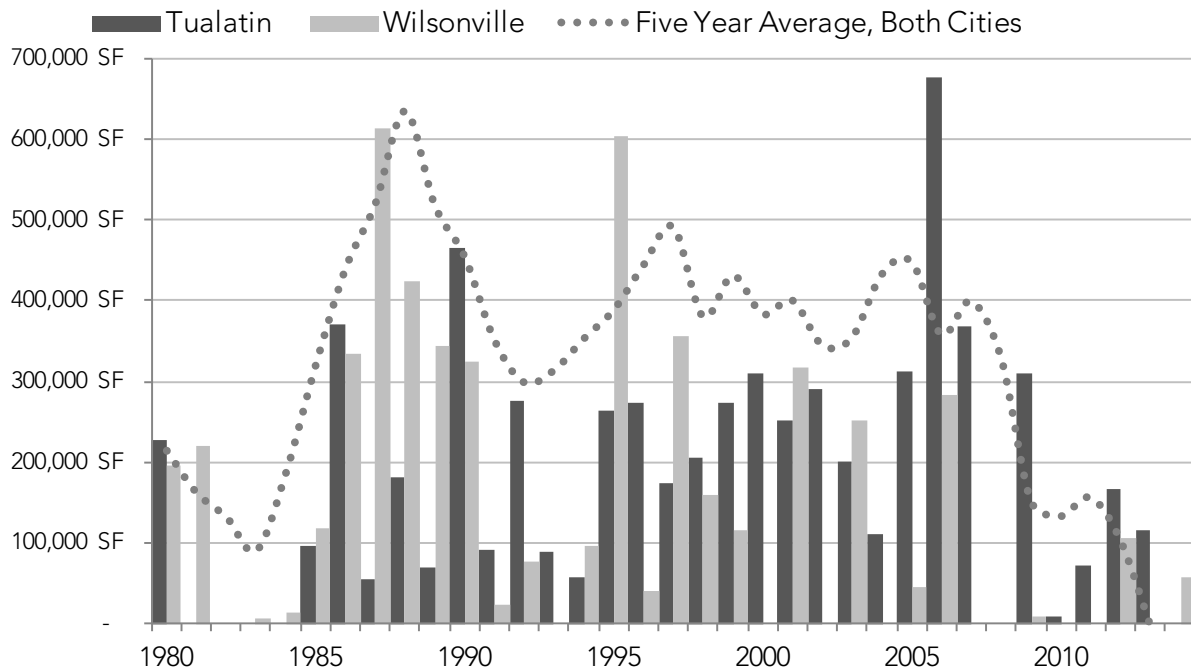


Figure 26 Industrial Development, Tualatin and Wilsonville, 1980 to 2014. Source: CoStar, Leland Consulting Group, 2014.

Office Development, Tualatin and Wilsonville, 1980 - 2014

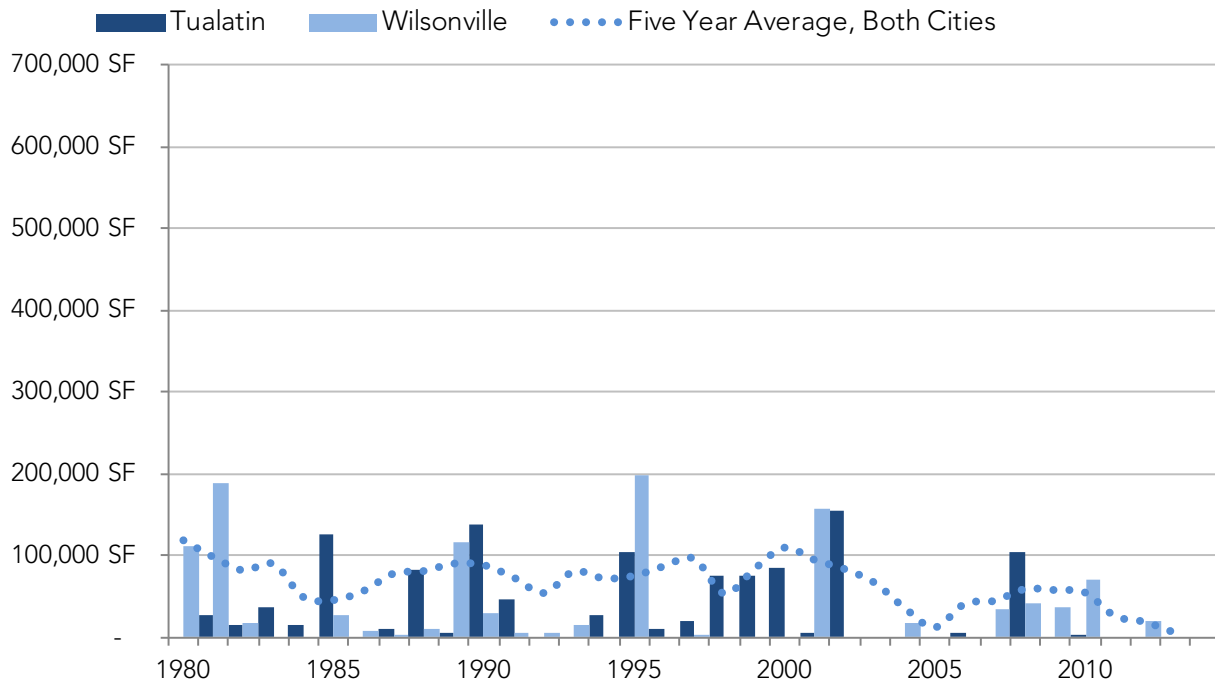


Figure 27 Office Development, Tualatin and Wilsonville, 1980 to 2014. Source: CoStar, Leland Consulting Group, 2014.

The past decade has been a slow period for both industrial and office development. The recession slowed industrial development beginning in 2008, particularly in Wilsonville. The pace of recent industrial development has been about half of development during the 1990s and early 2000s—considered to be a time of robust activity for industrial developers (see Figure 26). Office development has also slowed, although this trend began in 2003, before the recession. Office development in the past decade has also taken place at about half the pace of office development in the 1990s (Figure 27). Clearly, both industrial and office development go through significant peaks and troughs. By focusing on the five-year rolling-average trend line, however, a somewhat more consistent pattern of development can be seen.

Employment Building and Site Attributes

Table 5 shows some key attributes of industrial and office development in Tualatin and Wilsonville. From looking at these attributes, it can be determined that:

- On average, 43.1 acres of industrial land and 13.6 acres of office land per year have been developed in both cities combined. Wilsonville has seen about 25 acres of employment land development per year, 16.3 acres of industrial land, and 8.3 acres of office land. Tualatin has seen about 32 acres of employment land development per year, 26.8 acres of industrial land, and 5.3 acres of office land. Employment land in Basalt Creek is likely to develop more slowly than this pace because there is less

developable land in the study area than the cities as a whole. However, development in Tualatin and Wilsonville can be used to gauge the rate of employment land development in Basalt Creek.

- Average industrial building sites (9.1 and 6.5 acres in Tualatin and Wilsonville respectively) tend to be larger than office building sites. Industrial buildings also tend to be larger than office buildings. Floor area ratios (FAR) are helpful to understanding the physical form of buildings on their sites. Most industrial buildings have a FAR of 0.2 to 0.4. Most office buildings have FARs between 0.3 and 0.5; however, there are some newer office buildings in Tualatin that feature structured parking and FARs up to 1.0. These FARs are consistent with Metro’s analysis and future projections.

Table 5 Attributes of Industrial and Office Development in Tualatin and Wilsonville. Source: CoStar, Leland Consulting Group 2014. SF: Square feet; FAR: Floor area ratio, the ratio of a building’s size in square feet (or gross building area) to the size of the piece of land upon which it is built.

	Industrial			Office		
	Tualatin	Wilsonville	Total	Tualatin	Wilsonville	Total
Total Area (SF)	10,470,000	8,390,000	18,860,000	1,260,000	1,250,000	2,510,000
Av. Annual Development, 1980 - 2014						
<i>Square Feet</i>	186,960	150,980	337,940	34,632	32,985	67,617
<i>Acres</i>	26.8	16.3	43.1	5.3	8.3	13.6
Building Averages, 2000 - 2014						
<i>Square Feet</i>	60,224	80,000	-	31,807	35,000	-
<i>Acres</i>	9.1	6.5	-	4.2	2.0	-
Typical Floor Area Ratios (FAR)	0.2 to 0.4	0.2 to 0.4	-	0.4 to 1.0	0.3 to 0.5	-

It is of note that, while the averages shown here are useful for high-level planning purposes, both industrial and office buildings vary considerably in size, scale, and purpose. For example, the industrial building category includes flex buildings, which can often be divided into 5,000 square foot tenant spaces and feature significant amounts of office and showroom space. The industrial category also includes distribution and warehouse buildings, which can be hundreds of thousands of square feet in size. Sample industrial and office buildings are pictured below in Figures Figure 28, Figure 29 and Figure 30.

Typical Industrial Buildings: Office/Distribution and Flex

The first building pictured below (Figure 28) is located in the Wilsonville Business Center west of I-5 and contains a mix of office space (left foreground) and warehouse/distribution space, where freight trucks are parked. The second building pictured below (Figure 29) is a typical flex industrial building located in the Tualatin Industrial Center, which features high ceiling heights, freight loading, and small, flexible spaces that can serve as a combination of office, showroom, and/or industrial.



Figure 28 Example of typical building with a mix of office space and warehouse/distribution space.



Figure 29 Example of typical flex industrial building, located in Tualatin.

Headquarters Office Building (Mentor Graphics)

The Mentor Graphics building (Figure 30) is located east of I-5 between the Elligsen Road and Wilsonville Road interchanges. Despite its size and height, the FAR of the building is similar to other buildings in the area because of its extensive campus, landscaped areas, and surface parking.



Figure 30 Mentor Graphics Headquarters Office Building in Wilsonville.

Office Development Outlook

Office development—nationally and regionally—is not expected to bounce back from the recession with the same resiliency as industrial space. Office development in the short- and long-term faces several challenges. In the short-term, the Portland region’s employment levels have just recovered in 2014 to their pre-recession (2008) levels. While office vacancies are far lower than several years ago, there is not yet market pressure for new development. As Table 6 shows, the region is expected to add just 288,000 square feet of office in 2014, or 0.6% of the total regional inventory of nearly 47 million square feet. Tualatin’s current vacancy rate of 20.5% suggests a soft market, though that space will be occupied in the long term. The market is expected to improve as the region and nation continue to recover from the recession, and businesses grow and add jobs. However, office development is not expected to return to levels seen in the 1990s without a major upturn in the economy.

Table 6 Current Office Market Summary, Portland Metro Region. Source: CoStar, Leland 2014.

Market	Existing Inventory		Vacancy	YTD Net	Under Const. &	Class A
	# Blds	Total RBA	%	Absorption	Complete YTD	Rates
Portland CBD	374	26,309,983	10.0%	(36,157)	288,000	\$25.58
Lake Oswego/West Linn	142	1,144,080	8.5%	13,170	0	\$25.50
North Beaverton	151	3,246,113	6.7%	37,420	0	\$26.33
Sunset Corridor/Hillsboro	359	10,374,721	6.2%	111,442	0	\$21.53
Tigard	226	3,313,116	10.4%	35,859	0	\$24.27
Tualatin	68	1,263,266	20.5%	10,099	0	\$22.28
Wilsonville	59	1,252,446	7.1%	9,476	0	\$20.50
Totals	1,379	46,903,725		181,309	288,000	

Tualatin and Wilsonville’s Economic Positioning and Goals

The Cities of Tualatin and Wilsonville are proactively pursuing economic development in order to provide high paying jobs for their residents, strengthen their tax bases, offer quality public services, and enable general prosperity in the communities. The two Cities’ main economic development plans relevant to Basalt Creek are shown in Table 7 below.

Table 7 Relevant Economic Development Plans. Source: Cities of Tualatin and Wilsonville.

Tualatin	Wilsonville
<ul style="list-style-type: none"> • Economic Development Strategic Plan (2014) • Industry Cluster Analysis (2014) • Linking Tualatin Market Study (2012) • Southwest Tualatin Concept Plan (2010) 	<ul style="list-style-type: none"> • Economic Development Strategy (2012) • Coffee Creek Master Plan (2007)

Target Industry Clusters

Tualatin and Wilsonville have both identified a series of targeted industry clusters. According to Tualatin's Industry Cluster Analysis, a cluster is an agglomeration of similar and related businesses and industries that are mutually supportive, regionally competitive, attract capital investment, encourage entrepreneurship, and create jobs. For example, 57% of Tualatin's jobs fall within its five key industry clusters, which also provide wages that are on average 70% (\$35,000) higher than those in all other industries.

Clusters reflect a community's strengths and competitive advantages, suggest which sectors of the economy are most likely to generate jobs in the future, and provide policy makers with guidance about the types of land, buildings, infrastructure improvements, and other actions needed to grow jobs in the future.²³

Both Tualatin and Wilsonville have determined that they excel in the following three industry clusters²⁴:

Advanced Manufacturing (and related activities)

This cluster is a significant driver of both cities' economies. It is Tualatin's largest cluster, accounting for 22% of jobs in the city. It accounts for a significant portion of Wilsonville's economy; computer and electronic product manufacturing was Wilsonville's largest industry sector as of 2012, and includes several of the city's largest employers such as Xerox, TE Connectivity, and Rockwell Collins.

The Oregon Institute of Technology (OIT), now educating students in the engineering, technology, management, and health sciences fields from its Wilsonville campus, is an important anchor institution for the Southwest Metro economy. The Cities are looking for ways to capitalize on OIT's presence and to strengthen partnerships between the school and private businesses.

Growth in this cluster will result in ongoing demand for industrial land and buildings in Basalt Creek and other areas. Freeway access, freight mobility, and access to a skilled workforce will be important to this cluster's continued success.

Corporate and Professional Services

This cluster accounts for 12% of Tualatin's jobs, and was the second-largest industry sector in Wilsonville as of 2012. Major employers include: Portland General Electric (PGE) and Express Employment Professionals in Tualatin, and Mentor Graphics in Wilsonville. Growth in this cluster will result in ongoing demand for office land and buildings in Basalt Creek and other areas. A variety of locational factors tend to be important to corporate and professional service firms, including: a

²³ Wilsonville's EOA uses the term industry "sectors." The terms cluster and sector are used interchangeably here

²⁴ The economic figures included below are drawn from the Cities' economic development plans.

skilled workforce, available land or office space, transportation connections, and nearby restaurants and commercial services.

Health Care and Medical-Related.

This cluster is important in both cities: it is the third-largest in Tualatin and fourth largest in Wilsonville. Tualatin's health care cluster is anchored by Legacy Meridian Park Medical Center (among Tualatin's largest employers), and also includes associated industries such as clinics, laboratories, physician offices, and assisted living centers. Wilsonville's largest health care-related employers (as of completion of the 2012 Economic Development Strategy) were Infinity Rehab and Avamere, both ambulatory (outpatient) service providers. Wages in this cluster are well above average.

Because of the diversity of health care businesses, firms in this cluster can operate in health care-specific zones (such as Tualatin's Medical Center zone), or general employment zones (such as Wilsonville's Planned Development Industrial zone). In some cases, health care firms that serve smaller, more localized populations can locate in retail/commercial zones.

In addition to the three clusters described above that have been identified as targets for both cities, Tualatin and Wilsonville have also identified these industry clusters:

Other Industrial Clusters.

Both Cities have identified additional industrial target clusters that could locate in the Basalt Creek area. Tualatin has identified two other industry clusters likely to generate demand for industrial land and buildings: food processing and distribution, and wood, paper, printing, and related industrial activities. Wilsonville identified a number of other industrial business types: light manufacturing and warehouse/showroom operations; specialty contractors and construction firms; sustainable product manufacturing and distribution; miscellaneous manufacturing; and wholesale trade.

Growth in these clusters will result in ongoing demand for industrial land and buildings in Basalt Creek and other areas. Freeway access, freight mobility, and access to a skilled workforce will be important to these clusters' ongoing success.

Other Professional and Commercial Services.

Wilsonville's 2012 Economic Development Strategy also identifies creative services (such as transportation logistics, legal services, management consulting, and accounting) as a target cluster. Similar to corporate and professional services, growth in this cluster should result in demand for office land and buildings in Basalt Creek and other areas.



Figure 31 Lam Research Facility, Tualatin. Photo credit: Tualatin Chamber.

Sub-Regional Context

Transportation is fundamentally important to these employment areas, and transportation connectivity has the potential to make a whole that is greater than the sum of its parts by enabling firms to trade goods and services easily. I-5 is the most important single transportation corridor. The 124th Avenue Extension and East-West Connector will also be very important in knitting the employment areas together. Regional connectivity will be challenged due to the limited access nature of the East-West Connector. This large agglomeration of employment areas has the potential to create economic momentum, and also the potential to be a source of competition for the Basalt Creek area. This is because the areas can project a powerful combined brand, while also competing for individual employers who are looking for sites.

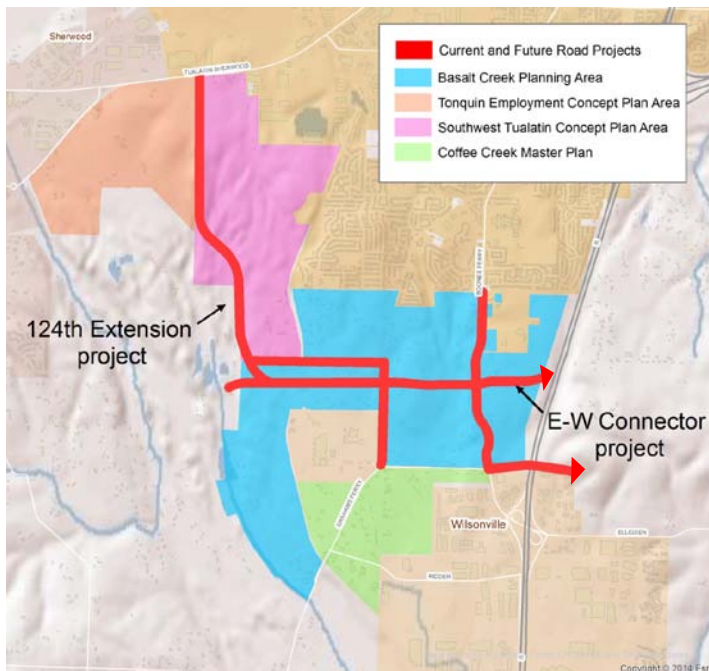


Figure 32 Major TRP road projects in relationship to the Basalt Creek planning area and planned areas nearby Source: Fregonese Associates 2014.

Established Employment Areas

The Tualatin and Wilsonville employment areas have capacity for additional businesses and jobs. To the west of I-5, Wilsonville's employment area tends to contain more industrial, manufacturing, distribution, and flex businesses and buildings; to the east of I-5, a larger share of businesses are office-based professional service firms, such as Mentor Graphics and Xerox Corporation. However, the zoning is the same (Planned Development Industrial) throughout the entire Wilsonville employment area.

Planned Employment Areas

Southwest Tualatin, Tonquin Employment Area, and Coffee Creek are planned employment areas located within the UGB that have yet to be served by infrastructure or see new private development. Annexation and development in the areas are property-owner initiated. The following summarizes the current activity in each of the planning areas.

- The Southwest Tualatin concept plan area: Most of the area remains an active quarry; the City expects this use to continue for an indeterminate period.
- The Coffee Creek industrial area: No development or annexation has taken place in Coffee Creek since the adoption of the master plan; land assemblage challenges, and lack of City services and a financing plan to build those services are the primary obstacles to development here.
- The Tonquin employment area is a 300-gross-acre area located in the City of Sherwood. It is planned for light industrial development with a small amount of ancillary retail/commercial services.

Employment Strengths and Challenges

Basalt Creek's primary strengths/competitive advantages and challenges vis-à-vis industrial and office development are as follows:

Strengths and Competitive Advantages

- Tualatin and Wilsonville's established and successful industry clusters in advanced manufacturing, professional services, and a variety of other industrial and office-based employment categories. Large contiguous cluster of existing and planned employment areas.
- Excellent access to I-5, as well as I-205 and Highway 217. Additional transportation strengths include existing and planned arterial roads, and local and regional transit service provided by TriMet, WES Commuter Rail, and SMART.
- Educated workforce
- Market success of recent industrial, office, and retail developments

Challenges

- Vision and regulation. This Concept Plan and subsequent Comprehensive Plan and zoning amendments need to be in place prior to development.
- Planning, financing, and construction of new infrastructure. This is because roads, water, sanitary sewer, and other infrastructure for urban expansion areas are expensive. Cities are often focused on maintaining and improving existing infrastructure and therefore do not budget to make extensive extensions. Developers of individual sites typically cannot afford to build out a comprehensive set of infrastructure to serve multiple properties.
- Lot sizes and property aggregation. There is a mix of large and small lots throughout the Basalt Creek area. The time and cost required to secure properties from multiple parties in order to aggregate developable industrial or office properties of adequate size can be a significant deterrent to developers.
- Natural features including wetlands and slopes. Basalt Creek and its surrounding slopes and wetland areas run north-south through the planning area, dividing it into east and west sections.
- The market for new office development continues to be slow. However, the planning area will not be ready for private development for several years, which may allow enough time for this market to recover.

Housing Market Analysis

Demographic Context

The City of Tualatin, compared to the Portland Metropolitan Statistical Area (MSA), has a higher percentage of family households (two or more related people), larger average households, higher household incomes, and higher per capita incomes. A larger share of residents has college degrees (42.3%) and is employed in white collar jobs (67.5%) compared to the region. Tables Table 8, Table 9 and Table 10 provide additional perspective on the demographics of the subject cities compared to the Portland MSA.

Wilsonville, compared to the Portland MSA, has a higher percentage of family households and smaller households--likely because the city has a higher share of young households (in the 25-34 age category) and seniors, Baby Boomers, and retirees. Each age group has different housing preferences. Wilsonville also has a larger share of residents with college degrees (39.3%) and white collar jobs (70.1%).²⁵

While the Basalt Creek market area includes both Tualatin and Wilsonville, its demographics are generally more similar to those in Tualatin. When compared to the Portland MSA, the market area has a

²⁵ Data shows information about *jobs held by residents of the given geographical areas*, not the jobs within those areas

higher percentage of family households, larger households, higher household and per capita incomes, more residents with college degrees, and more residents who work in white collar jobs. In general, these demographics are favorable to housing development in the Basalt Creek area; they also reflect the types of residents most likely to locate in the planning area.

Table 8 Demographic Summary of the Basalt Creek planning area. Source: ESRI Business Analyst, Leland Consulting Group. 2014 Data except where noted.

	Tualatin	Wilsonville	Basalt Creek
Comparison to Portland MSA:	<ul style="list-style-type: none"> • More families • Larger HHs • Higher HH Income • Higher PC Income • More college degrees • More white collar emp. 	<ul style="list-style-type: none"> • Fewer families • Smaller HHs • More Gen Y • More Boomers • More low-income HHs • More college degrees • More white collar emp. 	<ul style="list-style-type: none"> • More families • Larger HHs • Higher HH incomes • Higher PC incomes • More college degrees • More white collar emp.

Table 9 Demographic Summary of the Basalt Creek planning area (Continued). Source: ESRI Business Analyst, Leland Consulting Group. 2014 Data except where noted.

Demographic Attribute	Tualatin	Wilsonville	Basalt Creek	Portland MSA
Population	26,520	21,235	73,786	2,296,285
Number of Households	10,170	8,638	28,121	896,982
Family Households (2010 Census)	68%	59%	68%	64%
Household Size (Average)	2.60	2.32	2.57	2.52
Household by Size (2010 Census)				
1 and 2 person	57%	68%	58%	61%
3 and 4 person	33%	25%	32%	29%
5 + person	10%	7%	10%	10%
Median Household Income	\$64,324	\$59,812	\$70,256	\$57,441
Per Capita Income	\$32,672	\$31,995	\$33,336	\$30,135
Population By Age				
0 to 24	35%	31%	34%	32%
25 - 34	14%	16%	13%	15%
35 - 44	15%	14%	15%	14%
45 to 54	14%	13%	14%	14%
55 to 64	13%	11%	12%	13%
65 +	9%	15%	11%	13%
Median Age	35.7	37.0	36.6	37.5

Key:  Low High

Table 10 Demographic Summary of the Basalt Creek planning area (Continued). Source: ESRI, Leland Consulting Group. 2014 data except where noted.

Demographic Attribute	City of Tualatin	City of Wilsonville	Basalt Creek Market Area	Portland MSA
Education and Employment				
Less than High School	9.7%	8.0%	8.0%	9.4%
High School or Equivalent	16.5%	20.4%	18.2%	22.1%
Associate's or some college	31.5%	32.3%	32.5%	34.2%
Bachelor's or Advanced Degree	42.3%	39.3%	41.3%	34.3%
Occupation				
"White Collar"	67.5%	70.1%	69.3%	63.1%
"Blue Collar"	11.3%	14.1%	13.5%	19.5%
Housing				
Median Home Value	\$331,190	\$349,927	\$337,289	\$275,516
Housing Tenure				
Owner Occupied Housing Units	51.9%	43.4%	55.0%	56.2%
Renter Occupied Housing Units	42.6%	50.5%	39.8%	37.7%

Key: Low High

Finally, the South Tualatin residential neighborhoods immediately to the north of Basalt Creek reflect many of the demographic attributes typical of Tualatin’s population. The neighborhoods—including low volume local roads, street trees, parks, and schools—create a positive environment for residential development within the Basalt Creek area, particularly along the northern edge.

Recent Housing Development

Table 11 below shows the recent residential permitting trends in the cities of Tualatin and Wilsonville, and in Villebois, a master-planned community in Wilsonville. Villebois is shown here because: it is the largest master planned community (482 acres) that has been developed recently in the Southwest Metro area; it is a defined area that has been planned to include a range of housing, parks, and commercial services; due to its success in the marketplace in recent years, housing absorption has been relatively rapid (adjusting for the recession), and many houses sell for a premium when compared to the competition in other areas. Naturally, recent housing built in these areas provides one benchmark from which to estimate future demand.

As Table 11 shows, the housing types that have been permitted and built in these areas correlate closely to the types of people and households who live there; the housing types also likely reflect zoning and other regulatory and market forces. Recent housing permitted in Tualatin is composed largely of large- and medium-lot single-family housing. No small lot single-family housing (lots smaller than 4,000 square feet) or attached single-family housing has been permitted since 2004. About 20% of the recently permitted housing in Tualatin is multifamily—market rate and affordable apartments, condominiums,

and senior housing. Very little existing multifamily housing is located in the neighborhoods immediately north of Basalt Creek; most of Tualatin’s multifamily housing is clustered further north near downtown Tualatin, between Tualatin-Sherwood Road and Avery Street, and the Bridgeport Village area. The majority were built prior to 2000, although the 367-unit Eddyline at Bridgeport (under construction) is a notable exception. Historically, this multifamily share is relatively typical; multifamily has comprised about 20% of total housing in many communities during the past five decades.

Wilsonville’s housing is more diverse and features a significantly higher percentage of small lot single-family and multifamily housing, and much less large- and medium-lot single-family housing. Again, this is likely to due to market, demographic, and regulatory reasons. The broad housing mix reflects the presence and growth of the four “S groups” in Wilsonville: seniors, singles, single-parent households, and starter households. The large multifamily share (66%) is partially due to the large number of new 20- and 30-something households recently formed, which will slow in coming years. Villebois’ housing mix is similar to that in Wilsonville overall. However, during the time period surveyed (2000 to 2012) a larger percentage of small-lot single-family homes, townhouses and duplexes were built in Villebois, along with a smaller percentage of multifamily housing. Villebois’ developers and National Association of Realtors (NAR) surveys show that most American households, Baby Boomers included, prefer single-family homes over multifamily homes, but that they are quite open to smaller lot and home sizes, especially when the surrounding neighborhood is attractive and walkable.

Table 11 Residential Development in Tualatin and Wilsonville by Housing Type. Sources: HUD; City of Wilsonville, New Home Trends, Leland Consulting Group. Due to data availability, Table 12 shows housing built in Tualatin between 2004 and 2014; and permits issued in Wilsonville between 2000 and 2012.

Housing Type	Tualatin	Wilsonville	Villebois
	Recent Permits	Recent Permits	Recent Permits
Large Lot Single Family	44%	9%	8%
Medium Lot Single Family	36%	10%	8%
Small Lot Single Family	0%	12%	35%
Attached Single Family	0%	2%	6%
Multifamily	20%	66%	43%
Total	100%	100%	100%

Retail/Commercial Market Analysis

In addition to new residents and employees that may locate in the Basalt Creek area, the residents of the Tualatin neighborhoods located immediately to the north are important sources of support for retail. Residents spend more of their retail dollars locally than employees or passersby, and therefore are generally a more important source of demand for retail goods and services. Approximately 4,000

households live in the area between Norwood Road and Tualatin-Sherwood Road. These households already have other places to shop, particularly on and near Tualatin-Sherwood Road. However, based on existing traffic counts and interviews with residents and developers, it is clear that some of these residents are already accustomed to driving south through the Basalt Creek area to access I-5 or other destinations.

Retailers also look at traffic counts as an important demand indicator, since retail relies on pass-by traffic for support. Boones Ferry Road carries average daily traffic (ADT) of about 15,000 in 2014²⁶, which is high enough to suggest that it will be a good retail location in the future. Traffic counts on Grahams Ferry Road are below 6,000 ADT, and therefore it is likely to be a less desirable retail location. Traffic counts such as these likely reflect trips being made by residents and employees of the Southwest Metro area and beyond. The 124th Avenue Extension, which will be built to the western edge of the study area, and the planned East-West Connector Road that will run across the study area, are also important transportation arterials along which retail will seek to locate. A prime location for retail may be at the intersection of Boones Ferry Road and the East-West Connector Road.

²⁶ Source: ESRI Business Analyst, 2014

VI. Infrastructure

The objective of this section is to identify existing stormwater, wastewater conveyance and treatment, and potable water infrastructure that could be used to provide services for the Basalt Creek planning area. Existing jurisdictions and service agreements are also described, in addition to discussion of important areas of special consideration in and near existing receiving waters.

Policy Guidance on Infrastructure

The discussion in this section is framed by the Cities' desire to have a better understanding of how provision of services such as wastewater collection and treatment and potable water distribution serving Basalt Creek can function in the most efficient and economical manner.

Specifically the Cities are interested in determining, from a technical standpoint, if wastewater can be conveyed and treated more efficiently and cost-effectively by relying on gravity or if pump stations are more appropriate. This should consider improvement costs related to the collection systems (such as incremental pipe capacity needs in both cities; pump station construction, long term operations and maintenance costs; and treatment capacity needs at both treatment plants). Should pump stations be less desirable from a technical standpoint, what are non-technical issues that would need to be resolved? Part of answering this question is to identify where specific areas of Basalt Creek naturally drain and whether it makes sense from a technical point of view for wastewater to cross jurisdiction boundaries. This evaluation raises a policy question for the City of Wilsonville of whether or not they are willing to collect and treat wastewater that could be generated by land outside of their City supposing the service lines and jurisdictional lines are not the same.

Additionally, the Cities desire to evaluate and determine if there are efficiencies for the water system if the source of water is from the Willamette River. Another topic to explore is if it is a good idea to interconnect the two systems. The Cities are asking if it makes more sense to provide water services to Basalt Creek from the south rather than from the City of Tualatin's existing system. This exploration presents another policy question for the City of Tualatin about accepting water from the Willamette River.

Stormwater Infrastructure

Existing stormwater infrastructure within the Basalt Creek planning area consists of roadside drainage ditches and culverts. Culverts in the planning area are under the jurisdiction of Washington County and range from 12 to 30 inches, as shown in Figure 33. It is assumed that the existing culverts may not have capacity for future urban conditions and will need to be upsized to provide adequate capacity for runoff from new impervious areas, unless onsite detention or infiltration is required. Roadway drainage for SW Boones Ferry Road was recently transferred from the jurisdiction of Oregon Department of Transportation (ODOT) to that of Washington County, but the County does not yet have the

geographical information system (GIS) data available. Culverts to the south of the planning area are part of the City of Wilsonville stormwater system.

Basalt Creek itself flows to the south into Wilsonville as part of the Coffee Lake Creek basin. Basalt Creek discharges into the Coffee Lake wetlands. Coffee Lake Creek flows south from the wetlands and combines with Arrowhead Creek before discharging to the Willamette River.

Existing stormwater drainage basins based on existing topography and infrastructure are also shown in Figure 33, along with Oregon State Planning Goal 5, Significant Resource Areas near receiving waters. As can be seen in Figure 33, large portions of the planning area are Significant Resource Areas. The City of Tualatin has jurisdiction over the stormwater conveyance system to the north of the planning area.

The City of Tualatin is a co-permittee of Clean Water Services (CWS) watershed-based National Pollutant Discharge Elimination System (NPDES) permit, which includes the municipal separate storm sewer system (MS4) stormwater discharge permit. The City of Tualatin owns and operates the stormwater system within the city.

The City of Wilsonville owns and operates the public stormwater conveyance system to the south of the planning area. The City of Wilsonville is an NPDES MS4 co-permittee with Clackamas County and twelve other cities and service districts within the County (Permit Number 101348).

The City of Wilsonville's 2012 Stormwater Master Plan identifies a capital improvement project to restore a portion of the Basalt Creek channel to increase capacity to accommodate impacts caused by a reverse grade south of Day Road near the Commerce Circle area. The project is programmed for mid-term (6 to 10 years) implementation in the July 2014 Prioritized Stormwater Capital Improvement Plan (July 2014 Prioritized Project list). The master plan also identifies a regional detention facility to serve an area that includes the Basalt Creek planning area. This project is identified in the July 2014 Prioritized Project List as a long-term project (10 to 20 years).

Locations where stormwater runoff from the Basalt Creek plan area could connect to existing stormwater infrastructure in the future are shown in Figure 33 and summarized in Table 12. Should these locations be considered to receive stormwater discharge from the Basalt Creek plan area, the downstream conveyance system will need to be evaluated for capacity and condition.

Wastewater Infrastructure

Currently, no sewer service is provided to the planning area. Existing homes are, therefore, assumed to be using individually permitted and managed septic systems, but a public records request has not been made to confirm this assumption for each property in the planning area.

Wastewater Collection and Conveyance

Wastewater conveyance to the north of the planning area is under the jurisdiction of the City of Tualatin, who maintains a service agreement with CWS for wastewater collection and treatment at the Durham Advanced Wastewater Treatment Facility located at 16060 SW 85th Avenue in Tigard, a straight line distance of approximately 2.5 miles north of the Basalt Creek planning area. The City owns the

wastewater conveyance system (up to 18-inch diameter) within the City, while CWS owns larger pipes, pump stations, force mains, and treatment facilities.

Eight gravity mains exist near the north planning area boundary and could provide connection points for wastewater from the Basalt Creek plan area into the Tualatin collection system. The 200 gpm Victoria Woods Pump Station and associated force main are also located just to the north of the planning area boundary, west of the southern end of SW Eno Place. From these connection points, wastewater flows by gravity toward the treatment plant, crossing the Tualatin River via the Lower Tualatin Pump Station in Tualatin Community Park and associated force main. Pumping would be required to lift flows from the planning area into the existing gravity system.

Wastewater conveyance to the south of the planning area is under jurisdiction of the City of Wilsonville. Wastewater from the City of Wilsonville is conveyed to and treated at the Wilsonville Wastewater Treatment Plant located at 9275 SW Tauchman Street, approximately 3.2 miles south of the planning area.

The City of Wilsonville's Coffee Creek Industrial Area Plan identifies a new sanitary main line to be constructed in a future segment of Kinsman Road between Ridder and Day Roads. These lines are intended to provide conveyance of wastewater within the Coffee Creek area and are also intended to serve flows from the Basalt Creek planning area. Three existing possible connection points into the Wilsonville collection system were also identified. From these connection points, wastewater flows by gravity to the Wilsonville Wastewater Treatment Plant. The ongoing Sanitary Sewer Collection System Master Plan project has analyzed a range of flows from the planning area to identify trunk capacity, pipe size, and improvements needed to accept flow from the planning area. Connection Point 10 at Pioneer Road in Commerce Circle would require a lift station to deliver flow from the planning area into the Wilsonville system.

A brief description and location of the eight potential points of connection to the Tualatin conveyance system and three existing potential points of connection to the Wilsonville conveyance systems are shown in Figure 34 and summarized in Table 13. Wilsonville's planned sanitary main line in Kinsman Road is also shown in Figure 34.

Consideration of the Basalt Creek Planning Area in Sanitary Sewer Master Plans

The *Tualatin Sanitary Sewer Master Plan Update* has been put on hold until the Basalt Creek planning process is complete. The City of Wilsonville is in the process of updating its Sanitary Sewer Collection Systems Master Plan (MSA, 2014) and is including Basalt Creek as a contributing area. The resulting updated master plans will identify improvements needed to increase the capacity of each system to convey flow from the Basalt Creek planning area.

Clean Water Services conducted a system capacity evaluation to accept flows from the Basalt Creek planning area and the SW Concept Plan Area in addition to flows from the City of Tualatin (CH2M HILL, 2012). This study assumed that flow contributions would be routed to the Sherwood trunk line (located north of Tualatin-Sherwood Road) rather than through local service lines. A lift station would be required to convey flow from the Basalt Creek area to the Sherwood trunk line. The distribution of flow

to each of the cities and where connections need to be made will be determined as part of the Basalt Creek Concept Plan.

Wastewater Treatment

The nearest treatment facility to the north of the planning area is the CWS Durham Advanced Wastewater Treatment Facility (AWTF). This facility currently receives about 22.6 million gallons per day (mgd) in dry weather flow (CWS, 2013). Future flow projections, updated in 2011, did not include any areas outside of the existing Durham AWTF service area (CH2M HILL, 2011). Therefore, treatment of Basalt Creek wastewater flows at the Durham facility will require review of the plant capacity and analysis of impacts to level of service within the existing service area. In addition, expansion of the service district area to include the Basalt Creek planning area (or any portions thereof) needs to be evaluated.

The nearest treatment facility to the south of the planning area is the City of Wilsonville Wastewater Treatment Plant (WWTP). This facility was recently expanded to an average dry weather flow capacity of 4 mgd, with flow projections and design bases of improvements accounting for an ultimate buildout capacity of 7 mgd. The current 4 mgd is capacity designed to accommodate growth within the current city limits, and the 7 mgd buildout capacity is designed to accommodate additional growth areas outside the city limits. Expansion to 7 mgd can be achieved by adding a third primary clarifier and adding a membrane bioreactor to the aeration basins. Approximately half (300 acres) of the Basalt Creek planning area (identified as the “North Wilsonville” area in the technical assessments) was accounted for in the year 2030 buildout capacity assessment (7 mgd). Early development of the Basalt Creek planning area, in conjunction with other planned developments will require review of the timing of the next WWTP expansion phase.

Potable Water Infrastructure

The delivery of potable water to customers is impacted by many factors. Of the many requirements, pressure and flow are two that are closely tied and impact all water infrastructure decisions. Residential water service typically has a minimum pressure of 30 pounds per square inch (psi) and a maximum dictated by plumbing code of 80 psi. The pressure in a gravity fed system similar to the Wilsonville and Tualatin systems is constantly fluctuating based on the demand on the system at any given time. As demand goes up, reservoir levels go down, causing pressure in the system to be reduced. When demand reduces, water is placed/pumped back into the reservoirs, bringing the system pressure back. Storage requirements on a system are driven by customer demand and fire flow requirements because these reservoirs are not only providing system pressure, but also emergency storage.

In order to evaluate how the Basalt Creek area will be served with water, the existing City of Wilsonville and City of Tualatin Water Master Plans were reviewed. Below is a summary of the information gathered from those reports, and how that might impact water service to the Basalt Creek planning area.

City of Tualatin

The City of Tualatin water system currently provides drinking water to approximately 26,000 people, through 6,700 residential, commercial, industrial and municipal connections. The system consists of four hydraulically connected pressure zones that include five steel storage reservoirs with a combined storage capacity of 13 MG. A sixth storage reservoir with an additional 1.0 MG capacity (in level C) is anticipated to be online in fall 2015. The water supply is purchased wholesale from the Portland Water Bureau with a maximum available capacity of 10.8 mgd. The current (2013) MDD is 9.5 mgd, providing approximately 1.3 mgd of excess capacity at this time. Projected MDD in 2039, without the Basalt Creek planning area, is 14.2 mgd. Table 14 shows the City's existing pressure zones.

City of Wilsonville

The City of Wilsonville's water system currently provides drinking water to approximately 21,000 people. The system consists of three hydraulically connected services areas (A, B, and C) supplied by three steel storage reservoirs and a small underground concrete reservoir (Charbonneau) with a capacity of 7.6 million gallons (MG). Table 15 shows the capacity and hydraulic grade of each of the pressure zones.

The water supply source is the Willamette River Water Treatment Plant jointly owned by the City of Wilsonville and the Tualatin Valley Water District (TVWD). The plant has a current rated capacity of 15 mgd, but the buildings and piping and some of the unit processes were designed for an ultimate supply capacity of 70 mgd, with Wilsonville owning 20 mgd and TVWD owning 50 mgd of that capacity. The plant was designed for on-site expansion. TVWD sold 5.0 mgd of treated water capacity to the City of Sherwood in 2006. Based on Wilsonville's 2012 Water Master Plan, projected (2020) maximum day demands (MDDs) for the plant is 14.9 mgd, which includes the 5.0 mgd delivery to Sherwood, plus a 0.75 mgd allowance for new industrial users.

Basalt Creek Planning Area

The Basalt Creek planning area currently has no municipal water infrastructure in place. The area topography ranges from approximately 250 feet above mean sea level (msl) to a maximum elevation of 350 feet msl. Based on the topography, the Basalt Creek planning area could be served from the south through The City of Wilsonville's distribution system (Pressure Zones B and C) or from the north through the City of Tualatin's distribution system from Pressure Zone B and C. Lower elevations of the Basalt Creek planning area (below elevation 285) can be adequately served by Wilsonville's Pressure Zone B through existing 15-inch and 18-inch distribution lines that are adjacent to the area. A political factor in determining service boundaries is Tualatin's requirement for a public vote before switching to water supply from the Willamette River; the City currently receives its potable water primarily from the Bull Run reservoir near Mount Hood. A vote would only be required if Willamette River water was used to serve a part of Basalt Creek that ended up within Tualatin's jurisdiction.

Tualatin's and Wilsonville's Pressure Zone C reservoirs are located adjacent to each other on the East Side of I-5. The I-5 pipe crossings that connect to these reservoirs are in different locations. Analysis

needs to be completed to determine if the existing pipe configurations from each of these reservoirs provide adequate pressures to serve the higher elevations of Basalt Creek with emergency water demands. To provide for the additional flow to these higher elevations, it may be necessary to add booster pumping capacity within each City's water system. The City of Wilsonville master plan identifies a future I-5 crossing for their Zone C reservoir as well as a future Pressure Zone D reservoir that would address pressure needs to the higher elevations. Figure 35 identifies the potential pressure zones and existing adjacent infrastructure.

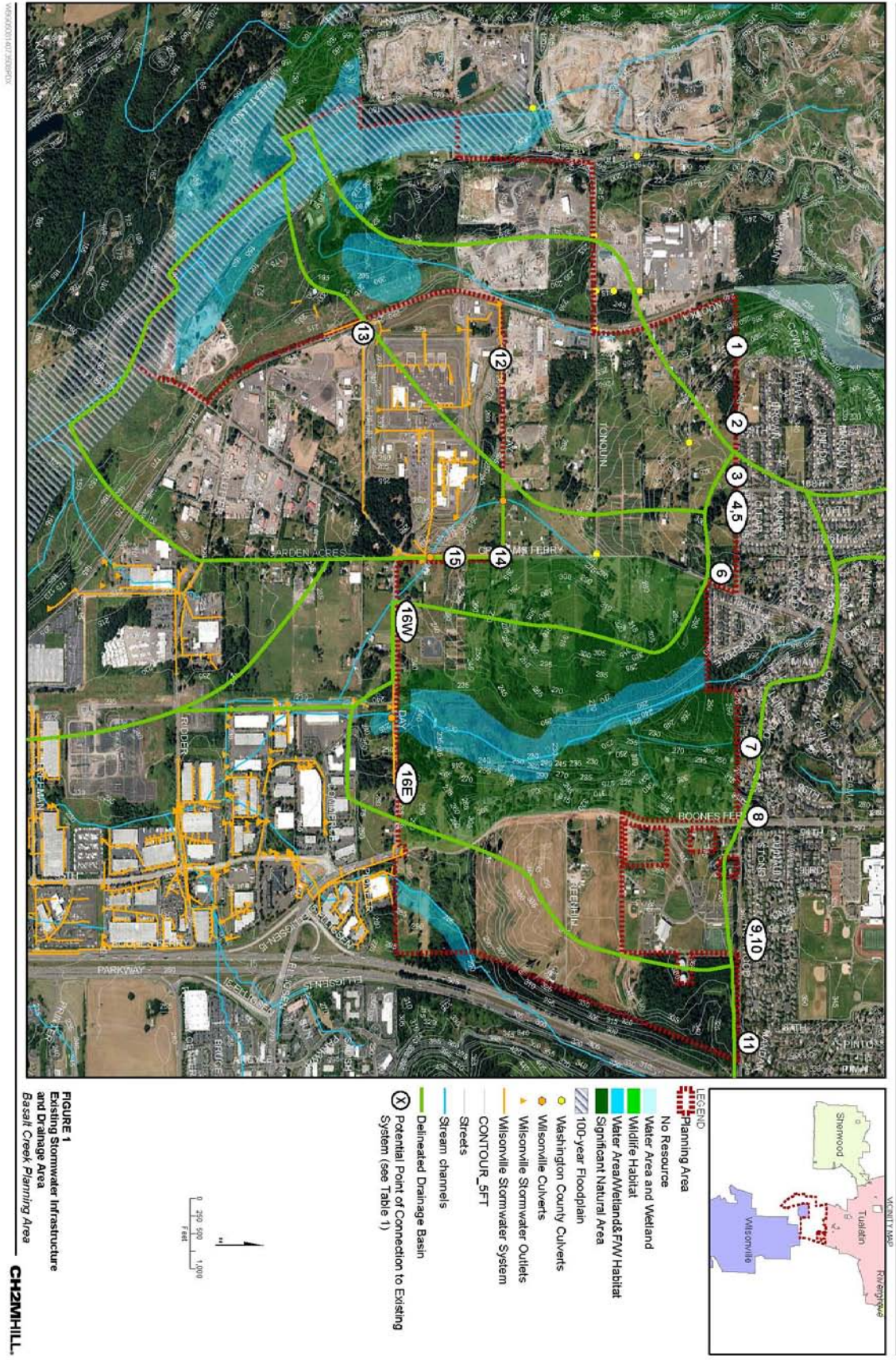


Figure 33 Existing Stormwater Infrastructure and Drainage Area near the Basalt Creek planning area
Source: CH2M Hill, 2014

Table 12 Potential Points of Connection to Existing Stormwater Facilities for the Basalt Creek planning area. Source: CH2M Hill 2014.

Map ID	Description	Location	Outlet	
1	12-inch PVC	112 th Ave.	Outfall at SW Cowlitz Dr. to Kolk Pond, approximately 900 feet from planning area.	
2	12-inch PVC	109 th Ave. and in Helenius Rd. to the east of	Detention facility at SW Helenius Rd. between 109 th Ave. and SW 108 th Ave.	
3	12-inch PVC	108 th Ave.	Connection Points 3 through 6 all outlet to Basalt Creek, which runs through the eastern portion of the planning area. The outfall is located west of Lodgepole Rd. Basalt Creek runs south through the planning area, then through piped and natural channels for approximately 3 miles to the confluence with Coffee Lake Creek, which then flows another 1.5 miles through natural and straightened channels to the Willamette River. Basalt Creek forms a part of the City of Wilsonville's stormwater drainage system.	
4	12-inch PVC	106 th Ave.		
5	12-inch PVC	Helenius Rd., east of 106 th Ave.		
6	12-inch PVC	Grahams Ferry Rd. at Whitebark Ln. and at Helenius St.		
7	Detention and/or water quality facilities	South of Eno Pl. and Erio Pl.		Both facilities outlet to Basalt Creek.
8	15-inch ADS	Boones Ferry Rd. at Stono Dr.		Connection Points 8 through 10 ultimately outfall to a natural watercourse approximately 0.5 mile to the north of the planning area near Columbia Dr. and Chehalis St. in Tualatin. This watercourse then flows north for approximately 2.5 miles through natural and piped conveyance to the Tualatin River.
9	15-inch CSP	Stono Dr. between Boones Ferry Rd. and 89 th Pl.		
10	18-inch CSP	89 th Pl.		
11	12-inch CSP	Mandan Dr.	Outfalls at the Chieftain/Dakota Greenway outfall to a natural watercourse, which then flows 2.6 miles northeast to the Tualatin River.	
12	12-inch capped lateral (N)	Clay Rd.	Capped lateral connects to 12-inch main line in Clay Rd., which connects to private 12-inch line. This system outlets to a tributary of Coffee Lake Creek.	
13	42-inch pipe	Cahalin Rd. south of Coffee Creek Correctional Facility	Outlets to a tributary to Coffee Lake Creek, 3.4 miles upstream of the Willamette River (via natural and straightened reaches).	
14	12-inch capped laterals (N and E)	Intersection of Grahams Ferry Rd. and Clay Rd.	Two capped laterals connected to 12-inch main line in Grahams Ferry Road. Outlets to Basalt Creek tributary crossing north of Day Rd.	
15	12-inch capped laterals (E)	Grahams Ferry Rd. between Clay Rd. and Day Rd.	Two capped laterals connected to main line in Grahams Ferry Rd, connected to 12-inch main line, which outlets to Basalt Creek tributary	

Map ID	Description	Location	Outlet
16E and 16W	12-inch and 15-inch pipe	Day Rd, east of Grahams Ferry Rd.	crossing north of Day Rd. 12-inch pipe connects curb inlets east and west of Basalt Creek culverts to 15-inch main line, which outlets to detention/water quality facility west of the Basalt Creek culverts, then connects to open and piped Basalt Creek channel to join Coffee Lake Creek after approximately 2 miles, which then flows an additional approximately 1.75 miles to the Willamette River.

ADS = Advanced Drainage Systems; CSP = corrugated steel pipe; PVC = polyvinyl chloride.

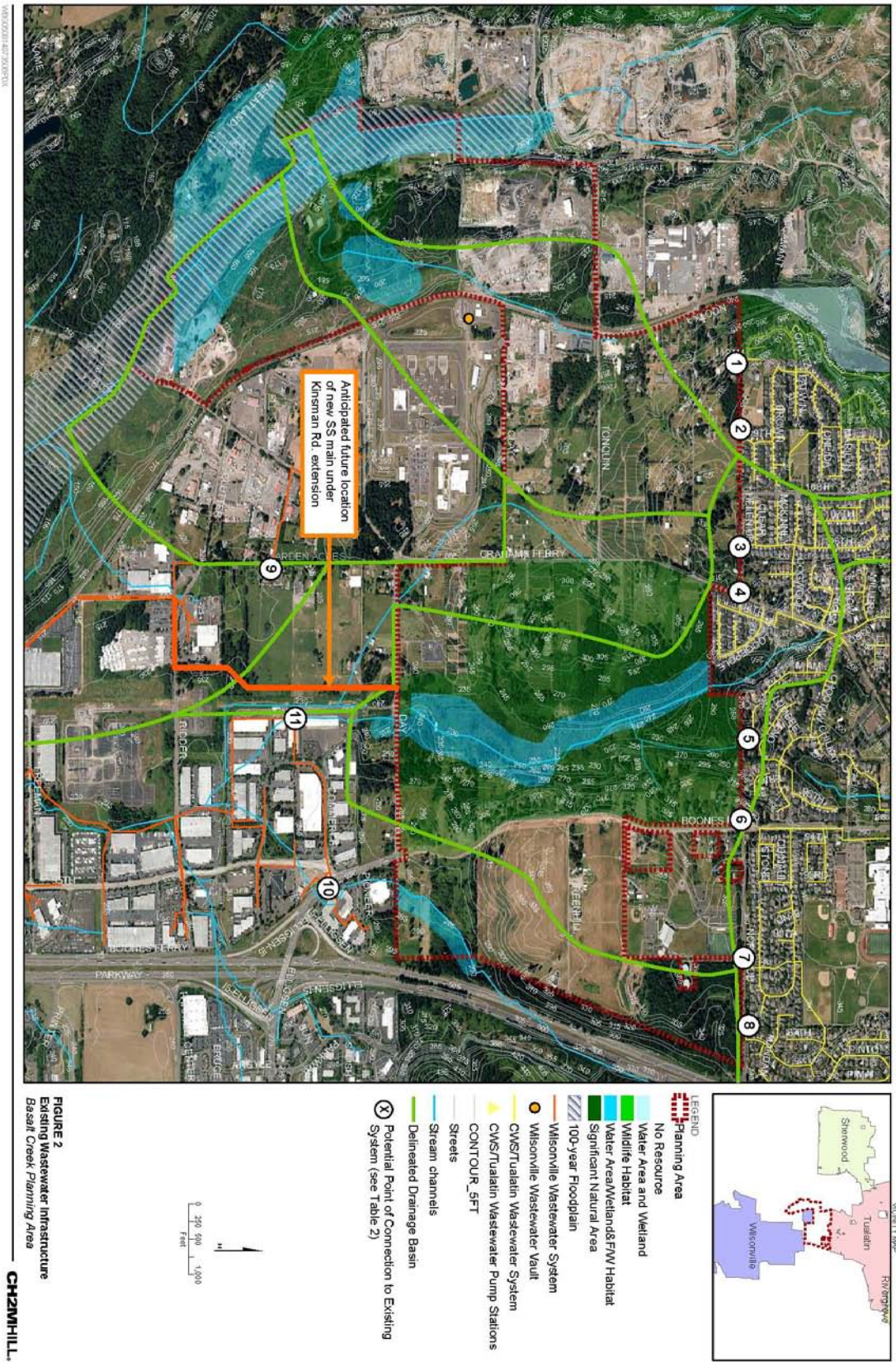


Figure 34 Map of Existing Wastewater Infrastructure near the Basalt Creek planning area. Source: CH2M Hill 2014.

Table 13 Potential Points of Connection to Existing Wastewater Systems for the Basalt Creek planning area. Source: CH2M Hill 2014.

Map ID	Facility Description	Location
1	10-inch gravity main	112 th Ave.
2	8-inch gravity main	109 th Ave.
3	8-inch gravity main	106 th Ave.
4	8-inch gravity main	Grahams Ferry Rd. @SW Helenius Rd
5	Victoria Woods Pump Station	Eno Pl.
6	8-inch gravity main	Boones Ferry Rd.
7	8-inch gravity main	Southwest of the intersection of Norwood Ave. and 89 th Ave.
8	8-inch gravity main	Vermillion Dr.
9	18-inch gravity main	Garden Acres Rd.
10	8-inch gravity main	Boones Ferry Rd. at Pioneer Court (Commerce Circle area)
11	12-inch gravity main	West of Commerce Circle

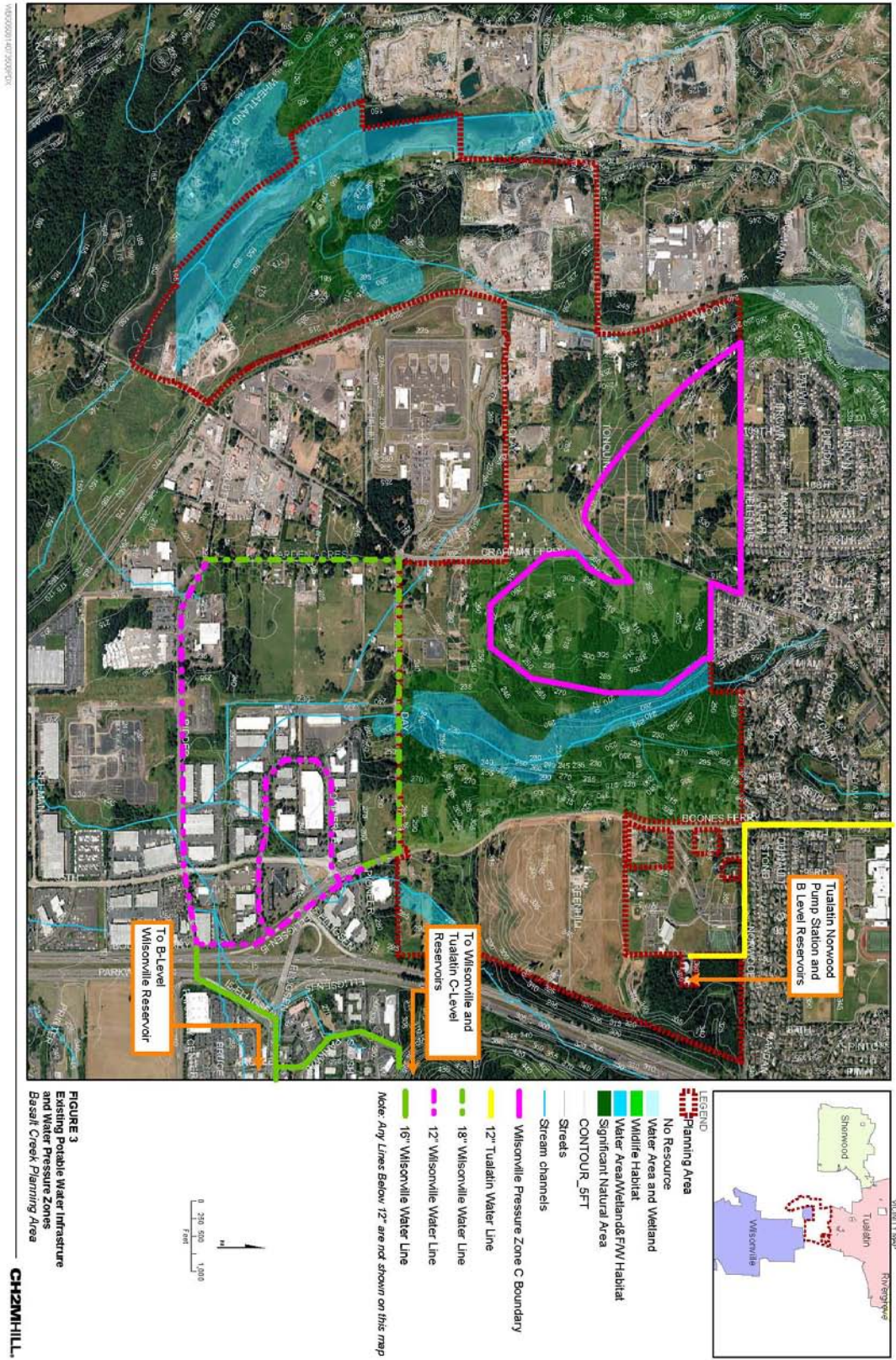


Figure 35 Map of existing potable water infrastructure and water pressure zones in and near Basalt Creek planning area. Source: CH2M Hill 2014.

Table 14 City of Tualatin Water System—Existing Pressure Zones. Source: CH2M Hill 2014.

Pressure Zone	Maximum/Minimum Hydraulic Grade Line (feet mean sea level)	Storage Volume (million gallons)
A	295	7.2
B	399	5.0
C	506	1.8
Bridgeport	360	-

Table 15 City of Wilsonville Water System—Existing Pressure Zones. Source: CH2M Hill 2014.

Pressure Zone	Static Hydraulic Grade Line (feet mean sea level)	Storage Volume (million gallons)
A	320	0.6
B	400	5
C	506	2

VII. Transportation

This section documents the existing transportation system and presents the planned transportation system developed as part of the Basalt Creek Transportation Refinement Plan (TRP). The purpose of the TRP was to identify a major transportation connection between 99W and I-5, in furtherance of the I-5/99W Connector Studies which call for additional east-west traffic alternatives. The plan provides 18 transportation investments broken into short, medium and long term phases, all of which are critical to ensuring that the transportation network functions at acceptable levels over time. The key element is the East-West Connector to 124th Avenue extension. This section discusses the pedestrian and bicycle existing and planned facilities, the current transit system and planned improvements to transit, and details the motor vehicle conditions for base year (2010) and future year (2035) conditions based on the Basalt Creek TRP.

Motor Vehicle System

This section documents base year and future year motor vehicle demand, presents intersection operations, and describes the planned improvements for the motor vehicle system.

Motor Vehicle Demand

Existing a.m. and p.m. peak hour (2010) motor vehicle volumes in the Basalt Creek planning area were collected for the Basalt Creek Transportation Refinement Plan, the SW 124th Avenue Extension Study, the Tualatin TSP, and the Wilsonville TSP. The 2010 volumes, along with percentage of truck traffic, are displayed in Figure 36. These plans applied the Metro Regional travel demand model to estimate 2035 future year p.m. peak hour motor vehicle volumes. The resulting 2035 volumes are displayed in Figure 37.

The Basalt Creek Transportation Refinement Plan applied the Metro regional travel demand model (2009 RTP), which provides estimates of both existing year (2005) and future year (2035) p.m. peak hour trips entering and exiting Transportation Analysis Zones (TAZs). TAZs divide the Portland Metro region into areas that represent sources of vehicle trips within the area, based on a combination of the roadway network, land use information, the Urban Growth Boundary (UGB), zoning, and comprehensive plan designations. Because the demand model covers both TAZs within and around the Basalt Creek planning area, the 2035 model volumes account for both local and regional growth.

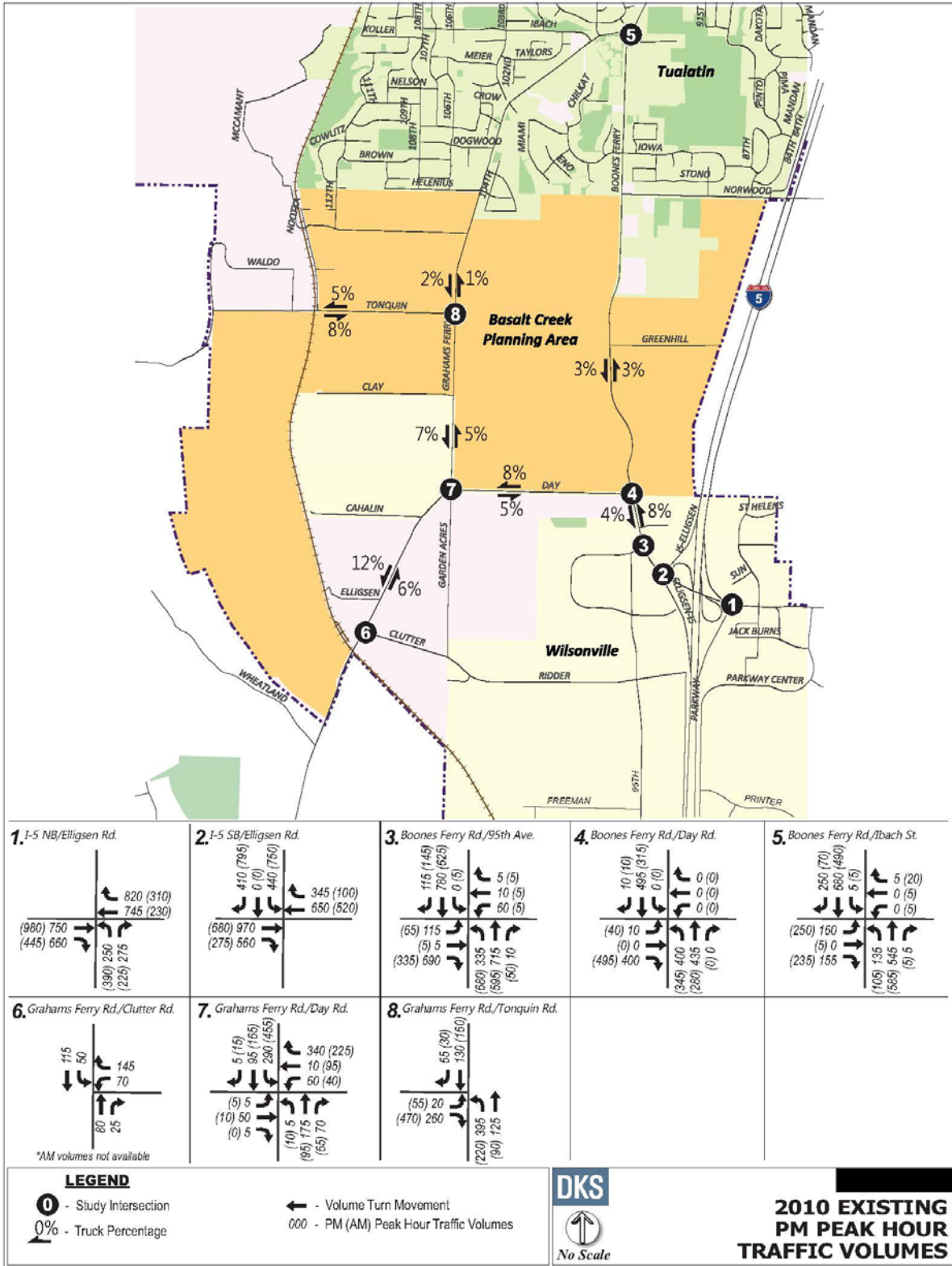


Figure 36 2010 Existing PM Hour Traffic Volumes by intersection in planning area. Source: DKS Associates 2014.

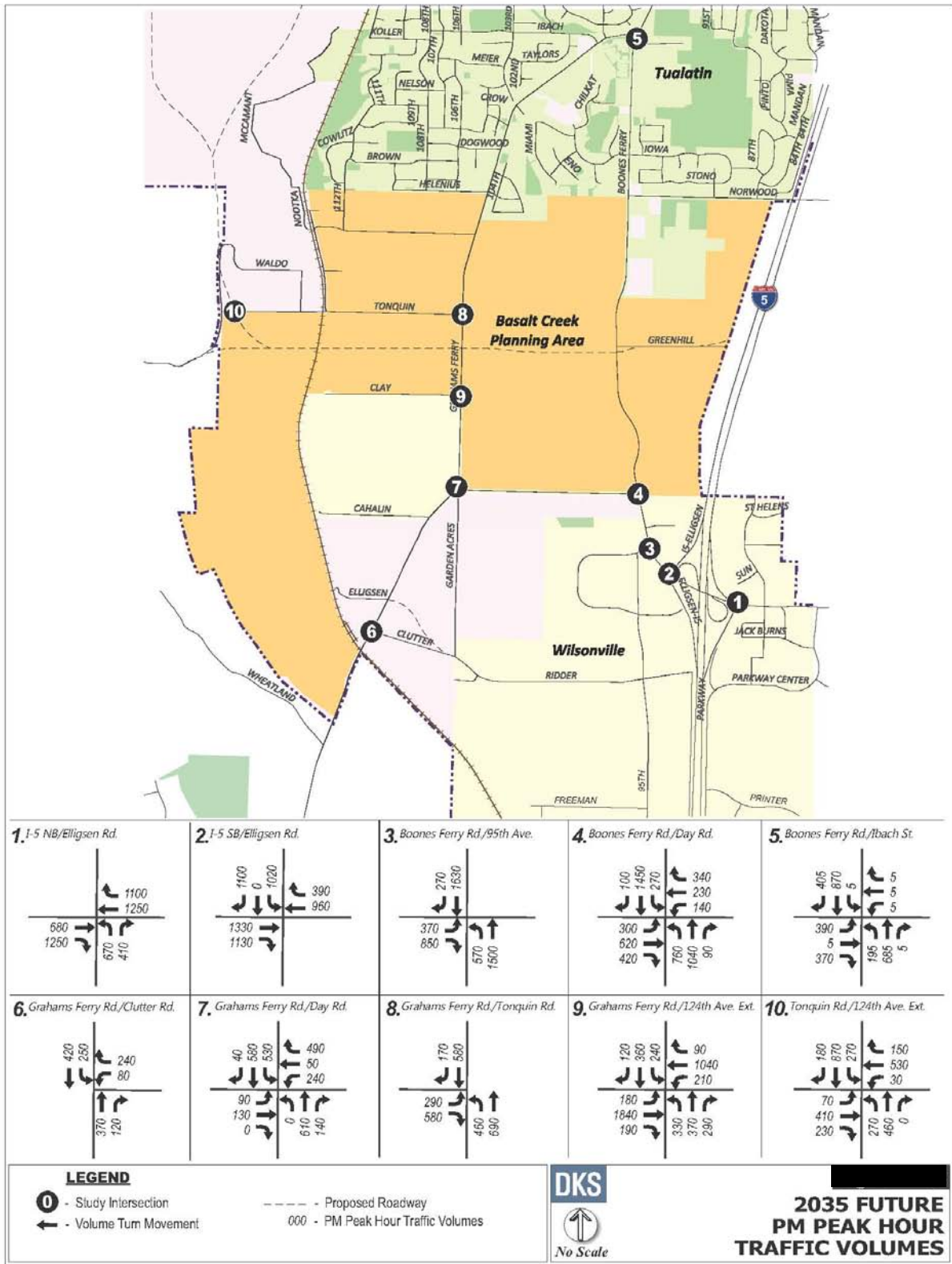


Figure 37 2035 Future PM Hour Traffic Volumes by intersection planning area. Source: DKS Associates 2014.

As shown in Figure 38, the Basalt Creek planning area is made up of three TAZs. Table 16 provides model trip p.m. peak hour estimates for each of the three TAZs. Between 2005 and 2035, the planning area is expected to generate an additional 2,255 trips—a 460% increase from the 2005 estimate of 490 trips.

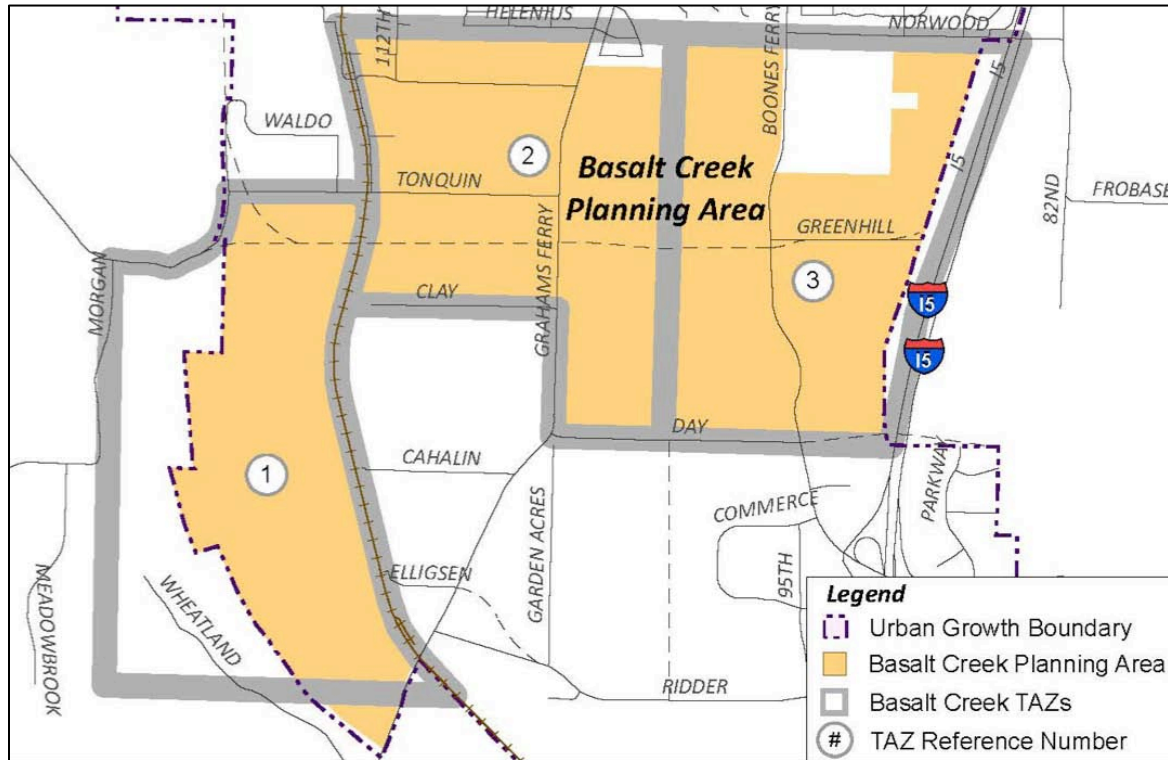


Figure 38 Basalt Creek planning area TAZ Structure. Source: DKS Associates 2014

Table 16 Basalt Creek planning area Estimated PM Peak Hour Trips²⁷. Source: DKS, Metro.

TAZ	2005			2035		
	Entering	Exiting	Total	Entering	Exiting	Total
1	99	267	366	308	559	867
2	50	32	82	528	416	944
3	27	15	42	506	428	934
Total	176	314	490	1,342	1,403	2,745

²⁷ Within Metro’s regional model, TAZs 1-3 are represented by regional TAZs 1019, 1013, and 1014, respectively.

The growth between the 2005 and 2035 model volumes was interpolated to represent model growth for the smaller 2010-to-2035 time increment. This interpolated growth was added to the base year (2010) traffic volumes shown in Figure 36, resulting in the forecast 2035 volumes shown in Figure 37.

Motor Vehicle Operations

Based on the volumes shown in Figure 36 and Figure 37, previous planning studies have documented motor vehicle conditions near the Basalt Creek planning area for existing conditions and for the future planning horizon year 2035. The 2035 motor vehicle conditions assume that the 18 projects in the Basalt Creek Transportation Refinement Plan's Action Plan, shown in Table 18 and Figure 39, will be constructed by 2035.²⁸ The resulting 2010 and 2035 p.m. peak hour intersection operations are shown in Table 17.

Table 17 P.M. Peak Hour Motor Vehicle Operations. Source: DKS Associates, Metro 2014.

Intersection	Jurisdiction	Mobility Target	Existing Year (2010)		Future Year (2035)	
			PM LOS	PM V/C	PM LOS	PM V/C
I-5 NB/Elligsen Rd ^A	ODOT	0.85	A	0.55	B	0.82
I-5 SB/Elligsen Rd ^A	ODOT	0.85	C	0.60	C	0.89
Boones Ferry Rd/95th Ave ^A	Washington County	0.99	C	0.84	C	0.87
Boones Ferry Rd/Day Rd ^A	Washington County	0.99	C	0.64	E	0.99
Boones Ferry Rd/Ibach St* ^B	Washington County	0.99	B	0.70	D	0.98
Grahams Ferry Rd/Clutter Rd* ^C	Washington County	0.99	A/B	0.31	A/F	>1.50
Grahams Ferry Rd/Day Rd ^A	Wilsonville	D	B	0.55	D	0.95
Grahams Ferry Rd/East-West Arterial ^A	Washington County	0.99	-	-	E	1.00
Grahams Ferry Rd/Tonquin Rd ^A	Washington County	0.99	A/B	0.44	C	0.88
124th Ave/Tonquin Rd ^D	Washington County	0.99	-	-	F	>1.50

Bolded and Red indicates intersection does not meet mobility targets

Worst mainline LOS/worst side street LOS reported for unsignalized intersections

*Existing year is 2011 for these intersections

^A Operations from: Basalt Creek Transportation Refinement Plan, November 2012.

^B Operations from: Tualatin Transportation System Plan, February 2013.

^C Operations from: Wilsonville Transportation System Plan, June 2013.

^D Operations from: SW 124th Ave Extension Traffic Impact Analysis Hybrid Scenario Report, January 2013.

²⁸ Not all 18 projects may be included in the 2014 financially constrained RTP project list.

As shown in the above table, five of the ten study intersections are expected to operate worse than the accepted level of mobility in the 2035 p.m. peak hour.²⁹ While the mobility target shown for the I-5 ramps is 0.85, it may be increased to 0.90 if it can be shown with at least 95 percent probability that queues will not spillback onto the mainline or to the portion of the ramp needed for safe deceleration. Therefore, it is possible that the I-5NB/Elligsen Road intersection may meet the mobility target if queuing is not an issue. Further study is needed for a higher level of certainty.

It is important to note that the forecasting for Basalt Creek Transportation Refinement, 124th Avenue Analysis, and the two city TSPs was performed using earlier versions of the regional travel demand model that assumed more intense development in Basalt Creek and other adjacent areas. The regional model has since been updated (with Metro's "Gamma" model version, for the 2014 Regional Transportation Plan). While the new model was not used for the analysis summarized in this report, it is significant that the overall trip numbers for the planning area are lower due to a decreased forecast for housing units and retail jobs (which produce far more trips than industrial or other commercial employment). This decreased trip forecast (Table 18), in combination with a concept plan that will strategically consider appropriate land uses, multimodal transit networks, local road connections and existing plans for road expansions, will likely mitigate some of the operational deficiencies shown in Table 17.

Table 18 Comparing Housing and Employment Forecasts for 2025 in the Basalt Creek planning area.
Source: Metro 2014.

	New Households	New Retail Employment	New Service Employment	Other New Employment	Total New Employment
Forecast used in Basalt Creek TRP (Beta Version)	1386	467	581	1514	2562
New Forecast (Gamma Version)	1214	46	427	1843	2316
Change between Beta and Gamma forecasts	-172	-421	-154	+329	-246

The 124th Avenue extension is planned to be a five lane roadway; however, the operations shown for the 124th Avenue/Tonquin Road intersection assume 124th Avenue as a three lane facility. As a five lane facility, it is possible that the intersection may meet the mobility target.

At the time of the Basalt Creek Transportation Refinement Plan, the 2035 operational analysis assumed that the East-West Connector (i.e., 124th Avenue south of Tonquin Road) would be located north of Tonquin. However, the arterial is currently planned to be located south of Tonquin. Therefore, operations in Table 17 may vary—especially the Grahams Ferry Road/East-West Connector and Grahams Ferry Road/Tonquin Road intersections—assuming the south alignment of the arterial.

²⁹ Operational issues may also exist in the a.m. peak hour for one or more of the study intersections. Morning peak hour analysis was not available for this study.

Basalt Creek Transportation Refinement Plan Projects

The Basalt Creek Transportation Refinement effort included a recommendation for phased investments to support regional and local transportation needs through 2035. The resulting Action Plan includes the projects shown in Table 18 and Figure 39. Analysis showed that the entire set of projects would be needed to support the local and regional growth reflected in the adopted 2035 RTP model (discussed earlier), and all projects on the list are included in the assumed network on which the operations results shown in Table 17 were based.

The Action Plan project list represents the transportation framework needed to accommodate the RTP's future growth assumptions. However, this framework is different from a list of "reasonably likely" projects (i.e., projects from a financially constrained plan) that would inform a Transportation Planning Rule analysis that would support changes to comprehensive plan/zoning designations. Table 18 includes information on whether each project is identified in the Federal RTP (i.e., reasonably likely) or whether the project was from the State RTP or another source (i.e., not reasonably likely).

Major capacity improvements beyond those listed in Table 18 are not anticipated. Therefore, the trips generated in the study area, as shown in Table 16, are considered "sideboards" for the Basalt Creek planning area, meaning that trip generation lower than these totals should allow the Action Plan network to operate acceptably in 2035. Within this framework, the East-West Connector is a special case requiring further discussion.

East-West Connector Considerations

While the East-West Connector project is not part of the federal financially constrained project list in the adopted RTP, the first phase of this facility has been fast-tracked and funding has been identified for construction between 124th Avenue/Tonquin Road and Grahams Ferry Road and is recommended to be included in the 2014 financially constrained RTP list. Therefore, this section (part of Washington County's 124th Avenue Extension project) can be considered "reasonably likely" for TPR purposes.

Partner agencies on the Basalt Creek Transportation Refinement Plan identified key characteristics that should be included in the East-West Connector in order to support development. These included:

- Design for 45 mph and posted speed limit of 45 mph
- Access spacing of one-half mile to one mile

This means the only accesses provided within the study area would occur at the Grahams Ferry Road and Boones Ferry Road intersections. Additional roadway or pedestrian/bicycle crossings between the north and south sides of the facility would need to be grade-separated.

Table 19 Basalt Creek Refinement Action Plan

ID	Project	Short-Term	Medium-Term	Long-Term	Cost (\$2012)	Previously Planned?
1	124 th Avenue Extension (Tualatin-Sherwood Road to Tonquin Road): Construct three lane road extension with bike lanes and sidewalks	x			\$20,000,000	Federal RTP
2	Tonquin Road (124 th Avenue to Grahams Ferry Road): Widen to three lanes with bike lanes and sidewalks, grade separate at railroad, improve geometry at Grahams Ferry Road ¹	x			\$10,500,000	Federal RTP
3	Grahams Ferry Road (Tonquin Road to Day Road): Widen to three lanes with bike lanes and sidewalks	x			\$5,400,000	Federal RTP
4	Boones Ferry Road (Norwood Road to Day Road): Widen to three lanes with bicycle and pedestrian improvements	x			\$10,800,000	In design
5	124 th Avenue/Tonquin Road Intersection: Signal (may include Tonquin Trail crossing)	x			_ ²	-
6	Grahams Ferry Road/Tonquin Road Intersection: Signal	x			\$500,000	Federal RTP
7	Boones Ferry Road/Day Road Intersection: Add second southbound through approach lane	x			_ ³	-
8	Boones Ferry Road/95 th Avenue Intersection: Construct dual left-turn and right-turn lanes; improve signal synchronization, access management and sight distance	x			\$2,500,000	Federal RTP
9a	Tonquin Trail (Clackamas County Line to Tonquin Loop Road): Construct multi-use trail with some segments close to but separated from road	x			\$8,900,000 ⁴	Federal RTP
9b	Tonquin Trail (Tonquin Loop Road to Tualatin-Sherwood Road): Construct multi-use trail with some segments close to but separated from road		x		\$7,100,000 ⁴	Federal RTP
10	124 th Avenue Extension (Tualatin-Sherwood Road to Tonquin Road): Widen from three to five lanes with bike lanes and sidewalks		x		\$14,000,000	Federal RTP
11	East-West Arterial (124 th Avenue to Boones Ferry Road): Construct 5 lane roadway with railroad and creek crossings, integrate segment of Tonquin Trail ⁵		x		\$57,900,000	State RTP
12	Boones Ferry Road (East-West Arterial to Day Road): Widen to five lanes with bike lanes and sidewalks		x		\$1,100,000	State RTP
13	Kinsman Road Extension (Ridder Road to Day Street): Construct three lane road extension with bike lanes and sidewalks		x		\$10,400,000	Federal RTP
14	Day Road (Kinsman Road to Boones Ferry Road): Widen to five lanes with bike lanes and sidewalks		x		\$5,800,000	Similar to RTP project
15	I-5 Southbound off-ramp at Boones Ferry Road/Elligsen Road: construct second right turn lane		x		\$500,000	No
16	Boones Ferry Road/95 th Avenue Intersection: Access management		x		_ ⁶	-
17	Day Road Overcrossing: Extend new four lane crossing over I-5 from Boones Ferry Road to Elligsen Road			x	\$33,700,000 - \$44,100,000 _ ⁷	State RTP
18	East-West Arterial Overcrossing: Extend new four lane crossing over I-5 from Boones Ferry Road to Stafford Road. Integrate multi-use path in corridor that connects to Tonquin Trail			x	\$38,000,000	State RTP
TOTAL		\$59M	\$97M	\$72-82M	\$228-238M	

¹ Grade separation for Tonquin Road is optional. An at-grade crossing would reduce cost by around \$2,000,000

² Cost included in Project 1

³ Coordinate with Project 4. Cost of approach lane included in estimate for Project 12

⁴ Tonquin Trail cost estimated by Metro as part of trail planning effort

⁵ Project 11 can potentially be built in two phases funded separately, west and east of Grahams Ferry Road. However, traffic benefits needed in the medium term (around 2030) will not be realized unless entire project is completed

⁶ Project details to be determined by further coordination between City of Wilsonville and ODOT. Cost expected to be minimal

⁷ Specific alignment approaching Elligsen Road will determine project cost. Alignment to Parkway Center Drive is estimated at \$33,700,000, and alignment to Canyon Creek Road is estimated at \$44,100,000

* Time frames may shift with updates to the RTP

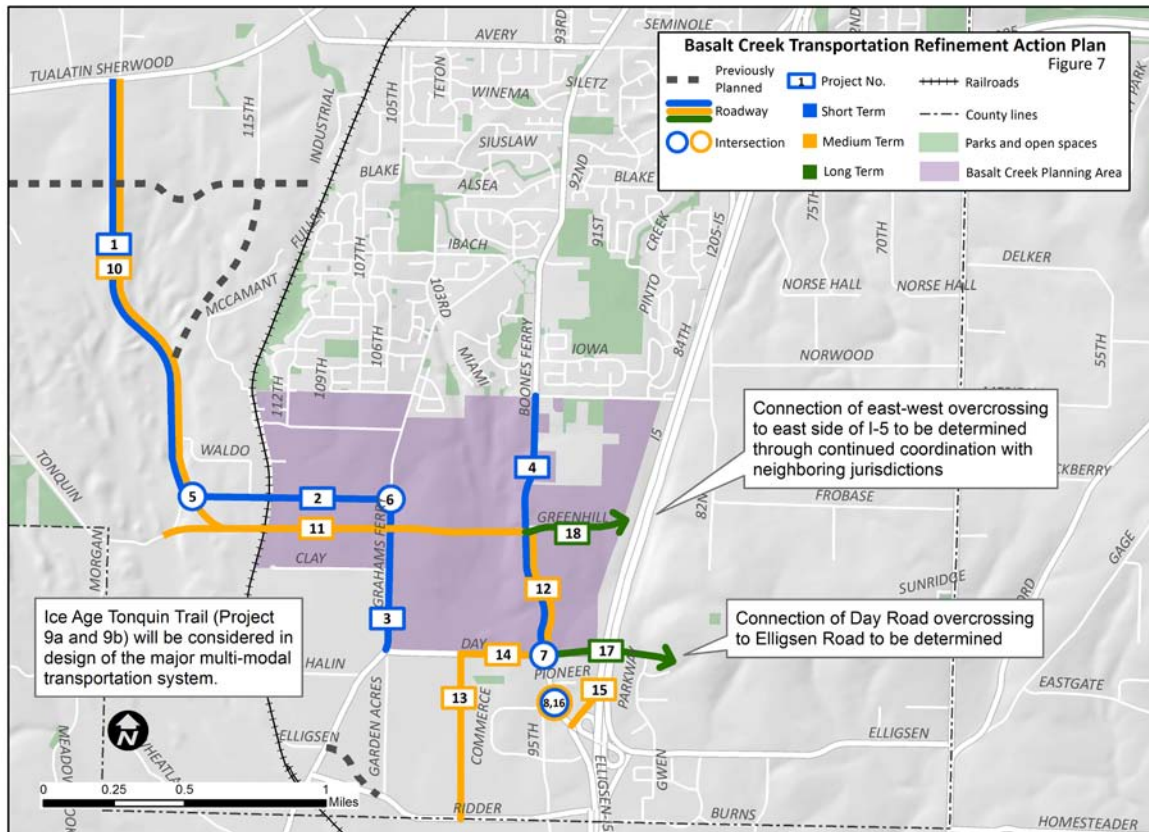


Figure 39 Basalt Creek Transportation Refinement Plan (TRP)

Pedestrian and Bicycle System

The Basalt Creek planning area is primarily served today by Tonquin Road, Grahams Ferry Road, and Boones Ferry Road. However, except for Boones Ferry Road, as shown in Figure 41 and Figure 42, these roads generally do not provide adequate pedestrian and bicycle connections to the Basalt Creek planning area.

While there are adopted design standards and several planned projects that address deficiencies in the existing pedestrian and bicycle system, there are a few rural roads in the Basalt Creek planning area without planned pedestrian and bicycle improvements, including:

- 112th Avenue south of Brown Street
- Clay Street

- Grahams Ferry Road north of Tonquin Road
- Tonquin Loop

As the area develops, these rural roads should be improved to meet urban standards.

Transit System

TriMet currently runs a bus route on Boones Ferry Road through the Basalt Creek planning area (Route 96). This route connects north Wilsonville (at Commerce Circle), Tualatin, and downtown Portland with frequent commuter service during the weekdays. As shown in Figure 39, the route runs along Boones Ferry Road with stops spaced approximately ¼ mile through the Basalt Creek planning area. Weekend transit service, however, is not provided in the planning area.

South Metro Area Regional Transit (SMART) runs transit service to Commerce Circle via Route 2X (Barbur Boulevard Transit Center to SMART Central with a stop at the Tualatin Park & Ride and Route 5 (Commerce Circle to SMART Central). Route 2X runs limited service to Commerce Circle Monday through Friday; Route 5 runs with frequent service Monday through Friday.

TriMet’s WES commuter rail service runs along the rail tracks through the planning area, connecting Wilsonville to Beaverton. While it stops in Wilsonville and Tualatin, it currently does not stop in the planning area.

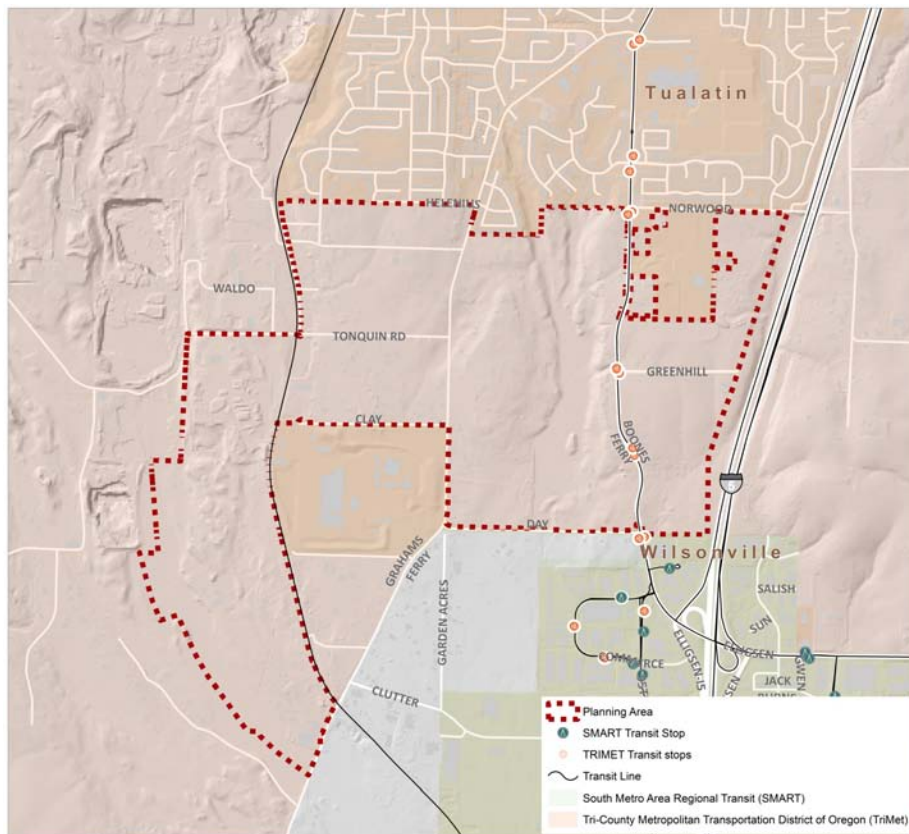


Figure 40 Transit service boundaries for TriMet and SMART in and around Basalt Creek area

Overall, the combined TriMet/SMART transit system meets the needs of the typical commuter—outside of typical commute hours, however, transit service in the Basalt Creek plan area is nonexistent. Two projects have been identified to enhance the transit system adjacent to the Basalt Creek planning area. These projects are from the Tualatin Transportation System Plan, which did not plan for projects in the planning area, and are estimated with a medium-term planning horizon (i.e., five to ten years):

- Look for potential park-and-ride locations south of Bridgeport Village.
- Add bus pullouts on SW Boones Ferry Road at existing bus stops where possible

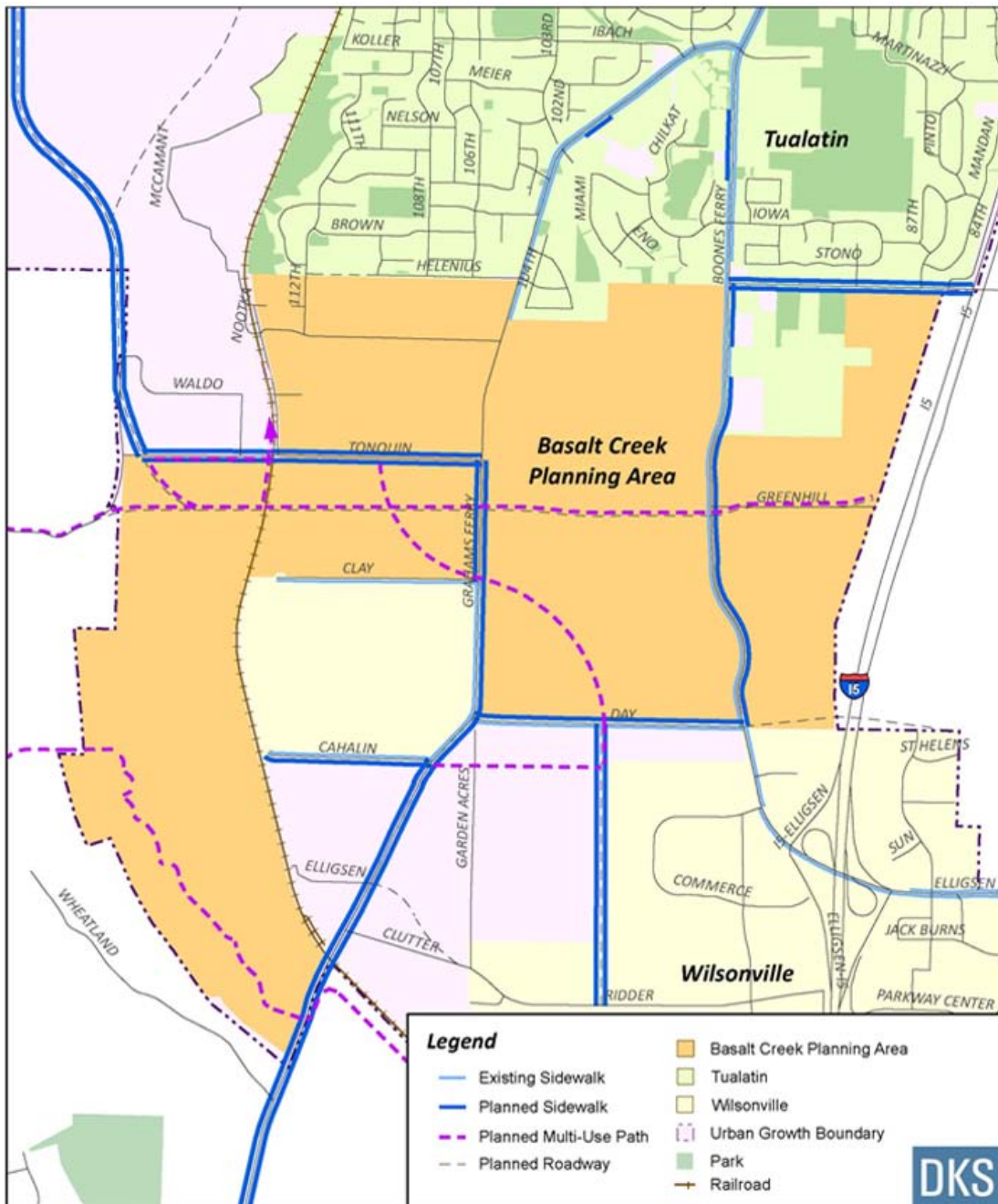


Figure 41 Existing Pedestrian system in Basalt Creek planning area. Source: DKS Associates 2014

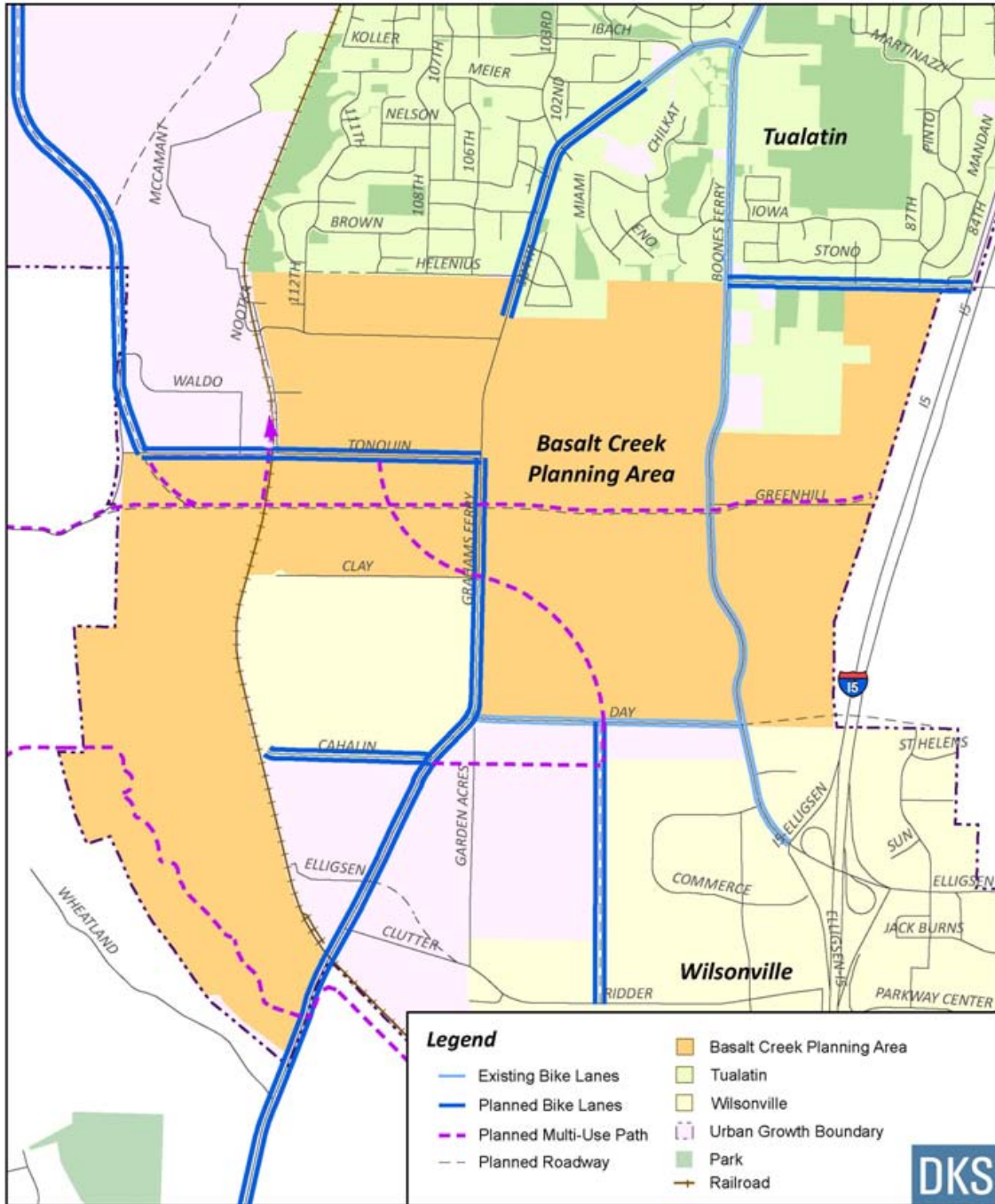


Figure 42 Existing bicycle system in Basalt Creek planning area. Source: DKS Associates 2014

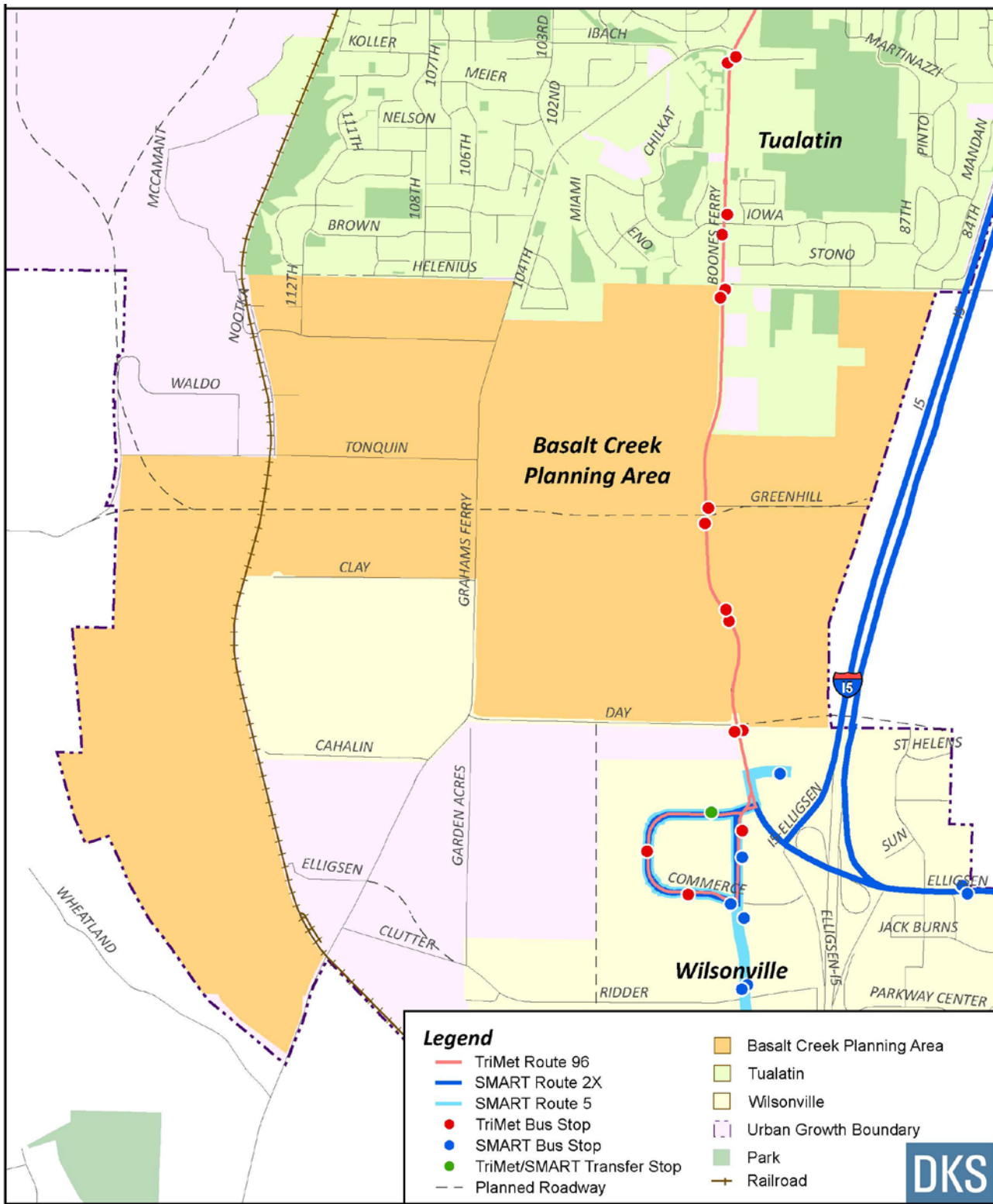


Figure 43 Existing transit system in Basalt Creek planning area. Source: DKS Associates 2014

VIII. Land Capacity Analysis

The bulk of this section describes the methods and data sources used to perform the land capacity analysis for the Basalt Creek planning area. The results of the analysis are presented toward the end of the section.

Methodology

The land capacity analysis is an estimate of the development potential within the planning area to provide a realistic estimate of where and how much land can be developed. The analysis is twofold: an assessment of “buildable lands” – areas that are suitable for development given the physical and regulatory constraints on the land, and two, an assessment of the land supply within the planning area. Land supply is an assessment at the parcel level that identifies areas that are not constrained and are either vacant or redevelopable.

Buildable Lands

The buildable lands assessment focuses primarily on identifying places where there is limited or no development potential. These areas are screened out from the analysis to identify the places where development is most suitable given the environmental and regulatory context. There are a range of factors that influence development potential within the planning area, but they can be generally divided into two categories: hard and soft constraints. Hard constraints are either physical or legal requirements that prohibit new development. These areas will be fully excluded from the analysis with the assumption that no new development will occur in them. Soft constraints are also based on physical or legal requirements but do allow for some development, and provide guidance for assigning appropriate land uses and intensities. The analysis of constraints for the purpose of assessing land capacity focused primarily on environmental and manmade constraints. A conservative approach is taken in this analysis toward development in and around environmental constraints to emphasize preservation of natural resources.

Hard Constraints

State, regional and local laws provide a range of protections for environmental features and habitat. This analysis provides a framework that meets:

- Oregon Statewide Planning Goal 5
- Metro Regional Functional Plan Requirements (Titles 3 and 13)
- Clean Water Services (CWS) Regulations
- City of Wilsonville Significant Resource Overlay Zone (SROZ) Development Code

Since local regulations are compliant with state and regional land use requirements, and in some cases go above and beyond what is required, this analysis uses the CWS and Wilsonville SROZ requirements as

the foundation for determining constraints. For the purpose of this analysis, where methodologies differ the approach that offers more protection is taken into account. The major differences between CWS and Wilsonville’s SROZ requirements are summarized in Table 20 below. The chief difference between the two is that Wilsonville differentiates for size and location of wetland and includes more drainage area classes.

Table 20 Comparing methodologies³⁰ for buffering natural resources between Clean Water Services and Metro’s Title 3/City of Wilsonville. Source: Fregonese Associates, Clean Water Services, City of Wilsonville and Metro 2014.

COMPARING BUFFERING METHODOLOGIES

WATER FEATURE	CWS	SROZ and Title 3
Primary Water Feature	50 ft	50 ft
Primary Water Feature -- With steep slope	Up to 200 ft	Up to 200 ft
Secondary Water Feature	15 ft/25 ft/50 ft	15 ft
Secondary Water Feature -- With steep slope	Up to 200 ft	50 ft
Slope Stability	Top of ravine plus 35 ft	

It should be noted that when actual development takes place, a more detailed and site-specific analysis will be undertaken and will include application of local regulations. The analysis in this report provides a detailed but high-level assessment of buildable lands for the purpose of creating the concept plan.

Hard constraints are split into two major categories: environmental and manmade. Basic environmental constraints are summarized below:

- Open Water
- Streams
- Wetlands
- Floodplains (50% reduction of developable area)
- Title 3 Water Quality and Flood Management protections
- Title 13 Nature in Neighborhoods (20% reduction of developable area in areas designated Riparian Habitat Classes I and II)
- Steep Slopes (25% slopes and greater)

Unless otherwise noted all of the constraints described above are fully excluded from the land being considered for development in this analysis.

³⁰ For definitions of features, please refer to CWS’s Design and Construction Standards - Chapter3, City of Wilsonville’s Significant Resource Overlay Zone (SROZ) Ordinance, and Metro’s Urban Growth Management Functional Plan

The following describes the environmental hard constraints methods and findings in more detail. Maps showing the environmental constraints (open water, wetlands, streams, floodplains, and Title 3 and 13 areas) can be found in *Section III: Natural and Historic Resources*.

Open water

All areas of open water in the planning area were digitized by Fregonese Associates based on 2013 and 2012 leaf-off aerials.³¹ Forty-nine (49) acres of open water (which includes a 50-foot buffer surrounding water features) were excluded from the analysis.

Streams

Three categories of streams were defined for the analysis and include:

- Natural streams (18,845 feet)
- Underground streams (789 feet)
- Intermittent streams (1,402 feet)

Stream categories determined by visual survey of 2013 and 2012 leaf-off aerials and intermittent stream and through field checks conducted by the City of Wilsonville. For the constraints analysis the following buffers were applied:

- Natural streams (50 foot buffer)
- Intermittent streams (15 foot buffer)

Underground streams were not considered in the analysis. A total of 31 acres of streams and associated buffers were excluded from the analysis.

Wetlands

Wetlands were identified using RLIS, the Wetland Delineation Report for Proposed Boones Ferry Widening, and additional wetlands digitized by Fregonese Associates based on 2013 and 2012 (leaf-off) aerials. For the constraints analysis the following wetland buffers were applied:

- Wetlands (50-foot buffer)
- Isolated wetland and smaller than a half acre (25-foot buffer)

A total of 69 acres of wetlands and buffer areas were excluded from the analysis.

³¹ Leaf-off aerials are aerial photos taken during a season (usually winter) when there is a lack of foliage on deciduous tree and shrub species, and ground features (including water bodies) can be seen more distinctly.

Floodplains

Areas identified by FEMA as being within the 1% annual chance flood event area were constrained by 50% for the analysis, resulting in a total of 53 acres of land within the 100 year floodplain.

Title 3-Designated Land

Title 3 is a regulatory designation used by Metro to protect riparian resources such as streams, wetlands and floodplains. Title 3 restricts development within these areas to protect natural resources as well as life and property threatened by flooding. There are 116 acres of Title 3 land within the planning area.

Steep Slopes

Steep slopes were analyzed using RLIS data and digitized slopes by Fregonese Associates using a 3-foot digital elevation model (DEM) provided by Metro (Figure 44). Using RLIS, only 41 acres of steep slopes were identified. The 3-foot DEM provides additional accuracy and added nine additional acres of steep slopes, for a total of 50 acres of slopes. The analysis includes non-isolated slopes, greater than half an acre, natural and or along a riparian area. These areas are excluded from the analysis.

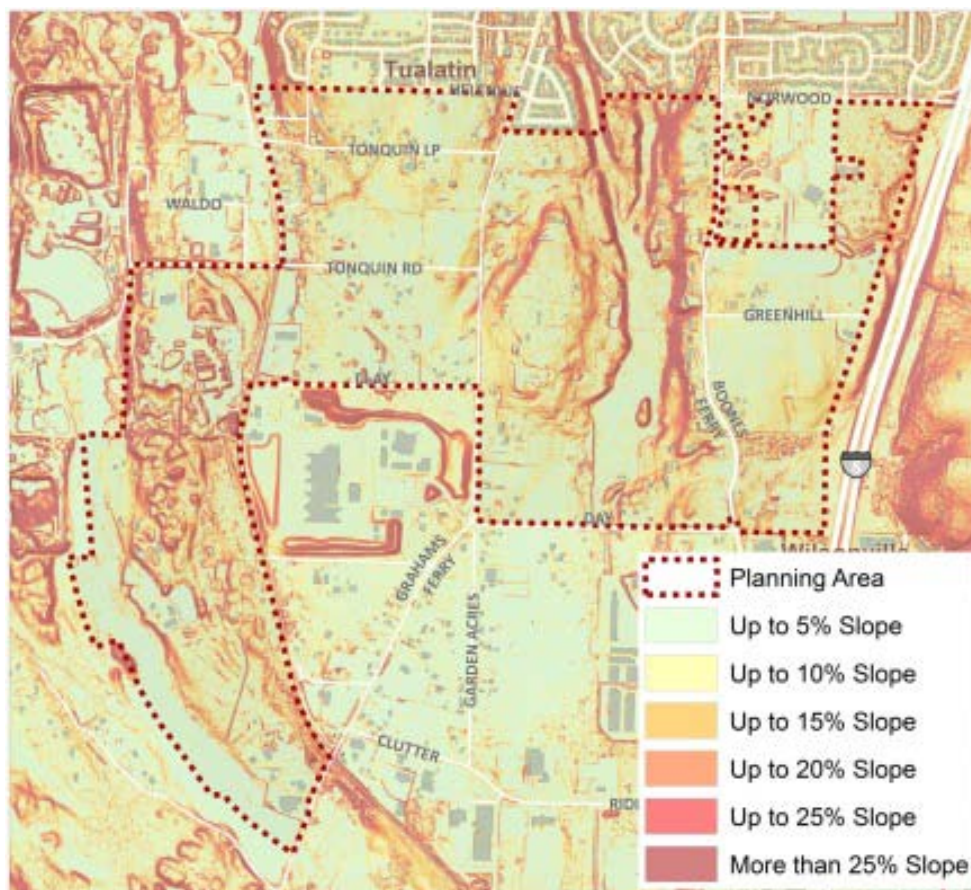


Figure 44 Map showing classification of slopes by steepness in the Basalt Creek planning area. Source: Fregonese Associates, RLIS 2014.

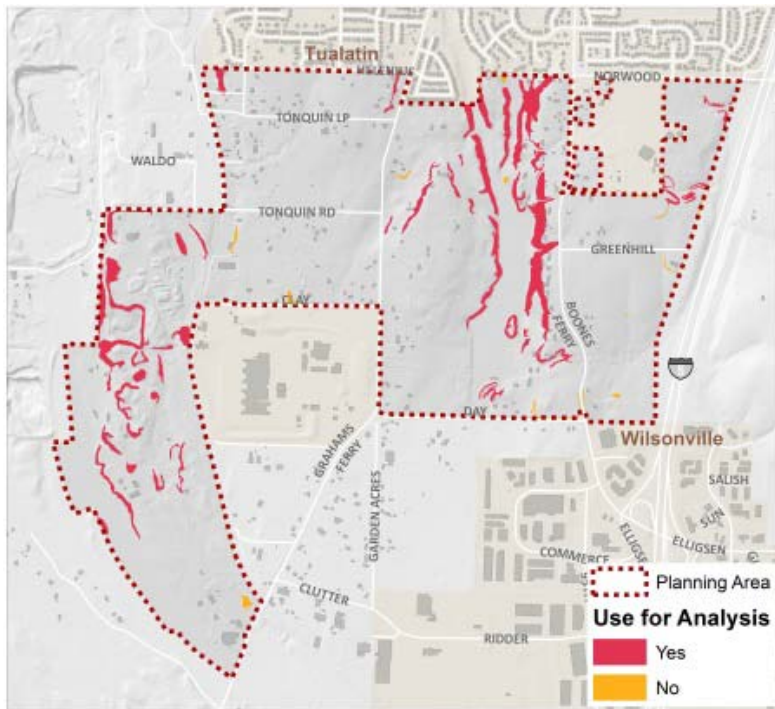


Figure 45 Slopes over 25% in the Basalt Creek planning area. Source: Fregonese Associates, RLIS 2014.

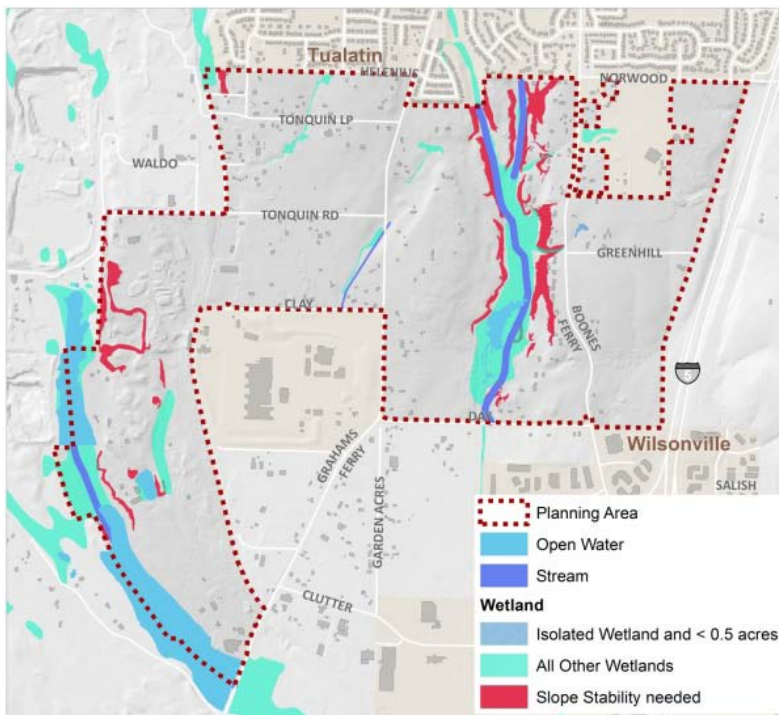


Figure 46 Slope stability in the Basalt Creek planning area. Source: Fregonese Associates, RLIS 2014.

Slope Stability

Clean Water Services has a requirement for slope stability within vegetated corridors. CWS requires an additional 35 feet for steep slopes within a vegetated corridor from top of ravine. This affects streams, open water and wetlands. The slope stability is in effect for a distance of up to 200 feet. This removes an additional area of 11 acres from the analysis (Figure 46).

Manmade Constraints

Basic manmade constraints include:

- Easements
 - BPA easements
 - PGE easements and substation
 - Natural Gas Pipeline
- Roads
 - Existing
 - Future/planned roads and expansions included in the Basalt Creek Transportation Refinement Plan

All of the manmade constraints are fully excluded from the buildable lands. The following describes the methodology and findings for the manmade constraints:

- Almost 16,000 feet of transmission lines crossing the area
- Two Easements:
 - BPA: 42.3 acres
 - PGE: 18.0 acres plus 4.1 acres substation
- Two Natural Gas lines:
 - 25.7 acres
- For constraints analysis:
 - Remove from buildable land

Roads

There are four major road projects:

- East-West Connector (6,460 feet)
- 124th Ave. Extension (890 feet)
- Boones Ferry Road (4,860 feet)
- Two 2035 I-5 Overcrossings (approx. 4,000 feet)

Soft constraints:

- Inverse buffering of tax lots along the alignments by 10-foot increments to accommodate for projects

Additional road projects:

- 11,512 feet

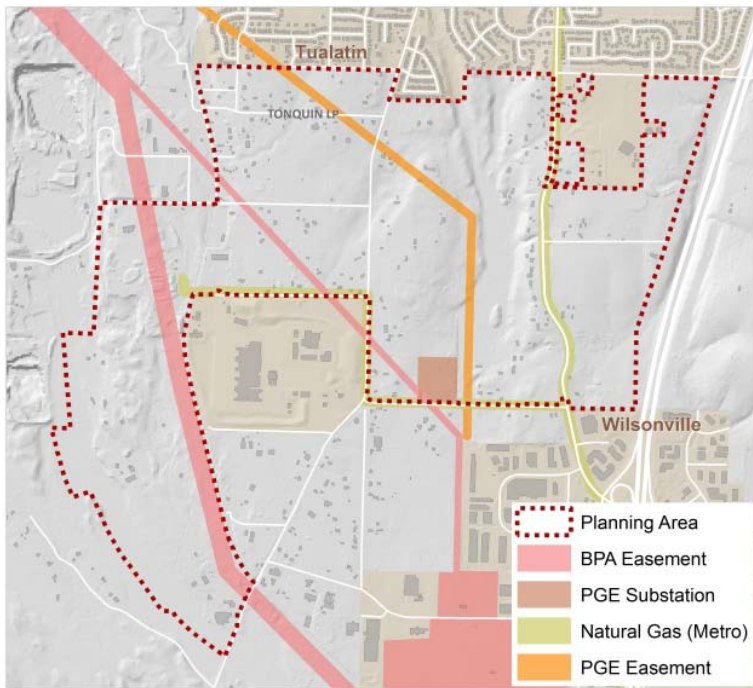


Figure 47 Infrastructure constraints in the Basalt Creek planning area. Source: Fregonese Associates, RLIS 2014

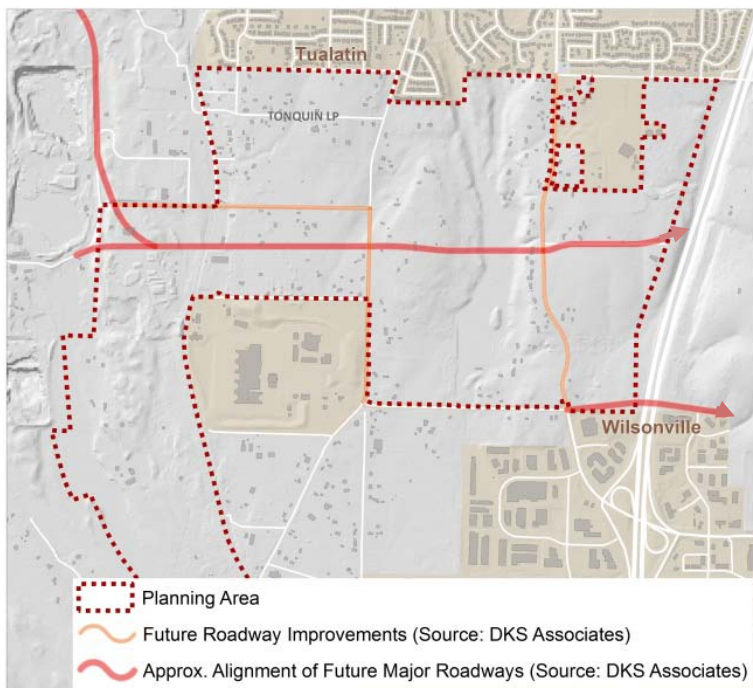


Figure 48 Road constraints in the Basalt Creek planning area. Source: Fregonese Associates, RLIS 2014

Soft Constraints

Soft constraints provide guidance for determining suitability for different land uses in areas that are environmentally constrained. Two key soft constraints are included in the analysis: Slopes greater than 10% (as a constraint for industrial suitability) and Title 13 protections of upland habitat

Title 13 – Designated Land

Title 13 refers to Nature in Neighborhoods. It was adopted by Metro in 2007 as an enhancement to Title 3. Title 13 encourages the protection of habitat and conservation efforts. For our analysis we restricted development within the Riparian Class I and II. There are 431 acres of Title 13-designated land in the planning area. For the constraints analysis, the developable acreage was reduced by 20%. Title 13 is considered a soft constraint, as it is a policy guidance designation but not regulatory.

Constraints Summary

Overall 35% (297 acres) of the total land area within the Basalt Creek planning area is constrained.

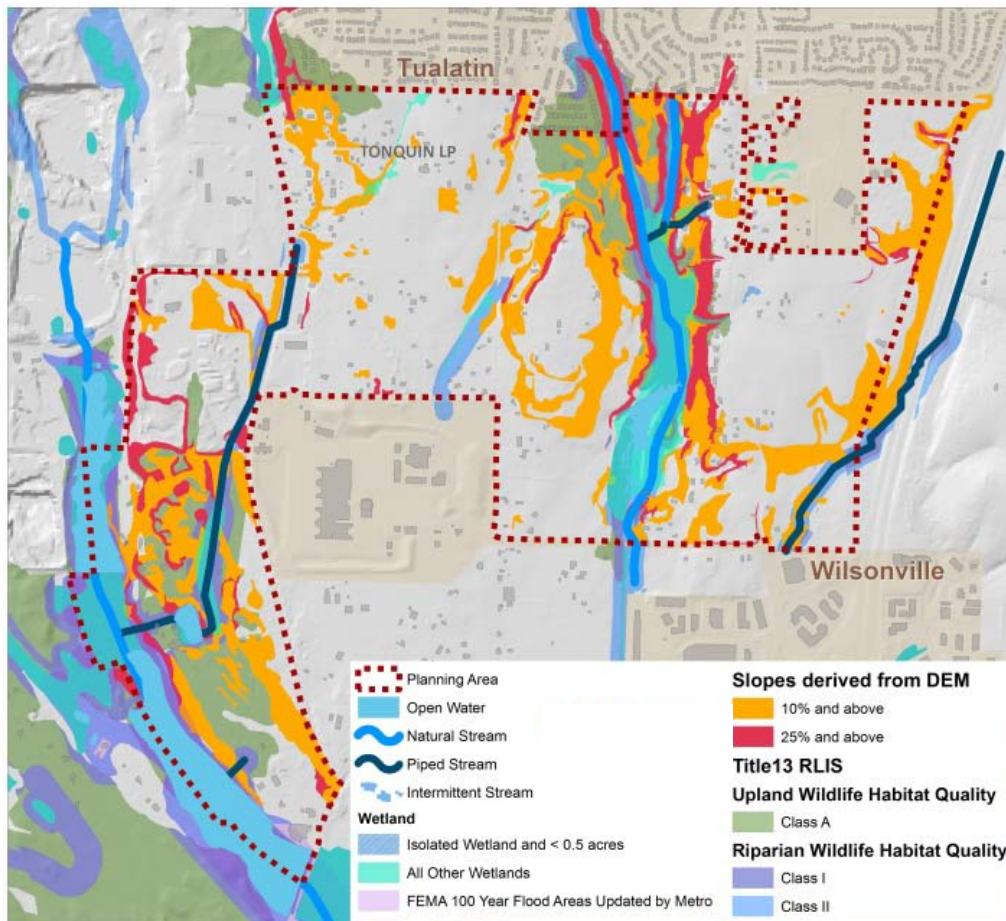


Figure 49 Map of development constraints (excluding roads) in the Basalt Creek planning area. Source: Fregonese Associates, RLIS 2014

Figure 50 below illustrates the land area that is either fully or partially constrained based on the methodology described above.

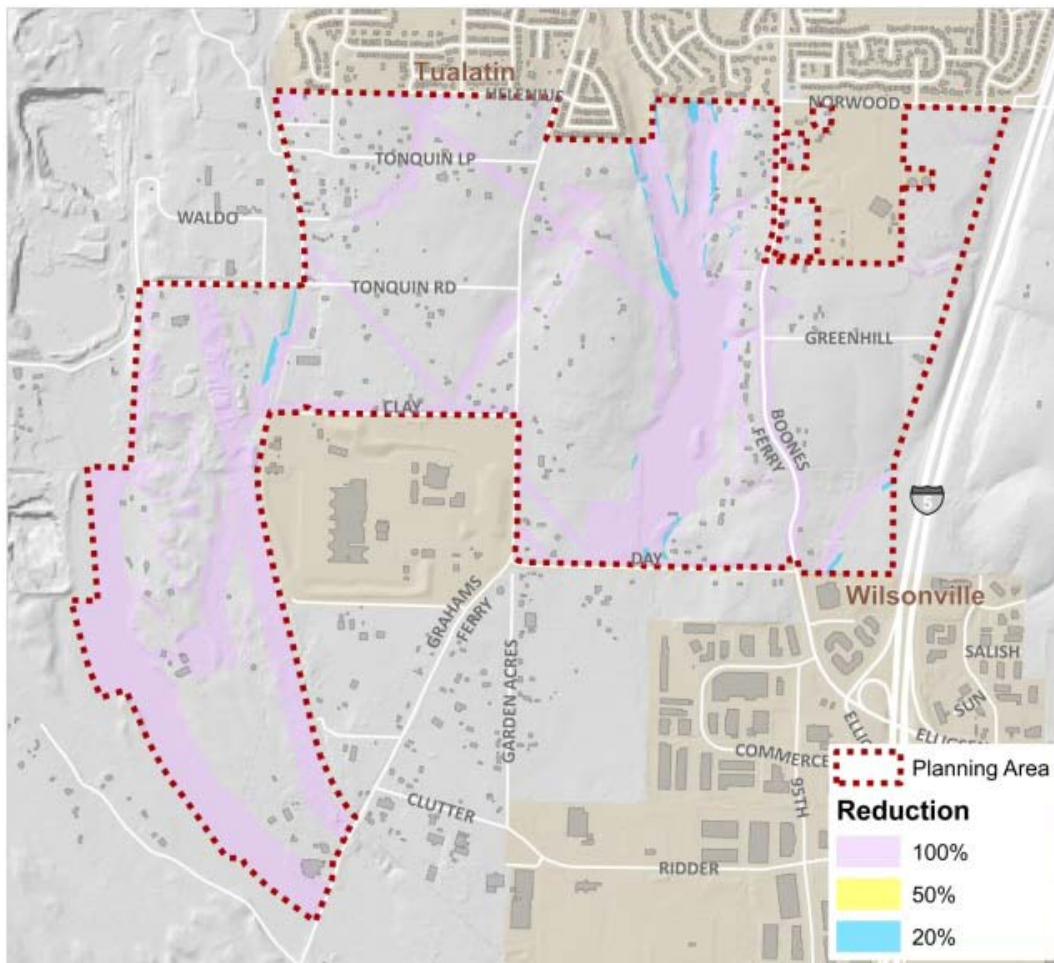


Figure 50 Map of all constrained area (hard constraints) in the Basalt Creek planning area. Source: Fregonese Associates, RLIS 2014

Land Supply

The second step in the buildable lands analysis examines the potential for new development or redevelopment of existing uses within the planning area. While much of the land within the planning area is vacant, there are existing businesses, homes and other uses within the area that are considered. This part of the analysis brings together the buildable lands analysis with an assessment of developable land within the planning area to provide an estimate of land supply available for development. This analysis is conducted at the tax lot level because land uses are tied to property lines.

The outcome of this analysis is to classify every parcel within the planning area into one of the three categories described below:

- Vacant Land – Land ready to build, no major structure on site
- Redevelopable Land – Land with existing uses but have redevelopment potential
- Stable Land – Land and structures on it will not change in the future

The land supply analysis is then combined with the buildable lands to create a geographically referenced database of land capacity within the planning area.

The land supply analysis is based on four major steps (Figure 51):

- Existing Land Use – Land use provided by tax lot data via RLIS
- Visual Survey – Ground proofing via aerials and online tools
- Building Value – Define “stable” and redevelopment potential via building value
- Local Input – Refine analysis with local input

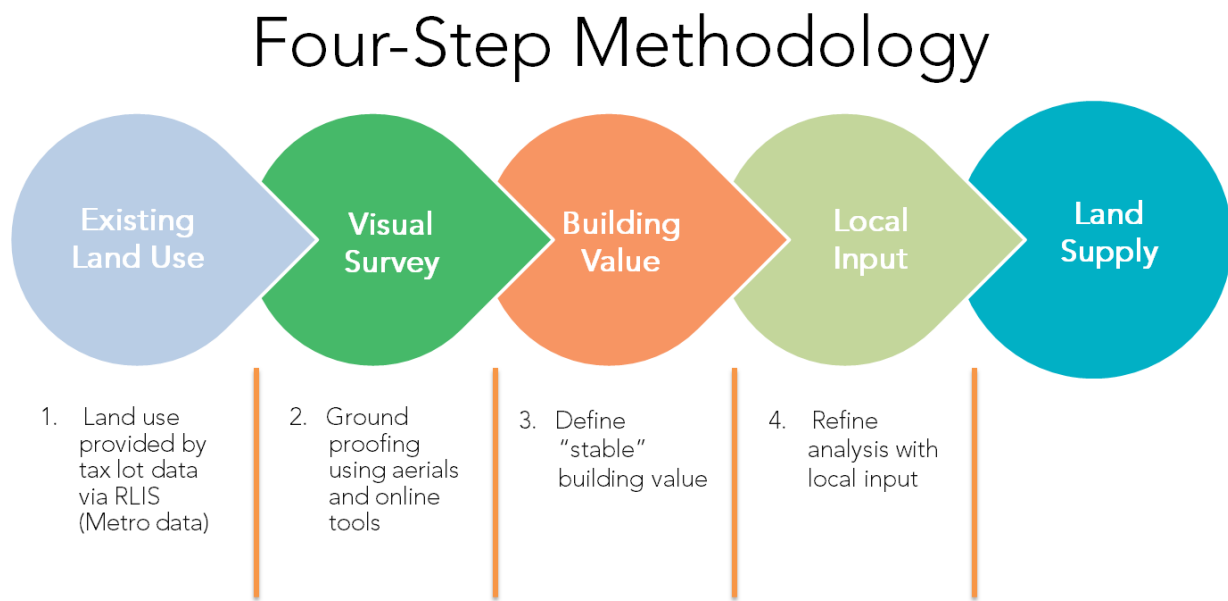


Figure 51 Graphic illustration of four-step methodology for analyzing land supply. Source: Fregonese Associates 2014.

Existing Land Use

In this step parcels are categorized into either developed or vacant land. Step one is based on existing land use using tax lot data provided by RLIS. Parcels that are considered developed are classified in RLIS as:

- Commercial
- Industrial
- Public
- Residential

Parcels that are considered vacant are classified in RLIS as:

- Rural
- Forest
- Agriculture
- Unknown
- Vacant

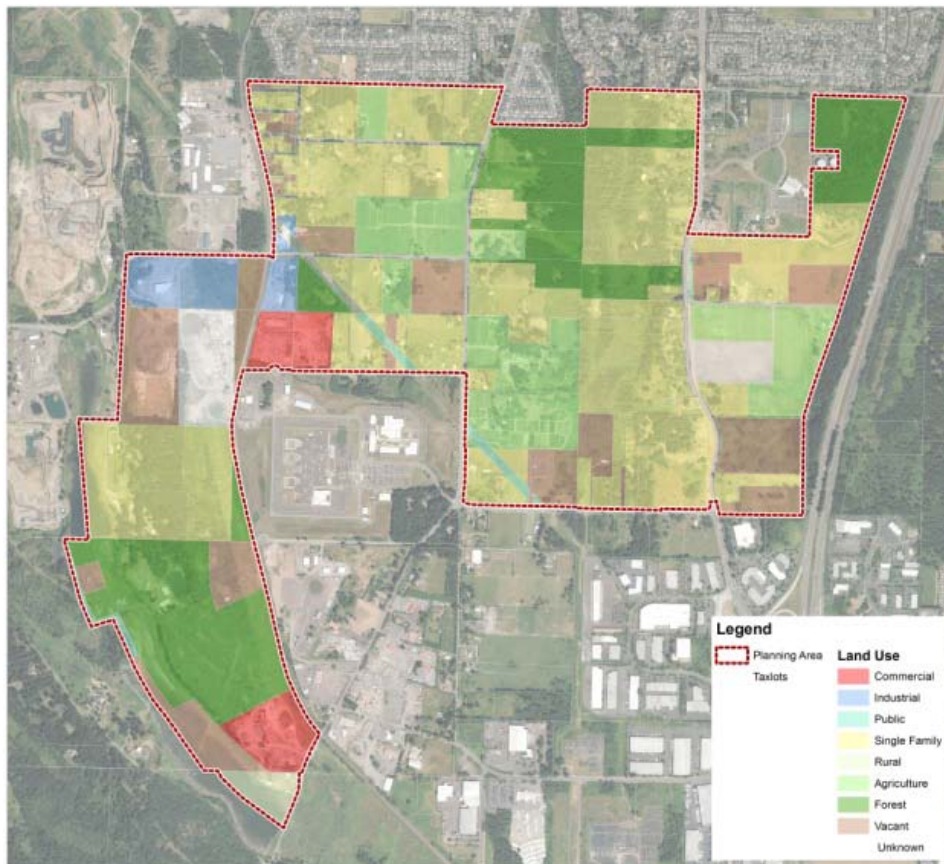


Figure 52 Map of existing land uses inside Basalt Creek planning area. Source: Fregonese Associates, RLIS 2014

Visual Survey

In step two Fregonese Associates used a visual survey, other data resources and online tools to confirm and refine tax-lot-based classification of developed and vacant land. First, the vacant and developed land inventory (RLIS March 2014) was utilized to further refine the tax-lot-based analysis. The vacant and developable lands inventory is not limited to the tax lot lines and uses a “cookie cutter approach” around buildings to adjust for large amount of “unused” land on a development lot that may have an existing structure. Using this dataset as a guide in parallel with aerial photography, Google Map Street View, and Bing Map Bird’s Eye the parcel dataset was refined.

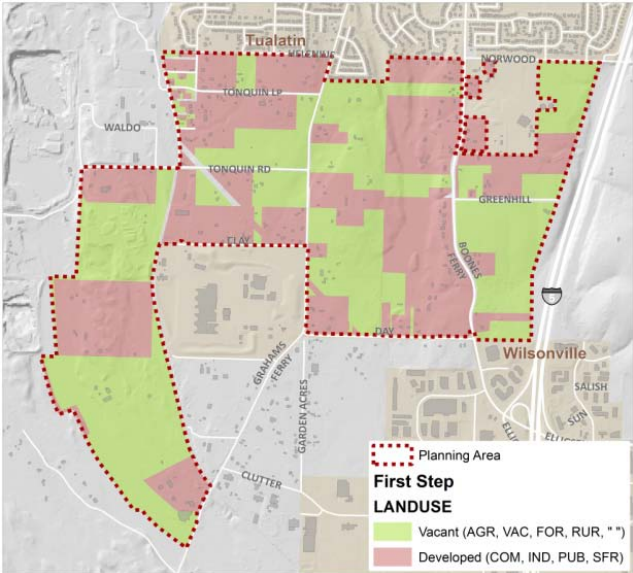


Figure 53 Vacant and Developed land as identified by Metro data. Source: Fregonese Associates, RLIS 2014

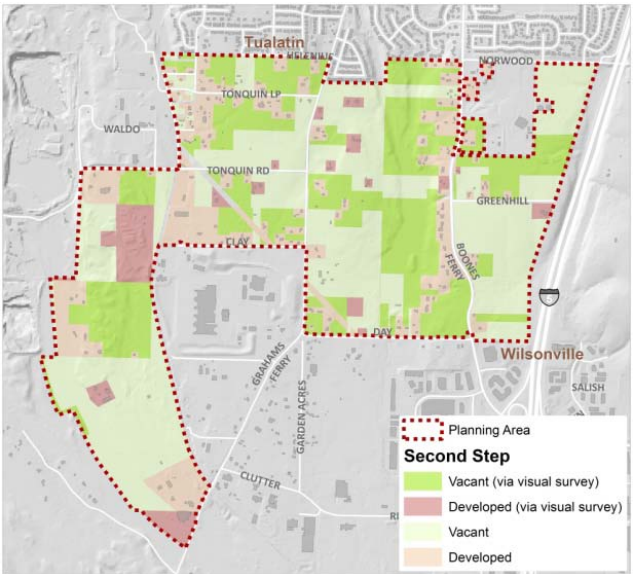


Figure 54 Map of Vacant and Developed land identified via visual survey in Basalt Creek planning area. Source: Fregonese Associates, RLIS 2014

Building Value

Once vacant and developed lands were identified an assessment of redevelopment potential was conducted. This step analyzes developed parcels classified under steps 1 and 2 and subdivides them into two categories: redevelopable or stable. Redevelopable means there is an existing use that will likely redevelop over the planning period and can thus be considered as part of the land capacity. Tax lots defined as stable are where no changes in existing land use are expected, so no additional growth in households and employment are expected. Tax lots classified as stable are fully excluded from the buildable lands.

First, tax lots with non-commercial structures on developed land were classified as stable. This captures residential uses in the planning area. The average building value (\$125,474) was then used to create a break point for building value to estimate redevelopment potential. Tax lots with a building value of \$150,000 or more were included in the analysis as “stable” the remainder are classified as redevelopable. This cutoff point was based on a combination of average building value and input from local property owners about their interest in redeveloping.³²

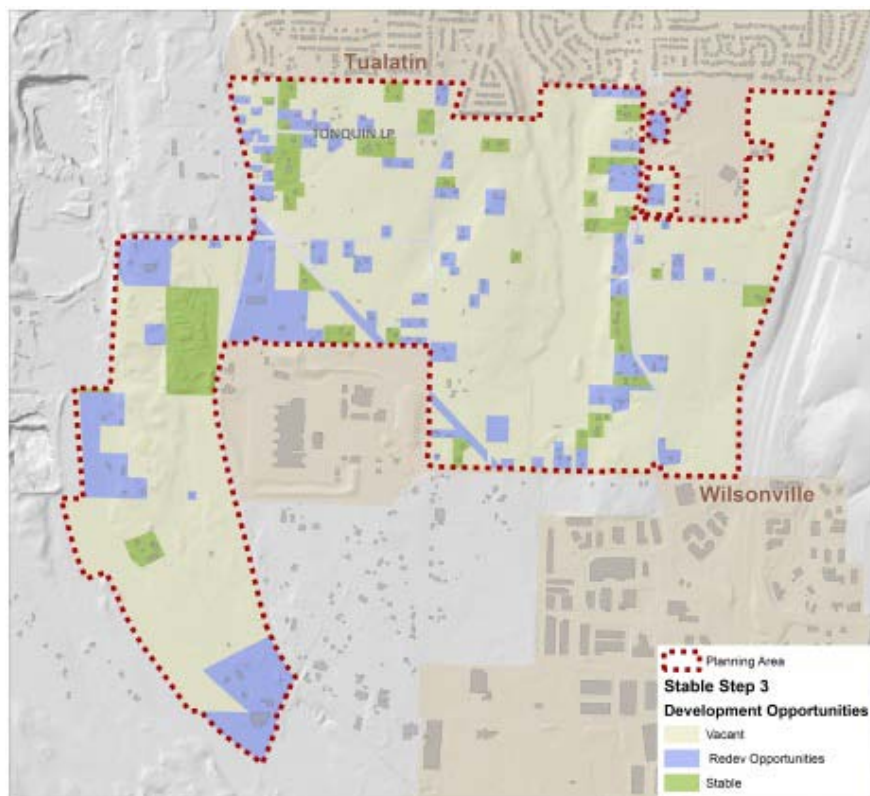


Figure 55 Vacant, Stable and Redevelopable Land in the Basalt Creek planning area, as identified by combining Metro data and visual survey data. Source: Fregonese Associates, RLIS 2014.

³² Raising the cutoff from \$125,000 to \$150,000 makes an assumption that most properties will redevelop as they have been developed previously under rural circumstances. There are a reasonable number of properties in the third and fourth quantiles of property values that are stable, but not as many as are likely to redevelop.

Local Input

The final step refines the stable and redevelopable tax lot inventory using information gathered through the planning process. A number of stakeholder interviews and focus groups were held with property owners in the planning area. Input gathered from these meetings was used to refine the assumptions from steps 1-3.

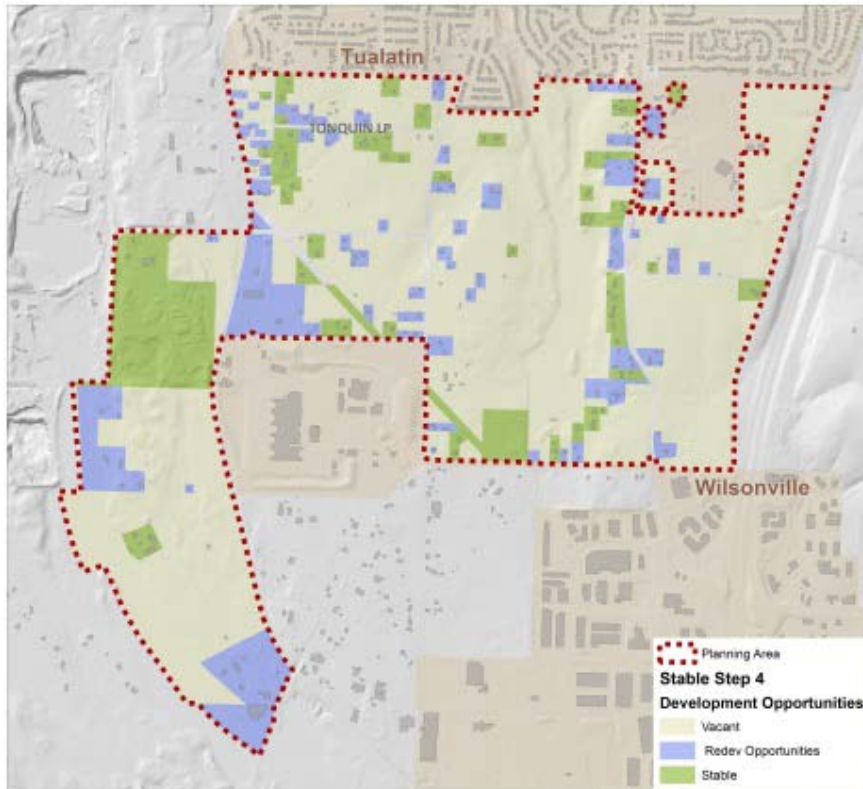


Figure 56 Final Map of Vacant, Stable and Redevelopable Land in the Basalt Creek planning area, as identified by combining Metro data, visual survey data, and local input from property owners. Source: Fregonese Associates, RLIS, local property owner input 2014.

Land Supply Findings

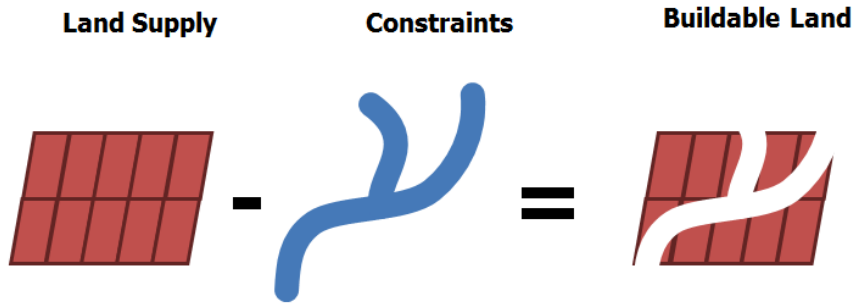
Through the process described above 43 tax lots within the planning area are defined as stable. Absent any constraints the land supply for the planning area includes:

- 596 acres of vacant land
- 117 acres of land with redevelopment potential
- 109 acres of stable land

The remaining acreage is covered by roads.

Land Capacity

The final step in determining the land capacity for the planning area brings together the buildable lands and the land supply analysis to provide a robust estimate of land development capacity within the planning area.



The land capacity estimate for the planning area is 391 acres. This land capacity analysis will form the foundation for determining land use suitability and creating the development alternatives in the next phase of the project.

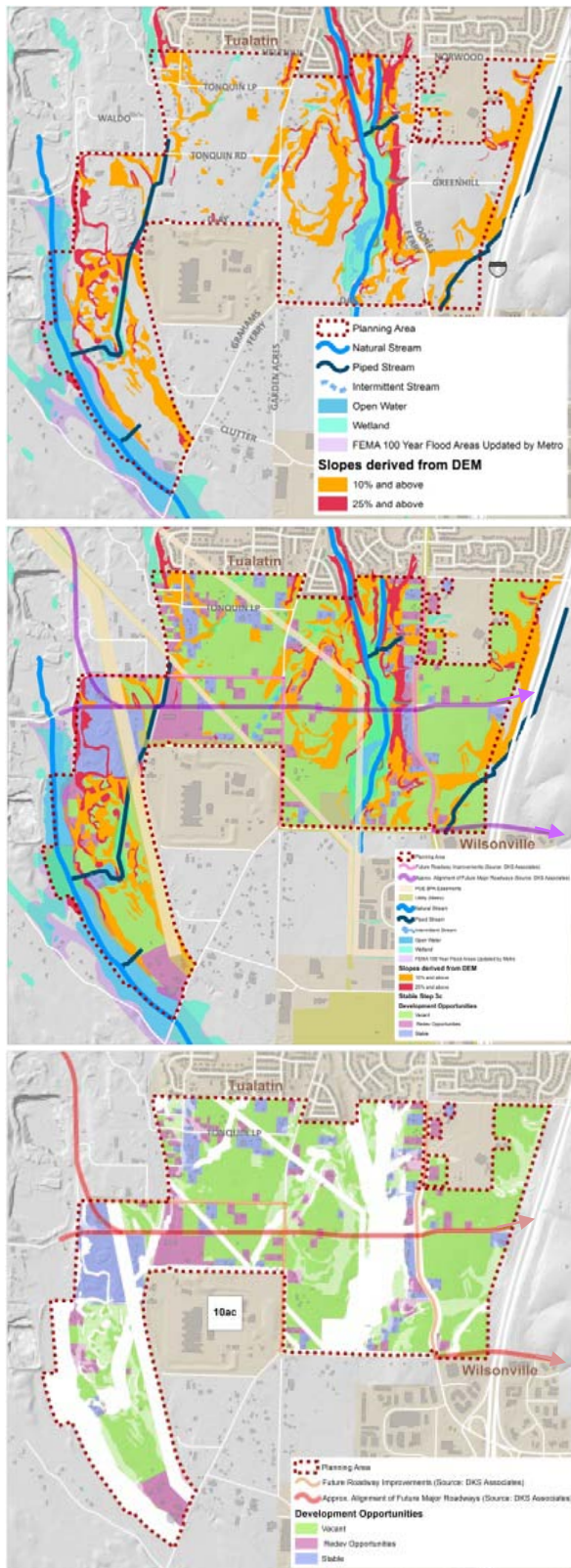


Figure 57 Sequence of maps illustrating the data and steps used to determine the total acreage of developable land in the Basalt Creek planning area. Source: Fregonese Associates 2014.