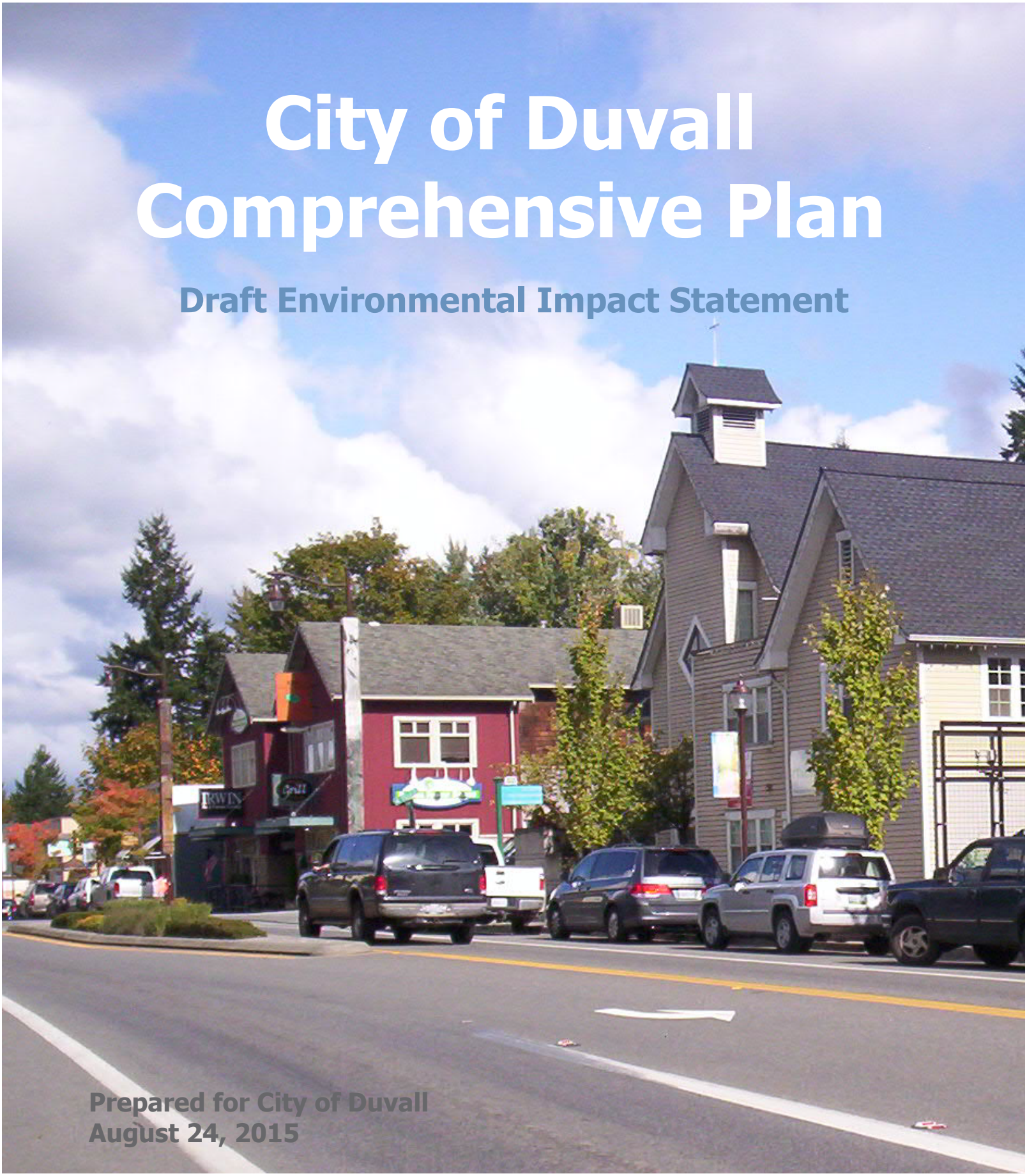
City of Duvall Comprehensive Plan

Draft Environmental Impact Statement



Prepared for City of Duvall
August 24, 2015

City of Duvall
Small Town. Real Life.

August 24, 2015

Dear Affected Agencies, Organizations, and Interested Parties:

The City of Duvall invites your review of this Draft Environmental Impact Statement (Draft EIS) that evaluates the potential impacts of the City's update of its Comprehensive Plan. The update will consist of text and map amendments to the Comprehensive Plan that will influence the manner and distribution of approximately 1,140 additional housing units and 840 additional jobs in Duvall through 2035. The proposal applies to the entire city of Duvall and its proposed urban growth areas. The EIS evaluates three action alternatives and one no-action alternative, each representing different approaches to accommodating population growth. Alternatives include:

1. Alternative 1: 2015 Comprehensive Plan Alternative
2. Alternative 2: Urban Growth Area Reserve
3. Alternative 3: Revised Urban Growth Area Boundaries
4. Alternative 4: No Action Alternative

This Draft EIS identifies environmental impacts and mitigation measures for each alternative. Elements of the environment evaluated in this Draft EIS include: water resources, earth, plants and animals, land use and housing, aesthetics, noise, public services and utilities, and transportation. The public comment period for this Draft EIS is from August 24 - September 23, 2015. Please see the Fact Sheet for information on options for providing comments and the project website at www.duvallwa.gov/297/Comprehensive-Planning. In addition, the City invites your comments at:

Comprehensive Plan Update, Draft EIS Open House and Public Hearing
September 2nd, 2015 from 6:00 - 7:30 p.m.
Duvall Visitor Center, 15619 Main Street NE

Following the Draft EIS comment period, a Final EIS will be prepared that addresses comments received during the Draft EIS comment period.

Thank you for your interest in the Comprehensive Plan Update and this Draft EIS. We welcome your comments.

Sincerely,

Lara Thomas
Planning Director

FACT SHEET

Name of Proposal

2015 Adoption of Duvall Comprehensive Plan Amendments

Proponent

City of Duvall

Project Location

The area represented by this Draft EIS is the entire city of Duvall and its existing and proposed urban growth areas (UGA). The city encompasses approximately 2.5 square miles and is surrounded by unincorporated King County. The city is bounded on the west by Snoqualmie River, the east by 284th Avenue NE, the north by NE Cherry Valley Road, and the south by NE Big Rock Road.

Project Description

The City is considering text and map amendments to the Duvall Comprehensive Plan that may alter the distribution of projected growth targets of 1,140 housing units and 840 jobs in Duvall through 2035, and that would influence City operations to promote and achieve goals related to public health, safety, welfare, and service delivery.

Proposed Alternatives

This Draft Environmental Impact Statement (EIS) considers four alternatives, including a No Action Alternative. All alternatives are based on the same projected growth targets, but vary in approach to where the growth would be distributed. The table below briefly describes each alternative.

Alternative Name	Description
Alternative 1: 2015 Comprehensive Plan Alternative	Under Alternative 1, the household and employment allocations would be accommodated within current city limits and UGA, consistent with revised goals and policies in the draft Comprehensive Plan, and revisions to the City's Future Land Use Map and Zoning map, including the creation of a new "Residential 20 units per acre" designation. The City would support annexation of the Southwest UGA and the North UGA. Annexation of the UGA-Reserve would not be included under this alternative.
Alternative 2: Urban Growth Area Reserve	Under Alternative 2, the household and employment allocations would be accommodated within the current city limits consistent with the current Future Land Use Map and Zoning map and revised goals and policies in the draft Comprehensive Plan. The City would also accommodate growth upon annexation of the UGA-Reserve located to the east of city limits and the North UGA. Annexation of the Southwest UGA would not be included under this alternative.

Alternative Name	Description
Alternative 3: Revised Urban Growth Area Boundaries	Under Alternative 3, the household and employment allocations would be accommodated within the current city limits consistent with the current Future Land Use Map and Zoning map and revised goals and policies in the draft Comprehensive Plan. The City would work with the County to remove the northern portion of the UGA-Reserve from their boundaries and add an approximately equal area south of Big Rock Road that is currently not part of Duvall's urban growth area or city limits. Under this alternative, the City would support annexation of the North UGA and the new area south of Big Rock Road. Annexation of the Southwest UGA would not be included under this alternative
Alternative 4: No Action Alternative	Under the No Action Alternative, the household and employment allocations would be accommodated within the current city and UGA limits consistent with the current Future Land Use Map and Zoning map. The City would support annexation of the North UGA. Annexation of the UGA-Reserve and the Southwest UGA would not be included under this alternative.

State Environmental Policy Act (SEPA) Lead Agency

City of Duvall

SEPA Responsible Official and EIS Contact Person

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Duvall, WA 98019

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Final Action

Adoption of an updated Comprehensive Plan by the Duvall City Council

Required Permits & Approvals

The following actions would be required for adoption of Comprehensive Plan amendments:

- Identification of a preferred alternative;
- Amendment of the King County Comprehensive Plan (Alternative 3 only); and
- Finalized maps and policy language.

Authors and Principal Contributors

This Draft EIS has been prepared under the direction of the City of Duvall Planning Department, in consultation with other City departments. Research and analysis associated with the EIS were provided by: Environmental Science Associates (ESA).

Date of Issue

August 24, 2015

End of Comment Period

All comments must be postmarked or emailed on or before midnight, September 23, 2015.

Commenting on the Draft EIS

Individuals may comment on the Draft EIS by emailing or mailing written comments to:

Lara Thomas, Planning Director
City of Duvall
PO Box 1300
Duvall, WA 98019
Email: Lara.thomas@duvallwa.gov

Individuals may also provide comments at the public hearing to be held from 6:00 p.m. to 7:30 p.m. on September 2, 2015. The public hearing will be held at:

Duvall Visitor Center
15619 Main Street
Duvall, WA 98019

Availability of the Draft EIS

Copies of the Draft EIS and/or Notices of Availability have been distributed to agencies, tribal governments, and organizations on the Distribution List in Chapter 12.

The Draft EIS may be viewed online and downloaded from the project website:
http://www.duvallwa.gov/297/Comprehensive-Planning

Copies of the Draft EIS are also available for review at the following locations:

- Duvall Library, 15508 Main St NE, Duvall, WA, 98019
- Duvall City Hall, 15535 Main Street NE, Duvall, WA, 98019

Copies are available to purchase for cost of reproduction by contacting Duvall City Hall at (425) 788-1185.

TABLE OF CONTENTS

FACT SHEET FS-1
ACRONYMS AND GLOSSARY AG-1
CHAPTER 1. SUMMARY 1-1
1.1 Introduction 1-1
1.2 Organization of Draft EIS 1-1
1.3 Summary of Impacts 1-3
1.4 Areas of Major Controversy or Uncertainty 1-13
CHAPTER 2. DESCRIPTION OF PROJECT ALTERNATIVES 2-1
2.1 Introduction 2-1
2.2 Planning Context 2-1
2.2.1 Duvall Comprehensive Plan 2-1
2.2.2 Existing Zoning 2-6
2.3 Project Objectives 2-7
2.4 Proposed Action and Alternatives 2-7
2.4.1 Alternative 1: 2015 Comprehensive Plan Alternative 2-8
2.4.2 Alternative 2: Urban Growth Area Reserve 2-11
2.4.3 Alternative 3: Revised Urban Growth Area Boundaries 2-12
2.4.4 Alternative 4: No Action Alternative 2-14
2.5 Policy and Regulatory Amendments 2-15
2.6 Benefits and Disadvantages of Delaying the Proposed Action 2-15
CHAPTER 3. WATER RESOURCES 3-1
3.1 Relevant Plans, Policies, and Regulations 3-1
3.2 Affected Environment 3-4
3.2.1 Climate 3-4
3.2.2 Topography 3-4
3.2.3 Streams and Rivers 3-4
3.2.4 Lakes 3-6
3.2.5 Wetlands 3-6
3.2.6 Watershed Subbasins 3-8
3.2.7 Water Quality 3-8
3.2.8 Watershed Functions 3-9
3.3 Impacts 3-10
3.3.1 Impacts Common to All Alternatives 3-10
3.3.2 Alternative 1: 2015 Comprehensive Plan Alternative 3-12
3.3.3 Alternative 2: Urban Growth Area Reserve 3-12
3.3.4 Alternative 3: Revised Urban Growth Area Boundaries 3-13

3.3.5 Alternative 4: No Action Alternative 3-14
3.4 Mitigation Measures 3-14
3.5 Significant Unavoidable Adverse Impacts 3-14
CHAPTER 4. EARTH 4-1
4.1 Relevant Plans, Policies, and Regulations 4-1
4.2 Affected Environment 4-2
4.2.1 Soil Conditions 4-2
4.2.2 Erosion 4-2
4.2.3 Landslides 4-4
4.2.4 Earthquakes 4-4
4.3 Impacts 4-5
4.3.1 Impacts Common to All Alternatives 4-5
4.3.2 Alternative 1: 2015 Comprehensive Plan Alternative 4-7
4.3.3 Alternative 2: Urban Growth Area Reserve 4-8
4.3.4 Alternative 3: Revised Urban Growth Area Boundaries 4-9
4.3.5 Alternative 4: No Action Alternative 4-10
4.4 Mitigation Measures 4-11
4.5 Significant Unavoidable Adverse Impacts 4-12
CHAPTER 5. PLANTS AND ANIMALS 5-1
5.1 Relevant Plans, Policies, and Regulations 5-1
5.2 Affected Environment 5-3
5.2.1 Description of Plants and Animals in Areas that Could Develop 5-6
5.3 Impacts 5-9
5.3.1 Impacts Common to All Alternatives 5-9
5.3.2 Alternative 1: 2015 Comprehensive Plan Alternative 5-10
5.3.3 Alternative 2: Urban Growth Area Reserve 5-11
5.3.4 Alternative 3: Revised Urban Growth Area Boundaries 5-11
5.3.5 Alternative 4: No Action Alternative 5-12
5.4 Mitigation Measures 5-12
5.5 Significant Unavoidable Adverse Impacts 5-13
CHAPTER 6. LAND USE AND HOUSING 6-1
6.1 Relevant Plans, Policies, and Regulations 6-1
6.2 Affected Environment 6-3
6.2.1 Population and Employment 6-3
6.2.2 Current Land Uses and Housing Types 6-4
6.2.3 Historical and Cultural Resources 6-6
6.2.4 Future Land Use Designations and Zoning 6-8
6.2.5 Impacts Common to All Alternatives 6-12
6.2.6 Alternative 1: 2015 Comprehensive Plan Alternative 6-14

6.2.7 Alternative 2: Urban Growth Area Reserve 6-15
6.2.8 Alternative 3: Revised Urban Growth Area Boundaries 6-15
6.2.9 Alternative 4: No Action Alternative 6-16
6.3 Mitigation Measures 6-16
6.4 Significant Unavoidable Adverse Impacts 6-16
CHAPTER 7. AESTHETICS 7-1
7.1 Introduction 7-1
7.2 Relevant Plans, Policies, and Regulations 7-2
7.2.1 Comprehensive Plan 7-2
7.2.2 Downtown Sub-area Plan Goals and Policies 7-6
7.2.3 Zoning Code 7-6
7.3 Affected Environment 7-8
7.3.1 Scenic Resources 7-8
7.3.2 Viewsheds 7-11
7.3.3 Existing Urban Form 7-12
7.4 Impacts 7-13
7.4.1 Impacts Common to All Alternatives 7-13
7.4.2 Alternative 1: 2015 Comprehensive Plan Alternative 7-15
7.4.3 Alternative 2: Urban Growth Area Reserve 7-16
7.4.4 Alternative 3: Urban Growth Area Reserve 7-17
7.4.5 Alternative 4: No Action Alternative 7-17
7.5 Mitigation Measures 7-17
7.6 Significant Unavoidable Adverse Impacts 7-18
CHAPTER 8. NOISE 8-1
8.1 Environmental Noise and Vibration Fundamentals 8-1
8.2 Relevant Plans, Policies, and Regulations 8-2
8.3 Affected Environment 8-3
8.3.1 Noise Sources in Duvall 8-3
8.3.2 Sensitive Receptors in Duvall 8-5
8.4 Impacts 8-5
8.4.1 Impacts Common to All Alternatives 8-6
8.4.2 Alternative 1: 2015 Comprehensive Plan Alternative 8-7
8.4.3 Alternative 2: Urban Growth Area Reserve 8-8
8.4.4 Alternative 3: Revised Urban Growth Area Boundaries 8-8
8.4.5 Alternative 4: No Action Alternative 8-9
8.5 Mitigation Measures 8-9
8.6 Significant Unavoidable Adverse Impacts 8-10
CHAPTER 9. PUBLIC SERVICES AND UTILITIES 9-1
9.1 Relevant Plans, Policies, and Regulations 9-1

9.2 Affected Environment 9-1
9.2.1 Police 9-1
9.2.2 Fire 9-3
9.2.3 Parks and Recreation 9-4
9.2.4 Government 9-5
9.2.5 Schools 9-5
9.2.6 Utilities 9-6
9.3 Impacts 9-9
9.3.1 Impacts Common to All Alternatives 9-9
9.3.2 Alternative 1: 2015 Comprehensive Plan Alternative 9-10
9.3.3 Alternative 2: Urban Growth Area Reserve 9-11
9.3.4 Alternative 3: Revised Urban Growth Area Boundaries 9-13
9.3.5 Alternative 4: No Action Alternative 9-14
9.4 Mitigation Measures 9-14
9.4.1 Police 9-14
9.4.2 Fire 9-14
9.4.3 Parks and Recreation 9-14
9.4.4 Government 9-15
9.4.5 Schools 9-15
9.4.6 Utilities 9-15
9.5 Significant Unavoidable Adverse Impacts 9-15
CHAPTER 10. TRANSPORTATION 10-1
10.1 Relevant Plans, Policies, and Regulations 10-1
10.2 Affected Environment 10-2
10.2.1 Existing Roadway Network 10-2
10.2.2 Transit Services 10-6
10.2.3 Pedestrian and Bicycle Network 10-7
10.2.4 Safety 10-8
10.2.5 Major Planned Upgrades to Transportation System 10-11
10.3 Impacts 10-11
10.3.1 Impacts Common to All Alternatives 10-11
10.3.2 Alternative 1: 2015 Comprehensive Plan Alternative 10-14
10.3.3 Alternative 2: Urban Growth Area Reserve 10-14
10.3.4 Alternative 3: Revised Urban Growth Area Boundaries 10-14
10.3.5 Alternative 4: No Action Alternative 10-15
10.4 Mitigation Measures 10-15
10.5 Significant Unavoidable Adverse Impacts 10-16
CHAPTER 11. REFERENCES 11-1
CHAPTER 12. DISTRIBUTION LIST 12-1

LIST OF TABLES

Table 2-1. Existing Housing Units, and Commercial and Industrial Square Footage....2-5
Table 2-2. Housing Development Capacity....2-5
Table 2-3. Employment Development Capacity....2-5
Table 2-4. Housing Development....2-10
Table 2-5. Employment Development....2-10
Table 2-6. Housing Development Capacity: Alternative 2....2-11
Table 2-7. Employment Development Capacity: Alternative 2....2-11
Table 2-8. Housing Development Capacity: Alternative 3....2-13
Table 2-9. Employment Development Capacity: Alternative 3....2-13
Table 3-1. State and Federal Regulatory Agencies and the Programs and Policies they administer...3-3
Table 5-1. State and Federal Regulatory Agencies and the Programs and Policies they administer...5-2
Table 6-1. Long Range Planning Documents....6-1
Table 6-2. Recorded Archaeological Sites....6-7
Table 6-3. Historic Register Properties....6-7
Table 6-4. Comprehensive Plan Designations (2006)....6-8
Table 6-5. Duvall Zoning Districts....6-10
Table 7-1. Scenic Resources and Views....7-9
Table 8-1. Maximum Environmental Noise Levels....8-3
Table 8-2. Existing Environmental Noise Sources in Duvall....8-4
Table 8-3. Sensitive Receptors in Duvall....8-5
Table 9-1. Duvall Police Department Service Calls City-wide 2009-2013....9-3
Table 9-2. King County Fire District 45 Average Response Time 2011-2012....9-4
Table 10-1. Long Range Planning Documents....10-1
Table 10-2. Commuting to Work (2012)....10-7
Table 10-3. PM Peak Hour Trips....10-12
Table 10-4. Intersections that Exceed City's Level of Service Standards in 2035....10-14

LIST OF FIGURES

Figure 2-1. Future Land Use Map....2-3
Figure 2-2. Vacant and Developable Land....2-4
Figure 2-3. Zoning Map....2-6
Figure 2-4. Alternative 1 2015: Comprehensive Plan Alternatives, Future Land Use Map....2-8
Figure 2-5. Alternative 1: 2015 Comprehensive Plan Alternatives, Zoning Map....2-9
Figure 2-6. Alternative 2: Urban Growth Area Reserve....2-11
Figure 2-7. Alternative 3: Revised Urban Growth Area Boundaries....2-12

Figure 2-8. Alternative 4: No Action Alternative 2-14
Figure 3-1. Streams, Lakes, Wetlands and Floodplains 3-5
Figure 3-2. Watershed Areas and Subbasin Management Groups 3-7
Figure 4-1. Geologically Hazardous Areas 4-3
Figure 5-1. Land Cover 5-4
Figure 5-2. Wildlife Habitat Corridors 5-7
Figure 6-1. Population Profile (2012) 6-3
Figure 6-2. Employment types in Duvall (2015) 6-3
Figure 6-3. Unemployment Rate (2012) 6-4
Figure 6-4. Major Existing Land Uses in Duvall City Limits 6-4
Figure 6-5. Major Existing Land Uses in Duvall Urban Growth Areas 6-5
Figure 6-6. Owner and Renter-occupied Housing (2012) 6-5
Figure 6-7. Existing Housing Types in Duvall (2015) 6-5
Figure 6-8. Age of Housing Stock (2012) 6-5
Figure 6-9. Monthly Owner Costs as a Percentage of Household Income (2012) 6-6
Figure 6-10. Rent Costs as a Percentage of Household Income (2012) 6-6
Figure 7-1. Scenic Resources 7-10
Figure 9-1. Public Facilities 9-2
Figure 9-2. Utility Infrastructure 9-7
Figure 10-1. Motorized Transportation 10-3
Figure 10-2. Walking Routes and Bicycle Lanes 10-9

LIST OF PHOTOS

Photo 5-1. Common native plants within wetland habitats of Duvall and throughout the Puget Sound region. 5-3
Photo 5-2. Wildlife species associated with wetland and riparian habitats within and surrounding Duvall 5-6
Photo 7-1. Typical View of the Valley from East West Streets 7-2
Photo 7-2. Commercial Development along Main Street NE 7-8
Photo 7-3. View of the Cascade Range 7-12
Photo 7-4. Older Home along Main Street NE 7-13
Photo 7-5. Southeast UGA looking west from the residential subdivision Clay Plat 7-17
Photo 7-6. Snoqualmie River Valley Landscape 7-19

ACRONYMS AND GLOSSARY

Term/Acronym	Description
AADT	Average Annual Daily Traffic
AU	Assessment Units
Berm	Flat strip of land, raised bank bordering a river/ canal; path or grass strip beside a road; artificial ridge or embankment
CARAs	Critical Aquifer Recharge Areas
CO	Commercial zoning district
Corps	U.S. Army Corps of Engineers
DAHP	Department of Archaeology and Historic Preservation
dB	Decibel (0-120dB is typical range of human hearing)
Development capacity/ Zoned capacity	An estimate of how much new development would be allowed over an unlimited time period
DMC	Duvall Municipal Code
Ecology	Washington State Department of Ecology
EDNA	Environmental Designation for Noise Abatement
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Federal Endangered Species Act
FAR	Floor Area Ratio
FEMA	U.S. Federal Emergency Management Agency
FGTS	Washington State Freight and Goods Transportation System
Higher Intensity Development	Higher intensity development as used in the Draft Watershed Plan means the subbasin could be developed at urban levels of density without negatively impacting the watershed processes. Examples of such densities include multi-family buildings, commercial and industrial buildings with parking lots, and community facilities.
HPA	Hydraulic Project Approval (construction in or near state water)
Impervious	Not allowing stormwater to pass through
LI	Light Industrial zoning district
LID	Low Impact Development
LiDAR	Light Detection and Ranging; remote sensing technology that uses light in the form of pulsed laser to measure variable distances
LOS	Level of Service

Term/Acronym	Description
Lower Intensity Development	Lower intensity development as used in the Draft Watershed Plan means the subbasin could be developed at rural to suburban levels of density without negatively impacting the watershed processes. Examples of such densities include large-lot residential subdivisions with undisturbed open space easements and parks with undisturbed forested areas for passive recreational use.
MBTA	Migratory Bird Treaty Act
MF	Multi-family means a dwelling unit within one or more buildings which accommodates two or more families in individual, primary dwelling units, normally located on a single lot. Manufactured homes are also considered multi-family.
Minor Impact	There is a reasonable likelihood that impacts considered to be less than moderate or significant could occur. Examples of minor impacts include removal of a small amount of trees, an increase in noise that is not noticeable by the human ear, or a slight increase in traffic that would not be noticed by most drivers.
Mitigation	The effort to reduce environmental impacts by minimizing or reducing the impact through policy or regulatory changes, or implementing construction and operational standards.
Moderate Impact	There is a reasonable likelihood that impacts considered to be more than minor but less than significant could occur. Examples of moderate impacts include removal of a large amount of trees, an increase in noise that is noticeable by the human ear, or an increase in traffic that would be noticed by most drivers.
Moderate Intensity Development	Moderate intensity development as used in the Draft Watershed Plan means the subbasin could be developed at suburban to urban levels of density without negatively impacting the watershed processes. Examples of such densities include small-lot residential subdivisions with yards, parks with recreational fields, and institutional uses like schools and religious facilities.
MT	Midtown zoning district
MU12	Mixed Use 12 zoning district
MUI	Mixed Use Institutional zoning district
NFIP	National Flood Insurance Program
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
OT	Old Town Mixed Use zoning district
PAU	Project Assessment Units
PF	Public facilities zoning district
R4	Residential - 4 units per acre zoning district
R4.5	Residential - 4.5 units per acre zoning district
R6	Residential - 6 units per acre zoning district
R8	Residential - 8 units per acre zoning district
R12	Residential - 12 units per acre zoning district

Term/Acronym	Description
Riparian corridor	Area between land and a river or a stream that is typically vegetated
RIV	Riverside village zoning district
Significant Impact	Significant, as used in the State Environmental Policy Act (SEPA), means a reasonable likelihood of more than a moderate adverse impact on environmental quality. Examples of significant impacts include removal of trees that result in irrevocable impacts to habitat, an increase in noise that causes sleep disruption, or an increase in traffic that results in an unacceptable level of service at intersections.
SF	Single-family means a detached or attached dwelling unit designated for occupancy by one family and can include a row house or townhouse.
SMP	Shoreline Master Program
UGA	Urban Growth Area
UT-1	Uptown-1st Avenue zoning district
WDFW	Washington State Department of Fish and Wildlife
WISAARD	Washington Information System for Architectural and Archaeological Records Data

CHAPTER 1. SUMMARY

1.1 Introduction

This chapter summarizes the findings of this Draft Environmental Impact Statement (EIS) with respect to environmental impacts, mitigation strategies and significant unavoidable adverse impacts for the four Duvall Comprehensive Plan alternatives. This summary provides a brief overview of the information considered in this EIS. The reader should consult Chapter 2 for more information on the alternatives and Chapters 3-10 for more information on the affected environment, environmental impacts and mitigation strategies for each alternative and element of the environment.

The following elements of the environment are addressed in this Draft EIS:

- Water Resources
- Earth
- Plants and Animals
- Land Use and Housing
- Aesthetics
- Noise
- Public Services and Utilities
- Transportation

1.2 Organization of Draft EIS

The Draft EIS is organized as follows:

1. **Chapter 1 Summary** - (this chapter) includes a summary of impacts associated with the four Duvall Comprehensive Plan alternatives.
2. **Chapter 2 Description of Project Alternatives** - includes summary descriptions of alternatives evaluated in the Draft EIS.

What are adverse impacts?

Impacts are the effects or consequences of actions. Environmental impacts are effects upon the elements of the environment listed in Washington Administrative Code (WAC) 197-11-444. Impacts identified in this Environmental Impact Statement (EIS) are identified as minor, moderate or significant.

What does a minor adverse impact mean?

A minor impact means there is a reasonable likelihood that impacts considered to be less than moderate or significant could occur. Examples of minor impacts include removal of a small amount of trees, an increase in noise that is not noticeable by the human ear, or a slight increase in traffic that would not be noticed by most drivers.

What does a moderate adverse impact mean?

A moderate impact means there is a reasonable likelihood that impacts considered to be more than minor but less than significant could occur. Examples of moderate impacts include removal of a large amount of trees, an increase in noise that is noticeable by the human ear, or an increase in traffic that would be noticed by most drivers.

What does significant adverse impact mean?

Significant, as used in the State Environmental Policy Act (SEPA), means a reasonable likelihood of more than a moderate adverse impact on environmental quality. Examples of significant impacts include removal of trees that result in irrevocable impacts to habitat, an increase in noise that causes sleep disruption, or an increase in traffic that results in an unacceptable level of service at intersections.

3. **Chapter 3 Water Resources** - includes a description of streams, rivers, wetlands, and watershed subbasins; evaluation of impacts associated with the alternatives; mitigation measures to minimize impacts; and potentially significant unavoidable long term adverse impacts on a cumulative basis associated with Alternatives 2: Urban Growth Area Reserve.
4. **Chapter 4 Earth -** includes a description of soil conditions and geologically hazardous areas (erosion, landslides and earthquakes); evaluation of impacts associated with the alternatives; mitigation measures to minimize impacts; and potentially significant unavoidable long term adverse impacts on a cumulative basis associated with Alternative 2: Urban Growth Area Reserve.
5. **Chapter 5 Plants and Animals -** includes a description of vegetation and fish and wildlife habitat, evaluation of impacts associated with the alternatives, mitigation measures to minimize impacts, and potentially significant unavoidable long term adverse impacts on a cumulative basis associated with Alternative 2: Urban Growth Area Reserve.
6. **Chapter 6 Land Use and Housing -** includes a description of population and employment, current land uses and housing stock, housing affordability, historic and cultural resources, and future land use designations and zoning districts; evaluation of impacts associated with the alternatives; and mitigation measures to minimize impacts. No significant unavoidable adverse impacts are identified.
7. **Chapter 7 Aesthetics -** includes a description of scenic resources, viewsheds and existing urban form; evaluation of impacts associated with the alternatives; and mitigation measures to minimize impacts. No significant unavoidable adverse impacts are identified.
8. **Chapter 8 Noise -** includes a description of noise sources and sensitive receptors, evaluation of impacts associated with the alternatives, and mitigation measures to minimize impacts. No significant unavoidable adverse impacts are identified.
9. **Chapter 9 Public Services and Utilities -** includes a description of police, fire, parks and recreation, government, schools, and utilities; evaluation of impacts associated with the alternatives; and mitigation measures to minimize impacts. No significant unavoidable adverse impacts are identified.
10. **Chapter 10 Transportation** - includes a description of the transportation system, evaluation of impacts associated with the alternatives, and mitigation measures to minimize impacts. No significant unavoidable adverse impacts are identified.
11. **Chapter 11 References** - includes references cited in this Draft EIS.
12. **Chapter 12 Distribution List** - identifies the agencies, governments, and other parties that have received the Draft EIS.

1.3 Summary of Impacts

The following pages summarize impacts associated with each EIS alternative, along with mitigation measures and any significant unavoidable adverse impacts. Each page is meant as a summary only; please see the corresponding chapters for more detail regarding impacts and mitigation measures.

3 WATER RESOURCES

This chapter describes potential impacts to streams, lakes, wetlands, and watershed subbasins under each EIS alternative.

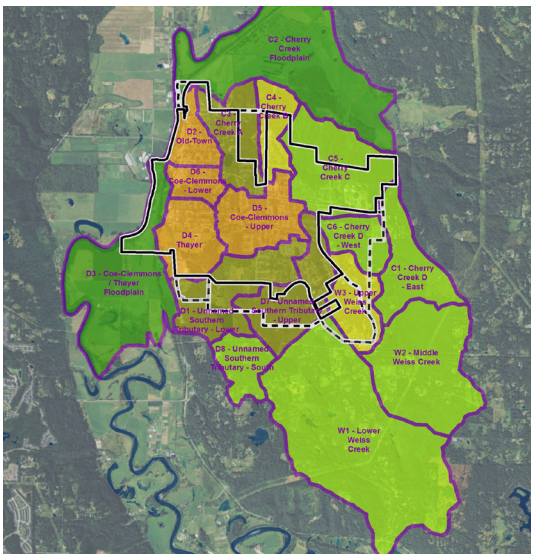
DUVALL TODAY

Duvall has 15 stormwater subbasins, with water flows to Cherry, Coe-Clemmons, Thayer, and Weiss Creeks all eventually converging with the Snoqualmie River.

Floodplain and wetland areas along the Snoqualmie River are protected within McCormick Park and other public parks and open spaces.

Loss in forest cover, development and changes in surface water runoff have resulted in loss of wetlands and erosion within streams.

Water quality concerns include elevated water temperatures, pathogen and nutrient levels, and turbidity.



SUMMARY OF IMPACTS

IMPACTS COMMON TO ALL ALTERNATIVES

- Minor adverse impacts to water resources within city limits.
- Moderate adverse impacts to water resources from new development in the North UGA, including disruption to water flow processes and impairment of water quality.

ALTERNATIVE 1

- New development in the Southwest UGA would result in minor adverse impacts to water resources.

ALTERNATIVE 2

- Significant adverse impacts to water resources as a result of new development within the UGA-Reserve, including fragmentation of extensive forested wetland areas, hydrologic modification, forest cover loss, and impacts to downstream water resources.

ALTERNATIVE 3

- Moderate adverse impacts to water resources in the UGA-Reserve South, including degradation of stream and associated buffers, removal of forest cover, impacts to the shoreline of Loutsis Lake and associated wetlands, and alterations of stormwater runoff pathways.

ALTERNATIVE 4

- No additional impacts.

MITIGATION MEASURES

- Implement low impact development techniques, including new impervious limits.
- Require developers to monitor stream water quantity and quality.

SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

- Even with mitigation measures, future development in the UGA-Reserve under Alternative 2 would result in significant adverse long term impacts to water resources on a cumulative basis.

4 EARTH

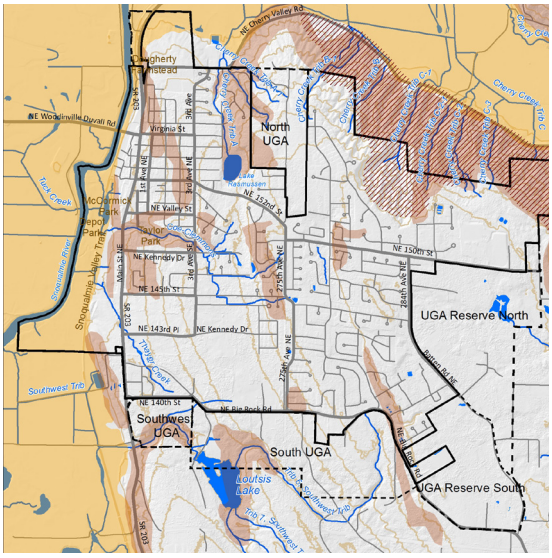
This chapter describes potential impacts to soil conditions and mapped erosion, landslide, and seismic hazard areas under each EIS alternative.

DUVALL TODAY

Duvall is located along the east side of the Snoqualmie Valley, extending up west-facing and north-facing slopes sitting atop relatively impermeable glacial till.

Erodible soils are mapped around the city, including north-facing steep slopes, which also have mapped landslide hazard areas.

Seismic hazards occur across the valley bottoms of the Snoqualmie River and Cherry Creek.



SUMMARY OF IMPACTS

IMPACTS COMMON TO ALL ALTERNATIVES

- Minor adverse impacts to earth resources within the city.
- Moderate adverse impacts to earth resources in the North UGA, related to loss of forest cover, extensive grading, and increases in impervious surface coverage near erosion and landslide hazard areas.

ALTERNATIVE 1

- New development in the Southwest UGA would result in minor adverse impacts to earth resources.

ALTERNATIVE 2

- Significant adverse impacts to earth resources as a result of new development within UGA-Reserve North, including significant alteration of native soils and overlying vegetative cover and increased potential for erosion in downstream areas.
- Moderate adverse impacts to earth resources as a result of new development within UGA-Reserve South.

ALTERNATIVE 3

- Moderate impacts to earth resources in the UGA-Reserve South, including loss of forest cover and extensive grading.
- Important areas for earth resources protected by overlapping sensitive areas protections.

ALTERNATIVE 4

- No additional impacts.

MITIGATION MEASURES

- Establish design guidelines to encourage subdivisions to cluster lots, and limit the extent of terraced walls to avoid mass grading for residential subdivisions.
- Integrate tree protection, open space, and sensitive areas standards to preserve intact forest adjacent to geologically hazardous areas.

SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

- Even with mitigation measures, future development in the UGA-Reserve North under Alternative 2 would result in significant adverse long term impacts to earth resources on a cumulative basis.

5 PLANTS AND ANIMALS

This chapter describes potential impacts to vegetation, fish, wildlife, and habitat areas under each EIS alternative.

DUVALL TODAY

Duvall lost about ¼ of its forest cover in the past 20 years.

Habitat for fish and wildlife is found in wetlands and stream and river corridors.

Endangered Species Act listed fish species are mapped within the Snoqualmie River and Coe-Clemons Creek.

State priority species mapping in Duvall include waterfowl, bald eagle, red-tailed hawk, bats, great blue heron, and pileated woodpecker.



SUMMARY OF IMPACTS

IMPACTS COMMON TO ALL ALTERNATIVES

- Minor adverse impacts to plants and animals within city limits.
- Moderate adverse impacts to plants and animal resources in the North UGA, including disruption of habitat corridors and impairment of wetlands, streams, and their associated buffers.

ALTERNATIVE 1

- New development in the Southwest UGA would result in minor adverse impacts to plants and animal resources.

ALTERNATIVE 2

- Significant impacts to wetlands, streams, and upland forested habitat in the UGA-Reserve.
- Development would disrupt habitat corridors in the UGA-Reserve that link contiguous forested blocks to the northeast, east and south.

ALTERNATIVE 3

- Moderate adverse impacts to wetlands, streams lakes and their buffers, along with removal of forest cover within UGA-Reserve South

ALTERNATIVE 4

- No additional impacts.

MITIGATION MEASURES

- Integrate subdivision open space requirements with tree protection and sensitive areas standards. Encourage subdivisions to cluster lots.
- Limit current allowances to clear-cut significant trees.
- Require tree preservation within contiguous tracts.
- Incorporate new protections for wildlife habitat corridors.

SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

- Even with mitigation measures, future development in the UGA-Reserve under Alternative 2 would result in significant adverse long term impacts to vegetation, wildlife, and wildlife habitats on a cumulative basis.

6 LAND USE AND HOUSING

This chapter describes potential impacts to existing land uses and housing under each EIS alternative.

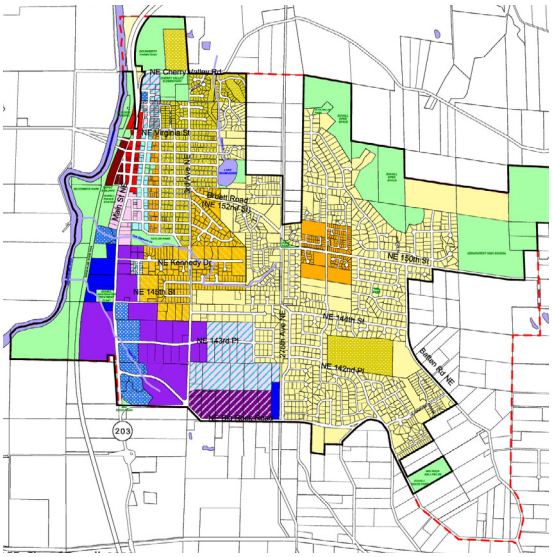
DUVALL TODAY

Around 7,325 people live in Duvall, with approximately 60% between the ages of 18 and 65 and 34% under the age of 18.

Median income is $111,356; with 33% of households considered cost burdened due to cost of housing.

There are 1,312 jobs in Duvall (approximately 1/3 of working population), focused primarily in retail and food service, education, and medical.

88% of housing stock is single family.



SUMMARY OF IMPACTS

IMPACTS COMMON TO ALL ALTERNATIVES

- New commercial and residential developments within city limits, primarily occurring in the southwest portion of the city, would result in minor adverse impacts to adjacent existing uses, primarily associated with aesthetics, noise, transportation, public services, and utilities.
- Development patterns in the North UGA would be single-family residential which could limit opportunity for new affordable housing.

ALTERNATIVE 1

- Minor adverse impacts to land use and housing. Proposed zoning changes may provide more housing options and improve housing affordability.

ALTERNATIVE 2

- Minor adverse impacts to land use and housing. New single-family residential development in the UGA Reserve could limit opportunity for new affordable housing.

ALTERNATIVE 3

- Minor adverse impacts to land use and housing. New single-family residential development in the UGA-Reserve South could limit opportunity for new affordable housing.

ALTERNATIVE 4

- No additional impacts.

MITIGATION MEASURES

- Incentivize inclusion of affordable housing units.
- Develop a multifamily property tax exemption program.
- Allow corner-attached housing units in single-family residential zones.
- Consider requiring a percentage of affordable housing units as part of pre-annexation agreements.

SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

- None

7 AESTHETICS

This chapter describes potential impacts to aesthetics, including scenic quality of Old Town and views throughout Duvall, under each EIS alternative.

DUVALL TODAY

Parks and trails are major scenic resources, including McCormick, Depot, Taylor's Landing, Big Rock, Taylor, and Lake Rasmussen parks and the Snoqualmie Valley and Valley View Loop trails.

Cultural and heritage sites include Dougherty Farmstead, Depot Building, Thayer Barn, and the Old Town District.

Notable views include Snoqualmie River and Valley, Mount Rainier and Mount Baker.



SUMMARY OF IMPACTS

IMPACTS COMMON TO ALL ALTERNATIVES

- New commercial and residential developments within city limits, primarily occurring in the southwest portion of the city, would result in minor adverse impacts to existing scenic quality because of a shift from rural uses to an urban character.
- Development patterns in the North UGA would be single-family residential, altering the existing aesthetic character of the area, but creating consistency with surrounding residential development.

ALTERNATIVE 1

- Minor adverse impacts to scenic quality. Proposed commercial zoning changes in the Southwest UGA would be consistent with existing uses to the north; and Park/Open Space designation would provide a new scenic resource.

ALTERNATIVE 2

- Minor impacts to scenic quality. New single-family residential development in the UGA Reserve would change the rural and forested character of the area, resulting in some impacts to views of forested/pasture lands visible from roadways, public properties and adjacent residences.

ALTERNATIVE 3

- Minor adverse impacts to scenic quality. New commercial and single-family residential development in the South UGA would be similar to impacts described under Alternative 2.

ALTERNATIVE 4

- No additional impacts.

MITIGATION MEASURES

- Evaluate and update lighting standards.
- Implement policies that encourage preservation of views during the design review process.

SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

- None

8 NOISE

This chapter describes potential impacts from environmental noise under each EIS alternative.

DUVALL TODAY

Vehicular traffic is the most prominent noise source, including general purpose traffic and freight traffic.

Other noise sources are more variable, including noise generated by community events and festivals, property maintenance, and construction.

Residences are most common sensitive receptors; others include schools, medical facilities, institutional uses, and parks.



SUMMARY OF IMPACTS

IMPACTS COMMON TO ALL ALTERNATIVES

- Infill residential development across the city is not expected to noticeably change the existing noise environment, resulting in a minor impact.
- In the southwest portion of the city, there is potential for minor to moderate adverse impacts from traffic-related noise increases along Main Street NE.
- Minor adverse impacts from noise associated with new residential development in the North UGA.

ALTERNATIVE 1

- Moderate potential for noise impacts to park users in the Southwest UGA with the Park/Open Space designation.

ALTERNATIVE 2

- Minor adverse impacts from noise within the UGA-Reserve. New single-family residential development and local vehicular trips are not anticipated to be a major source of noise.

ALTERNATIVE 3

- Moderate potential for noise impacts to future residential uses within southern portion of the UGA-Reserve South and existing rural properties to the south and east of this area. Impacts are associated with new commercial uses that could occur along Main Street.

ALTERNATIVE 4

- No additional impacts.

MITIGATION MEASURES

- Incorporate screening considerations (e.g., orientation, use of vegetation, building technique) between noise sensitive users and adjacent roadways and commercial development.

SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

- None

9 PUBLIC SERVICES AND UTILITIES

This chapter describes potential impacts on utilities, police, fire, parks, government, and schools under each EIS alternative.

DUVALL TODAY

Public safety and emergency services are provided by the Duvall Police Department and Duvall-King County Fire District 45.

Duvall has 18 parks, open spaces and other recreational facilities, and 3 public schools.

Government facilities include a City Hall, Duvall Community Center, and Public Works Building and Yard.



SUMMARY OF IMPACTS

IMPACTS COMMON TO ALL ALTERNATIVES

- Police would need a larger police station and more staff, and fire would need two new stations.
- Duvall does not currently meet its parks levels of service (LOS) standards and population growth would further increase demand resulting in a moderate adverse impact.
- A new city hall, elementary school, and middle school would be necessary.
- Major improvements to utility infrastructure.

ALTERNATIVE 1

- Applying a parks/open space land use designation to the Southwest UGA would alleviate some of the deficit in park needs.
- No additional impacts to other public services and utility infrastructure.

ALTERNATIVE 3

- Impacts to parks would be the same as Alternative 2 although the UGA-Reserve and South UGA would be easier to serve because they are closer to Big Rock Ball Fields and Main Street
- Sewer lift station(s) may be necessary
- No additional impacts to police, fire, schools and government facilities.

ALTERNATIVE 2

- Police and fire response time may increase as a result of development in the UGA Reserve.
- LOS for parks will be more difficult to meet in the UGA-Reserve because of its size and distance from existing facilities.
- Sewer lift station(s) and potential improvements to water system pumping station may be necessary
- No additional impacts to schools and government facilities.

ALTERNATIVE 4

- No additional impacts.

MITIGATION MEASURES

- Work with police, fire, and school district to site new facilities.
- Revise the LOS standards for parks and open space. Set aside land as part of Master Plan Recommendation Process.
- Implement the City's Capital Improvement Plan.

SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

- None

10 TRANSPORTATION

This chapter describes potential impacts on the transportation system under each EIS alternative.

DUVALL TODAY

Duvall's roadway system includes principal, collector and minor arterials, as well as local access streets. Main Street carries the highest percentage of car and freight traffic.

Two bus routes and a shuttle route serve Duvall, although most people commute to work by driving alone.

Duvall has limited pedestrian and bicycle infrastructure.

Traffic safety issues are minimal.



SUMMARY OF IMPACTS

IMPACTS COMMON TO ALL ALTERNATIVES

- PM peak hour trips are expected to more than double by 2035, exceeding the volume capacity on Main Street and NE Duvall Woodinville Road.
- Increase in trips would result in moderate adverse impacts and require intersection improvements to maintain the City's level of service standards.
- Moderate adverse impacts to transit service, pedestrian and bicycle safety.

ALTERNATIVE 1

- Roadway traffic would increase along Main Street NE.
- Second lowest number of peak hour trips.

ALTERNATIVE 2

- Roadway traffic will increase along Main Street NE and NE Big Rock Road.
- Second highest number peak hour trips.

ALTERNATIVE 3

- Roadway traffic will increase along Main Street NE and NE Big Rock Road.
- Highest number of peak hour trips.

ALTERNATIVE 4

- Roadway traffic will increase along Main Street NE.
- Lowest number of peak hour trips.

MITIGATION MEASURES

- Construct major planned upgrades through City's Transportation Improvement Program.
- Address LOS deficiencies at intersections and/or revise LOS at intersections along Main Street NE.
- Develop a funding and construction approach to address missing links in sidewalk infrastructure.

SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

- None

1.4 Areas of Major Controversy or Uncertainty

Key environmental issues and options facing decision-makers include:

- Where forecast growth should be guided, including within city limits and urban growth areas;
- Effect of alternative growth patterns on housing affordability;
- Review and refinement of draft goals and policies; and
- Adjustments to the urban growth boundary under Alternative 3.

CHAPTER 2. DESCRIPTION OF PROJECT ALTERNATIVES

2.1 Introduction

The City of Duvall is considering policy and Future Land Use Map amendments to the Duvall Comprehensive Plan that would influence the manner and distribution of growth targets of approximately 1,140 additional housing units and 840 additional jobs in Duvall through 2035. These amendments would influence City operations to promote and achieve goals related to public health, safety, welfare, and service delivery. Because the development capacity within City limits and the City's urban growth areas (UGAs) is substantially higher than the growth targets allocated to Duvall by King County (see Section 2.2.1 for more information), this EIS also evaluates additional development consistent with the City's zoning standards, including the potential for 3,775 additional housing units and 1,900 additional jobs.

The City has initiated this EIS to study the potential impacts of four different growth strategies that would accommodate the housing and job growth targets. All four alternatives assume the City would support annexation of the City's North UGA as currently reflected in the City's Comprehensive Plan. The growth strategies include a "no action alternative" that serves as a baseline and assumes no changes in policy, with growth following a similar pattern as has occurred in the last twenty years. The growth strategies also include three action alternatives that represent a range of possible growth patterns, each assuming a different part of the City's UGA would be annexed, in addition to the North UGA. This chapter describes the four EIS alternatives and the proposed policy and map amendments.

2.2 Planning Context

2.2.1 Duvall Comprehensive Plan

The City of Duvall Comprehensive Plan is a 20-year vision and roadmap for Duvall's future (City of Duvall, 2006). The Duvall Comprehensive Plan provides predictability for future development, preservation of existing uses and features, integrates specialized plans for land use, housing, and transportation, and provides a broad perspective for a 20-year period that anticipates future needs for population and employment growth. The City implements the plan through City programs and regulations, including the City's Zoning Map and land use code as well as other chapters of the Duvall Municipal Code, and specific plans related to transportation, parks and open space, watershed management, and shoreline management.

The Duvall Comprehensive Plan also identifies UGAs located in unincorporated King County that could be annexed into city limits. The City and the County work together to establish UGA boundaries and appropriate land use designations. The City must also ensure that its Comprehensive Plan is

consistent with the goals and policies of the County's Comprehensive Plan and Countywide Planning Policies. King County planning documents are described in more detail in Chapter 6.

Consistent with the Washington Growth Management Act, the City adopted the Duvall Comprehensive Plan in 1994, followed by a major update in 2004. Since then, it has been updated in an annual cycle of amendments. The City's Comprehensive Plan consists of eight major elements:

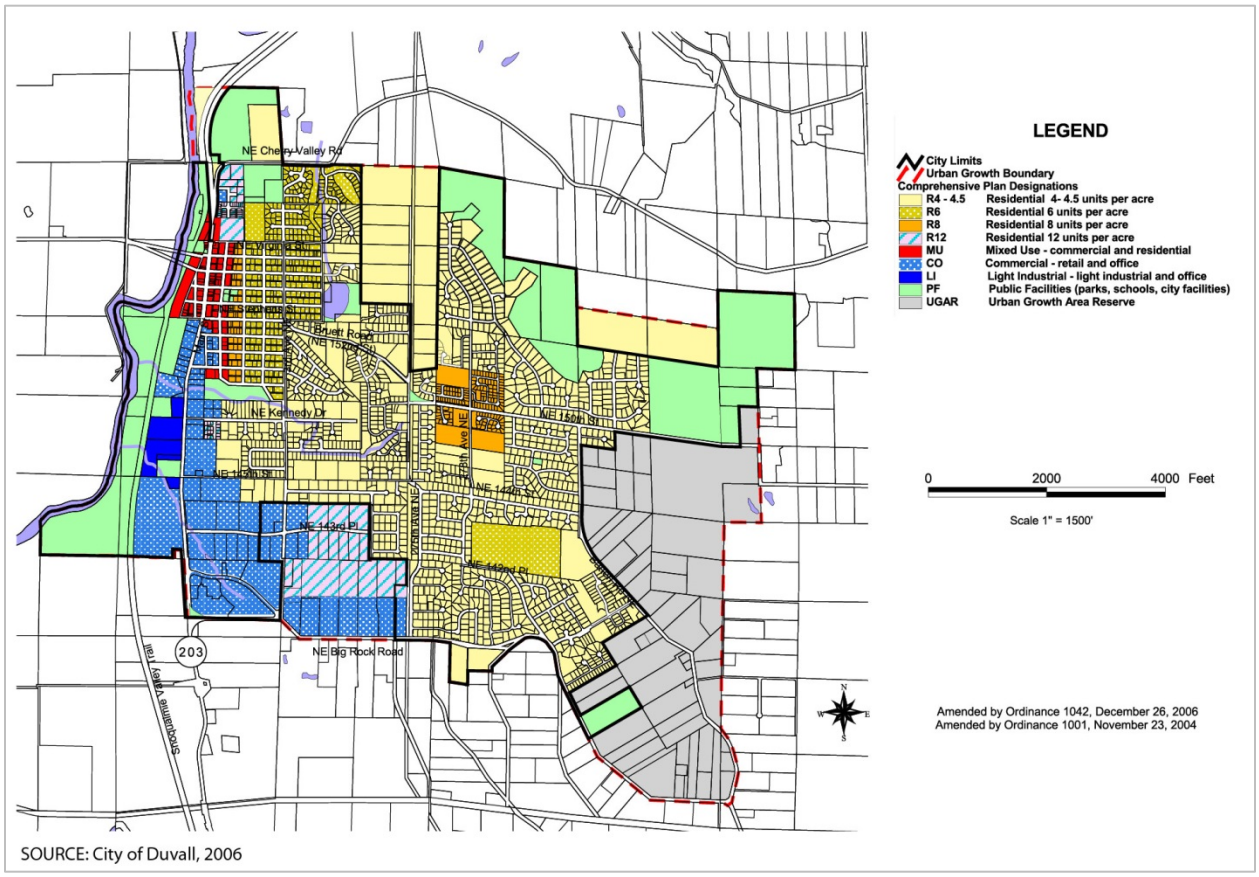
1. Land Use
2. Housing
3. Parks and Recreation
4. Economic Development
5. Transportation
6. Utilities
7. Capital Facilities
8. Essential Public Facilities

All of these elements will be reviewed and updated as part of the proposal, consistent with county, regional and state policies and feedback from the Duvall community.

2.2.1.1 Future Land Use Map

The Future Land Use Map is a required part of the Comprehensive Plan that shows where different categories of designated uses, such as single family, multifamily, mixed-use, commercial and industrial are expected to occur. The Future Land Use Map is discussed in the Land Use Element of the Comprehensive Plan. The land use designations shown on the Future Land Use Map are implemented through the City's Official Zoning Map and land use code. See Figure 2–1 for the 2006 Comprehensive Plan Future Land Use Map. After this EIS process is complete, Figure 2-1 could be revised consistent with one of the EIS alternatives described later in this chapter or some combination of alternatives. Figure 2-1 is considered as the baseline condition for the purposes of this EIS.

Figure 2-1. Future Land Use Map



SOURCE: City of Duvall, 2006

2.2.1.2 Housing and Employment Growth Targets

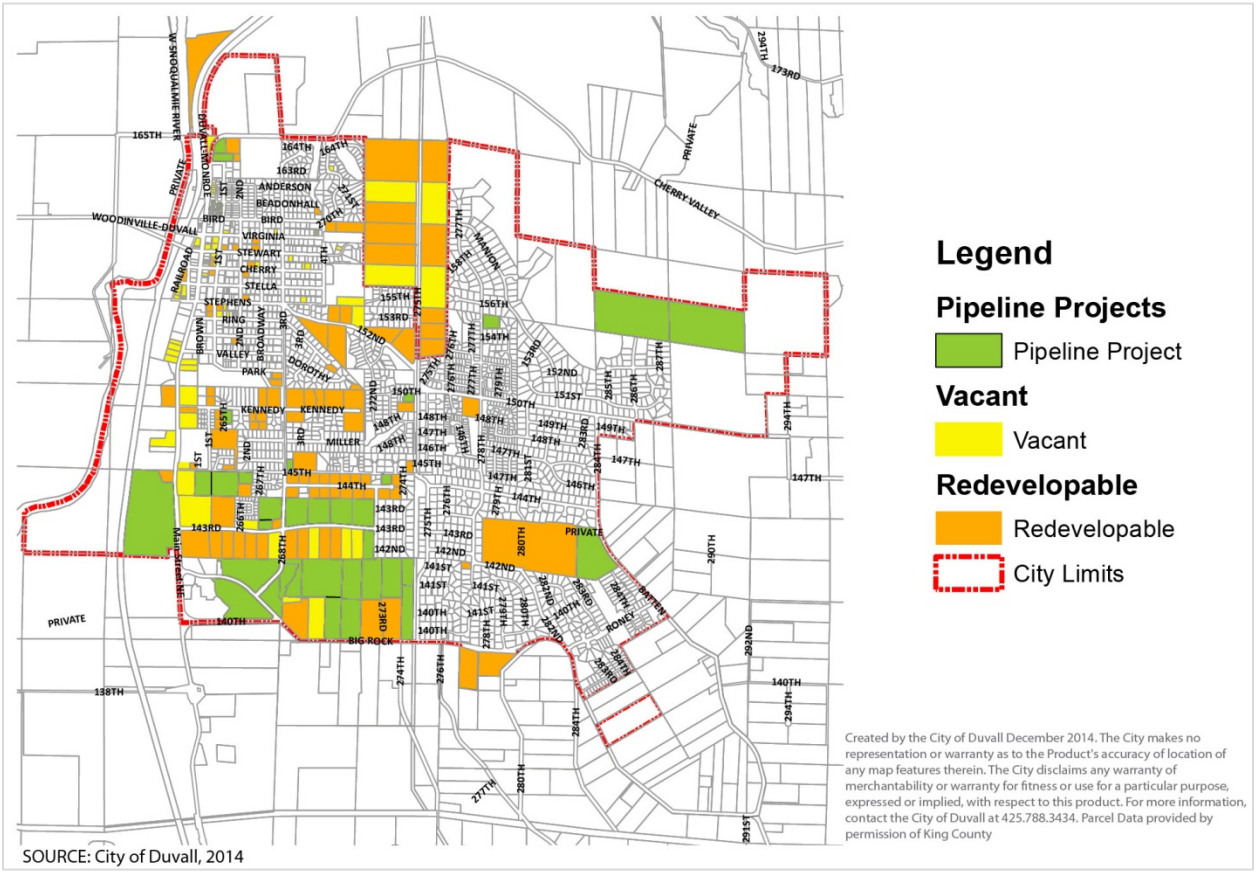
King County establishes household and employment targets in coordination with the cities to ensure that municipalities are planning for population growth in the next 20 years. The targets are developed through a process that starts with regional totals from the Washington Office of Financial Management and coordination with the Puget Sound Regional Council, the metropolitan planning organization for the Puget Sound region. The proposal considered in this EIS assumes the targets established by King County and assigned to Duvall for growth for the period from 2015 through 2035 of approximately 1,140 new housing units and 840 new jobs (King County, 2013).

2.2.1.3 Development Capacity

Development capacity, also referred to as zoned development capacity or zoned capacity, is an estimate of how much new development would be allowed theoretically over an unlimited time period. It represents the difference between the amount of development on the land today and the likely amount that could be built under current (or proposed) zoning. Because the City has many different zones, there are specific assumptions for each zone. Residential development capacity is expressed in number of units and non-residential development capacity is expressed as commercial square footage. The City of Duvall Public Works and Planning Departments prepared a capacity

analysis that identified the existing number of housing units and commercial square footage located within city limits and the North UGA as of January 2015 (City of Duvall, 2015). Development capacity was determined by identifying properties that were vacant or redevelopable and assigning future housing units or commercial square footage based on the zoning allowance and other site constraint factors. Projects that are vested by a Development Agreement, Pre-Annexation Agreement, received City permits, or were under construction (referred to as "pipeline" projects) were also included in the future housing unit or commercial square footage values. Figure 2-2 identifies the pipeline projects and vacant and redevelopable properties.

Figure 2-2. Vacant and Developable Land



Based on the development capacity analysis, the City determined the potential for future housing units and jobs within city limits and the North UGA (City of Duvall, 2015). Table 2-1 shows the existing number of housing units and commercial and industrial square footage present in the City and the North UGA in 2015. Table 2-2 shows the number of additional housing units that could be built by 2035 based on the current zoning map within current City Limits and the North UGA. Table 2-3 shows additional commercial and industrial square footage that could be built by 2035 based on the current zoning map within current City Limits and the North UGA. The added square footage equates to a potential for approximately 1,900 new jobs. The housing and job capacity exceed the King County

housing and employment targets assigned to Duvall. Exceeding the growth targets established by King County would not be considered inconsistent; however, it could influence any future discussions regarding the location of UGA boundaries. To ensure an adequate understanding of environmental impacts associated with additional population, this EIS assumes that the full development capacity could occur over the next 20 years.

Table 2-1. Existing Housing Units, and Commercial and Industrial Square Footage

Land Use Type	2015 Housing Units	2015 Square Footage
Single-family[1]	2,197	N/A
Multi-family[2]	389	N/A
Commercial	N/A	370,021
Industrial	N/A	56,200
Total	**2,586**	**426,221**

Source: City of Duvall, 2015

[1]Single-family means a detached or attached dwelling unit designated for occupancy by one family and can include a row house or townhouse.

[2]Multi-family means a dwelling unit within one or more buildings which accommodates two or more families in individual, primary dwelling units, normally located on a single lot. Manufactured homes are also considered multi-family.

Table 2-2. Housing Development Capacity

Housing Type	2035 Housing Units
Single-family	3,108
Multi-family	667
Total	**3,775**

Source: City of Duvall, 2015

Table 2-3. Employment Development Capacity

Commercial Type	2035 Square Footage
Commercial	964,790
Light Industrial	89,685
Total	**1,054,475**

Source: City of Duvall, 2015

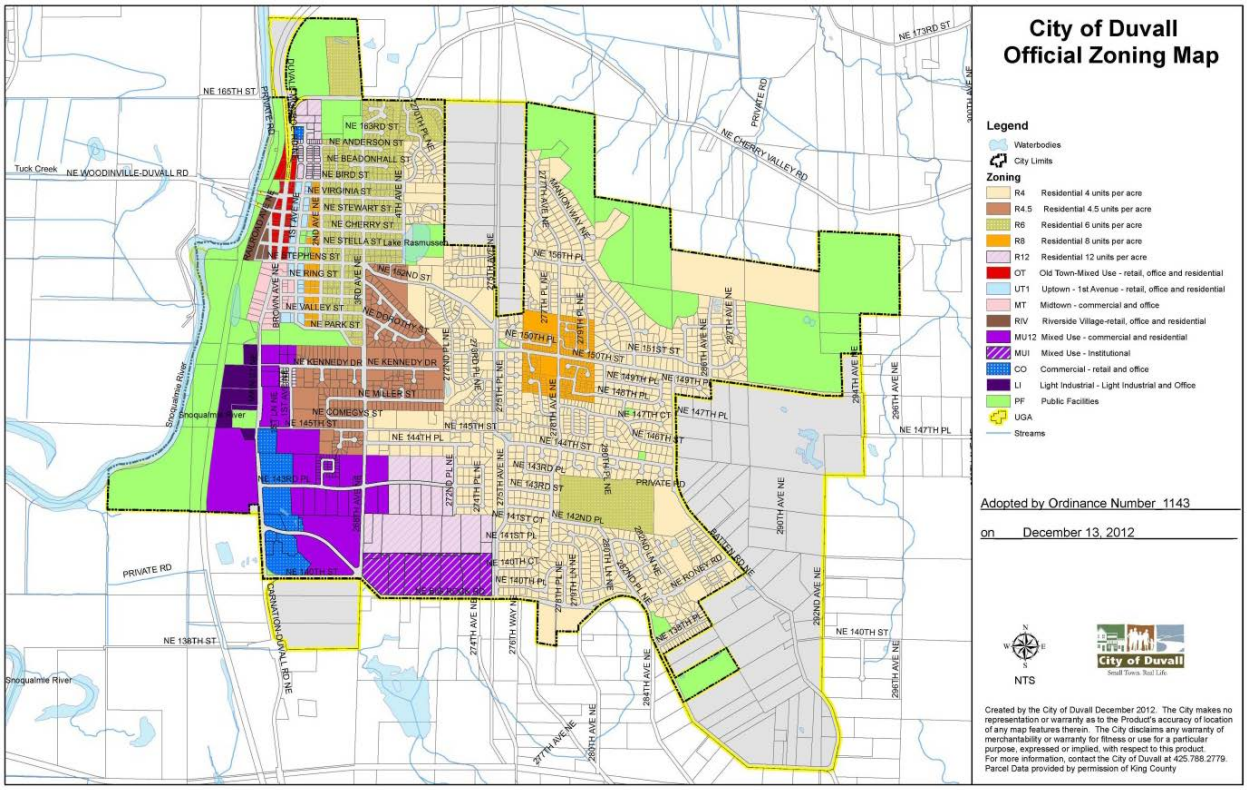
2.2.2 Existing Zoning

The City of Duvall has 14 zoning districts that establish allowed land uses, and standards on residential density, building height, impervious surface limits, lot coverage limits, and other bulk and scale limitations:

1. Commercial (CO)
2. Mixed Use Institutional (MUI)
3. Light Industrial (LI)
4. Mixed Use 12 (MU12)
5. Old Town Mixed Use (OT)
6. Midtown (MT)
7. Riverside Village (RIV)
8. Uptown – 1st Avenue (UT-1)
9. Residential – 4 units per acre (R4)
10. Residential – 4.5 Units per acre (R4.5)
11. Residential – 6 Units per acre (R6)
12. Residential – 8 units per acre (R8)
13. Residential – 12 units per acre (R12)
14. Public Facilities (PF)

See Figure 2–3 for the current Zoning Map.

Figure 2-3. Zoning Map



Source: City of Duvall, 2012

King County also establishes zoning districts for unincorporated areas of the County. The Duvall UGAs and UGA-Reserves are zoned as Urban Reserve (UR), a King County zoning district intended to reserve large tracts of land for possible future growth.

2.3 Project Objectives

The City's objectives for this proposal are based on the new Comprehensive Plan vision statement developed as part of a citizen advisory committee process and include:

1. Manage growth consistent with the goals of the Growth Management Act
2. Create jobs and economic opportunity for all city residents
3. Plan for growth that benefits the existing economy and community
4. Prioritize and manage growth first within already urbanized areas and allow incremental growth in existing UGAs, followed by incremental growth in UGA reserves
5. Create opportunities for new single-family neighborhood subdivisions in UGAs
6. Create opportunities for new multi-family and workforce housing in city limits
7. Encourage infill development within city limits to accommodate a variety of housing types to increase affordable housing options
8. Encourage an increase and diversification of Duvall jobs in economic sectors that support living wages through land use policy and zoning
9. Continue to support, promote, and maximize Duvall's unique identity through arts and culture
10. Maximize Duvall's existing natural and built environment by promoting technological innovations, smart growth principles, and sustainable practices

All EIS alternatives accomplish some or all of these objectives. Alternative 1 would achieve all objectives. Alternative 2 would achieve all objectives except 6, 7 and 10. Alternative 3 would achieve all objectives except 4, 6, 7, and 10. Alternative 4 would achieve all objectives except 6, 7. And 10.

2.4 Proposed Action and Alternatives

City staff from the Planning and Public Works Department worked with the EIS consultant to develop Comprehensive Plan alternatives for analysis in this EIS. The EIS alternatives were then presented to the Planning Commission and City Council for discussion and feedback. The alternatives presented below have been evaluated for their potential to impact different elements of the environment (see Chapters 3-10). The City Council will identify a preferred alternative based on community feedback, the findings of the EIS, and consistency with state and regional policies and regulations. The preferred alternative would then be incorporated into an updated Comprehensive Plan as policy and map revisions. The updated Comprehensive Plan is anticipated to be adopted by the City Council in December 2015.

2.4.1 Alternative 1: 2015 Comprehensive Plan Alternative

Under Alternative 1, the household and employment growth targets established by King County and approved by the City would be accommodated within current City limits and the North UGA, consistent with revised goals and policies in the draft Comprehensive Plan (see Section 2.3).

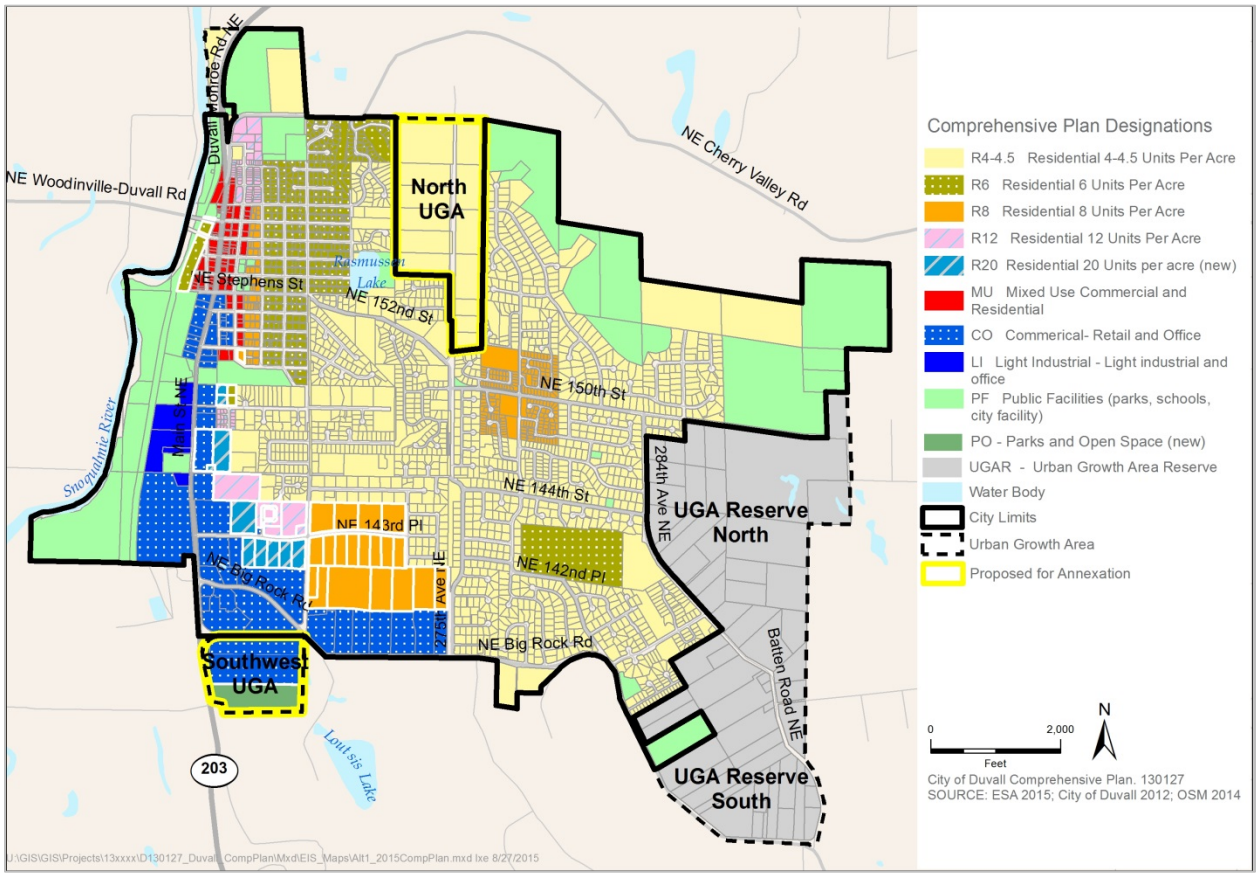
2.4.1.1 Proposed Changes to the City's Future Land Use Map

Under Alternative 1, the following revisions would be made to the City's Future Land Use Map (see Figure 2-4):

1. A new "Residential 20 units per acre" Comprehensive Plan land use designation would be created to address the multifamily needs in Duvall, specifically small unit condominiums and apartments that are not feasible in the current Residential 12 and Mixed Use 12 zones. The Residential 20 designation would be applied to several properties located near Main Street and NE 143rd.
2. The Mixed Use Comprehensive Plan land use designation would change to Residential 6 units per acre.
3. The Commercial Comprehensive Plan designation would change to Residential 6, Residential 12, and Residential 8.
4. The Residential 12 Comprehensive Plan designation would change to Residential 8.
5. The City would support annexation of the North UGA and the Southwest UGA (Burhen property). The North UGA would maintain the current pre-designation of Residential 4 - 4.5 units per acre. The City would assign the Southwest UGA a pre-designation of Commercial (for the two northern parcels) and Parks and Open Space (for the two southern parcels). Under this alternative, the UGA-Reserve would not be annexed.

For information on the type and intensity of land uses allowed in various Comprehensive Plan land use designations and zoning districts, see Chapter 6 Land Use and Housing.

Figure 2-4. Alternative 1: 2015 Comprehensive Plan Alternatives, Future Land Use Map



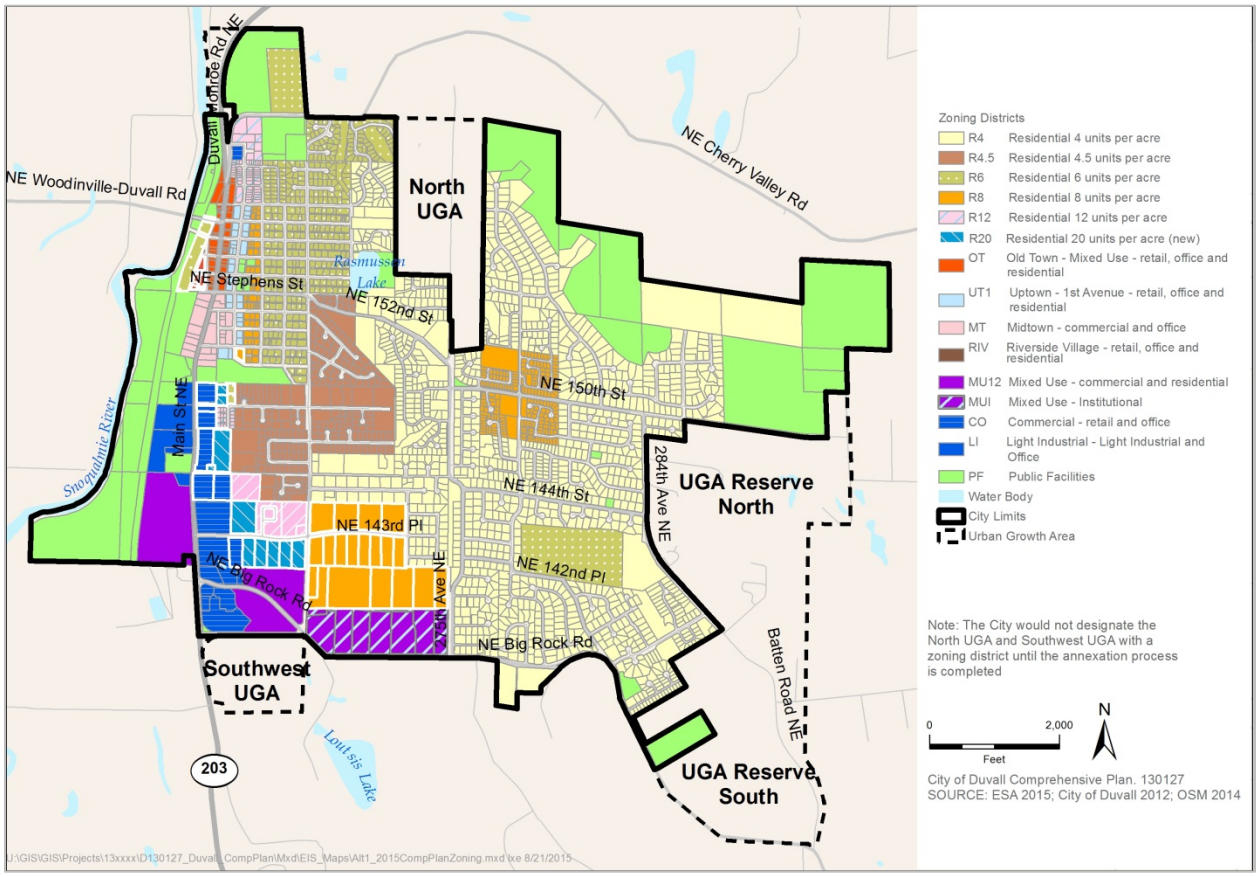
2.4.1.2 Proposed Changes to the City's Zoning Map and Zoning Code

The City's existing zoning map would be revised in the following manner (see Figure 2-5):

1. Riverside Village zoning district would change to Residential 6 and Old Town zones;
2. Mixed Use 12 zoning district would change to Commercial, Residential 20, Residential 12, and Residential 8 zones;
3. A portion of the Residential 12 zone would change to Residential 8; and
4. A new Residential 20 zoning district would be created that allows small unit condominiums and apartments.

The Residential 20 zoning district would establish allowed land uses and development standards addressing minimum and maximum densities, allowed housing types, minimum lot area, required building setbacks, maximum impervious surface allowance, maximum lot coverage allowance, and maximum building heights. Development standards will be developed consistent with the overall scale and character of Duvall to ensure neighborhood compatibility. For example, building height will not exceed 35 feet or three floors and densities will be within a range of 16 to 20 units per acre.

Figure 2-5. Alternative 1: 2015 Comprehensive Plan Alternatives, Zoning Map



2.4.1.3 Effect of Alternative 1 on City's Development Capacity

Alternative 1 would accommodate the King County growth targets as described above. The City's existing development capacity that exceeds the growth targets (see Section 2.2.1.3) would increase as a result of the changes to the zoning districts described above for multi-family units and commercial square footage. Alternative 1 is the only EIS alternative that proposes an increase in development capacity within city limits. Tables 2-4 and 2-5 identify the development capacity under Alternative 1.

Table 2-4. Housing Development Capacity: Alternative 1

Housing Type	2035 Housing Units
Single-family	3,068
Multi-family	773
Total	**3,841**

Source: Benson, 2015

Table 2-5. Employment Development Capacity: Alternative 1

Commercial Type	2035 Commercial Square Footage
Commercial	976,199
Light Industrial	89,685
Total Employees	**3,153 employees**

Source: Benson, 2015

2.4.2 Alternative 2: Urban Growth Area Reserve

Under Alternative 2, the King County household and employment growth targets would be accommodated within the current city limits consistent with the current Future Land Use Map and Zoning map and revised goals and policies in the draft Comprehensive Plan (see Section 2.3). In addition, the City would accommodate growth based upon annexation of the North UGA and the UGA-Reserve located to the east of city limits. The UGA-Reserve would be assigned a pre-designation of Residential 4-4.5 units per acre identical to the North UGA. Annexation could occur in a phased approach, beginning with the North UGA, followed by the area west of Batten Road in the UGA-Reserve (see Figure 2-6). Under this alternative, the Southwest UGA would not be annexed. The City's existing development capacity that exceeds the growth targets (see Section 2.2.1.3) would increase as a result of these potential annexations for single-family units. Tables 2-6 and 2-7 identify the development capacity under Alternative 2.

Table 2-6. Housing Development Capacity: Alternative 2

Housing Type	2035 Housing Units
Single-family	3,667
Multi-family	667
Total	**4,334**

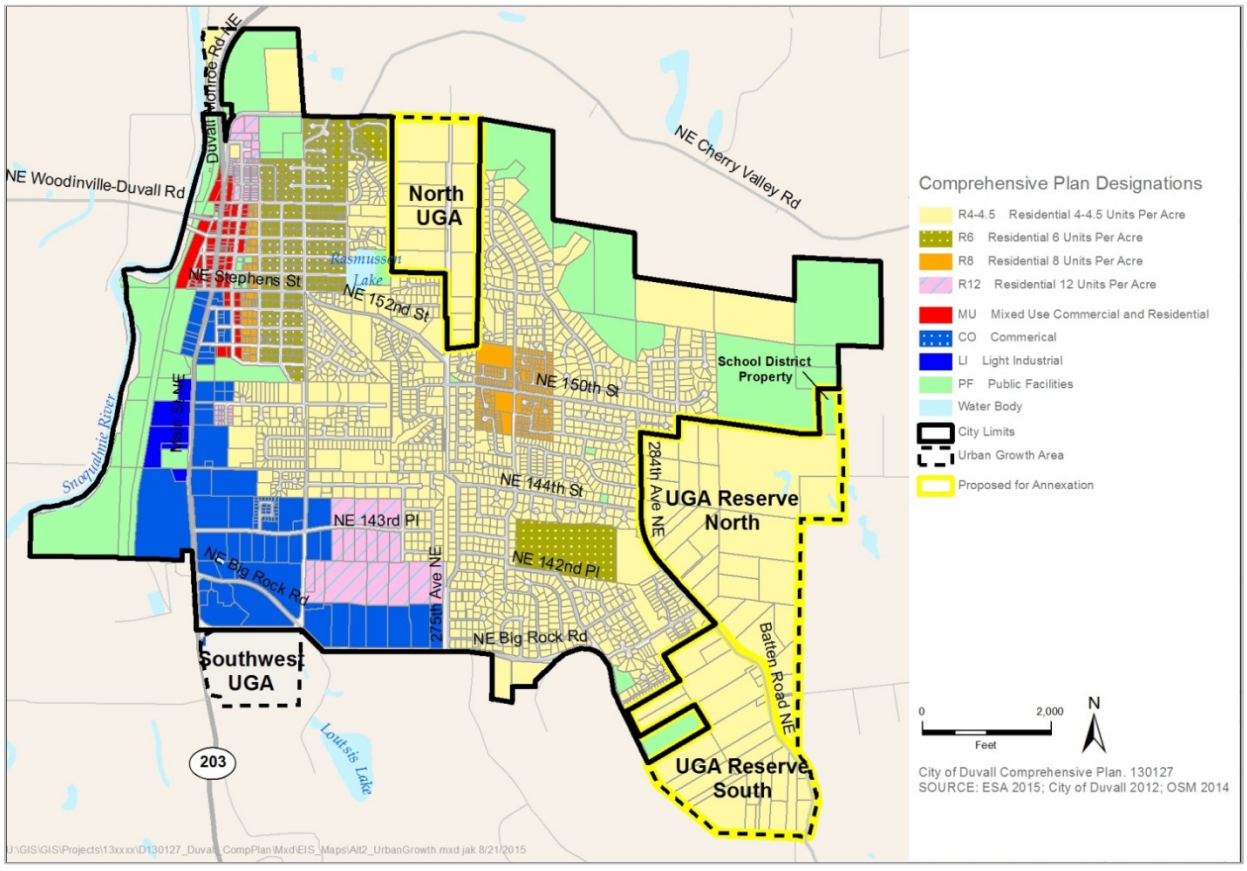
Source: Benson, 2015

Table 2-7. Employment Development Capacity: Alternative 2

Commercial Type	2035 Commercial Square Footage
Commercial	964,790
Light Industrial	89,685
Total Employees	**3,201 employees**

Source: Benson, 2015

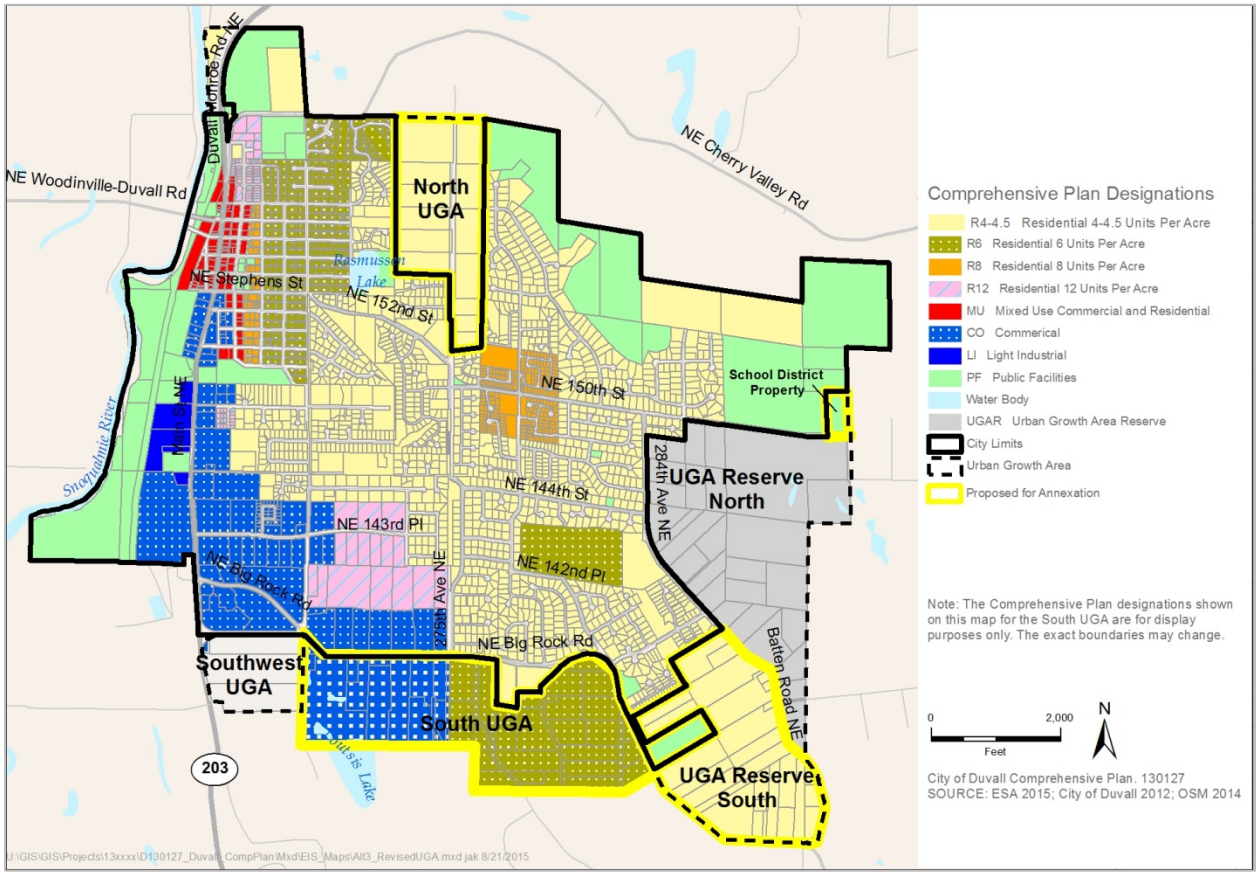
Figure 2-6. Alternative 2: Urban Growth Area Reserve



2.4.3 Alternative 3: Revised Urban Growth Area Boundaries

Under Alternative 3, the King County household and employment growth targets would be accommodated within the current city limits consistent with the current Future Land Use Map and Zoning map and revised goals and policies in the draft Comprehensive Plan (see Section 2.3). In addition, the City would work with the County to remove the northern portion of the UGA-Reserve from their boundaries and add an approximately equal area south of Big Rock Road that is currently not part of Duvall's UGA or City limits. Twenty-five percent of the area south of Big Rock Road would be assigned a pre-designation of Commercial and 75 percent would be assigned a pre-designation of Residential 6 units per acre (see Figure 2-7; please note that the locations of the Commercial and Residential 6 units per acre designations shown on the map are only one approach to applying the designations, the location of the designations may change). The City would also pre-designate the Riverview School District-owned northeast portion of the UGA-Reserve to Public Facilities. Under this alternative, the North UGA would be annexed at R 4-4.5 and Southwest UGA would not be annexed.

Figure 2-7. Alternative 3: Revised Urban Growth Area Boundaries



The City's existing development capacity that exceeds the growth targets (see Section 2.2.1.3) would increase as a result of these potential annexations for single-family units and commercial square footage. Tables 2-8 and 2-9 identify the development capacity under Alternative 3.

Table 2-8. Housing Development Capacity: Alternative 3

Housing Type	2035 Housing Units
Single-family	3,652
Multi-family	667
Total	**4,319**

Source: Benson, 2015

Table 2-9. Employment Development Capacity: Alternative 3

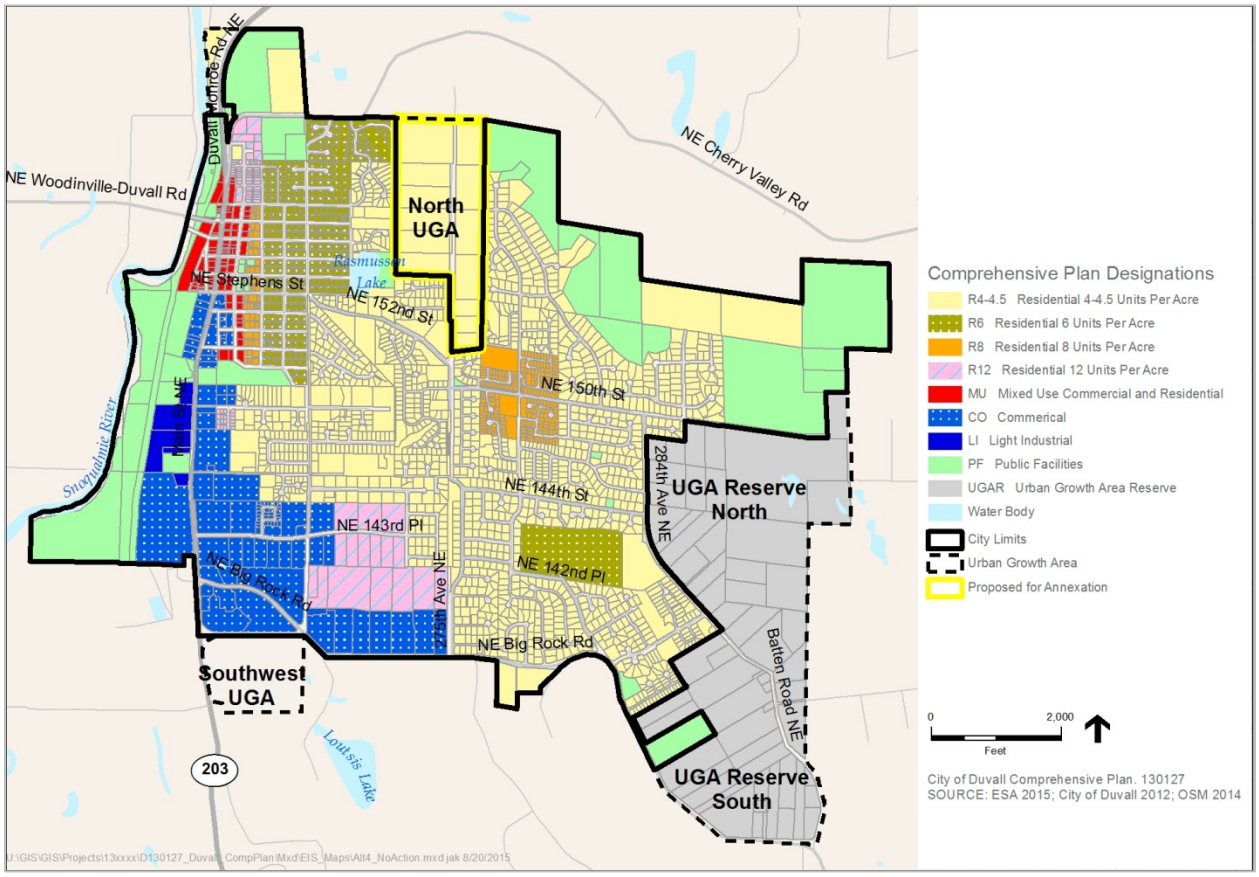
Commercial Type	2035 Commercial Square Footage
Commercial	1,136,900
Light Industrial	89,685
Total Employees	**3,694 employees**

Source: Benson, 2015

2.4.4 Alternative 4: No Action Alternative

Under the No Action Alternative, the King County household and employment allocations would be accommodated within the current city and UGA limits consistent with the current Future Land Use Map and Zoning map. The development capacity for housing and commercial and industrial square footage by 2035 described in Section 2.2.1.3 would also apply under Alternative 4 (see Tables 2-2 and 2-3). The City would support annexation of the North UGA and development would occur consistent with the pre-designation of Residential 4-4.5 units per acre (see Figure 2-8). Under this alternative, the UGA-Reserve and the Southwest UGA would not be annexed.

Figure 2-8. Alternative 4: No Action Alternative



2.5 Policy and Regulatory Amendments

In addition to the Future Land Use Map amendments described above, several policy and regulatory amendments are proposed. The amendments to be addressed in the plan update are briefly summarized below:

1. Create a new Sustainability and Environment element that establishes goals and policies addressing sustainability, sensitive area protections, watershed protections, and shoreline management. Existing goals and policies that relate to natural resources are moved to this element.
2. Delete goals and policies included in other adopted City documents to avoid redundancy and repetition.
3. Delete goals and policies that have been implemented through code adoption or other forms of implementation.
4. Incorporate planning tasks related to Transportation and Capital Facilities.
5. Revise the Duvall municipal code to address changes in parking, design guidelines, sensitive area and tree protection standards, create new standards for infill development, cottage housing, and clustered development., and create a new zoning district for Residential-20 (under Alternative 1 only)

The full range of proposed policy changes can be viewed in the Draft Comprehensive Plan elements (chapters) on the City's website at http://www.duvallwa.gov/297/Comprehensive-Planning.

2.6 Benefits and Disadvantages of Delaying the Proposed Action

SEPA requires a discussion of the benefits and disadvantages of reserving, for some future time, the implementation of a proposal compared to possible approval at this time. In other words, the City must consider the possibility of foreclosing future options by implementing the Proposal.

From the perspective of the natural environment, delaying implementation of Alternative 2 would avoid significant impacts to forest cover loss, fish and wildlife, and wetlands, streams and watershed subbasins in the UGA-Reserve. Alternatives 1, 3 and 4 would result in minor to moderate adverse impacts to earth, water resources, and plants and animals in the City's UGAs.

From the perspective of the built environment, reserving implementation of Alternative 1 for some future time could result in delay of the City's ability to focus future development and resource allocations to Main Street and NE 143rd. Such a delay could result in fewer housing types being built, and potentially affect housing affordability. If implementation of the proposal is delayed for some future time, existing growth trends and patterns of development would likely continue. Delay of alternatives 2, 3, and 4 would not result in the same implications as Alternative 1 because they do not involve changes to land use and zoning within city limits.

CHAPTER 3. WATER RESOURCES

3.1 Relevant Plans, Policies, and Regulations

The City of Duvall has adopted and is currently drafting several plans that govern how the City manages current development and both near-term and long-term growth while identifying, assessing, and protecting water resources (i.e., lakes, streams, and wetlands) that are critical to providing habitat for fish and wildlife, maintaining watershed processes, and maintaining a healthy environment for the general public.

Multiple local, state, and federal policies and regulations pertain to water resources located within the City limits and urban growth area (UGA). At the local level, various sections of the Duvall Municipal Code (DMC) play a major role in how water bodies are managed, including DMC Chapter 14. 42 (Sensitive Areas Regulations) that regulates lakes, wetlands and streams; DMC 14.38, Landscape Standards, that regulates required soil amendments and landscaping vegetation type and coverage for projects, DMC 14.40, Tree Protection Standards that regulates significant tree retention, replacement, and selection of new trees and DMC Chapter 9.06 (Storm Drainage Utility) that regulates the management of surface and stormwater for land use proposals and development projects that could have impacts related to water quality, erosion, clearing and grading activities, flood hazard zones, or critical areas.

A sensitive area review by the City is required for any development proposal permit application. The City's sensitive areas ordinance would be implemented for any development on a site that includes surface water resources, including lakes, wetlands and streams. Areas surrounding lakes, wetlands and streams would be protected within a vegetated buffer, with limited opportunity for alterations within these areas.

Any development would have to meet stormwater management requirements for water quantity and quality consistent with the City-adopted King County Surface Water Management Manual (Manual), the City's stormwater standards, the City's Phase II National Pollution Discharge Elimination System (NPDES) permit (see Table 3-1 for more information on NPDES), and other applicable documents and programs. When development occurs in areas near a tributary to a wetland or stream resource, the Manual requires evaluation of downstream impacts to that resource. In addition to these existing stormwater management requirements, additional guidelines for low impact development (LID) techniques in new construction and redevelopment are anticipated in December 2016. LID is a stormwater and land use management strategy that strives to mimic pre-disturbance hydrologic processes by emphasizing conservation, use of on-site natural features, site planning, and distributed stormwater management practices that are integrated into a project design.

Code provisions for clearing and grading activities, including such activities occurring adjacent to surface water resources, regulate the timing and extent of clearing for development. See Chapter 4 Earth for additional detail.

In addition to adopted regulations, the City's draft Shoreline Master Program[1] (SMP) and draft Watershed Plan are under local review, and will work in concert with existing regulations and the Comprehensive Plan to manage water resources. Once adopted[1], the SMP will manage shoreline resources and regulate development near the Snoqualmie River shoreline. The Watershed Plan identifies existing watershed characteristics in and immediately surrounding Duvall and will provide the City with a roadmap to improving watershed protections and focusing future development in appropriate areas within the City and its UGA. The Watershed Plan roadmap will result in updates to the adopted sensitive areas ordinance and stormwater standards, along with other existing development standards. These updates will require review from Washington State Departments of Ecology and Commerce, and will assist the City in ensuring that standards are consistent with state requirements for best available science (sensitive areas protections) and use of low impact development approaches (stormwater management).

At the state and federal levels, multiple policies and regulations are administered by a variety of agencies to manage and protect water resources. Regulatory agencies and associated programs or policies are briefly summarized in Table 3-1.

[1] Adoption of both the Watershed Plan and Shoreline Master Program are anticipated by September and November 2015, respectively.

Table 3-1. State and Federal Regulatory Agencies and the Programs and Policies they administer

Regulatory Agency	Regulatory Program or Policies	Area of Jurisdiction
Washington State Department of Ecology (Ecology)	Clean Water Act Section 401 Water Quality Certification and Washington State Water Pollution Control Act	Applicants receiving a Section 404 permit from the Corps must obtain a Section 401 water quality certification from Ecology indicating that Ecology anticipates that the applicant's project will comply with state water quality standards and other aquatic resource protection requirements under Ecology's authority. All projects affecting surface waters in the state, including those that are not subject to the federal Clean Water Act Sections 404/401, must still comply with the provisions of the State's Water Pollution Control Act (RCW 90.48).
	National Pollutant Discharge Elimination System (NPDES)	The NPDES permit program controls water pollution by regulating point sources that discharge pollutants into waters of the U.S. Industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters or if a construction project disturbs more than one acre of land.
Washington State Department of Fish and Wildlife (WDFW)	Hydraulic Project Approval (HPA)	The HPA program applies to any construction activity in or near the waters of the state. Permit applications must show that construction practices will prevent damage to the state's fish and shellfish, and their habitats.
U.S. Army Corps of Engineers (Corps)	Clean Water Act Section 404 Dredge and Fill Requirements and Section 10 Permit for Work in Navigable Waters	Any project that proposes discharging dredged or fill material into the waters of the United States, including special aquatic sites such as wetlands (non-isolated), must obtain a Section 404 permit. Any work in, over, or under navigable waters of the U.S. requires a Section 10 permit. The purpose of Section 10 permitting is to prohibit the obstruction or alteration of navigable waters of the U.S.
U.S. Federal Emergency Management Agency (FEMA)/City of Duvall	National Flood Insurance Program (NFIP)	FEMA's NFIP provides a flood insurance program for participating communities that applies to structures and uses within the floodplain. Although floodplain regulations are administered at the local level, the NFIP identifies minimum standards that must be met in order to maintain program participation.

3.2 Affected Environment

3.2.1 Climate

Duvall is in a region that has a temperate, maritime climate. Winters are cool and wet; while the summer and early fall typically have a drought period. The climate is influenced by Puget Sound to the west and the Cascade Mountains to the east. Average annual precipitation ranges from approximately 30 inches near Puget Sound to 90 inches in the Cascade foothills, with the area surrounding Duvall averaging nearly 50 inches (Parametrix, 2005).

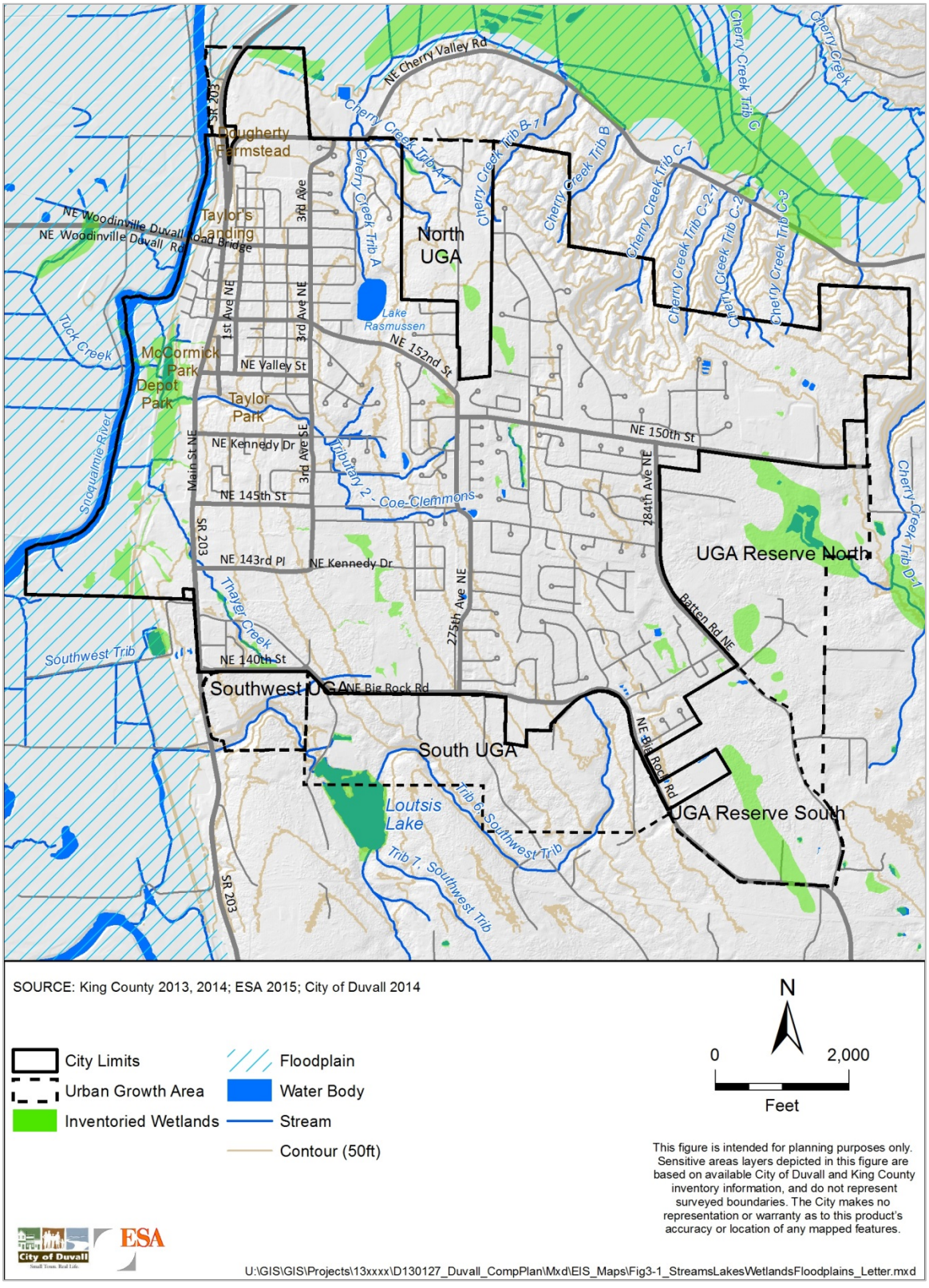
3.2.2 Topography

Duvall is located in the lower Snoqualmie Watershed. Encompassing approximately 692 square miles, the Snoqualmie Watershed extends from the crest of the Cascade Mountains in the east to the confluence of the Snoqualmie and Skykomish Rivers in southwestern Snohomish County. Elevation within the watershed varies from approximately 15 feet above mean sea level at the confluence of the Snoqualmie and Skykomish Rivers to approximately 6,700 feet above mean sea level along the Cascade crest. The Snoqualmie Watershed is within the Snohomish Basin (Water Resource Inventory Area 7), the second largest basin in Puget Sound (Snohomish Basin Salmon Recovery Forum, 2004). Elevations in Duvall range from approximately 40 feet above sea level along the banks of the Snoqualmie River to 490 feet along the eastern edges of the city.

3.2.3 Streams and Rivers

The mainstem Snoqualmie River flows through the western portion of the city. From there, the River extends south and east through unincorporated King County and several small cities. There are four smaller watersheds or basins that are tributaries to the Snoqualmie River, and they are located in or partially within the city or UGA boundary: Thayer Creek, Coe-Clemmons Creek, Cherry Creek and Weiss Creek (Figure 3-1). Cherry Creek is the lowest major tributary of the Snoqualmie River and the only significant tributary that drains areas of the city. Cherry Creek does not pass into the city or UGA; however, tributaries to Cherry Creek drain the northeastern portion of the city.

Figure 3-1. Streams, Lakes, Wetlands and Floodplains



3.2.4 Lakes

Lake Rasmussen is the only lake located in Duvall (Figure 3-1). It is relatively small (5.5 acres), and occurs in the upper portion of Cherry Creek Tributary A subbasin (labeled as Subbasin project assessment units C3 within the draft Watershed Plan; Figure 3-2). Cherry Creek Tributary A drains from the lake to the north within a narrow riparian corridor. Existing single family residential development occurs to the north and west of Lake Rasmussen, with areas to the south and east vegetated with a mixed forest community. Runoff from surrounding development and road improvements has likely increased pollutant inputs to the lake and downstream areas (ESA, 2015).

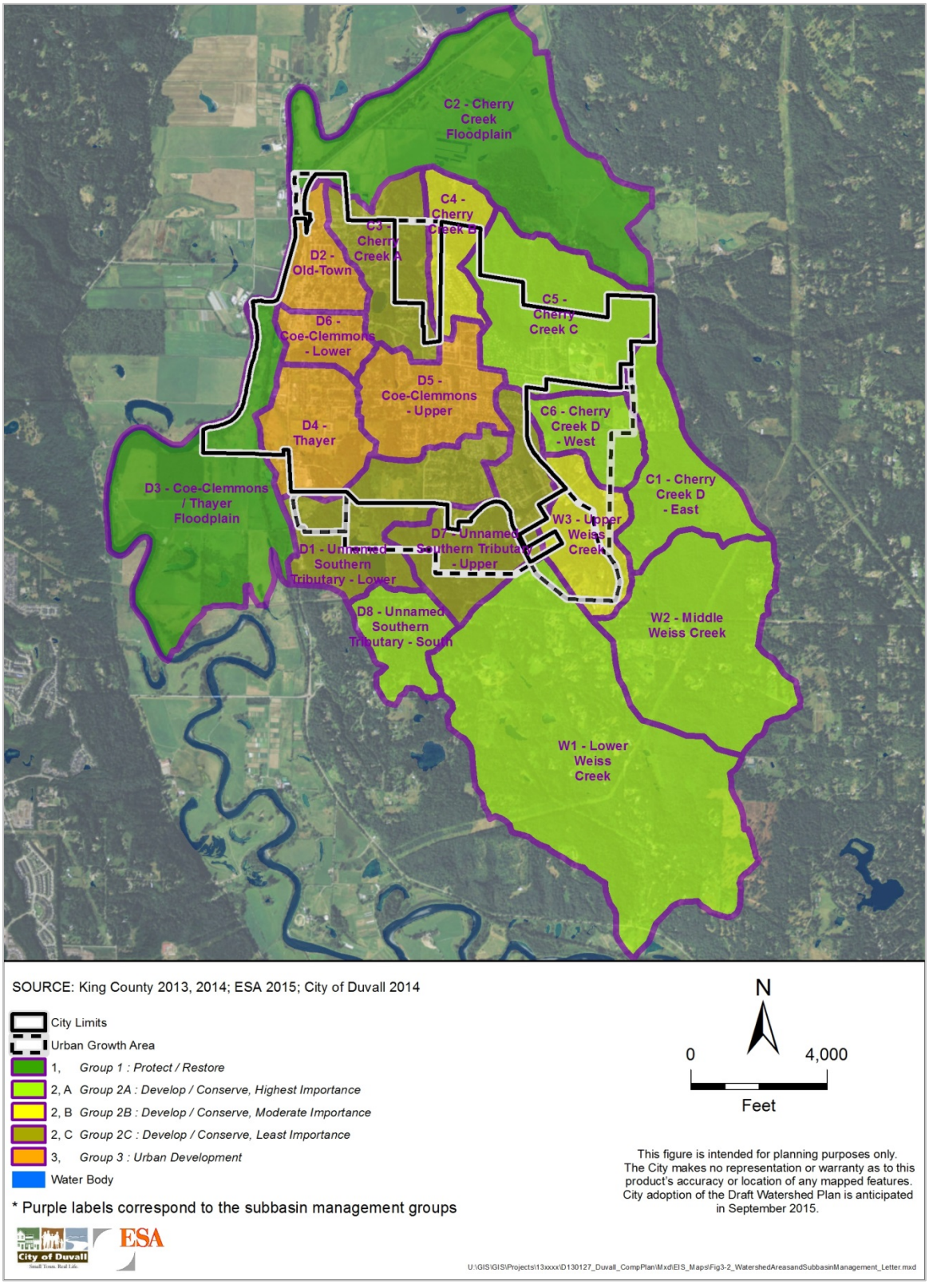
Loutsis Lake is located to the south of the city, within the western portion of the proposed South UGA under Alternative 3 (Figure 3-1). The small lake is approximately 19 acres in size, and is not considered a Shoreline of the State by King County's Shoreline Master Program (King County, 2013). An unnamed tributary stream flowing into the northeast corner of the lake is the primary source of hydrology; the stream flows out of the northwest corner of the lake. The outlet appears to be modified by a berm (supporting a private drive) that runs along the northwestern shoreline; it is unknown how much this modification influences the surface elevation of the lake. The lake is entirely surrounded by private property, with only the northern shoreline cleared and developed. Areas to the east, south and west of the lake support mixed forest. There is no information available on the water quality of Loutsis Lake (ESA, 2015).

3.2.5 Wetlands

Wetlands within Duvall's Snoqualmie River floodplain are limited to areas that receive surface and shallow subsurface flow from the tributary channels. Several small wetlands located on the slope above the Snoqualmie valley, immediately west of Main Street, receive shallow groundwater from hillside seeps (Figure 3-1). Much of the Snoqualmie River shoreline area (extending across the floodplain) is dominated by relatively coarse soils that allow for rapid infiltration and percolation, which prevents development of wetland conditions. Some of the North McCormick / Depot Park areas and South McCormick Park area appear to have finer surface deposits, which result in perched water tables supporting several large depressional wetlands. Depressional wetlands are mapped within the Snoqualmie River floodplain in and around Dougherty Farmstead at the north end of the city (Figure 3-1).

Additionally, large depressional wetland areas occur within the UGA-Reserve North and UGA-Reserve South areas (Figure 3-1). These wetlands, which are predominantly forested and occur on rural residential and vacant properties, serve as headwaters to Cherry Creek Tributary D and Weiss Creek, respectively (Figure 3-2). Other smaller depressional wetlands occur within the city in the upper reaches of Coe-Clemmons, Thayer and Cherry tributary streams (Figure 3-1).

Figure 3-2. Watershed Areas and Subbasin Management Groups



3.2.6 Watershed Subbasins

The City conducted a watershed characterization to assess the relative condition of Duvall's subbasins and inform future land use decisions. This characterization builds on the methods established by the Washington State Department of Ecology (Ecology) Puget Sound Watershed Characterization (Stanley et al., 2011).

Ecology mapped the boundaries of 3 Assessment Units (AUs) within the study area. The City subdivided the AUs into 17 project assessment units (PAUs) using a combination of high resolution LiDAR digital elevation model, stream maps, and stormwater infrastructure maps. The PAUs range from 98 to 1,273 acres and generally correspond to 1st order streams and jurisdictional boundaries (Figure 3-2).

3.2.7 Water Quality

Within urban and urbanizing areas, a typical key water quality parameter of concern is related to erosion and sediment movement within aquatic systems. "Sediment delivery to aquatic ecosystems is a natural phenomenon with a natural range of variability; however, excessive amounts of sediment can undermine the condition of many types of aquatic ecosystems" (Stanley et al., 2005). Sediment is generally transported through high gradient (steeply sloping) streams and deposited in lower gradient stream reaches. Areas of sediment supply and deposit within and in the vicinity of Duvall include the Coe-Clemons Creek riparian corridor and areas of the Cherry Creek basin on the northern edge of the city.

In Duvall, primary water quality concerns include: excess runoff resulting in erosion within tributary streams; surface water temperature within tributary streams, especially as they flow into the large wetland areas within the Snoqualmie River shoreline environment; fecal coliform levels within the Snoqualmie River; and the potential for elevated levels of key nutrients, including phosphorus and nitrogen. The contribution of excess nutrients and pathogens is exacerbated by the removal of riparian vegetation and loss of wetlands that would otherwise capture or slow the entry of these pollutants into water bodies.

The Snoqualmie River extending through and upstream of the city has been listed as a Category 4(a) water for fecal coliform for more than a decade (Ecology, 2012). A Category 4(a) listing indicates that tested levels have been in excess of water quality standards and that a Total Maximum Daily Load (TMDL) plan is in place to maintain or improve water quality within the listed water. According to the Snoqualmie Watershed Water Quality Synthesis Report (Kaje, 2009), both Snoqualmie River and Cherry Creek are impaired or are of concern for multiple water quality parameters in. These waters are designated by Washington State as core summer salmonid habitats (entire Cherry Creek system, and Snoqualmie River mainstem upstream of Duvall starting at Harris Creek), with associated higher water quality standards to ensure protection of sensitive salmon populations. Monitoring within the Cherry Creek valley during late summer months has revealed impairment for temperature, dissolved

oxygen, fecal coliform, pH, and nutrients (phosphorus and nitrogen), with temperature and dissolved oxygen identified as the impairments of greatest concern (WDFW, 2008; Kaje, 2009). Impairment for temperature is also noted within the Snoqualmie River, with other water quality parameters indicated as of concern.

Across the Snoqualmie River watershed, runoff from agricultural areas and lack of riparian vegetation are likely the most significant sources of elevated water temperatures within the Cherry Creek valley (Kaje, 2009). Runoff from both agricultural areas and rural residential areas (likely primarily from inadequate septic systems) are probably the most significant sources of fecal coliform bacteria and nutrients entering rivers and streams. These land uses do not occur within Duvall; as such, primary water quality impairments within the Snoqualmie River and Cherry Creek are not thought to be associated with urban runoff from land uses within the city.

3.2.8 Watershed Functions

There are 17 subbasins or PAUs that encompass Duvall and the surrounding area. For each subbasin, the draft Watershed Plan evaluated the importance of watershed processes and the level to which these processes have been degraded by changes in land cover and other modifications (ESA, 2015). Watershed processes evaluated include water flow, water quality, and fish and wildlife habitat. In general, the most important subbasins for watershed processes are located within the Snoqualmie River and Cherry Creek floodplains – primarily areas that are either outside of Duvall or are within the city and in use as park lands and open space. These subbasins (labeled as PAUs D3 and C2 in the draft Watershed Plan; Figure 3-2) have also experienced degradation to important watershed functions primarily as a result of past clearing and agricultural uses. Due to high importance and high degradation, these areas are targeted highest for protection and restoration and grouped into Subbasin Management Group 1.

How are watershed functions assessed?

The Watershed Plan provides an assessment of watershed processes that identifies:

(1) ***importance*** *of each subbasin, with results based on underlying, pre-development physical conditions, and*

(2) ***degradation*** *of each subbasin, with results identifying the amount of change to watershed processes that has occurred due to past development.*

This approach identifies each subbasin's relative importance and degradation within Duvall's watershed, with composite results indicating, at a coarse scale, areas that should be targeted for restoration, protection, and moderate or higher intensity development.

Areas of lower importance for maintenance of watershed processes are located within the core of the city, along Main Street and east throughout the Coe-Clemmons and Thayer subbasins (labeled as PAUs D2, D4, D5 and D6; Figure 3-2). Watershed processes within these areas are both less important, relative to other areas around the city, and are highly degraded by existing development patterns. The draft Watershed Plan suggests that additional development and higher intensity uses be focused within these areas and are grouped into Subbasin Management Group 3.

Areas in the Subbasin Management Group 2 subbasins are of moderate importance to watershed processes, and also have moderate levels of degradation. These subbasins include the Cherry Creek tributary subbasins along the north edge and east of the city (labeled as PAUs C3, C4, C5 and C6; Figure 3-2), the upper subbasin of Weiss Creek to the southeast of the city (labeled as PAU W3, within the UGA-Reserve South area; Figure 3-2), and unnamed southern tributary subbasins along the southern edge of Duvall (labeled as PAUs D1 and D7; Figure 3-2). Based on the existing condition of forest cover, presence of water storage features, sediment export potential, and aquatic habitat, these subbasins were split into three management groups: Groups 2A, 2B, and 2C. Subbasin Management Group 2A areas are generally the least degraded areas within or near the city, making them the most important areas for protection of existing watershed processes. Subbasin Management Groups 2B and 2C have higher levels of existing degradation, and underlying conditions show they are of lower importance for maintaining watershed processes. The draft Watershed Plan recommends approaches to maintain remaining functions within these areas while providing additional development opportunities.

3.3 Impacts

3.3.1 Impacts Common to All Alternatives

All alternatives would allow for development and urbanization within currently vacant and underdeveloped areas of the city, with potential impacts to water resources. Development activities that have detrimental effects on water resources typically include land cover conversion (pervious, complex vegetative cover converted to impervious surfaces, lawn, and bare ground) and increased sediment and pollutant inputs due to changes in land use (undeveloped land converted to commercial and residential use with increased vehicular, human, and pet presence). All of these activities would occur as areas of Duvall developed under any of the alternatives.

The magnitude of potential impacts resulting under each of the alternatives would depend on the scale, pace, required improvements to mitigate impacts, and location of development. Because development consistent with any Comprehensive Plan alternative would largely be driven by private entities, the pace of development under any of the alternatives is not known. However, the potential scale and extent of development under each alternative is better understood based on evaluation completed as part of the City's 2015 Capacity Analysis Study and EIS Alternatives memorandum (City of Duvall, 2015).

All alternatives would allow for similar levels of future development within existing City limits, with similar potential for impacts to water resources. There is relatively low opportunity for future development or redevelopment across the majority of Duvall city limits, with relatively low potential for impacts to water resources (see Figure 2-2 in Chapter 2 Summary of Project Alternatives that identifies vacant and underdeveloped lands in Duvall). For most areas, future development would be limited to infill development, potential short plats of existing residential parcels, and redevelopment

that maintains existing uses. These activities would primarily occur within previously disturbed areas within city limits.

An exception would be development that could occur along NE 143rd Avenue extending east from Main Street, as well as along the east side of Main Street from NE 143rd north to Taylor Park. Development within these areas would be a combination of commercial and higher-density residential (between 8 and 20 units per acre depending on the Comprehensive Plan alternative). Site disturbance could result in increased off-site migration of sediment (which can include nutrients, metals, and bacteria and associated with increased surface water turbidity) that would follow topography and surface water flow paths and could have impacts on water resources down-gradient from this area, including Coe-Clemmons and Thayer Creeks, numerous wetlands, and the Snoqualmie River. Increased sediment loads within surface runoff can potentially reduce stream channel capacity and wetland area, negatively impacting the functions of both water resources.

The City's draft Watershed Plan identifies the subbasins surrounding the NE 143rd Avenue / Main Street as appropriate for higher intensity development, as defined in the glossary (labeled as PAU D4 and D1). The area also has low sediment export potential, as detailed in Chapter 4 (ESA, 2015). For these reasons, new development expected within the NE 143rd Street / Main Street NE / NE Big Rock Road area under all alternatives would result in minor adverse impacts, as defined in Chapter 1, to water resources.

All alternatives would include annexation of the North UGA. Annexation of the North UGA with proposed low density single family residential use would impact streams, wetlands, and their associated buffers, located predominantly in the central and northern portions of the UGA. Four potential tributaries to Cherry Creek flow through the North UGA, with at least three streams originating within this area. These streams flow to the northwest outside of the UGA and are associated with several inventoried wetlands. Other inventoried wetlands are mapped further south within the UGA.

The City's draft Watershed Plan maps the North UGA within two subbasins that split the area into western and eastern sections. The western two-thirds of the UGA is designated as having lower importance for conservation and the eastern one-third is identified as having moderate importance for conservation (labeled as PAU C3 and C4). The Watershed Plan also identifies the Cherry Creek tributary subbasins as having moderate sediment export potential. The Watershed plan results indicate that development of the North UGA upon annexation would disrupt water flow processes in the area and downstream within Cherry Creek, and could result in water quality impairment due to erosion of sediments. For these reasons, and assuming mitigation approaches detailed in Section 3.4, development within the North UGA would likely result in moderate adverse impacts, as defined in Chapter 1, to earth resources.

3.3.2 Alternative 1: 2015 Comprehensive Plan Alternative

Impacts to or from water resources under Alternative 1 would be largely consistent with the impacts common to all alternatives described in Section 3.3.1. Opportunity for future development would remain highest along NE 143rd Street / Main Street NE / NE Big Rock Road area, with only the type of new development being different (see Chapter 2 Description of Project Alternatives for details on Alternative 1 land use designations).

Impacts to or from water resources under Alternative 1 could also occur with future development of the Southwest UGA. Commercial development in the northern two parcels of the Southwest UGA would occur within close proximity to an unnamed tributary of the Snoqualmie River. The southern two parcels would be designated for park and open space uses, resulting in little to no impacts to current conditions if the park is designed for passive recreational use and remains relatively undeveloped.

The Southwest UGA is located within a subbasin designated for lowest conservation (labeled as PAU D1), suggesting that more intense development is also appropriate for this area, along with focused protection of remaining important areas. Sediment export potential throughout all of these areas is low (see Chapter 4 Earth for details). In addition, any future development, whether commercial in the northern portion of the Southwest UGA or parks uses within the southern portion, would be required to comply with sensitive areas requirements protecting wetlands and streams (areas most important for maintenance of water resources) and steep slopes. For these reasons, new development expected within the Southwest UGA would result in minor adverse impacts to water resources.

3.3.3 Alternative 2: Urban Growth Area Reserve

Within existing Duvall city limits and the North UGA, development and associated impacts to and from water resources under Alternative 2 would occur consistent with those described in Section 3.3.1 (Impacts Common to All Alternatives).

Alternative 2 assumes annexation of the UGA Reserve located to the east and southeast of existing city limits. Future development in these areas would likely result in potentially significant cumulative impacts to water resources. Extensive wetland areas are mapped throughout UGA Reserve. Within UGA Reserve-North, these wetlands occur across a predominantly forested area and occur in a headwater position, draining to the upper reaches of Cherry Creek Tributary D (ESA, 2015). Even with wetland protections provided by the City's sensitive areas regulations (DMC 14.42), future residential and infrastructure development would impact these wetlands. Impacts would be associated with fragmentation between wetland areas, hydrologic modification, and elimination of forest cover from surrounding areas. Fragmentation between wetland areas would occur as a result of road infrastructure providing access to new residential development; even if residential building sites would be required to avoid direct impacts to wetlands and streams, DMC 14.42 would allow for buffer reduction and development between wetland areas. Development could also result in direct

modification to wetland areas, as necessary to provide site access and for utility and stormwater infrastructure.

Similar circumstances occur within UGA-Reserve South, although less area is mapped as wetland. Wetlands in this area occur in the upper Weiss Creek subbasin, also in headwater locations that form the upper reaches of Weiss Creek. Future residential and infrastructure development within UGA-Reserve South would likely impact these wetlands, with similar implications to those for UGA-Reserve North.

The draft Watershed Plan prioritizes the UGA-Reserve for conservation (labeled as PAU C6 and W3) (ESA, 2015). The Plan suggests that any allowed development should ensure that intact water flow processes are maintained. The majority of UGA-Reserve North and UGA-Reserve South are mapped as a sediment sink (meaning that the areas trap sediments, nutrients and pathogens that could be detrimental to downstream water quality), further suggesting that these areas should be protected from future development to safeguard water quality in the subbasins and downstream within Cherry Creek and Weiss Creek.

Sensitive areas requirements, which would apply both during construction and upon completion, would minimize the potential for impacts to water resources; however, would not allow for avoidance of all impacts due to the ecological importance and existing conditions throughout the UGA-Reserve. Wetlands, stream and ecological conditions within the UGA-Reserve North and South areas, as well as areas downstream, would likely be most sensitive to future change; for these reasons, future UGA-Reserve North and South development under Alternative 2 would likely result in potentially significant cumulative adverse impacts, as defined in Chapter 1, to water resources.

3.3.4 Alternative 3: Revised Urban Growth Area Boundaries

Within existing Duvall city limits and the North UGA, development and associated impacts to and from water resources under Alternative 3 would occur consistent with those described in Section 3.3.1 (Impacts Common to All Alternatives). Impacts on water resources within UGA-Reserve South associated with this alternative are described under Alternative 2 and would be considered significant.

Revising urban growth boundaries to include areas south of Big Rock Road for future commercial and residential development would impact the shoreline of Loutsis Lake and associated wetlands, an unnamed stream that drains through to the lake, and stream buffers. Access to the southeastern portion of the revised UGA would require a stream crossing. The revised UGA is designated by the draft Watershed Plan as having lower importance for conservation (labeled as PAU D1 and D7). This area also has low sediment export potential (ESA, 2015; Stanley et al., 2011). These results suggest that future, higher intensity development in this revised UGA may be appropriate and would have relatively minor impacts to water flow and sediment transport processes. Future development within the potential South UGA would, however, still result in substantial loss of forest cover, extensive

grading, increases in impervious surface coverage, and alterations of stormwater runoff pathways. For these reasons, development within the potential South UGA under Alternative 3 would likely result in moderate adverse impacts to water resources.

3.3.5 Alternative 4: No Action Alternative

Within existing Duvall city limits and the North UGA, development and associated impacts to and from water resources under Alternative 4 would occur consistent with those described in Section 3.3.1 (Impacts Common to All Alternatives) and result in minor to moderate adverse impacts.

3.4 Mitigation Measures

For future development that could occur under all alternatives, implementation of the impervious surface, sensitive area, open space, and tree protection policies included in the draft Watershed Plan, if adopted and implemented, would substantially strengthen protections for water resources. Once adopted, the Watershed Plan is intended to provide the City with policy direction to update stormwater regulations and other regulations in the DMC. Draft Watershed Plan strategies most important for protection of water resources would include implementation of:

1. LID techniques to minimize potential stormwater quantity and quality impacts, consistent with existing and anticipated Ecology guidelines.
2. Water quantity and quality monitoring for Cherry Creek tributary streams and/or other streams, focusing on subbasins and reaches where development is occurring; this would likely be most successful if required at the time of annexation of the North UGA and for new subdivision development proposals along the northern edge of Duvall. Monitoring and adaptive management of stormwater systems would be completed by project proponents.
3. New impervious surface limits, which would effectively reduce allowances for impervious coverage when future single-family residential land uses occur.

Many of the potential impacts identified for all alternatives identified above can be mitigated by the implementation of existing sensitive areas and stormwater management requirements, in concert with the other site development standards and mitigation measures detailed in this section. However, stormwater retention/detention and treatment are still emerging technologies, and development occurring adjacent to intact wetlands and stream corridors has impacts even when sensitive areas standards and future watershed-related regulations are enforced. All of Duvall and its associated UGAs are in an area with streams and wetlands that drain to the Snoqualmie River and Cherry Creek, both regionally important surface waters for maintaining salmon populations.

3.5 Significant Unavoidable Adverse Impacts

Even with mitigation measures as detailed above, future development in the UGA-Reserve North area under Alternative 2 would likely result in significant adverse long term impacts to water resources on

a cumulative basis. Impacts would occur to wetland soils that support extensive forest cover at the headwaters to Cherry Creek tributary streams and tributaries extending to the southeast. Impacts would also occur to downstream stream channels, as changes in stormwater runoff resulting from UGA-Reserve North development would change the timing and quantity of flows to these areas. Adverse impacts that may occur despite mitigation are:

1. Stream channel sedimentation and erosion, and accelerated transport of sediment and nutrients to tributary streams and eventually to the Snoqualmie River and Cherry Creek; this adverse impact would occur as a result of reduction of forest cover and increase in impervious surfaces.
2. Degradation of surface water quality as a result of greater population and impervious surfaces.
3. Degradation of ground water quality, primarily via recharge of impacted surface waters (recharge occurs primarily within the Snoqualmie and Cherry valleys, where little future development is anticipated).

CHAPTER 4. EARTH

4.1 Relevant Plans, Policies, and Regulations

The City of Duvall regulates land use and development activities that have potential to impact earth resources and geologically hazardous areas primarily through Duvall Municipal Code (DMC) Chapter 10.12 – Clearing and Grading; and DMC Title 14 – Unified Development Regulations. In addition, the City provides additional development/design standards for public roadways and other public facilities through DMC Title 8 – Streets Sidewalks, Public Improvements, and Public Places.

Clearing and Grading standards integrate International Building Code standards, and any development activity that proposes land clearing and/or grading must be consistent with these provisions. All development must also adhere to applicable requirements of a building permit issued by the City of Duvall Building Department, which include seismic standards for structures.

The City's Unified Development Regulations include standards for maximum impervious surface cover, site design, tree protection, sensitive areas protection, and landscaping; all of these standards require consideration of existing native soils (and overlying vegetation) as new land use and development activities occur. Impervious surface standards are applied to specific zoning districts, and range from 60 percent (Residential 4 units per acre [R4]) to 100 percent (Old Town – mixed use district). Site design standards (DMC Chapter 13.34) are additional to Clearing and Grading requirements, and are provided to minimize soil disturbance, integrate new developments into the natural terrain, contain and manage stormwater runoff on-site, and minimize impermeable site area.

Tree Protection (DMC Chapter 14.40) and Sensitive Areas Regulations (Chapter 14.42) require additional consideration and protection of areas that also provide protection of earth resources. These areas, including steep slopes, landslide hazard areas, stream corridors, wetlands and remaining upland areas that maintain tree canopy, often times are vulnerable to disturbance, with clearing and grading increasing potential for erosion and sedimentation.

Among other purposes, the City's Landscaping Standards (DMC 14.38) require development activities to "promote retention and protection of existing vegetation and reduce the impacts of development on storm drainage systems and natural habitats by… retaining existing vegetation and significant trees by incorporating them into the site design; reducing erosion and stormwater runoff; replacing existing vegetation and trees; [and] promoting proper plant selection and continuous maintenance so that plant materials can flourish…" The standards include specific requirements for replacement of top soils and establishment of trees and other vegetation as part of site development.

Additionally, the City developed a Draft Watershed Plan, with local adoption anticipated by September 2015. Once adopted, the Watershed Plan is intended to provide the City with policy

direction to update the Unified Development Regulations summarized above. The draft Watershed Plan (ESA, 2015) recommends reducing maximum allowable impervious surface limits for some areas of the city, requiring additional protection of mature trees, and better integrating regulations that protect ecological processes, including processes involving soils and geology. The Watershed Plan also identifies existing impervious surface coverage, forest cover, and other key information pertaining to earth resources for each subbasin across Duvall.

4.2 Affected Environment

4.2.1 Soil Conditions

Duvall stands on the east side of the lower Snoqualmie Valley extending up the west slope of a knoll at the western edge of the Cascade foothills. Topography along the northern portion of the city is quite steep and King County has mapped this area as prone to landslides (King County, 2005; Figure 4-1). These north-facing steep slopes fall to the Cherry Creek Valley, to the north of Duvall. The Snoqualmie River forms the western city limits of Duvall and approximately 7 percent of the city (138 acres) lies within the Snoqualmie floodplain (see Figure 4-1).

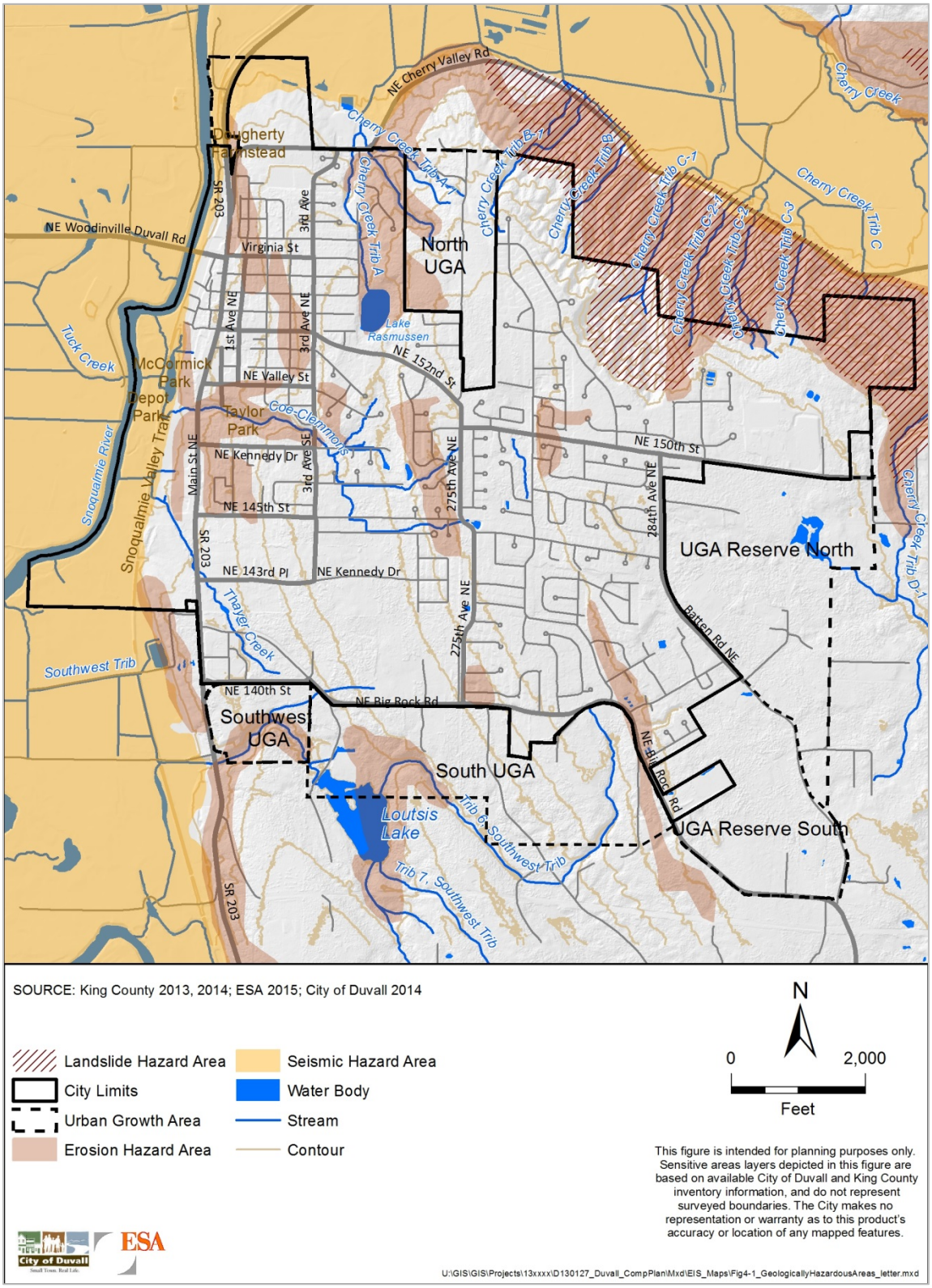
The City's sensitive areas ordinance (adopted under Duvall Municipal Code Chapter 14.42) includes standards to protect erosion, landslide, and seismic hazard areas.

The principal soil type across Duvall is relatively impermeable glacial till (Alderwood gravely sandy loam), which is found in 91 percent of the land area of the city (1,837 acres). The remainder consists of glacial outwash soils (48 acres; 2 percent) and alluvial soils (138 acres; 7 percent) (U.S. Department of Agriculture, Soil Conservation Service, 1992). The outwash soils include Alderwood and Kitsap soils found on very steep slopes (25 to 70 percent slope), which have rapid runoff, a severe to very severe erosion hazard rating, and a severe potential for slope failure (U.S. Department of Agriculture, Soil Conservation Service, 1992). Outwash soil is found primarily along the northeastern city limits, roughly corresponding to the landslide hazard area mapping (see Figure 4-1). Alluvial soils occur primarily within the Snoqualmie River floodplain, and are fine grained, have slow to moderate permeability, slow runoff, and a slight erosion hazard. Some of the alluvial soils within the City's floodplain area and other areas near Duvall are classified as hydric soils. These soils typically develop in low-energy and saturated conditions, and may be a wetland indicator (Sheldon et al., 2003).

4.2.2 Erosion

Soil erosion is a process in which individual soil particles are detached and moved by natural agents such as wind, rain, frost action, or surface water flows. Erosion poses a potential public health and safety hazard and over time can also undermine improvements such as building foundations, roads, and sidewalks. Eroded sediment entering bodies of water can negatively impact ecosystem functioning (see also Chapter 3 for more information on sediment impacts to water resources).

Figure 4-1. Geologically Hazardous Areas



In addition, erosion can directly and indirectly damage private property as well as valuable habitat and natural areas. King County mapped erosion hazard areas to include those soils identified by U.S. Department of Agriculture (1973 and 1992) as susceptible to erosion with loss of vegetative cover, grading and land use changes (see Figure 4-1). These erosion hazard areas occur within the city, urban growth areas (UGAs) and surrounding area, with the largest concentration on steeper slopes along the northern edge of the city.

4.2.3 Landslides

Duvall defines landslide hazard areas as those areas susceptible to landslides because of "any combination of physical factors, including bedrock, soil, slope, structure, hydrology" (DMC 14.42.400). Generally, these areas include slopes exceeding 40 percent that are more than 10 feet in height, as well as unconsolidated soils with slopes greater than 15 percent that are underlain with impermeable geologic materials and/or have seeps. These areas are especially subject to slope failure, and many such areas have experienced soil movement in the past. Landslides in such areas can result in public and private costs, threats to human health and safety, and natural resource and environmental damage (Parametrix, 2005).

Potential landslide hazard areas within and around Duvall have been mapped by King County and, as with erosion hazard areas, occur predominantly along the northern edge of the city (Figure 4-1). Additional areas with known landslide and/or severe erosion hazard are located in Taylor Park, where stream incision and stream bank erosion along Coe-Clemmons Creek have resulted in recent failures on ravine slopes. Potential landslide areas within Duvall include those areas that are naturally unstable or have become unstable due to structural changes from adjacent disturbance (land development and changes in surface water flows within adjacent areas). Beyond the northern and northeastern steep slope areas and the areas of recent failure along Coe-Clemmons Creek, there are no other areas within the city or UGAs that have been designated as potential landslide hazard areas.

4.2.4 Earthquakes

The City of Duvall designates and defines seismic hazard areas. These include areas that are susceptible to a severe risk of earthquake damage as a result of seismically induced ground shaking, differential settlement, slope failure, settlement, lateral spreading, mass wasting, surface faulting or soil liquefaction (DMC 14.42.400). King County has mapped seismic hazard areas within Duvall and across surrounding areas (Figure 4-1). Seismic hazards are mapped as occurring across the valley bottoms of the Snoqualmie River and Cherry Creek, at the western and northern edges of the city, respectively. These are areas generally made up of alluvial soils, which are fine grained with relatively high groundwater tables. Liquefaction in these areas during seismic events is considered potentially likely, although the presence of liquefiable materials can only be determined through site specific analysis. Existing uses within seismic hazard areas are primarily limited to parks and open space, including McCormick Park to the west of the Snoqualmie Valley Trail, Depot Park, Taylor's Landing and Dougherty Farmstead (partially within the Cherry Valley floodplain).

4.3 Impacts

4.3.1 Impacts Common to All Alternatives

4.3.1.1 Erosion and Landslide Hazards

All alternatives would allow for development and urbanization within currently vacant and redevelopable areas of the city. Development under any of these scenarios could impact earth resources, with negative effects amplified for development within or adjacent to landslide or erosion hazard areas, if not designed appropriately. New development under any of the scenarios could also result in changes to geologically hazardous areas that increase the risk from these hazards to adjacent uses. For example, development activity in an area above an erosion hazard area that cleared forest, increased impervious surface cover, and altered stormwater flows could result in increased erosion within the hazard area, affecting downslope uses and resources.

Development activities that have detrimental effects on soils, slope stability, and erosion include the removal of protective vegetative cover, direct excavation of the soil profile, and changes in land cover and use. All of these activities would occur, at least temporarily if not long term, as areas of Duvall are developed under any of the alternatives. As a result of these activities, soil can be lost to erosion and steep slopes may grow increasingly unstable, potentially resulting in in damage to new structures if not designed appropriately.

The magnitude of potential impacts resulting under each of the alternatives would depend on the scale, pace, and location of development. Because development consistent with any Comprehensive Plan alternative would largely be driven by private entities, the pace of development under any of the alternatives is not known. However, the potential scale and extent of development under each alternative is better understood based on evaluation completed as part of the City's 2015 Capacity Analysis Study and EIS Alternatives memorandum (City of Duvall, 2015).

All alternatives would allow for similar levels of future development within existing City limits, with somewhat similar potential for impacts to or from earth resources. There is relatively low opportunity for future development or redevelopment across the majority of Duvall, and thus low potential for impacts to earth resources (see Figure 2-2 in Chapter 2 Description of Project Alternatives that identifies vacant and redevelopable lands in Duvall). For most areas, future development would be limited to infill development, potential short plats of existing residential parcels, and redevelopment that maintains existing uses. These activities would primarily occur within previously developed areas, where any disturbed soils would be subsequently covered by new or redeveloped structures, landscaping, or impervious surface. In addition, all development that requires a City permit would be required to adhere to the City's regulatory requirements for grading and construction. For these reasons, the infill development expected across the majority of Duvall within city limits under all alternatives would result in minor adverse impacts, as defined in Chapter 1, to earth resources.

One exception would be development that could occur along NE 143rd Street extending east from Main Street NE, NE Big Rock Road, and both sides of Main Street NE south of NE 145th Street (see Figure 2-2 in Chapter 2 Description of Project Alternatives). Development within these areas would be a combination of commercial and higher-density residential (between 12 and 20 units per acre), depending on the Comprehensive Plan alternative. Higher intensity development has more potential for impacts to earth resources, as more site clearing and grading and higher impervious surface coverage are often required. In addition, higher density development could expose more people to potential seismic hazards. Existing land cover in the NE 143rd Street / Main Street NE / NE Big Rock Road area, however, includes low amounts of forest cover (less than 20 percent forest cover), and there are no mapped potential landslide hazard areas. Potential erosion hazard areas are mapped extending southeast from the Coe-Clemmons Creek corridor, including across the undeveloped properties east of Main Street NE to the north and south of Kennedy Drive. These properties are moderately sloped; however areas outside of the Coe-Clemmons Creek ravine have been previously cleared and graded, with no intact forest cover. Development within these areas would increase impervious surface cover; however due to the existing altered condition of potential erosion hazard areas, would likely not result in significant adverse impacts, as defined in Chapter 1, to earth resources. In addition, as stated above, all development that requires a City permit would be required to adhere to City of Duvall grading, sensitive areas, and building code requirements which include measures to reduce erosion potential and geologic hazard risk both during construction and once a development is completed. For these reasons, new development expected within the NE 143rd Street / Main Street NE / NE Big Rock Road area under all alternatives would result in minor adverse impacts to earth resources.

All alternatives would support annexation of the North UGA which would provide opportunity for new development across much of this area. Existing rural residential and undeveloped properties, associated with high forest cover (69 percent across the North UGA) and low impervious surface cover (5 percent), would transition to low density single-family residential. New development would likely require significant clearing and grading, impacting both top soils and protective vegetative cover. Additionally, stormwater runoff from new development could result in increased ground- and surface-water flows, potentially increasing erosion and sedimentation (both within the North UGA, and to downstream resources).

The City's draft Watershed Plan (ESA, 2015) prioritizes the two subbasins extending across the North UGA (labeled as Subbasin PAU C3 and PAU C4) as appropriate for some additional development provided that environmentally important areas and processes are maintained. Results show that these North UGA subbasins are of moderate to high importance, as defined in the glossary, for ecological processes related to earth resources, including recharge to groundwater and maintaining slope areas that are susceptible to erosion and landslides. Both subbasins show moderate sediment export potential, meaning that changes to surface water runoff pathways that would occur with

future development could likely result in increased erosion, especially along Cherry Creek tributary streams and within landslide and erosion hazard areas.

New development in the North UGA, and elsewhere, would not be allowed in landslide hazard areas and would be regulated within erosion hazard areas. Potential landslide and erosion hazard areas could occur in the northern portion of the North UGA, across forested steep slopes that fall to the Cherry Creek valley to the north of the City. While there are allowances for alteration and development within erosion hazard areas, many of the mapped potential erosion hazard areas occur surrounding slope wetlands and tributary streams (see Figure 3-1 in Chapter 3 Water Resources). Sensitive areas protections for streams and wetlands and associated buffers would preserve vegetation and soils in the overlapping areas most important for earth resources. These sensitive areas protections would minimize potential for future erosion, reducing impacts to downstream resources.

Even with protections, future development within the potential future UGA would cumulatively result in substantial loss of forest cover, extensive grading, increases in impervious surface coverage, and alterations of stormwater runoff pathways. For these reasons, development within the North UGA would likely result in moderate adverse impacts, as defined in Chapter 1, to earth resources.

4.3.1.2 Seismic Hazards

No adverse impacts to seismic hazard areas would result from future development that could occur under any of the Comprehensive Plan alternatives, as very little development potential occurs within seismic hazard areas.

4.3.2 Alternative 1: 2015 Comprehensive Plan Alternative

Impacts to or from earth resources within city limits and the North UGA under Alternative 1 would be largely consistent with the impacts common to all alternatives described in Section 4.3.1. Opportunity for future development would remain highest along NE 143rd Street / Main Street NE / NE Big Rock Road area, with only the type of new development being different (see Chapter 2 Description of Project Alternatives for details on Alternative 1 land use designations).

Impacts to or from earth resources under Alternative 1 could also occur with future development of the Southwest UGA. Commercial land use designation for the northern portion of this UGA could impact existing earth resources, with clearing, grading and high level of impervious surface coverage likely, if not designed appropriately. Existing native soils would be removed and or covered with impervious surfaces throughout the majority of the site. This area is currently vegetated with a forest and shrub community; however no geologically hazardous areas are inventoried (see Figure 4-1).

The southern portion of the Southwest UGA would receive a Parks and Open Space land use designation. Parks and open space uses would be much lower intensity than commercial uses to the north. Parks development would likely maintain existing native soils throughout the majority of the

area, and would provide opportunity to improve vegetative structure – especially along the reach of the unnamed stream that drains through this area.

The City's draft Watershed Plan prioritizes the subbasin extending across the Southwest UGA (labeled as Subbasin PAU D1) for moderate to higher intensity development, as defined in the glossary, with results suggesting that the area is of lower relative importance, as defined in the glossary, for key ecological processes related to earth resources. The subbasin has low export potential for sediment, and low importance for support of water recharge (infiltration) processes. Only processes related to springs or seeps (often times slope wetlands), where shallow groundwater reaches the surface and contributes to stream flows, are more important within the Southwest UGA subbasin. Slope wetland areas are primarily located along the unnamed stream corridor within the Southwest UGA.

Any future development, whether commercial in the northern portion of the UGA or parks within the southern portion, would be required to comply with sensitive areas requirements, protecting soils and vegetation within landslide hazard areas as well as within and surrounding wetlands and streams. For these reasons, new development expected within the Southwest UGA would result in minor adverse impacts to earth resources.

4.3.3 Alternative 2: Urban Growth Area Reserve

Impacts to or from earth resources under Alternative 2 could occur with conversion of existing undeveloped and rural residential areas to lower-density single family residential development in the UGA-Reserve, if not designed appropriately. Large lots (generally greater than 10 acres in size) predominate the existing UGA-Reserve North and South areas. Most of these existing lots are developed with a residential structure and outbuildings, and some of the lots are vacant. Land cover across approximately half of the UGA-Reserve area is forested, with substantial areas of forested, depressional wetlands identified by the draft Watershed Plan (ESA, 2015). Soils and overlying vegetation throughout the UGA-Reserve maintain important ecological processes, including surface storage of water, maintenance of stream baseflows, and water quality maintenance. No geologically hazardous areas are inventoried in the UGA-Reserve (see Figure 4-1). The City's draft Watershed Plan prioritizes the subbasin extending across the UGA-Reserve North (labeled as Subbasin PAU C6) for highest conservation, with results suggesting that the area is of higher relative importance, as defined in the glossary, for key ecological processes related to earth resources. The UGA-Reserve South (labeled as Subbasin PAU W3) is prioritized as moderate conservation, indicating the area is of moderate importance, as defined in the glossary, for ecological processes related to earth resources. Draft Watershed Plan analysis shows that these two subbasins within the UGA-Reserve North and South areas serve as sediment sinks, meaning that they provide more opportunity for soil deposition than erosion. Water storage and soil deposition provided by depressional wetlands across the UGA-Reserve areas are important for attenuating flood flows and channel erosion within downstream areas.

If the UGA-Reserve North and South areas were to be annexed into the city with a Residential 4-4.5 units per acre land use designation, future development would result in moderate to significant impacts to earth resources (as defined in Chapter 1). Existing impervious surface levels (less than 10 percent) could increase to 40 percent or more, with even more impact to existing forest and shrub vegetation likely. While sensitive areas protections would require wetlands, streams, and associated buffers to be maintained, allowances within DMC 14.42 and impacts from surrounding development would result in significant alteration of native soils and overlying vegetative cover. Stormwater management requirements, which would apply both during construction and upon completion, would minimize the potential for erosion; however would not allow for avoidance of all impacts due to the ecological importance and existing conditions throughout the UGA-Reserve. Soils and ecological conditions within the UGA-Reserve North area, as well as areas downstream, would likely be most sensitive to future change; for these reasons, future UGA-Reserve North development under Alternative 2 would likely result in potentially significant cumulative adverse impacts to earth resources.

While still ecologically important, there is a higher level of existing alteration and less coverage of wetlands and other areas important to soil resources within the UGA-Reserve South. For these reasons, development within UGA-Reserve South under Alternative 2 would likely result in moderate adverse impacts to earth resources.

For other areas of the city and the North UGA, earth impacts under Alternative 2 would be largely consistent with the impacts common to all alternatives described in Section 4.3.1.

4.3.4 Alternative 3: Revised Urban Growth Area Boundaries

The permanent elimination of the UGAR-North area would relieve potential future higher intensity development and associated earth resource impacts from occurring in that area. Similar impacts to earth resources would be expected within UGAR-South as described under Alternative 2.

Revising urban growth boundaries to include areas south of Big Rock Road for future commercial and residential land uses would provide opportunity for new development. Existing rural residential and undeveloped properties, associated with high forest cover (approximately 60 percent across the total area to be added) and low impervious surface cover (approximately 7 percent), would transition to high intensity commercial use in areas along Big Rock Road, and low density single-family residential for areas farther to the east. New development would require substantial clearing and grading, impacting both top soils and protective vegetative cover. Additionally, stormwater runoff from new development could result in increased ground- and surface- flows, potentially increasing erosion and sedimentation (both within the additional area and to downstream resources within the Duvall tributary basin). However, as stated above, all development that requires a City permit would be subject to clearing and grading, sensitive areas, and building code requirements.

The City's draft Watershed Plan (ESA, 2015) prioritizes the subbasins extending across the potential South UGA (labeled as Subbasin PAU D1 and Subbasin PAU D7) as appropriate for moderate levels of additional development, provided that environmentally important areas and processes are maintained. Results show that the potential South UGA subbasins are of moderate to low importance for ecological processes, including processes supported by earth resources. These subbasins have low sediment export potential, meaning that changes to surface water runoff pathways that would occur with future development would have less potential to result in increased erosion. Within subbasin PAU D1 (occurring in the western portion of the potential South UGA) only processes related to springs or seeps, often times occurring as slope wetlands, have higher relative importance. Slope wetland areas are primarily located along the unnamed stream corridor within the potential South UGA. Within subbasin PAU D7, all processes related to movement of water through soils are of lower relative importance.

New development in the potential South UGA, and elsewhere, would be regulated within erosion hazard areas, and highly restricted within and around wetlands and streams. There are very few areas of potential erosion hazard mapped (less than 1 percent of the overall area). Areas that are mapped as potential erosion hazards are around the Unnamed Southern Tributary, especially in the lower portions of the stream in the western half of the area upstream and just downstream of Loutsis Lake. While there are allowances for alteration and development within erosion hazard areas, many of the mapped potential erosion hazard areas are also stream, lake, and wetland areas (see Figure 3-1 in Chapter 3 Water Resources). Sensitive areas protections for streams, lakes, and wetlands and associated buffers would preserve vegetation and soils in the overlapping areas most important for earth resources. These sensitive areas protections would minimize potential for future erosion, reducing impacts to downstream resources.

Even with protections, future development within the potential UGA would result in substantial loss of forest cover, extensive grading, increases in impervious surface coverage, and alterations of stormwater runoff pathways. For these reasons, development within the potential South UGA under Alternative 3 would likely result in moderate adverse impacts to earth resources.

For other areas of the city and the North UGA, earth impacts under Alternative 3 would be largely consistent with the impacts common to all alternatives described in Section 4.3.1.

4.3.5 Alternative 4: No Action Alternative

Earth impacts under Alternative 4 would be largely consistent with the impacts common to all alternatives described in Section 4.3.1 and result in minor to moderate adverse impacts.

4.4 Mitigation Measures

A sensitive area review by the City is required for any development proposal permit application. The City's sensitive areas ordinance would be implemented for any development on a site that includes landslide, erosion and/or seismic hazard areas. Landslide hazards require the highest level of protection, with substantial limits on allowed development as well as requirements for buffers from the top and toe of the steep slopes. A standard 50-foot wide buffer is applied to the top and toe of landslide hazards with an allowed reduction to 10-feet upon review and approval of a geotechnical analysis that supports the reduction. Erosion hazard areas are split into two categories: 1) severe erosion hazard areas, which are treated largely the same as landslide hazard areas, and 2) moderate erosion hazard areas. Moderate erosion hazard areas do not require a buffer, and many development activities may be allowed within the erosion hazard area; however, many other limits to minimize impacts from adjacent and allowed development are still required.

According to the sensitive areas ordinance, lands that are located wholly within a landslide or erosion hazard area (or required buffer) may not be subdivided to create buildable parcels entirely within the hazardous area. Land that is located partially within a hazard area may be divided when each resulting lot has sufficient buildable area outside of the hazardous area so as to avoid future impacts to earth resources. These requirements could limit potential for new development within the potential South UGA (as could occur under Alternative 3) and the northern portion of the North UGA (as could occur under all alternatives). In addition, areas of slope wetlands and stream corridors within these areas, and within other areas of the City and UGAs, would generally be maintained as open space. Based on the inventoried extent of geologically hazardous areas, as well as wetlands and streams within areas of steep slopes, it is likely that DMC 14.42 requirements would limit future development within areas most important for protection of earth resources.

Code provisions for clearing and grading activities and erosion hazard areas regulate the timing and extent of clearing for development. Clearing, grading, filling, and foundation work in an erosion hazard area is generally allowed only during the drier season of the year: May 1 to September 30 (DMC 14.42.420.F). Point discharges from stormwater facilities into or upstream of an erosion or landslide hazard area is generally prohibited (DMC 14.42.220.G). Required impervious surface limits, subdivision open space requirements, and tree protection standards would also provide protection for earth resources as future development occurs.

For future UGA development that could occur under all alternatives, all of which could result in moderate or significant adverse impacts to earth resources, implementation of the impervious surface, sensitive area, open space, and tree protection policies included in the draft Watershed Plan, if adopted and implemented, would strengthen protections for earth resources (ESA, 2015). Once adopted, the Watershed Plan is intended to provide the City with policy direction to update clearing, grading, and hazard area regulations and other regulations in the DMC. Draft Watershed Plan

strategies most important for protection of earth resources would include implementation of the following measures:

1. Integrate subdivision open space requirements with tree protection and sensitive areas standards to encourage tree protection and/or reforestation contiguous with sensitive areas buffers (Watershed Plan Actions DS-10, SA-3, and SA-7);
2. Discourage buffer reduction adjacent to landslide hazard areas and severe erosion hazard areas, and ensure that where buffer reduction is proposed an equivalent area of forest vegetation is preserved (or restored) elsewhere on the development site or within an alternative location agreeable to the City (Watershed Plan Action SA-7);
3. Limit current allowances for clear-cut of all on-site significant trees, instead requiring and incentivizing some level of tree preservation within contiguous tracts with clear preferences for where within a site trees should be preserved (typically areas contiguous with sensitive areas) (Watershed Plan Action DS-7);
4. Encouraging subdivisions to cluster lots, minimizing mass clearing and grading and maximizing protection of native soils within open space, through incentives (Draft Watershed Plan Action DS-9);
5. Add limits on the number of terraced walls or total length of terraced walls to avoid mass grading for residential subdivisions (Draft Watershed Plan Action DS-11); and
6. Require soil and vegetation management plans for development projects (Draft Watershed Plan Action DS-5).

In addition, for potential future development occurring within predominantly forested areas, a vegetation management plan would be required for all subdivisions, short-subdivisions, or binding site plans. This would be applicable to development occurring within UGAs as proposed under all Alternatives. Vegetation should be retained until building permit approval for development on individual lots. Clearing of vegetation on lots should not be allowed unless the City determines that clearing is a necessary part of the grading plan and there is no reasonable alternative to performing grading on an individual lot basis.

These measures, along with enforcement of existing land use and building standards (as detailed in Section 4.4), will mitigate potential for minor and moderate adverse impacts to earth resources identified in Section 4.3 for Alternatives 1, 3, and 4.

4.5 Significant Unavoidable Adverse Impacts

Even with mitigation measures as detailed above, future development in the UGA-Reserve North area under Alternative 2 would likely result in significant adverse long term impacts to earth resources on a

cumulative basis. Impacts would occur to wetland soils that support extensive forest cover at the headwaters to Cherry Creek tributary streams and tributaries extending to the southeast. Impacts would also occur to downstream landslide and erosion hazard areas, as changes in stormwater runoff resulting from UGA-Reserve North development would change the timing and quantity of flows to these areas, likely increasing the rate of landslide failures and hillside erosion.

CHAPTER 5. PLANTS AND ANIMALS

5.1 Relevant Plans, Policies, and Regulations

Several plans, policies, and regulations have been adopted by the City of Duvall that pertain to plants and animals and associated habitat. The Duvall Comprehensive Plan polices and Sensitive Areas and tree protection regulations guide development within the city limits while protecting sensitive areas (including associated plant and animal habitats) from development pressures. The City is also in the process of adopting a Watershed Plan and a Shoreline Master Program (SMP), each of which will provide additional protections for tree canopy, vegetation and wildlife habitats after they are adopted. Adoption of both the Watershed Plan and the SMP is anticipated by September and November 2015[1], respectively.

Existing conditions information provided in the draft Watershed Plan, SMP Inventory and Characterization Report, and Fish Habitat Report (Herrera, 2006) was utilized to assess impacts attributed to each of the Comprehensive Plan alternatives.

Duvall Municipal Code (DMC) 14.42 (Sensitive Areas Regulations) regulates sensitive areas, including wetlands, fish and wildlife habitat conservation areas, geologic hazard areas, frequently flooded areas, and critical aquifer recharge areas (CARAs). These regulations designate sensitive areas and prescribe development requirements that protect these resources, while allowing reasonable use of private property (DMC 14.42.010—Purpose). The majority of sensitive areas within the city are undeveloped open spaces, providing vegetative cover and important habitat for fish and wildlife species. Even frequently flooded areas and CARAs within Duvall, both mapped within the Snoqualmie River and Cherry Creek valleys, are predominantly undeveloped, with active uses limited to public parks and trails. Protection of critical areas supports the conservation and enhancement (through mitigation) of plants and habitat used by fish and wildlife to carry out life cycle.

DMC 14.40 (Tree Protection) regulates significant trees by establishing limits for removing trees and tree replacement standards. The chapter requires 35 percent of significant trees on a development site to be retained and the remaining percentage of significant trees to be replaced at 1:1 ratio to ensure there is no net reduction of total significant trees as a result of development. If a project proponent is unable to meet the 35 percent retention standard, the code allows trees to be replaced at a 3:1 ratio. The purpose of this chapter is to avoid the removal of trees, mitigate environmental and

[1] Information on existing conditions of plants and animals from technical analysis completed for the Watershed Plan and SMP is included in this chapter, both to describe the affected environment and impacts associated with each alternative. Since policies within the Watershed Plan and Shoreline Master Program have not yet been adopted, they were not assumed; however, policies being considered by both of these plans are considered as potential mitigation measures to address identified adverse impacts.

aesthetic consequences of tree removal, and maintain and protect the public health, safety and general welfare.

As part of the 2015 Comprehensive Plan Update, the City is drafting an Environment and Sustainability Element that will identify steps the City and the Duvall community should take to ensure a sustainable future that meets the needs of the present community without compromising the needs of the community in the future. The element prioritizes protection of sensitive areas and watershed processes in Duvall and includes polices that range from the preservation and enhancement of sensitive areas and their buffers to updating sensitive areas regulations so that they are consistent with best available science.

At the state and federal levels, multiple policies and regulations are administered by a variety of agencies to manage and protect plants and animals. Regulatory agencies and associated programs or policies are briefly summarized in Table 5-1.

Table 5-1. State and Federal Regulatory Agencies and the Programs and Policies they administer

Regulatory Agency	Regulatory Program or Policies	Area of Jurisdiction
Washington State Department of Fish and Wildlife (WDFW)	Hydraulic Project Approval (HPA)	The HPA program applies to any construction activity in or near the waters of the state. Permit applications must show that construction practices will prevent damage to the state's fish and shellfish, and their habitats.
U.S. Fish and Wildlife Service (USFWS) or the National Oceanic and Atmospheric Administration Fisheries (NOAA Fisheries)	Federal Endangered Species Act (ESA)	All projects that have the potential to directly or indirectly impact wildlife species listed as endangered or threatened under ESA are subject to environmental review.
USFWS	Bald and Golden Eagle Protection Act	The Bald and Golden Eagle Protection Act prohibits anyone without a permit from taking bald eagles, including their parts, nests, or eggs. These regulations also cover impacts associated with human-induced alterations around a nest site if these alterations negatively affect or interrupt normal eagle behavior or lead to nest abandonment.

Regulatory Agency	Regulatory Program or Policies	Area of Jurisdiction
USFWS	Migratory Bird Treaty Act (MBTA)	Similar to the Bald and Golden Eagle Protection Act, the MBTA makes it illegal without a permit to take, possess, or transfer a migratory bird, or their parts, nests, or eggs.

5.2 Affected Environment

Plants that provide for fish and wildlife habitat are found in wetlands and stream and river corridors throughout the city and urban growth area (UGA), including along Coe-Clemmons Creek, Thayer Creek, and Cherry Creek tributaries, as well as the Snoqualmie River (Figure 5-1).

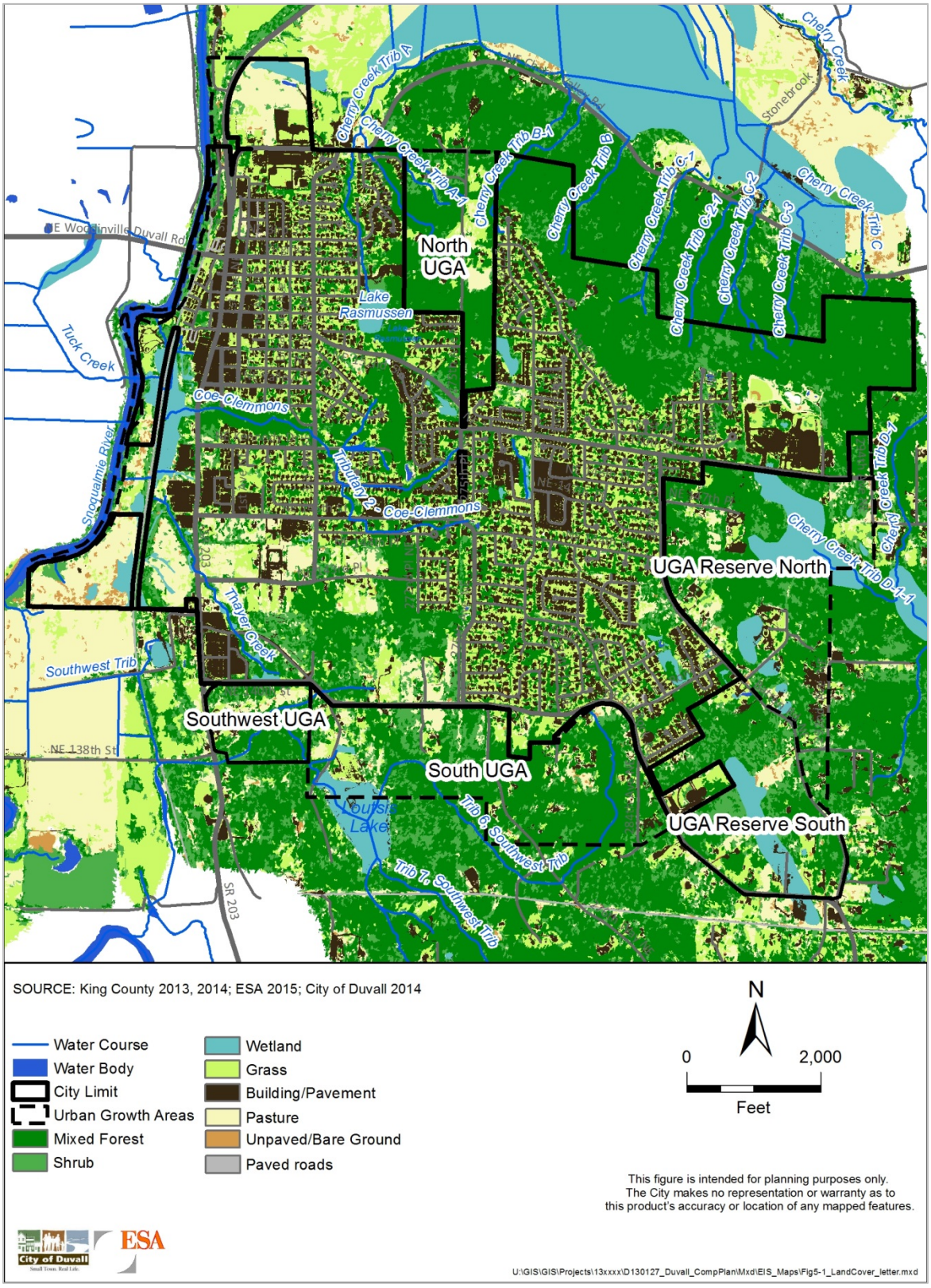
Forested corridors along the smaller streams remain in many areas, and include wetland and upland habitats with Douglas fir, western redcedar, big leaf maple, alder and vine maple as common tree species and tall Oregon grape, salmonberry, bald hip rose, red elderberry, and osoberry (Indian Plum) as common understory shrub species (Photo 5-1). Herbaceous and shrub wetlands occur extensively within the Snoqualmie River floodplain along the western edge of the city; these wetland types are common throughout lowland areas of the Puget Sound region. The most common plants in the lowland shrub wetland communities include red alder, willow, red-osier dogwood, salmonberry and hardhack, while common herbaceous wetland plants include sedges, rushes, cattails, and skunk cabbage. No rare plants are located within Duvall according to the State's Natural Heritage database (DNR, 2014).

Photo 5-1. Western redcedar, salmonberry, and skunk cabbage are common native plants within wetland habitats of Duvall and throughout the Puget Sound region.





Figure 5-1. Land Cover



Aerial photograph analysis within the city and its UGA indicates that between 1992 and 2011, developed lands increased by approximately a third (from 31 percent to 41 percent) while approximately a quarter of forested lands were lost (from 42 percent to 31 percent , with the UGA containing much of the remaining forested land (NOAA C-CAP, 1992 and 2011). While the reduction of forest canopy cover across Duvall is substantial, the city's remaining tree canopy is comparable to other urban areas in the Puget Sound region. The conservation and re-establishment of tree cover is important due to the numerous functions that forests provide, including: increased water infiltration, reduced surface water flow velocities and soil erosion, temperature moderation, and wildlife habitat.

The Snoqualmie River in the vicinity of the city supports several salmonid species, including fall Chinook salmon (federally listed as threatened), coho salmon, fall chum salmon, pink salmon (odd year), sockeye salmon, bull trout/Dolly Varden (federally listed as threatened), cutthroat trout, and summer and winter steelhead trout (the latter is federally listed as threatened). Mapped use of tributary streams within the city's shoreline area is limited to the presence / migration of bull trout and coho salmon within Coe-Clemons Creek and coho salmon within Thayer Creek.

For all of these species, the Snoqualmie River is used as a migratory corridor and habitat for juvenile rearing and migration to the Puget Sound (WDFW, 2014a; Snohomish Salmon Recovery Forum, 2005). However, channel incision, a lack of habitat complexity or substantial overhanging vegetation, historical shoreline armoring, and reduction in accessible floodplain area due to channelization of tributary streams have limited and degraded spawning and rearing habitat.

The Washington Department of Fish and Wildlife maintains a list and map of priority habitats and species throughout the state. Priority habitats are those that have a high value to many fish and wildlife species and may be limited in number or distribution. Priority species are those requiring protection or management to ensure their survival (WDFW, 2014a). Priority wildlife habitats are mapped along the western edge of the city near the Snoqualmie River and the adjacent floodplain, including wetlands and riparian zones (Figure 3-1 in Chapter 3 Water Resources). The wetlands, open water areas, and shoreline trees provide foraging and nesting habitats for priority species such as waterfowl, bald eagle, red-tailed hawk, bats, great blue heron, and pileated woodpecker. Beaver, mountain beaver, rabbit, skunk, black-tailed deer, black bear, and numerous other bird, resident fish, and amphibian species are assumed to use the open space area located at the south end of the city along the Snoqualmie River (Photo 5-2). The Snoqualmie River contains several Endangered Species Act-listed fish species including fall Chinook, winter steelhead, and bull trout. No rare plants are located in this area (DNR, 2014). Portions of tributary streams that flow through Duvall, including Coe-Clemmons, Thayer, and Cherry Creek Tributary A, are known to contain coho salmon, a state priority species. Some of the lower reaches within these streams may provide potential habitat for bull trout, a federally threatened species. Juvenile populations of Fall Chinook and winter Steelhead trout (both federally listed as threatened) are presumed within lower Coe-Clemmons Creek, but have not been documented.

Photo 5-2. Pileated woodpecker and Pacific tree frog are wildlife species associated with wetland and riparian habitats within and surrounding Duvall; rainbow trout is a common salmonid species resident to the Snoqualmie River and tributary streams.

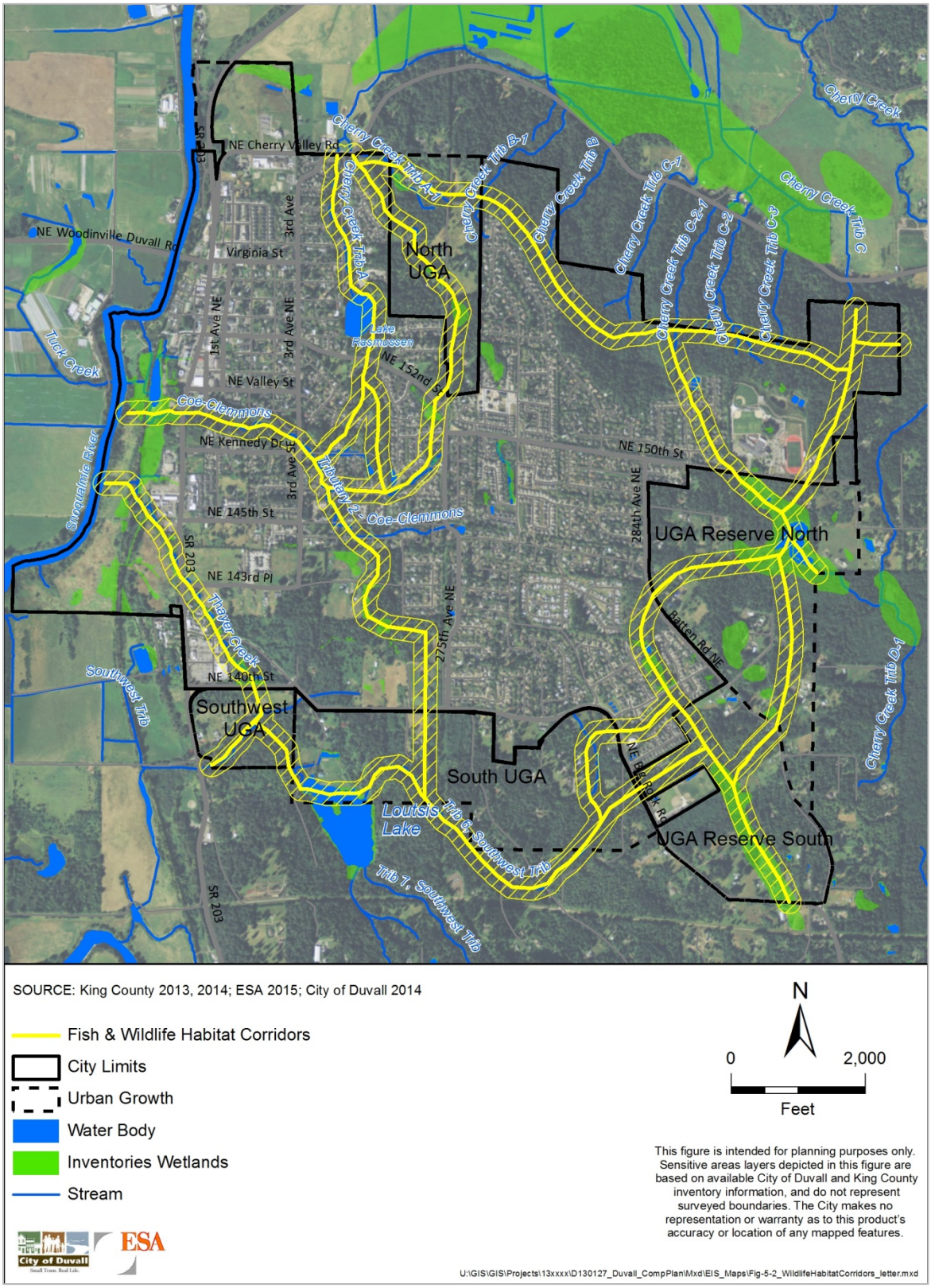


Steep slopes, frequently associated with landslide and erosion hazard areas within Duvall, also commonly are adjacent to wetlands and stream corridors, providing additional wildlife habitat and wildlife movement corridors for many of the bird and mammal species. In addition, the City has identified habitat corridors, primarily associated with forest, wetland, and stream land cover types that are important migration corridors for wildlife around the city and UGA (Figure 5-2; developed as part of the draft Watershed Plan; ESA, 2015).

5.2.1 Description of Plants and Animals in Areas that Could Develop

There is substantial remaining development opportunity for the area east of Main Street, approximately between NE Kennedy Drive and NE 143rd Place (see Figure 2-2 in Chapter 2 Description of Project Alternatives). In this area, undeveloped parcels are typified by grass fields with scattered shrubs and trees, with a couple of forested parcels with mixed canopies (e.g., evergreen and deciduous trees). This area occurs in close proximity to Coe-Clemmons Creek (to the north) and includes a reach of Thayer Creek from NE Big Rock Road to north of NE 143rd Place.

Figure 5-2. Wildlife Habitat Corridors



The current Riverside Village zoning area, located adjacent to the Snoqualmie Valley Trail to the north of the eastern end of Stephens Street, would change to R6 and Old Town-Mixed Use (e.g., retail, office, and residential) land use designations under Alternative 1. The proposed changes for land use designations along the current Riverside Village zoning area would generally maintain a similar potential for future land use activities in the area; most of this area is a mobile home park. One parcel contains a commercial building, and several parcels that are grouped between NE Stella Street and NE Stephens Street are undeveloped with a forested, deciduous canopy. This area is adjacent to the Snoqualmie River and associated forested riparian corridor.

There is less existing development, and associated alteration to vegetation and wildlife habitats, within the city's urban growth areas (UGAs). The Southwest UGA consists of four parcels along Main Street located to the south of the existing City limits. The northern two parcels contain deciduous forest and cleared land. The southern two parcels currently contain two single family residential structures, deciduous forest, and cleared areas. Streams are mapped flowing across the two southern parcels. These unnamed streams, one of which is the outlet stream for Loutsis Lake, converge and eventually drain to the Snoqualmie River. No federally listed or state priority species are mapped in this area; however, listed fish species are documented downstream of Main Street, which contains a culvert that does not allow fish to pass upstream.

The majority of the UGA Reserve-North contains substantial forest cover and is primarily undeveloped with small areas of rural residential development and associated land clearing. A tributary to Cherry Creek is located in the northeast portion of UGA Reserve-North and is fed by an extensive area of headwater wetlands. Several other relatively large wetlands are located in proximity to 290th Avenue NE and Batten Road NE. No federally listed or state priority species are mapped in this area.

UGA Reserve-South contains similar land cover as that of UGA-Reserve North. Ongoing land clearing associated with rural residential development is more common in the southern portion of this area. A tributary to Weiss Creek drains to the southeast and is associated with a substantial area of headwater wetlands. No federally listed or state priority species are mapped in this area.

The western portion of the proposed South UGA contains a mixture of forested, rural residential, cleared, and open water land cover types. Mixed forest is primarily located in the central and southeastern portions of this area. Single family residential and associated clearing are concentrated to the west and east, with limited development along NE Big Rock Road. Unnamed stream channels flow through the potential South UGA area, including main channel that flows into Loutsis Lake. No federally listed or state priority species are mapped in this area; however, listed fish species are documented downstream of Main Street, which contains a culvert that does not allow fish to pass upstream.

The eastern prtion of the proposed South UGA is primarily forested with a mixed canopy, but rural residential development and associated land clearing are located in the northern portion of the

proposed UGA adjacent to NE Big Rock Road. An unnamed stream flows from north to south through the eastern portion of the UGA, eventually draining to Loutsis Lake.

The North UGA, common to all alternatives, contains limited rural residential development and associated clearing, with the majority of land clearing on the east side of the UGA; the western and southern portions largely contain mixed forest cover. Four tributaries to Cherry Creek flow through the North UGA, with three streams mapped as originating within this area (Figure 3-1). These streams primarily flow to the northwest, outside of the UGA (to the Cherry Creek valley, located north of Duvall). Several relatively large wetlands are mapped within the North UGA.

5.3 Impacts

5.3.1 Impacts Common to All Alternatives

All alternatives would allow for development and urbanization within currently vacant and underdeveloped areas of the city, with potential impacts to plants and animals. Development activities that have detrimental effects on plants and animals include land cover conversion (pervious, complex vegetative cover converted to impervious surfaces, lawn, and bare ground), increased population densities and associated disturbance within the landscape, and transportation systems that isolate habitats. All of these activities would occur as areas of Duvall developed under any of the alternatives.

The magnitude of potential impacts resulting under each of the alternatives would depend on the scale, pace, and location of development. Because development consistent with any Comprehensive Plan alternative would largely be driven by private entities, the pace of development under any of the alternatives is not known. However, the potential scale and extent of development under each alternative is better understood based on evaluation completed as part of the City's 2015 Capacity Analysis Study and EIS Alternatives memorandum (City of Duvall, 2015).

All alternatives would allow for similar levels of future development within existing City limits, with similar potential for impacts to plants and animals. There is relatively low opportunity for future development or redevelopment across the majority of Duvall within city limits, with relatively low potential for impacts to plants and animals (see Figure 2-2 in Chapter 2 that identifies vacant and underdeveloped lands in Duvall). For most areas, future development would be limited to infill development, potential short plats (i.e., subdivisions) of existing residential parcels, and redevelopment that maintains existing uses. These activities would occur within areas in Duvall city limits where vegetation communities are already disturbed.

One exception would be development that could occur along NE 143rd Avenue extending east from Main Street, as well as along the east side of Main Street from NE 143rd north to Taylor Park. Development within these areas would be a combination of commercial and higher-density

residential (between 12 and 20 units per acre), depending on the Comprehensive Plan alternative. Existing land cover along NE 143rd Avenue and Main Street, however, supports low amounts of forest cover, and the only mapped priority species is coho salmon within Thayer Creek, which requires a buffer per City code (DMC 14.42). The City's draft Watershed Plan identifies the subbasins surrounding the NE 143rd Avenue / Main Street as appropriate for higher intensity development, as defined in the glossary, with results suggesting that the area is of lower relative importance for water flow processes affecting plants and animals than other areas in and around Duvall (ESA, 2015). In addition, the draft Watershed Plan identifies a wildlife habitat corridor along the Thayer Creek drainage to promote wildlife movement from undeveloped areas south of Big Rock Road, through 143rd Place, across Main Street and ultimately to the Snoqualmie River floodplain. For these reasons, new development expected within the NE 143rd Street / Main Street NE / NE Big Rock Road area under all alternatives would result in minor adverse impacts, as defined in Chapter 1, to plants and animals.

All alternatives would include annexation of the North UGA. Development of low density single -family residential use in the North UGA would impact forested habitat in the western and northern portions of the UGA. Development would occur adjacent to streams, wetlands, and their associated buffers, located predominantly within the northwestern and central portions of the UGA, respectively. Land clearing and development could disrupt wildlife habitat corridors (Figure 5-2). Sensitive areas protections for streams and wetlands and associated buffers would preserve vegetation in many important areas for vegetation and wildlife habitat. That said, even with protections, future development within the potential future UGA would result in substantial loss of forest cover. For these reasons, development within the North UGA would likely result in moderate adverse impacts, as defined in chapter 1, to plant and animal resources on a cumulative basis.

5.3.2 Alternative 1: 2015 Comprehensive Plan Alternative

Impacts to vegetation and habitats supporting animals under Alternative 1 would be largely consistent with the impacts common to all alternatives described in Section 5.3.1. Opportunity for future development would remain highest along NE 143rd Street / Main Street NE / NE Big Rock Road area, with only the type of new development being different (see Chapter 2 Description of Project Alternatives for details on Alternative 1 land use designations).

Commercial development at the north and south ends of the NE 143rd Place / Main Street NE / NE Big Rock Road area are located adjacent to Coe-Clemmons and Thayer Creeks, respectively. Development would be located adjacent to the buffer of these streams (in the case of Coe-Clemmons Creek, a stream that provides habitat for federally listed fish species); however development would be required to meet stream buffer requirements within DMC 14.42.

New land use designations proposed for the eastern portion of this area (east of 3rd Ave NE) would result in less density, but could still impact several relatively large wetlands and/or their buffers, in addition to requiring the removal of dense forest cover, reducing wildlife habitat.

In the north, near NE Woodinville Duvall Road Bridge, proposed land use designation changes are not likely to impact the Snoqualmie River and associated riparian corridor. Residential and commercial development is present, resulting in minimal land use change. In addition, any development would have to comply with requirements of the City's SMP (adoption anticipated in November 2015), which requires a vegetated corridor along the Snoqualmie River, as well as compliance with impervious surface limits and integrated protections for sensitive areas.

Commercial development in the northern two parcels of the Southwest UGA would result in clearing of forest land cover and, at the eastern extent, occur within close proximity of an unnamed tributary, and its buffer, of the Snoqualmie River. The southern two parcels would be zoned as parks and open space, resulting in little to no impacts on current conditions. For these reasons, new development expected within the Southwest UGA would result in minor adverse impacts to plant and animal resources.

5.3.3 Alternative 2: Urban Growth Area Reserve

Within existing Duvall city limits and the North UGA, development and associated impacts to plants and animals under Alternative 2 would occur consistent with those described in Section 5.3.1 (Impacts Common to All Alternatives).

Proposed land use designations and annexation of UGA-Reserve North and South areas would provide for future low density single family residential development, resulting in significant adverse cumulative impacts, as defined in Chapter 1, to wetlands, streams, and their associated buffers, as well as upland forested habitat located outside of these sensitive areas. Existing impervious surface levels (less than 10 percent) could increase to 40 percent or more, with even more impact to existing forest and shrub vegetation likely. Extensive wetland areas, associated with Cherry Creek Tributary D to the northeast and with upper Weiss Creek to the south, would be impacted by single family residential development and associated infrastructure. Habitat corridors linking the UGA Reserve areas and other areas within Duvall to more extensive contiguous forested blocks to the northeast, east and south would also be interrupted by future development, resulting in fragmentation of habitats. For these reasons, future development across the UGA-Reserve area under Alternative 2 would likely result in significant adverse cumulative impacts to plants and animal resources.

5.3.4 Alternative 3: Revised Urban Growth Area Boundaries

Within existing Duvall city limits and the North UGA, development and associated impacts to plants and animals under Alternative 3 would occur consistent with those described in Section 5.3.1 (Impacts Common to All Alternatives). Land use and implications for vegetation cover and fish and wildlife habitat within UGA-Reserve South area are the same as those described under Alternative 2.

Proposed commercial and residential development within the new South UGA could impact the shoreline of Loutsis Lake and associated wetlands, an unnamed stream that drains to the lake, along

with shoreline and stream buffers. Much of the devlopable land has been cleared in association with rural residential devleopment; however, some conversion of forested land would occur to facilitate development. Access to the southeastern portion of the area would require at least one stream crossing, which would require removal of riparian vegetation.

Commercial development along NE Big Rock Road within the northeastern portion of the proposed South UGA area would likely have limited impacts to habitat, as most of the forest cover in this area has been cleared and contains rural residential development. Proposed residential development further south would remove a substantial amount of forested habitat and potentially impact the buffer of the unnamed stream that flows to Loutsis Lake. Alternative 3 would likely result in moderate adverse impacts to plants and animal resources.

5.3.5 Alternative 4: No Action Alternative

Impacts to plants and animals under Alternative 4 would be largely consistent with the impacts to plants and animal resources common to all alternatives described in Section 5.3.1 and result in minor to moderate adverse impacts.

5.4 Mitigation Measures

Impacts to plants and animals from the proposed Comprehensive Plan Alternatives would stem from land cover conversion (e.g., forest cover loss) and increased population densities and associated disturbance within the landscape (e.g., pets, traffic, lights).

For future UGA development that could occur under all alternatives, which could result in moderate or significant adverse impacts to vegetation and fish and wildlife populations, implementation of the sensitive area, open space, and tree protection policies included in the draft Watershed Plan, if adopted and implemented (ESA, 2015), would strengthen protections for plants and animal resources. Once adopted, the Watershed Plan is intended to provide the City with policy direction to update critical area regulations and other regulations in the DMC. Draft Watershed Plan strategies most important for protection of plants and animal resources within UGA areas are included below:

1. Integrate subdivision open space requirements with tree protection and sensitive areas standards to encourage tree protection and/or reforestation contiguous with sensitive areas buffers (Draft Watershed Plan Actions DS-10 and SA-7);
2. Limit current allowances for clear-cut of all on-site significant trees, instead requiring some level of tree preservation within contiguous tracts with clear preferences for where within a site trees should be preserved (typically areas contiguous with sensitive areas) (Draft Watershed Plan Action DS-7);
3. Encourage subdivisions to cluster lots (maximizing protection of native vegetation within open space) through incentives (Draft Watershed Plan Action DS-8);

4. Incorporate new protections for wildlife habitat corridors, so that new large residential subdivisions within UGA areas are required to consider and maintain corridors that remain today (Draft Watershed Plan Action SA-1);
5. Incorporate sensitive areas standards with tree protection requirements, so that maintenance of full width wetland and stream buffers is incentivized (Draft Watershed Plan action SA-3); and
6. Eliminate (or at least minimize) allowances for stream and wetland buffer reduction and alteration, especially within areas where existing buffers are largely intact (Draft Watershed Plan Action SA-5).

These standards, along with ongoing implementation of existing tree protections within DMC 14.40 and sensitive areas protections within DMC 14.42, will mitigate the potential for minor and moderate adverse impacts to vegetation and wildlife identified in Section 5.3 for Alternatives 1, 3 and 4.

5.5 Significant Unavoidable Adverse Impacts

Even with mitigation measures as detailed above, future development in the UGA-Reserve under Alternative 2 would likely result in significant adverse long term impacts to vegetation, wildlife, and wildlife habitat on a cumulative basis. Impacts would occur to extensive forested wetlands and surrounding forests that are located at the headwaters to Cherry Creek Tributary D (to the northeast) and Weiss Creek (to the south). Alterations associated with development within the UGA Reserve would eliminate existing habitats, and would degrade habitat areas that are maintained. In addition, alterations within these areas would likely result in additional impacts to downstream fish and wildlife habitats (see Chapters 3 and 4 for details).

CHAPTER 6. LAND USE AND HOUSING

6.1 Relevant Plans, Policies, and Regulations

Existing state, regional and local planning documents establish policies that are intended to guide Duvall's approach to accommodating an increase in population and employment. Table 6-1 provides a summary of these key planning documents.

Table 6-1. Long Range Planning Documents

Plan	Agency	Description
Growth Management Act	Washington State Department of Commerce	Adopted in 1990, the Growth Management Act (GMA) requires state and local governments to manage growth by identifying and protecting critical areas and natural resource lands, designating urban growth areas, preparing comprehensive plans and implementing them through capital investments and development regulations.
Vision 2040	Puget Sound Regional Council	Updated in 2008, Vision 2040 is the long-range growth management, economic and transportation strategy for the central Puget Sound region encompassing King, Kitsap, Pierce and Snohomish counties. The Duvall Comprehensive Plan update must ensure consistency with Vision 2040.
King County	Countywide Planning Policies	Adopted in 2013 by the Growth Management Planning Council, this document outlines a county-wide vision and serves as a framework for each jurisdiction to develop its own comprehensive plan. The document established population and employment targets for all King County cities, including Duvall. To ensure consistency with King County's Countywide Planning Policies, Duvall must show that it has the zoning capacity and ability to provide public services to accommodate an additional 1,140 housing units and 840 jobs by 2035.
King County	Comprehensive Plan	Adopted in 2012, the King County Comprehensive Plan establishes policies for all land use and development regulations in unincorporated King County, and for regional services throughout the county including transit, sewer, parks, trails and open space. The plan designates a potential annexation area (PAA) for Duvall that would be the initial area that the City could annex outside of the current city limits. Upon annexation, the City's plans, policies and regulations would govern new development. The PAA corresponds with the North UGA described in Chapter 2 (also see Figure 2-1).

Plan	Agency	Description
Shoreline Master Program	City of Duvall	The Duvall Shoreline Master Program establishes local land use policies and regulations which manage shoreline use and access, protect natural resources, and plan for water dependent uses along the Snoqualmie River. The State's Shoreline Management Act requires that all cities and counties which plan under the Growth Management Act develop and regularly update shoreline master programs.
Duvall Comprehensive Plan	City of Duvall	Adopted in 2004, the plan describes goals and policies for the eight major elements including land use, housing, parks and recreation, economic development, transportation, utilities, capital and essential public facilities, as required by the Growth Management Act. The purpose of this EIS is to evaluate the impacts associated with an update to the Comprehensive Plan.
City-wide Visioning Plan	City of Duvall	This visioning document outlines Duvall residents' desires for the future growth of the city and provides a framework for guiding the development over the next 20 years (2003-2023 time period).
Duvall Downtown Sub-area Plan	City of Duvall	Adopted in 2004, the Downtown Sub-area plan was written as a follow-up to the City-wide visioning plan which identified preserving and enhancing downtown as the highest priority. The plan includes short and long range actions as well as goals and policies for Duvall's downtown area in the 2004-2024 time period.
Annexation Plan	City of Duvall	The Annexation Plan prepared in 2005 provides a policy framework for the processing, timing, and phasing of Duvall's remaining urban growth areas.
Parks, Trails and Open Space Plan	City of Duvall	Developed through a year-long process in 2008 and adopted in 2009, the creation of this Plan involved the formation of a park Advisory Committee and included an extensive public process to outline goals and policies for the development of Duvall's parks and open space system over the 2009-2029 time period.
Economic Development Strategic Action Plan	City of Duvall	Adopted in 2005, this was prepared shortly after the City's development moratorium was lifted. It provides policies and goals to give direction and prioritization for the City and its partners in economic development.

Source: Washington State, 1990; Puget Sound Regional Council, 2009; King County 2012b; City of Duvall, 2003; 2004; 2005a; 2008; 2005b

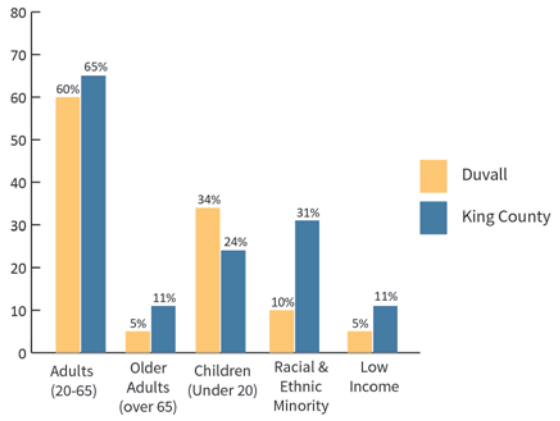
6.2 Affected Environment

6.2.1 Population and Employment

6.2.1.1 Population

As of 2010, Duvall had a population of 6,695, approximately 0.4 percent of the total population of King County (U.S. Census, 2010). In 2014, the State Office of Financial Management estimated the population of Duvall to be 7,325, a 9 percent increase. According to U.S. Census data from 2012 (the most recent available dataset which provides more detailed demographic information and is based on surveys of a sample of Duvall's population conducted every 5 years), approximately 60 percent of the population is between the ages of 18 and 65 (see Figure 6-1).

Figure 6-1. Population Profile (2012)



Source: US Census, American Community Survey 5-Year Estimates, Table S1701[1]

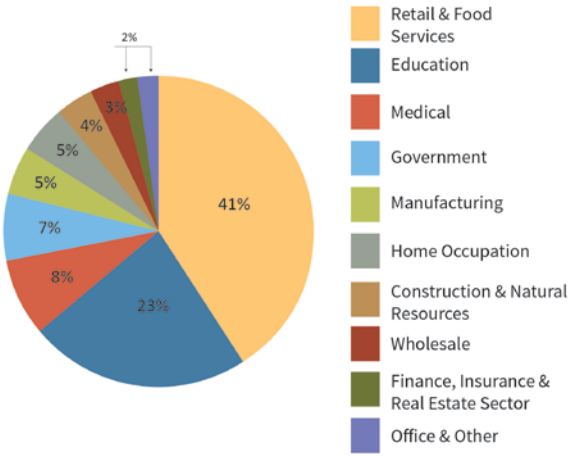
Thirty-four percent are under the age of 18 and 5 percent are over the age of 65. Duvall's population age profile differs from King County's as a whole, with fewer residents over the age of 65, and more residents under the age of 18. Less diversity in race and ethnicity is represented in Duvall than King County as a whole. Approximately 10 percent of Duvall's population is considered a racial or ethnic minority, compared to approximately 31 percent in King County. In 2012, the median household income in Duvall was $111,356, which was nearly $40,000 higher than that of King County (U.S. Census, 2012).

6.2.1.2 Economic Profile

According to the City of Duvall's 2015 capacity analysis study (City of Duvall, 2015a) the City had approximately 1,169 jobs in 2015 across the following top six sectors (see Figure 6-2 below for all employment categories):

1) retail and food service (41 percent),
2) education (23 percent),
3) medical (8 percent),
4) government (7 percent),
5) manufacturing (5 percent), and
6) home occupation (5 percent).

Figure 6-2. Employment types in Duvall (2015)

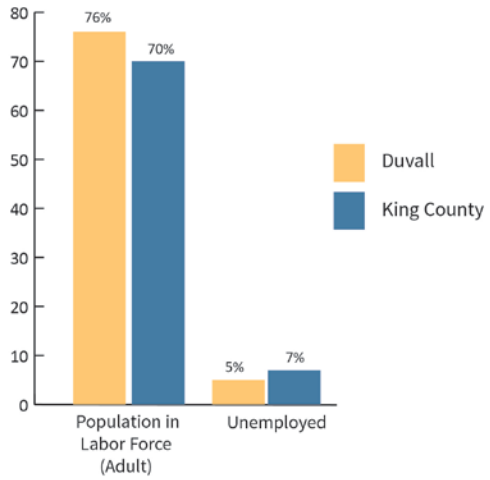


Source: City of Duvall, 2015a

[1] Note that in some cases the data from the American Community Survey can have a high margin of error because it is based on a sample of Duvall's population.

These jobs only represent about one third of Duvall's working population, which means that many residents commute outside the city for employment (See Chapter 10, Transportation, for more detail on commuting habits). The most common type of job found in the city is in the retail and food service sector. Duvall's unemployment rate is less than King County as a whole (see Figure 6-3).

Figure 6-3. Unemployment Rate (2012)



Source: US Census, American Community Survey 5-Year Estimates, Table S1701[1]

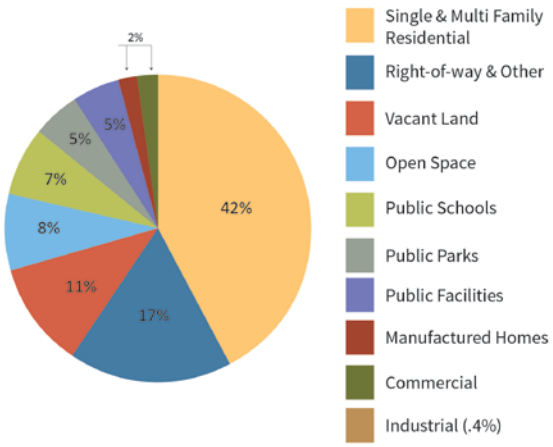
Duvall's economy experiences similar spending patterns to other cities its size in King County. Retail spending opportunities are somewhat limited to residential neighborhood scale spending such as supermarkets and convenience stores, with the majority of residents traveling to regional shopping centers for a wider variety of shopping opportunities. Because of the limited opportunities to spend money within the city, Duvall businesses captured approximately 53 percent ($83 million) of the total $175 million spent by Duvall residents in 2012 (Draft Economic Profile, 2014). The City's largest retail sectors include restaurant, food sales, building materials, miscellaneous retailers, furniture, repair and maintenance, education, motor vehicles and parts (Draft Economic Profile, 2014).

6.2.2 Current Land Uses and Housing Types

6.2.2.1 Current Land Uses

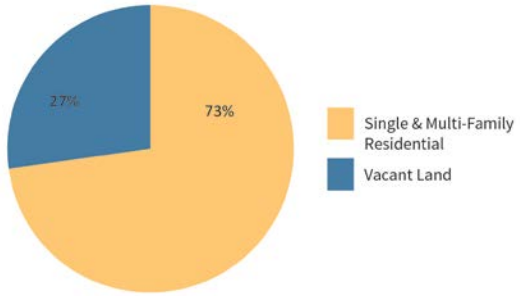
Figures 6-4 and 6-5 summarize the existing land uses in Duvall and adjacent Urban Growth Areas as percentages of total land area. The most predominant land use pattern within the city limits of Duvall is single- and multi- family residential (42 percent), followed by right-of-way (17 percent), vacant lands (11 percent), open space (8 percent), and public schools (7 percent). The land uses in Duvall's UGAs (including North, UGA-Reserve, and Southwest) and the proposed UGA immediately south of the city limits are predominantly single family residential (73 percent) and vacant lands (27 percent).

Figure 6-4. Major Existing Land Uses in Duvall City Limits



Source: City of Duvall, 2015a

Figure 6-5. Major Existing Land Uses in Duvall Urban Growth Areas

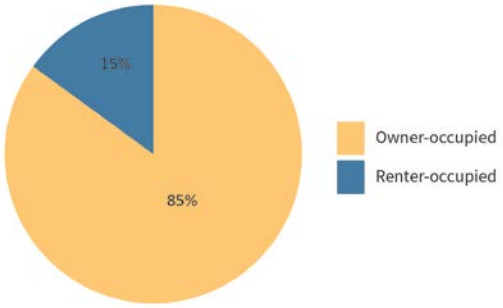


Source: City of Duvall, 2015a

6.2.2.2 Housing

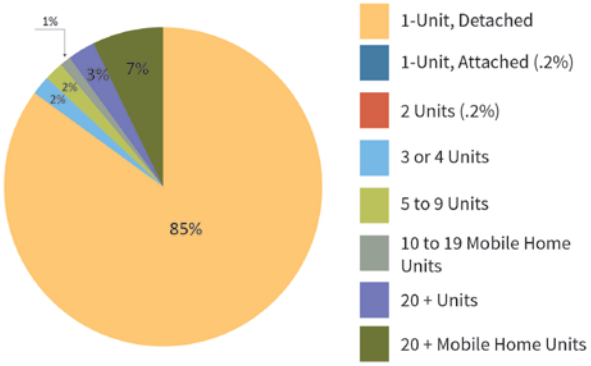
According to the U.S. Census from the American Community Survey conducted in 2012, Duvall has housing units that are predominately owner-occupied (at 85 percent) with far fewer occupants renting (15 percent) (see Figure 6-6). According to the City of Duvall's 2015 capacity analysis where the City conducted an inventory of their existing housing stock, nearly 85 percent of the housing in Duvall consists of single family detached homes, found in all city neighborhoods. A small number of multi-family and mixed-use units are found in the central commercial district. These housing types range from one to 20 residential units. In addition, a small percentage of manufactured residential homes are located in the city (see Figure 6-7). Nearly 90 percent of the housing stock in Duvall was constructed since 1980 (see Figure 6-8).[1]

Figure 6-6. Owner and Renter-occupied Housing (2012)



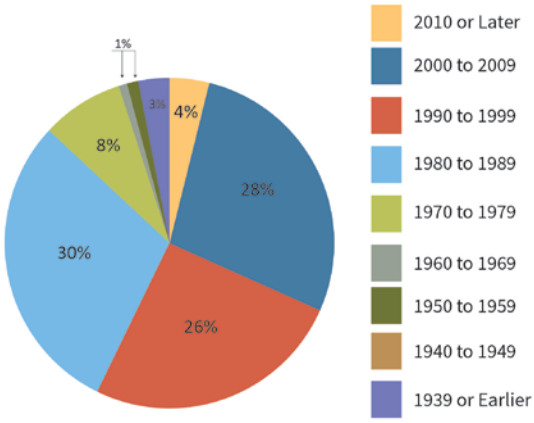
Source: US Census, American Community Survey 5-Year Estimates, Table DP04[1]

Figure 6-7. Existing Housing Types in Duvall (2015)



Source: City of Duvall, 2015a

Figure 6-8. Age of Housing Stock (2012)

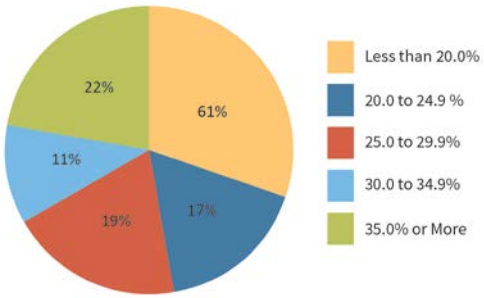


Source: US Census, American Community Survey 5-Year Estimates, Table DP04[1]

6.2.2.3 Housing Affordability

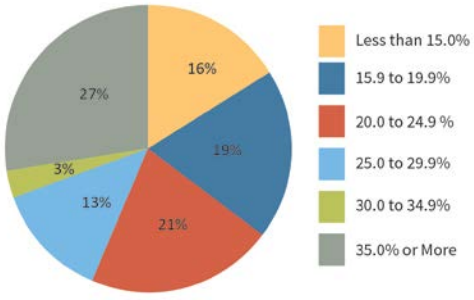
The City strives to improve housing affordability in Duvall by allowing a variety of housing types in zoning districts located near commercial areas along Main Street. Housing affordability for homeowners and renters is an important indicator of a healthy local economy that can provide opportunities to a wide range of incomes. Households that pay more than 30 percent of their income towards their mortgage or rent are considered cost-burdened. Thirty-three percent of households that own their home and 30 percent that rent their home are considered cost-burdened in Duvall (see Figures 6-9 and 6-10).

Figure 6-9. Monthly Owner Costs as a Percentage of Household Income (2012)



Source: US Census, American Community Survey 5-Year Estimates, Table DP04[1]

Figure 6-10. Rent Costs as a Percentage of Household Income (2012)



Source: US Census, American Community Survey 5-Year Estimates, Table DP04[1]

6.2.3 Historical and Cultural Resources

The City's historic and cultural character is expressed through its environmental setting and built environment. The City does not have its own local registry for identifying historic buildings, however, in 1997 a Cultural Resources Survey and Inventory was prepared by Artifacts Consulting and Drager Associates (consultants) (Sivinski and Drager, 1997). The survey identified one-hundred buildings constructed in Duvall before 1956 (then more than 40 years old). Of those one-hundred buildings, fifty were deemed to be significant historically or architecturally to Duvall. Fourteen of these properties were identified in previous surveys as being significant to the history of the town. The Dougherty Farm, first inventoried in 1978, was subsequently designated to the Washington Heritage Register, and the National Register of Historic Places (NRHP), for maintaining local significance.

The consultants proposed a Duvall Main Street Historic District be developed to protect the commercial area near the south end of town. The buildings selected to be in the inventory were all built before 1956. Inclusion in the inventory was based on a range of criteria including construction time period, integrity, building type and size, as well as architectural size. The survey provides a listing of the parcel numbers and addresses of the properties included in the inventory.

The Washington Heritage Register, the NRHP, and the Department of Archaeology and Historic Preservation's (DAHP) online Washington Information System for Architectural and Archaeological Records Data (WISAARD) were consulted to identify any listed properties

located in Duvall and its UGA. There is one historic cemetery site (not evaluated or currently NRHP listed) and an adjacent historic farmstead (NRHP listed in 2005) described in more detail in Tables 6-2 and 6-3.

Table 6-2. Recorded Archaeological Sites

Site Number	Site Name	Site Type	Location	Description	National Register of Historic Places Eligibility
45-KI-861	Cherry Valley/ Duvall Cemetery	Historic Cemetery (ca. 1885-1909)	200 ft from southwest corner Dougherty Farmstead (26524 NE Cherry Valley Rd.)	Site is the historic pioneer cemetery of the defunct community of Cherry Valley, now part of Duvall, Washington. Consists of the original cemetery parcel, a fallen marble, "Civil War Type" headstone and a headstone base with broken headstone fragments. Site boundary likely extends toward road, and the speculated location of Mrs. Duvall's grave.	Not Evaluated

Source: Anderson, 2010

Table 6-3. Historic Register Properties

Site Number	Site Name	Site Type	Location	Description	National Register of Historic Places Eligibility
45-KI-220	Dougherty Farmstead	Historic Farmstead	26524 NE Cherry Valley Road	Comprising five contributing features, the John and Kate Dougherty Farmstead in Duvall, is a collection of buildings representing the early dairying operations in north central King County. The extant features include an 1888 farmhouse, a 1918 milk house, a 1910 bunkhouse, a 1919 garage and the remnants of a 1940s cow barn. In 1910, the new alignment of the Great Northern Railroad forced the relocation of the farmhouse near the southern boundary of the original 160-acre farmstead tract.	NRHP Listed 2005 (Criterion A)

Source: Sodt, 2003; Department of Archaeology and Historic Preservation, ND

According to the DAHP's online WISAARD the area within the proposed UGA boundaries range from low to very high risk for encountering cultural resources. All cultural resources surveys conducted to date within the UGA boundaries and the City of Duvall have not resulted in the discovery of cultural resources below the ground. Only one archaeological site has been recorded within the UGA—the Cherry Valley/Duvall Cemetery at the northwest corner.

6.2.4 Future Land Use Designations and Zoning

The land use element of the City of Duvall Comprehensive Plan (City of Duvall, 2006) establishes nine Comprehensive Plan designations in the city and its UGA (see Figure 2-1 in Chapter 2). These Comprehensive Plan designations serve as the basis for zoning districts which establish allowed and prohibited land uses. Table 6-4 lists these designations and their corresponding purpose statements as currently written in the Duvall Comprehensive Plan. The majority of the city is designated with residential designations. Mixed use, commercial and light industrial designations are mainly concentrated along Main Street, NE Big Rock Road, and NE 143rd Place while the Public Facilities designation is dispersed throughout the city, on the east bank of the Snoqualmie River, and south of NE Cherry Valley Road. The North UGA is predesignated as Residential 4 - 4.5 units to the acre. The UGA-Reserves and Southwest UGA do not have a pre-designation.

Predesignation is a Comprehensive Plan designation that is applied to an urban growth area. A predesignation allows the City to identify the appropriate land use designation prior to the area annexing into the city. Upon annexation, the predesignation would be used to guide the determination of the appropriate Comprehensive Plan designation and zoning district. Predesignations are established in coordination with King County.

Table 6-4. Comprehensive Plan Designations (2006)

Comprehensive Plan Designation	Purpose
Mixed Use (MU)	Allows for a variety of pedestrian-oriented commercial uses of limited scale with residential uses allowed outright on upper floors and conditionally on ground floors in some zones. Residential density shall be limited by site plan and building design requirements. Old Town design review criteria will apply to Old Town Mixed Use designation. In the Mixed Use 12 designation a combination of commercial, above ground floor residential, and ground floor residential are encouraged.
Residential - 4 – 4.5 units per acres (R4-4.5)	Allows for single-family detached residential development of 4 to 4.5 units per net acre. Properties designated 4 units per acre were previously low-density residential and/or zoned at 3 units per acre. Properties designated at 4.5 units per acre were previously zoned at 4.5 units per acre. Single-family design review criteria will apply to this designation.

Comprehensive Plan Designation	Purpose
Residential – 6 units per acre (R-6)	Allows for attached or detached single-family residential development at 6 units per gross acre. Attached units are limited to two-unit structures. Single-family design review criteria will apply to this designation.
Residential – 8 units per acre (R-8)	Allows for attached or detached single-family residential development or cottage-style developments at 8 units per gross acre. Attached units are limited to two-unit structures. Single-family design review criteria will apply to this designation.
Residential – 12 units per acre (R-12)	Allows for attached or detached single-family residential development, cottage-style developments, or multi-family development at 12 units per gross acre. Twenty percent of the units are required to be attached. Multi-family design review criteria will apply to this designation.
Commercial (CO)	Allows for a wide range of retail, wholesale, mixed-use, and office uses. Outside of Old Town, this land use designation includes commercial, mixed-use and mixed-use/institutional zoning with a residential density of a maximum of 12 units per acre. Residential density in the mixed-use and mixed-use/institutional districts shall be a maximum of 12 units per acre and policies applying to the R-12 land use designation shall also apply. On Main Street and arterials, pedestrian-oriented design will be required. Residential development will be permitted on upper floors in all areas, with residential density limited by site plan and building design requirements. Commercial design review criteria will apply to this designation.
Light Industrial (LI)	Allows for light industrial, wholesale, and outdoor retail and wholesale uses. Residential development will be permitted on upper floors, with residential density limited by site plan and building design requirements. Industrial design review criteria will apply to this designation.
Public Facilities (PF)	These are areas designated as parks and open space. This designation also includes public facilities located permanently in a specific location.
Urban Growth Area Reserve (UGAR)	This area is within Duvall's Urban Growth Area but remains undesignated. The area is not required to meet Duvall's target population. Designation of this area in the future will consider the East and Southeast UGAR designations set out in the 2002 City-Wide Visioning Plan as depicted on Figure LU – 7 and Figure LU – 8 respectively. Designation of this area will not occur until such time that specific plans have been prepared for the area and when financial measures are in place to ensure development pays for itself in terms of general government services.

Source: City of Duvall, 2006

Table 6-5 identifies the City of Duvall's zoning districts, along with standards on residential density, building height, impervious surface limits, lot coverage limits, and other bulk and scale limitations. Duvall has 14 zoning districts, all of which allow residential land uses except for Public Facilities (see Figure 2-3 in Chapter 2). Maximum building height is typically 35 feet with a few zones that allow up to 45 or 50 feet. Impervious surface limits range from 60 to 100 percent. The lower range applies to residential zones and the higher range applies to commercial, mixed use and industrial zones. Residential densities also vary with a minimum of 4 units to the acre in the most common residential zones and no upper limit in zones that allow a mix of uses.

Table 6-5. Duvall Zoning Districts

Zoning District	Allowed Uses / Residential Housing Types	Density Standard	Maximum Height (feet)	Impervious Standards/Lot Coverage	Additional bulk and scale standards
Commercial (CO)	Retail, restaurants, offices, entertainment uses, upper-floor residential / mixed use buildings with upper floor residential	Upper floor residential, density determined by site plan limitations	45	85% maximum impervious surface	Large-scale retail development allowed, designs must reduce perceived bulk and scale
Mixed Use Institutional (MUI)	Retail, restaurants, offices, entertainment uses, parks, schools, lodging / mixed use buildings with upper floor residential	Upper floor residential, density determined by site plan limitations	50	85% maximum impervious surface	Bulk retail allowed as conditional use
Light Industrial (LI)	Auto services, special use residential, offices, government services, certain manufacturing, medical, parks / attached or detached residential, upper floor residential in mixed use buildings	Upper floor residential, density determined by site plan limitations	45	85% maximum impervious surface	

Zoning District	Allowed Uses / Residential Housing Types	Density Standard	Maximum Height (feet)	Impervious Standards/Lot Coverage	Additional bulk and scale standards
Mixed Use 12 (MU12)	Retail, restaurants, offices, entertainment uses, upper-floor residential / mixed use buildings with upper floor residential	8-12 residential units per gross acre; 25% of the gross usable site must be -commercial with a minimum FAR of 20%	35 residential/ 45 commercial	75% (residential) - 85% (commercial) maximum impervious surface coverage, 60% maximum building coverage for residential	Minimum of 20% of the non-commercial portion of the property must be attached residential units
Old Town Mixed Use (OT)	Cultural, upper floor dwelling units, retail, lodging, medical offices, government, social service / mixed use buildings with upper floor residential	Upper floor residential, density determined by site plan limitations	35	100% maximum impervious surface and building coverage	2,500 sf min lot area
Midtown (MT)	Retail, restaurants, offices, entertainment uses, upper-floor residential / mixed use buildings with upper floor residential	Upper floor residential, density determined by site plan limitations	35	75% maximum impervious surface	
Riverside Village (RIV)	Retail, restaurants, offices, entertainment uses, upper-floor residential / mixed use buildings with upper floor residential	n/a (zoning district promotes mixed-use pedestrian development)	35	100% maximum impervious surface	2,500 sf min lot area
Uptown – 1st Avenue (UT-1)	Retail, restaurants, offices, entertainment uses, upper-floor residential / mixed use buildings with upper floor residential	Upper floor residential, density determined by site plan limitations	35	100% maximum impervious surface	2,500 sf min lot area
Residential - 4 units per acre (R4)	Residential, park, recreational / Detached residential, cottage housing	4 units per gross usable acre	35	60% maximum impervious surface	6,000 sf min lot size
Residential – 4.5 Units per acre (R4.5)	Residential, park, recreational / Detached residential, cottage housing	4.5 units per gross usable acre	35	60% maximum impervious surface	6,000 sf min lot size

Zoning District	Allowed Uses / Residential Housing Types	Density Standard	Maximum Height (feet)	Impervious Standards/Lot Coverage	Additional bulk and scale standards
Residential – 6 Units per acre (R6)	Residential, park, recreational / Detached residential, attached two-family, cottage housing	4-6 units per gross usable acre	35	60% maximum impervious surface	5,000 sf min lot size
Residential – 8 units per acre (R8)	Residential, park, recreational / Detached residential, cottage housing	6-8 units per gross usable acre	35	60% maximum impervious surface	4,000 sf min lot size
Residential – 12 units per acre (R12)	Residential / Single family and attached residential units,	8-12 units per gross usable acre for the non-commercial portion of the property	35	75% maximum impervious surface, 60% maximum building coverage	A minimum of 20% of units must be attached
Public Facilities (PF)	Government, schools, parks / employee restaurant and recreational, dormitory, garage	Not applicable (residential not allowed)	45	80% maximum impervious surface	None

Source: City of Duvall, 2015b

6.2.5 Impacts Common to All Alternatives

Under all alternatives, Duvall would likely continue to experience housing and employment growth over the long term, consistent with the planning growth estimates described in Chapter 2, resulting in additional development activity. The primary differences between the alternatives lie in the distribution and intensity of growth across the city and UGA and the land use patterns that are projected to result, influenced in part by the implementation of comprehensive plan policies, related regulations and actions and decisions made by individual property owners and developers. Impacts under all alternatives are considered to be minor.

6.2.5.1 Population and Employment

Under all alternatives, Duvall would have sufficient development capacity to accommodate planned levels of residential and employment growth during the 20-year planning period (King County growth targets equal to 1,140 additional housing units and 840 additional jobs through 2035). To the extent that future infill housing development occurs anywhere in the city, population and employment density would increase and developable land would decrease over time. No impacts to population and employment would occur under any EIS alternative.

6.2.5.2 Land Use and Housing

In general, all alternatives would result in infill development within city limits on vacant and redevelopable properties (see Figure 2-2 in Chapter 2). Infill development could be a mix of single-family residential subdivisions, attached housing (e.g., townhouses), apartment buildings, commercial centers, mixed use buildings, light industrial, and office as allowed by zoning. The largest concentration of new development would likely occur along Main Street, 143rd Place NE and Big Rock Road in the southeast portion of the city.

Figure 2-2 in Chapter 2 identifies vacant, redevelopable, and pipeline properties within city limits. Vacant properties are undeveloped and do not contain housing or commercial structures but could be developed according to the allowed uses and density established in the zoning district. Redevelopable properties have enough undeveloped land area to accommodate additional lots based on the allowed density in the zoning district. Pipeline properties are associated with proposed projects that are vested to the existing City code by pre-annexation agreements, development agreements, or other entitlements.

Development in the southwest portion of the city along Main Street, NE 143rd and Big Rock Road would result in a change in land use from large vacant properties to suburban and urban residential and commercial developments. There would be noise, transportation, public services, and utility implications as described in other chapters of this EIS. The residential land uses would be generally compatible with adjacent existing residential neighborhoods located within city limits, although there would be a visual change, as described in Chapter 7 Aesthetics. Developments that include attached housing units would be more dense than existing single-family developments but setbacks required by City code would provide a separation to limit this to a minor impact.

Attached housing units offer an alternative to single-family residential housing types which are the most common housing type in Duvall. Such an alternative may help to provide more affordable housing options.

Development that occurs in the North UGA upon annexation would result in conversion of large lot rural development pattern to single family subdivisions. To develop this area to the full capacity allowed under the pre-designation of Residential 4 to 4.5 units to the acre, additional roads, utilities, and stormwater facilities would need to be constructed. There would be noise, transportation, public services, and utility implications as described in other chapters of this EIS. The residential land use would be compatible with adjacent existing residential neighborhoods located within city limits, although there would be a visual change, as described in Chapter 7 Aesthetics. Development of single-family residential would continue the pattern of limiting housing types in Duvall and would not be likely to increase affordable housing options in the community unless specific affordability measures were required with development.

6.2.5.3 Historic and Cultural Resources

None of the EIS alternatives would impact the Dougherty Farmstead, a NRHP Listed property, or the Cherry Valley/Duvall Cemetery. The risk for discovering archaeological resources in areas proposed for new development is low to very high depending on the UGA proposed for annexation. Creating more commercially-zoned land under Alternatives 1 and 3 could result in more competition for Duvall Main Street businesses, however, Old Town businesses are generally smaller scale retail and service businesses, and are pedestrian-oriented. Other commercial development on Main Street features larger anchor tenants and is more vehicular-oriented. New commercial development outside of Old Town is not likely to attract the same businesses that would locate in Old Town (Easton, 2015).

6.2.6 Alternative 1: 2015 Comprehensive Plan Alternative

6.2.6.1 Land Use and Housing

Under Alternative 1, proposed zoning changes would likely result in potential for more commercial development along Main Street with higher density attached housing located immediately behind the commercial structures and fewer mixed-use buildings (see Commercial and Residential 20 units per acre zoning districts in Figure 2-3 in Chapter 2). Although Duvall has allowed mixed-use buildings in various zoning districts, developers have historically chosen to build commercial buildings without a residential component. Mixed use buildings with residential uses over commercial are successful in communities with strong multifamily residential demand, limited land supply, and high land prices. Mixed use buildings are more expensive to build than single-purpose multifamily residential buildings, and require higher rents to recover initial costs. Prevailing rents in Duvall are not high enough to support these costs, and land prices are not high enough to drive the associated residential density (Easton, 2015).The Residential 20 units per acre zoning district would offer an alternative to the single-family residential housing type. Proposing to create this zoning district may help to provide more affordable housing options. The proposed zoning changes would also reduce the allowable density of residential development east of 3rd Avenue NE (see Residential 8 units per acre zoning district in Figure 2-3) and west of 3rd Avenue NE (see Residential 12 units per acre zoning district in Figure 2-3). This reduced density allowance east of 3rd Avenue NE would be similar to the proposed pipeline projects in this area, which have proposed densities close to the minimum allowed by the zoning district, rather than the maximum. The impacts on land use as a result of these zoning changes would be minor because there would be only minor differences in density of existing and expected development, and City code requires setbacks to separate zoning districts that have different density requirements, which would create a transition zone where there were differences in density.

Upon annexation, the Southwest UGA could be developed into commercial or mixed-use buildings and parks and open space. The commercial property would be compatible with the large grocery store (Safeway) development located immediately north and the parks and open space property would be compatible with the large, rural lots located immediately south and east. There would be no impacts to land use in the Southwest UGA.

Development in the North UGA would be similar to those described under Impacts Common to All Alternatives in Section 6.3.1.2.

6.2.7 Alternative 2: Urban Growth Area Reserve

6.2.7.1 Land Use and Housing

Impacts to land use would be similar to those described under Impacts Common to All Alternatives. In addition, development that occurs in the UGA-Reserve upon annexation would be predominately single-family residential subdivision with some parks and open space land set aside by developers as required by City code. To develop this area to the full capacity allowed under the pre-designation of Residential 4 to 4.5 units to the acre, additional roads, utilities, and stormwater facilities would need to be constructed. The current large lot, mostly vacant rural setting would change over time to a residential suburban neighborhood. There would be noise, transportation, public services, and utility implications as described in other chapters of this EIS. The residential land use would be compatible with adjacent existing residential neighborhoods located within city limits, although there would be a visual change, as described in Chapter 7 Aesthetics. Development of single-family residential would continue the pattern of limiting housing types in Duvall and would not be likely to increase affordable housing options in the community unless specific affordability measures were required with development.

The lack of affordable housing can have an effect on transportation patterns, community cohesiveness, and social justice and equity issues. When young people, service providers (e.g., teachers, firefighters, wait staff, etc.) and seniors cannot afford to buy a home, they would have to move away or commute to Duvall for work. Attached housing and apartments provide more flexibility for people to rent or buy a house at a lower cost.

6.2.8 Alternative 3: Revised Urban Growth Area Boundaries

6.2.8.1 Land Use and Housing

Impacts to land use would be similar to those described under Impacts Common to All Alternatives. In addition, development that occurs in the revised UGA boundaries immediately south of city limits upon annexation would be predominately commercial development and single-family residential subdivisions. To develop this area to the full capacity allowed under the pre-designation of Commercial (applied to approximately 25 percent of the proposed South UGA) and Residential 6 units to the acre (applied to the remaining 75 percent), additional roads, utilities, stormwater facilities and parking lots would need to be constructed. The current large lot, mostly vacant rural setting would change over time to a suburban commercial and residential suburban neighborhood. There would be noise, transportation, public services, and utility implications as described in other chapters of this EIS. The commercial and residential land uses would be compatible with adjacent existing neighborhoods located within city limits, although there would be a visual change, as described in Chapter 7 Aesthetics. Development of single-family residential would continue the pattern of limiting

housing types in Duvall and would not be likely to increase affordable housing options in the community unless specific affordability measures were required with development. Similar to impacts described under Alternative 2, the lack of affordable housing has community and transportation implications.

6.2.9 Alternative 4: No Action Alternative

6.2.9.1 Land Use and Housing

Impacts to land use would be similar to those described under Impacts Common to All Alternatives and would result in minor adverse impacts.

6.3 Mitigation Measures

While not considered a significant impact, the lack of affordable housing under all alternatives would have implications on transportation and community cohesiveness, as well as social equity considerations. The City could consider pursuing the following actions if it wishes to increase affordable housing options in Duvall:

1. Consider amendments to zoning regulations that incentivize developers to include affordable housing units by allowing height increases, increased density, or larger floor-area ratios.
2. Develop a multifamily property tax exemption program to encourage for-profit developers to include affordable units as part of new housing developments.
3. Allow corner-attached housing units in single-family residential zones.
4. Consider requiring a percentage of affordable housing units as part of pre-annexation agreements.

6.4 Significant Unavoidable Adverse Impacts

Under all alternatives, additional growth would occur in Duvall, leading to a general increase in development intensity over time, as well as the gradual conversion of rural uses to suburban and urban development patterns. This conversion of rural land uses is not considered significant for the city of Duvall, nor would it contribute significantly to the cumulative conversion of rural land to urban uses, because such conversions are limited by statewide and countywide policies.

The City's adopted development regulations will sufficiently mitigate most localized land use compatibility issues. Project level SEPA review would allow opportunity to ensure that transitions between uses are adequate. The effects of the Comprehensive Plan on housing affordability, while an important issue, is not considered a significant impact. Therefore, no significant unavoidable adverse impacts to land use are anticipated.

CHAPTER 7. AESTHETICS

7.1 Introduction

The analysis of potential impacts to scenery from changes in land use can be somewhat subjective due to the nature of measuring aesthetic quality. However, there are many elements of aesthetic analysis on which there is broad agreement. Most people agree for example that views of a river or snow-covered mountain peak are scenic views. Likewise, views of historic, well-preserved buildings are valued for the contribution those views make to forming a community's character and a sense of place. In contrast, when scenic views are obscured by new buildings, or as scenic areas like forested hillsides are developed, then the scenic quality and character of a community is altered and potentially diminished.

In the visioning survey done in 2002 as part of the City-wide Visioning Plan, Duvall's natural/rural setting was considered by participants as Duvall's greatest asset. The participants said that they clearly wanted Duvall to retain its identity as an individual community, including retaining its small town character and surrounding rural context. Since protecting the town's small town character is important, the City-Wide Visioning Plan recommended reviewing current design standards or guidelines to ensure that new development fits with the town's architectural character and rural setting.

This chapter examines the existing Comprehensive Plan goals and policies that affect Duvall's scenery, discusses the scenic quality of the Duvall community in general and looks at how those scenic resources may be affected by the Comprehensive Plan alternatives. This analysis was performed by visiting places in Duvall where people gather and travel such as parks and busy roadways (see Photo 7-1) and observing the quality of the scenery and how the scenery may be affected by changes in land use. This analysis included examining the scenic quality of Old Town and views from Duvall's residential neighborhood streets (see Photo 7-1).

Photo 7-1. Typical View of the Valley from East West Streets



7.2 Relevant Plans, Policies, and Regulations

Three chapters of the Comprehensive Plan (Land Use, Housing, and Utilities elements), the Downtown Sub-area Plan, and two sections of the zoning code (landscaping and height/bulk/scale) that are related to protecting the character and scenic resources of Duvall are described.

7.2.1 Comprehensive Plan

The City of Duvall Comprehensive Plan (City of Duvall, 2006) and the Duvall Downtown Sub-area Plan (City of Duvall, 2004) include goals and policies that relate to scenic resources. The goals and policies that would be included in the updated Comprehensive Plan are in italics. The remaining goals and policies are not currently proposed to be included:

7.2.1.1 Land Use Element Goals and Policies

- ***Goal LU – 1*** *Preserve and enhance Duvall's unique small-town character*. Duvall's unique small-town character results from its rural setting that includes parks, open space and tree

coverage within the city, pedestrian-friendly Old Town, mixed-use buildings, limited sign display, and an eclectic mix residential architecture.

- *LU – 1.1 Preserve views of the Snoqualmie Valley through the establishment of setbacks, height limitations, exterior lighting limitations, and massing controls.*
- LU – 1.2 Preserve nighttime views of the dark sky by limiting outside lighting in developments.
- *LU – 1.5 Allow for a variety of housing types, including cottages, duplexes, triplexes, attached and detached single-family houses, townhouses, and apartments to maintain the character of varying types of housing options found in Duvall.*
- LU – 1.8 Amend the significant tree requirements to increase the percentage of trees preserved at the time properties develop and to require preservation of stands of trees. Trees to be saved shall be in locations and of a species type to allow maximum opportunity for retention.
- LU – 1.10 Amend the sign code to allow businesses to display temporary signs on a limited basis in order to have an aesthetically pleasing community, while allowing for necessary business identification.
- *LU – 1.12 Encourage the preservation of significant natural features, such as tree stands or large boulders, as properties develop.*
- *LU – 1.15 Ensure that new development adjacent to the Snoqualmie Valley Trail protects the integrity of the Snoqualmie Valley Trail by incorporating a "soft edge" of native and informal plantings that complement the shoreline's riparian habitat, thus creating an authentic environmental experience for pedestrians.*

- **Goal LU – 2** Preserve and enhance the unique historic character of Old Town. The unique character of Old Town is created in part by the two-lane Main Street, pedestrian-friendly building design, historic and new buildings at historic scale, the eclectic mix of businesses, street furniture, public art, outside displays, and mixed-use buildings.
  - LU – 2.3 Continue to promote the preservation and enhancement of Main Street's historic structures.
  - *LU – 2.8 Existing aboveground utilities on Main Street from Bird Street to Valley Street shall be undergrounded if feasible during public or private improvements to Main Street.*
  - LU – 2.11 Amend the sign code to create appropriate signs for the pedestrian scale of Old Town.
  - LU – 2.13 Require conditional use permits for all new or expanded buildings with a footprint larger than 7,500 square feet to ensure that new buildings and uses are compatible with the historic scale of development in Old Town and do not negatively impact the streetscape.
  - LU – 2.21 Encourage new development in the 1st Avenue – Uptown area to be pedestrian oriented and compatible with the character of Old Town.

- LU – 2.23 Require extensive landscaping on properties that are used solely for parking to screen and buffer pedestrians from automobiles.

- **Goal LU – 3** Develop design and site plan standards for residential, commercial, industrial and mixed-use development. Much of Duvall's charm derives from the use of design and site plan standards that guide how developments look. In addition to having design plan standards for commercial buildings, this plan includes policies to implement such standards in all types of developments.
  - *LU – 3.1 Review and update building design standards to ensure standards for limiting the mass and height of buildings in all commercial, industrial, and mixed-use zones. Reflect the scale of historic development, including peaked roofs, window treatments, and narrow façade design.*
  - LU – 3.2 Ensure that single-family development has specific building design requirements such as porches, window treatments, peaked roofs, and recessed garages, etc. that are consistent with the historic character of Duvall.
  - LU – 3.3 Develop design standards for multi-family buildings that ensure standards for limiting the mass and height of buildings and are consistent with the historic character of Duvall, including features such as peaked roofs, window treatments, and narrow façade design.
  - *LU – 3.4 Develop single-family site plan standards that provide for the creation of neighborhoods and create attractive buffers to adjacent roads.*
  - LU – 3.5 Ensure multi-family, mixed-use, commercial and industrial site plans have an amount and type of landscaping that provides for softening of parking areas, allows for buffers from adjacent uses, and provides an aesthetically pleasing appearance.
  - *LU – 3.6 Develop lighting standards for all developments that implement IES standards for number of streetlights and set out a light pole standard for use in specific areas of Duvall.*

- **Goal LU – 5** Encourage multi-family residential development in a manner that is consistent with the character of Duvall. A large portion of Duvall's future residential development may be multi-family in nature. Design and site plan standards, as well as goals and policies set out in the Housing Element, will define that development.
  - *LU – 5.6 Provide for landscape buffers to adjacent single-family zones.*

- **Goal LU – 6** Provide opportunities for retail, office and industrial development and ensure that such development fits with the design, land use, and circulation patterns of Duvall. In order for Duvall to be a sustainable community, commercial and industrial development that fits with Duvall's character is encouraged.
  - *LU – 6.6 Ensure that design elements of new buildings are built to pedestrian scale to provide visual interest and promote compatibility with Old Town.*

- *LU – 6.8 Provide substantial buffers, incorporating features such as existing vegetation, and adding berms, fences, and landscaping, including fast growing tree species, from commercial and industrial zones to neighboring single- and multi-family zones.*
- LU – 6.9 Require the South UGA to be developed in a compact, *pedestrian-oriented development* pattern with a mix of uses and a range of housing types.

7.2.1.2 Housing Element Goals and Policies

- ***Goal HO – 1*** *Preserve, maintain and improve existing housing and neighborhood character in Duvall.*
  - *HO – 1.1 Develop and incorporate residential design standards for new houses and housing developments within existing neighborhoods, such as site design standards, landscaping requirements and building design guidelines to preserve neighborhood quality and character.*
  - *HO – 1.2 Ensure that future mixed-use, commercial, and industrial development surrounding residential neighborhoods complements and enhances the character of the community. Ensure that the housing and commercial components of mixed -use developments are integrated in a way that is advantageous to both uses.*

- ***Goal HO – 2*** *Ensure houses in new residential subdivisions and new multi-family structures are of high quality residential and neighborhood design through the provision of required development standards.*
  - *HO – 2.1 Develop residential design standards for new single-family houses and multifamily structures, such as site standards, landscaping requirements and building design guidelines, to provide for quality and character consistent with Duvall.*

7.2.1.3 Utilities Element Goals and Policies

- **Goal UT – 2** Minimize impacts on adjacent properties and the natural environment associated with the siting, development and operation of utility services and facilities.
  - UT – 2.1 Ensure utility services are sited, designed, and buffered to fit in with their surroundings. When sited within or adjacent to residential areas, special attention should be given to improving aesthetics and to mitigate land use impacts of utilities.

- **Goal UT – 3** Provide safe, reliable and efficient electrical power and gas services for residents and businesses of Duvall.
  - UT – 3.5 Require installation of existing and proposed power distribution lines underground at the time of new construction to reduce possible storm damage and increase aesthetic character and views.

- **Goal UT – 6** Ensure placement of wireless communication facilities that minimizes impacts to adjacent land uses and provides the least impact on the aesthetic character of Duvall.

- UT – 6.1 Require the placement of wireless communication facilities in a manner that minimizes the adverse impacts on adjacent land uses. Consider undergrounding of related equipment facilities.

7.2.2 Downtown Sub-area Plan Goals and Policies

This objective from the Trails, Parks and Open Space section of the Downtown Sub-area Plan relates to scenic resources:

- Build on Downtown's trail, park and open space resources by enhancing the visibility and accessibility of these resources without compromising their aesthetic natural qualities.

7.2.3 Zoning Code

Generally, four types of development standards addressed by the zoning code relate directly to aesthetics: landscaping (Duvall Municipal Code [DMC] Chapter 14.38), tree protection (DMC Chapter 14.40), design guidelines (DMC Chapter 14.34) and the height/bulk/scale of buildings (DMC Chapters 14.12 - 14.32).

7.2.3.1 Landscaping and Tree Protection

Chapter 14.38 of the zoning code, Landscaping Standards, states that:

Landscaping shall be designed to preserve the aesthetic character of the community, improve the aesthetic quality of the built environment, promote retention and protection of existing vegetation and reduce the impacts of development on storm drainage systems and natural habitats by: providing visual relief from large expanses of parking areas; providing visual relief from long building elevations; providing physical separation between residential and nonresidential zones; providing visual screen and barriers as a transition between differing land uses; retaining existing vegetation and significant trees by incorporating them into the site design; enhancing the city's appearance and character through the use of street trees; visually unifying the city and its neighborhoods; reducing erosion and stormwater runoff; replacing existing vegetation and trees; promoting proper plant selection and continuous maintenance so that plant materials can flourish; adequately screening parking areas, fences, retaining walls and other less attractive features.

Similarly, the Tree Protection chapter aims to avoid the removal of stands of trees or significant trees (greater than 16 inch diameter) to maintain the quality of Duvall's urban environment. Thirty-five per cent of significant trees are required to be preserved on new development sites. Where that standard is not met, significant trees must be replaced with new trees at a 3:1 ratio. The protection of significant trees on all sites results in development in the city occurring in way that retains the rural feeling of Duvall. It is the community's intent to ensure that a substantial number of significant trees are retained on development sites. It is also the intent of the community to create open and/or park space within residential developments and to ensure pedestrian paths and connections are adequate.

7.2.3.2 Design Guidelines and Height, Bulk and Scale

At a number of public meetings, the issue of design standards for single- and multi-family units has arisen as a goal of the city (Duvall Comprehensive Plan, 2006). The City established design guidelines (DMC Chapter 14.34) that apply to new and redeveloped properties. For single-family units, design standards ensure homes fit into the historic character of the city by encouraging recessed garages, porches, fenced yards, trimmed windows, and similar features.

For multi-family units, design standards limit mass and scale and encourage features such as decks, windows and roof treatments that fit into the overall neighborhood context. Design standards also encourage street trees and landscaping adjacent to public roads. Street trees are intended to provide some standardized visual appeal to a subdivision. Landscaping adjacent to public streets is to provide an attractive buffer to a road and the traveling public. Parking lot and perimeter landscaping in multi-family developments are also encouraged and must be similar to that provided in commercial developments

The aesthetic quality of a city is affected in part by the height, bulk and scale of its buildings. Limitations in building height and size help to maintain views. Zoning regulations define the maximum limits of height and size for new and remodeled buildings. In Duvall's residential zones (Residential-4 units per acre, Residential 4.5 units per acre, Residential 6 units per acre and Rsesidential-8 units per acre) for example,the maximum building height is 35 feet and the maximum Floor Area Ratio (FAR) is 50 percent. The building height limits in combination with the FAR help maintain views above and between buildings – especially from properties with downhill neighbors. The building height and size limitations are important to maintain at least partial views from homes and roadways with views of the valley to the west and north.

The multi-family residential zoning districts (Residential 12 units per acre) limits building heights to 35 feet for residential and 45 feet for commercial, retail and upper story residential. Sixty percent of the lot can be covered by building if residential. The height of multi-family building roofs in the Residential 12 units per acre is not any higher than allowed in the single familiy zones however the larger scale of buildings in this zone will have an effect on views – especially views to the west from uphill adjacent neighbors.

The mixed use institutional zoning district has a 50-foot height limit and 15 percent of the building lot must be pervious. Mixed use 12 units per acre has a 35-foot height limit if residential but 45 foot height limit for commercial, retail and upper story residential. In the Commercial (CO) district, building heights are 45 feet above grade on the uphill side. Similarly, in the Light Industrial zone, the height limit is 45 feet. The mixed use, mixed use industrial and commercial districts have less restrictive height and bulk limits although these zoning districts are located at lower elevations (closer to the valley) than most of the residential properties in Duvall. The lower elevation of the buildings is therefore advantageous for maintining views toward the river.

7.3 Affected Environment

The affected environment for potential aesthetic impacts includes those areas in Duvall with views of properties that will undergo Comprehensive Plan land use designation or zoning changes and views of the urban growth areas that are proposed for possible annexation. The affected environment includes roadways, parks and other public properties and private properties

7.3.1 Scenic Resources

Scenic resources include picturesque views or landscapes that are valued as aesthetically appealing. Scenic resources may contain both built elements as well as natural elements. Scenic resources may include the views from roadways, (see Photo 7-2) overlooks, a trail, parks, and other locations.

Photo 7-2. Commercial Development along Main Street NE



Scenery is experienced differently by individuals based on their own perceptions. A view from a person's place of work for example, may not be as important as the view from a prominent window at

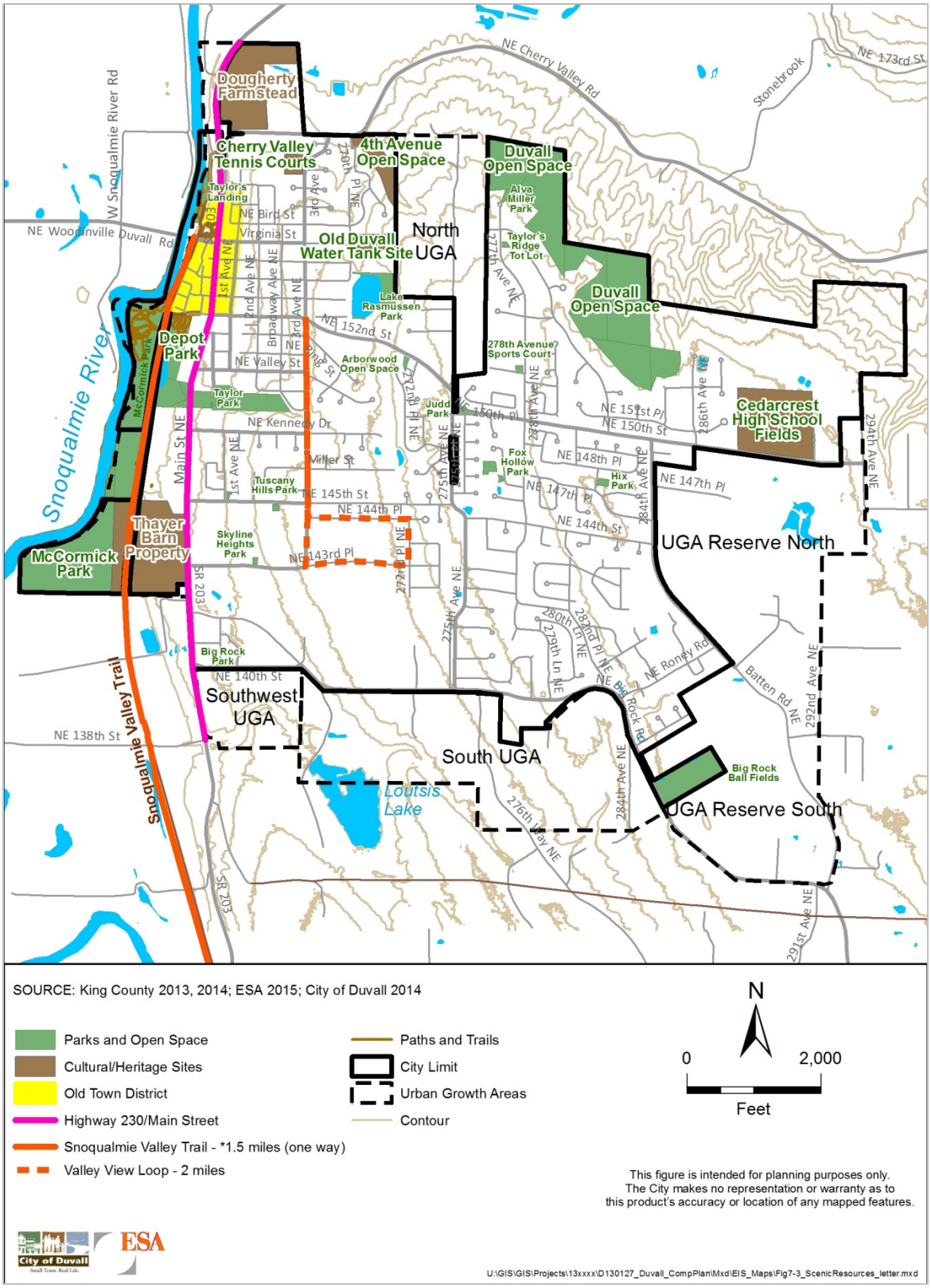
their home. The amount of sensitivity a person has toward changes in the landscape can affect their perception of impacts to scenic resources.

The following table includes a list of scenic resources located within the city of Duvall (see Figure 7-1 for location of scenic resources). The scenic features in and viewed from Duvall provide the backdrop to the community's daily interactions.

Table 7-1. Scenic Resources and Views

Scenic Resource Type	Resources
Parks and Open Space	McCormick Park Depot Park Taylor's Landing Big Rock Park Taylor Park Lake Rasmussen Park Big Rock Ball Fields 4th Avenue Open Space Cherry Valley Tennis Courts Old Duvall Water Tank Site Central Park Duvall Open Space Alva Miller Park 278th Avenue Sport Court Hix Park Fox Hollow Park Judd Park Arborwood Open Space
Cultural/Heritage Sites	Dougherty Farmstead Old Town District Thayer Barn
Trails	Snoqualmie Valley Trail Valley View Loop
Roads	Main Street/Highway 203
Notable Views	Mt. Rainier Snoqualmie Valley Snoqualmie River Mount Baker

Figure 7-1. Scenic Resources



7.3.2 Viewsheds

A viewshed is the total area which can be viewed from a specific location. Generally, larger viewsheds are more desirable depending on the quality of the scenery. In Duvall, viewsheds can be either extensive or very limited in size depending on the topography, vegetation and buildings present. Duvall's upland areas are typically hilly and forested. Consequently, viewing locations around much of the existing roadways and residences tend to have fairly small viewsheds consisting of neighboring residences and adjacent areas of forest. Some of the higher elevations in Duvall however, allow for views of nearby ridges and more distant mountains or the Snoqualmie River valley.

Views of the buildings fronting Main Street in Old Town are also an important part of experiencing the character of Duvall. Views of the older storefronts along Main Street are especially relevant for pedestrians and motorists. The location of these buildings at the street edge (as opposed to set back for parking) helps create a more intimate downtown.

Viewsheds in Duvall occasionally include views of either Mount Baker or Mount Rainier or portions of the Cascade Range (Photo 7-3). The Snoqualmie Valley viewsheds include parts of Old Town and hillside homes above downtown with views to the west. Some especially scenic valley views are also experienced when traveling west on the streets above Old Town and south of Old Town on NE 143rd Street. In addition, panoramic views of the Snoqualmie River valley with Mount Baker in the distance can be experienced from NE Cherry Valley Road including from the Dougherty Farmstead and residential areas at the north end of Duvall. Seasonal changes in the valley can be dramatic, such as when the Cherry Creek valley floods and the floodplain appears as a lake. Views of Mount Rainier are also possible from scattered viewpoints on the higher elevation streets and homes in Duvall.

Photo 7-3. View of the Cascade Range



7.3.3 Existing Urban Form

The existing urban form of Duvall can be characterized as being mostly rural and suburban residential in the hillside neighborhoods above Main Street. Along Main Street, low-rise commercial, and a few low-rise industrial buildings are present. Institutional buildings such as schools and churches occur throughout the city. Main Street in Old Town contains the buildings with the type of historic architectural character for which Duvall is acknowledged. Historic wood-framed buildings built early in the last century interspersed with newer buildings (Photo 7-4). The present Comprehensive Plan says that Old Town Duvall is often cited by residents as what they like most about Duvall and that Old Town "gives the city a unique presence in the Snoqualmie Valley." See Figure 7-1 for location of Old Town boundaries. Older streets tend to be on a grid arrangement while newer streets tend to be curvilinear with or without cul-de-sacs.

Photo 7-4. Older Home along Main Street NE



Newer commercial construction along Main Street (south of NE Stephens St.) is typically separated from the street with parking lots and landscaping as opposed to the older buildings that front directly on Main Street. Both residential and commercial buildings are generally within traditional architectural styles typical of the Northwest.

7.4 Impacts

7.4.1 Impacts Common to All Alternatives

Each of the Comprehensive Plan alternatives, including the no action alternative will have both specific and general impacts over time (as defined below). The following impacts would be especially attributed to homes, roadways and other places within that viewshed.

7.4.1.1 Specific Visual Impacts

Changes in the scenic quality of Duvall under each of the Comprehensive Plan alternatives may occur in specific limited areas as development happens. Three general types of aesthetic impacts could happen with future development projects:

1. An adverse impact could be caused by new development blocking or partially blocking an important scenic view (such as a view of the Snoqualmie River Valley);
2. A scenic place (a forested area for example) may be altered and become a densely built-up area (although in some cases, clearing a forested site may create new views for the new residents); or
3. The historic architectural character of buildings may be diminished by constructing new buildings that do not fit within a historic context because of size, height or architectural style.

These types of impacts to scenery from land use changes in Duvall can differ in significance depending on a number of factors such as:

- Where the view is from (home, business, park, roadway, etc.) and how many people may be viewing from that location,
- How unique or special the view is for this area,
- The composition of the view or what is included in the view – especially in the foreground; and
- The intensity and massing of development or re-development

Diminishing the quality of an important view, such as a view of the Snoqualmie River valley for example, is more significant if the viewpoint is in a well-used public area like a park or well-traveled roadway. The scarcity of the scenery is also a factor in how significant an aesthetic or visual impact may be. A view of a forested hillside for example, is common while a view of the Snoqualmie River is less common. The scenic quality of a view is also affected by what is in the foreground of the view.

The above specific aesthetic impacts associated with future development are limited in number and limited in places where they are likely to occur and are also highly project-specific. These types of impacts are expected in limited areas as discussed under each of the alternatives below.

7.4.1.2 Generalized Visual Impacts over Time

Duvall is a community valued for its rural character including farms in the valley, a downtown with historic buildings and forested hillsides. Theoretically, the construction of each new residential development, school or commercial building has the potential, to some degree, to make the character of Duvall less rural. This overall incremental change to a less rural community will happen in the interior portions of the town but will be more noticeably at the edges where the UGAs occur. That rural character will therefore be gradually diminished within the city limits and spread to a larger area as UGAs are annexed into the city. However, Duvall will remain rural by virtue of its location in an overall rural setting.

7.4.1.3 Aesthetics Impacts from Development in Southwest Part of the City

Under each of the alternatives, the southwest part of Duvall will be developed with a mix of residential and commercial development. Several projects are in the pipeline for development and in varying stages of planning and approvals. (Refer to Figure 2-2 in Chapter 2 Description of Project Alternatives) In addition, there are a number of vacant and redevelopable properties in the southwest corner of Duvall.

Aesthetically, the development likely in the southwest corner will be mostly consistent with recent development in that area. Views from the most traveled route through Duvall, Main Street NE toward the sloping hillside to the east will become more urban and less rural as those properties develop. Also, views from residences located on the hillside above the future residential and commercial development could be affected by development in the foreground of those views to the west. It does not appear that scenic views of the Snoqualmie River from public places such as roadways would be significantly altered from development in this area since view corridors along the east / west streets would remain largely intact.

7.4.1.4 Aesthetic Impacts from Development in the North UGA

The North UGA would be annexed into the city limits with a predesignation of Residential 4-4.5 units per acre. The North UGA is surrounded on three sides mostly by Residential 4 units per acre zoned properties that are essentially built-out. Future development in the North UGA, although substantially different from the current condition, will be aesthetically consistent with the residential development on the east, south and west sides. Aesthetic impacts associated with changing to a developed condition will be mostly limited to the properties adjacent and closely situated to the North UGA.

7.4.2 Alternative 1: 2015 Comprehensive Plan Alternative

A large area of land zoned Residential 12 units per acre (north of Big Rock Road) will be downzoned to Residential 8 units per acre resulting in less density. This change would be aesthetically more compatible with the surrounding low density residential land to the north and east. In addition, a Residential 20 units per acre land use designation will be applied to properties in the southwest part of the city primarily aligned along Main Street. Depending on the building height assigned to the Residential 20 units per acre district, a limited number of west-facing properties may have any views of the river valley diminished with the addition of new, taller buildings. At this time, a height limit of 35 feet is anticipated.

This alternative would include annexation of the North UGA which would result in impacts similar to those described under Section 7.4.1.4. The Southwest UGA would also be annexed under this alternative and assigned a pre-designation of Commercial (for the two northern parcels) and Open Space/Parks (for the two southern parcels). Aesthetically, new commercial development in the Southwest UGA will be consistent with the development along Main Street. Views of the developed Southwest UGA would occur mostly for travelers on Big Rock Road and Main Street NE. Special

considerations should be given to preserving and enhancing views to the west of the Snoqualmie Valley from Big Rock Road through the development review process.

A parks/open space designation would not result in aesthetic impacts because of the aesthetic nature of parks and open space and the aesthetic compatibility of parks and open space with adjacent rural designated areas.

7.4.3 Alternative 2: Urban Growth Area Reserve

Alternative 2 includes annexation of the City's UGA-Reserve (Photo 7-5), with future land use designation allowing for low density single family residential development. New development would likely impact the scenic quality of the forested/pasture land visible from roadways and nearby properties. The large, forested wetland complex which could be considered a scenic resource would be protected under existing land use regulations. The scenic quality of the wetland complex could be diminished over time by siting new homes and roadways at the boundaries of the protected area.

Photo 7-5. Southeast UGA looking west from the residential subdivision Clay Plat



Aesthetic impacts under Alternative 2 associated with development within city limits and the North UGA would be the same as those described under Impacts Common to All Alternatives in Section 7.4.1.3 and 7.4.1.4.

7.4.4 Alternative 3: Urban Growth Area Reserve

Under Alternative 3, the City would work with King County to remove the UGA-Reserve North from its UGA and transfer roughly the same size area to south of Big Rock Road. The area south of Big Rock Road is not currently in the city limits or in a UGA so there has not been a general expectation of this area developing. This action would potentially preserve a large forested wetland complex which will be a long term scenic resource within the UGA-Reserve North. Conversely, new development south of Big Rock Road will likely impact the scenic quality of the forested/pasture land visible from roadways and nearby properties. Specifically, development south of Big Rock Road will affect people using the road and residents of the large rural lots in the reallocated UGA. Residents to the north of Big Rock Road may also expect a change in the scenic quality as those properties develop and change from forested / pasture to built condition.

Aesthetic impacts under Alternative 3 associated with development within city limits and the North UGA would be the same as those described under Impacts Common to All Alternatives in Section 7.4.1.3 and 7.4.1.4.

7.4.5 Alternative 4: No Action Alternative

Aesthetic impacts under Alternative 4 associated with development within city limits and the North UGA would be the same as those described under Impacts Common to All Alternatives in Section 7.4.1.3 and 7.4.1.4 and result in minor adverse impacts.

7.5 Mitigation Measures

The comprehensive plan alternatives are generally consistent with the policies in the current comprehensive plan with regard to aesthetic considerations and generally maintaining the rural character of Duvall as described in the preceding section. Furthermore, none of the alternatives would create impacts in the Old Town area which is a policy priority for the current comprehensive plan.

Commercial development south of Big Rock Road would be reviewed for potential scenic view impacts from Big Rock Road toward the Snoqualmie River. Adjustments in the siting of buildings and the height may allow the preservation of views for travelers along Big Rock Road.

The City could consider pursuing the following actions if it wishes to decrease visual impacts in Duvall:

1. The City would evaluate its existing lighting standards for residential and non-residential projects to minimize lighting impacts to the night sky and work with Puget Sound Energy on

design including shielding, light color (LED versus incandescent), and minimum and maximum foot-candles while still maintaining adequate light for safety purposes.

2. The City would consider policies that take advantage of views during the design review process for residential and non-residential projects.

7.6 Significant Unavoidable Adverse Impacts

For each of the proposed Alternatives, there are no apparent significant unavoidable adverse impacts. The scenic resources for which Duvall is known (Photo 7-6) will remain intact. Each of the proposed alternatives have impacts to aesthetic resources that are mitigatable under existing zoning regulations covering development elements such as building height, bulk and scale or by policies protecting views in the Comprehensive Plan.

Photo 7-6. Snoqualmie River Valley Landscape



CHAPTER 8. NOISE

8.1 Environmental Noise and Vibration Fundamentals

Sound is any change in air pressure that the human ear can detect. Sound ranges from barely perceptible to levels that cause hearing damage. In general, the greater the change in air pressure, the louder the sound. Sound is measured in terms of loudness and frequency. The unit used to measure the loudness of sound is called a decibel (dB). A range from 0 to 120 dB is the typical range of human hearing. To account for the human ear's sensitivity to different sound frequencies, the dB measurement scale is adjusted to provide an accurate measure of what the human ear can actually hear. When the adjusted dB scale is used, these measures are referred to as the A-weighted decibel scale, or dBA.

Normal human conversation ranges between 44 to 65 dBA when people are about 3 to 6 feet apart. The smallest change in sound level that a human ear can perceive is about 3 dBA. For most people, each 10 dBA increase in sound seems twice as loud, while a 10 dBA decrease in sound levels is perceived to be half as loud. The point at which sound begins to harm hearing is 70 dB (U.S. Environmental Protection Agency, 1974).

Sounds that are unpleasant, disturbingly loud, or disruptive are considered noise. Noise is defined as unwanted sound. Human response to sound varies from person to person. Some key factors that can influence an individual's response include the loudness, the frequency, the duration of the activity generating the unwanted sound, the amount of background sound present, and the nature of the activity that is being affected by the sound.

Community sound (also called environmental noise, residential noise, or domestic noise) is defined as sound emitted from all sources except sound at the industrial workplace (World Health Organization, 1999). Primary sources of community sound include road, rail, and air traffic; industries; construction and public work; and the neighborhood. The main indoor sources of noise sound are ventilation systems, office machines, home appliances, and neighbors. In residential areas, noise is generated from mechanical devices (e.g., heat pumps, ventilation systems, and traffic), as well as voices, music, sounds generated by neighbors (e.g., lawn mowers, vacuum cleaners, and other household equipment, music, and noisy parties), and domestic animals such as barking dogs (World Health Organization, 1999). In general, residential land uses do not create an excessive amount of noise. Commercial and

> ***Noise*** *is defined as unwanted sound. Noise is inseparable from modern society; however, excessive noise can interfere with thought, communication and sleep, cause annoyance, health problems, loss of hearing and have secondary effects such as economic loss, property devaluation and disturbing wildlife.*

industrial activities can sometimes produce a significant amount of noise. In general, the more densely an area is populated and the higher the intensity of land uses there are, the noisier it will be.

8.2 Relevant Plans, Policies, and Regulations

The Federal Noise Control Act (1972) assigns primary responsibility for regulating non-transportation noise to state and local governments. State and local governments also regulate motor vehicles not involved in interstate commerce (any vehicle traveling on a public roadway is involved in interstate commerce). Federal noise authority preempts local and state noise regulations for three major noise sources: aircraft, railroads and motor vehicles engaged in interstate commerce.

The City regulates environmental noise through Duvall Municipal Code (DMC) Chapter 6.04 (Noise Control). The Noise Control standards prohibit individuals and property owners in the city from creating "public nuisance noises" and "public disturbance noises." Public nuisance noises are defined as "any sound which unreasonably disturbs, injures, interferes with or endangers the comfort, repose, health or safety of three or more persons residing within separate residences in the same community or neighborhood, although the extent of the damage may be unequal" (DMC 6.04.010). Public disturbance noises include a variety of specific noises, including the sounding of any horn or siren from a motor vehicle, use of a sound amplifier for the purpose of commercial advertising, and yelling or shouting on or near public streets. Other noises can also be considered public noise disturbances.

In addition to prohibition of public nuisance and public disturbance noises, the Noise Control standards also regulate specific activities that are typically associated with creation of environmental noise. These include use of motor vehicles without mufflers, modification to motor vehicles that create excessive noise, intentionally squealing or screeching tires, use of compression breaks, and construction noise outside of normal construction hours. Normal construction hours, as specified by the code, are between 7 a.m. and 6 p.m. except for Sundays and holidays. The Noise Control standards also identify specific exempt sounds; this generally includes environmental noise commonly occurring within urban and residential environments (for example, noise created by fire alarms).

The state government provides guidance on acceptable sound and vibration levels to ensure that the public's health and well-being are maintained. State law establishes maximum permissible environmental noise levels from one environmental designation for noise abatement (EDNA) to another EDNA (Washington Administrative Code 173-60 – Maximum Environmental Noise Levels). EDNAs are defined as an area or zone (environment) within which maximum permissible noise levels are established. The maximum permissible noise levels detailed in Table 8-1 are measured at the edge of property of the receiving property.

Table 8-1. Maximum Environmental Noise Levels

EDNA[1] of Noise Source	EDNA of Receiving Property		
	Class A	Class B	Class C
Class A (residential / recreational / community service uses)	55 dBA	57 dBA	60 dBA
Class B (commercial and entertainment uses)	57 dBA	60 dBA	65 dBA
Class C (storage and industrial uses)	60 dBA	65 dBA	70 dBA

Source: Washington Administrative Code 173-60

[1]EDNA stands for environmental designation for noise abatement

Between the hours of 10:00 pm and 7:00 am the above noise limitations in receiving properties are reduced by 10 dBA in Class A EDNAs.

8.3 Affected Environment

8.3.1 Noise Sources in Duvall

The existing sound environment in the city is characteristic of urban and residential areas across the Puget Sound Region. The most prominent existing environmental noise is vehicular traffic noise, most pronounced on principal and collector arterials (see Figure 10-1 in Chapter 10 Transportation). Other noise sources in the city are more variable, including noise generated by festivals (primarily during summer months), as well as noise from property maintenance activities (use of powered hand tools, hammers, leaf blowers and lawn mowers), and construction projects (both private property construction and public infrastructure projects). Table 8-2 details existing environmental noise sources in Duvall.

Table 8-2. Existing Environmental Noise Sources in Duvall

Noise Sources	Description
Vehicular Traffic Noise (principal and collector arterials)	State Route 203 (Main Street NE) NE Cherry Valley Road NE Big Rock Road Other collector arterials, as shown on Figure 10-1 in Chapter 10 Transportation Local arterials (these motorized transportation facilities provide local access only, and are generally not associated with significant vehicular traffic noise)
Monroe (Evergreen) Speedway	The Monroe Speedway is located adjacent to the Evergreen Fairgrounds just north of the SR 522 and SR 2 in Monroe, WA. The Speedway hosts regular auto-racing events, and even though it is located quite far from Duvall, it generates noise that can sometimes be heard in Duvall.
BNSF Scenic Subdivision Railway	The BNSF Scenic Subdivision Railway passes from Everett to Wenatchee, passing through Monroe approximately 8 miles to the north of Duvall. Even though it is located quite far from the city, rail traffic can sometimes generate noise that is heard in Duvall.
Majerle Field	Private airfield located approximately 1,200 feet to the north of the City (due north from Holy Innocents Catholic Church) within the Snoqualmie River valley. There is no data available on the amount of use from the airport; however based on the low number of aircraft based out of Majerle Field (5 single engine airplanes and 2 helicopters), it is likely that there are fewer than 2 operational events per day on average. (AirNav.com, 2015)
Festivals	Community festivals include Duvall Days (parade, run, and festival), Sand Blast, SummerStage & TeenStage, Movies in the Park, Big Rock Classic, and Duvall Farmers Market
Park Use and Sports Activities	Daytime and evening outdoor recreation occurs in Taylor Park (children's playground), McCormick and Depot Parks (variety of activities, generally not associated with significant noise), and Cedarcrest High School (youth sports practices and games)
Industrial Businesses	Industrial / warehouse uses that manufacture commercial products and small automotive-related shops
Property Maintenance	Use of powered hand tools (saws, drills, leaf blowers and lawn mowers) and hand-held impact devices (hammers) for home, business, and other property maintenance
Construction Projects	Construction activities have primarily included site development (clearing and grading for residential subdivision), home construction, and Duvall Public Works road and utility improvements

The vehicular traffic on principal arterials includes freight traffic which could produce more noise than motor vehicles. The Washington State Freight and Goods Transportation System (FGTS) classifies roadways, freight railroads and waterways based on the amount of annual freight tonnage they carry. In Duvall, SR 203 (Main Street NE) is classified as a T-2 roadway, which means between 4 million and 10 million gross tons of freight is carried a year. NE Cherry Valley Road and NE Big Rock Road are classified as T-3 roadways (between 300,000 and 4 million gross tons per year). The annual truck tonnage for a specific route is estimated using the average annual daily traffic (AADT), truck percentage, truck type, average truck type tonnage, and working days per year (WSDOT, 2014).

8.3.2 Sensitive Receptors in Duvall

Sensitive receptors are people associated with certain land uses that are considered to be the most sensitive to noise. The most common type of sensitive receptor in Duvall includes residences, located throughout the city. The large majority of residences occur along local arterial streets; these motorized transportation facilities provide local access only, and are generally not associated with significant vehicular traffic noise. Some residences are, however, located along Main Street NE as well as NE Big Rock Road and Cherry Valley Road, and along other collector arterials. Additional sensitive receptor types are detailed in Table 8-3 and Figure 9-1 in Chapter 9 Public Services and Utilities.

Table 8-3. Sensitive Receptors in Duvall

Sensitive Receptors
Residences
Schools – Cedarcrest High School, Eagle Rock Multiage School, Cherry Valley Elementary School
Medical facilities
Institutional Uses – Duvall Public Library, Community Building, Childcare Centers
Parks – Depot, McCormick, Taylor, Taylor's Landing, Big Rock Ball Fields, and other neighborhood parks

8.4 Impacts

Impacts related to environmental noise conditions are analyzed qualitatively in terms of potential effects resulting from implementation of the three Comprehensive Plan EIS alternatives and the No Action alternative. Differences between the alternatives involve the amount and location of new development, associated vehicular use increases, intensity and type of land use, and area remaining undeveloped.

8.4.1 Impacts Common to All Alternatives

Under all alternatives, limited increases in residential density throughout the city would result in some increase in the general level of environmental noise. However, as discussed above, residential land uses do not create an excessive amount of noise in general. In addition, there is relatively low opportunity for future infill development or redevelopment across the majority of Duvall, as many areas are built-out consistent with existing land use designations. Outside of temporary increased noise levels associated with construction, infill residential development is not expected to noticeably change the existing noise environment.

Opportunity for future development is highest along NE 143rd Street extending east from Main Street NE, NE Big Rock Road, and both sides of Main Street NE south of NE 145th Street (Figure 2-2 in Chapter 2 Description of Project Alternatives). Development within this area could be a combination of higher density single family units, attached housing units, and upper floor residences in mixed-use buildings. There can be less outdoor noise generated from attached single-family housing and multi-family housing because there are fewer outdoor residential noise sources, such as lawn mowers and other landscaping equipment (World Health Organization, 1999). That said potential new development would increase environmental noise compared to existing conditions. Commercial uses generally have more environmental noise than residential uses; as such, noise from future commercial activities could result in minor to moderate adverse impacts, as defined in Chapter 1, to adjacent or upper floor residential uses within the NE 143rd Street / Main Street NE / NE Big Rock Road area. It should be noted that historically, mixed use buildings with upper floor residential uses have not been constructed in Duvall. Developers have opted to construct 1-2 story commercial buildings that front a major roadway without a residential component.

Under all alternatives, potential new residential uses could be located immediately adjacent to Main Street NE and near commercial and industrial development as part of mixed-use buildings. Main Street NE has the highest traffic volumes of any road within the city (20 percent higher than the next busiest road (Woodinville-Duvall Road west of Main Street), with approximately 12,100 average annual daily vehicle trips in 2013; see Chapter 10 Transportation for more information. While site design, setbacks and screening considerations would likely limit the number of new residential units directly along Main Street NE, there is potential for moderate adverse impacts from traffic-related noise increases along Main Street NE. Although the large site located on the west side of Main Street NE, South of NE 145 Street has the potential to be developed with ground floor, attached residential housing units (e.g., townhouses or rowhouses), the property has a vested project which proposes to setback attached housing units from the roadway. A commercial structure, community facility and open space are proposed to be located immediately adjacent to Main Street NE.

Under all alternatives, traffic increases along the entire roadway system within Duvall would increase 2.3 to 2.7 times during the PM peak hour depending on the alternative. Much of the future generated traffic would increase as a result of new commercial square footage (see Section 2.2.1.3 in Chapter 2

for Duvall's commercial square footage development capacity). Under all alternatives the majority of new commercial uses would occur along Main Street, primarily in the vicinity of NE 143rd Street. Vehicular trips associated with commercial activity in this area would result in more traffic-generated noise throughout Duvall, with the highest increases expected along Main Street, as well as NE Big Rock Road, NE 143rd Street, and NE 145th Street. Increases in traffic along these roadways could result in minor to moderate impacts to existing and future residential uses, primarily located east of Main Street.

All alternatives include annexation of the North UGA., with future land use designation allowing for low density single family residential development. The North UGA, located at the northern end of the city and surrounded by incorporated areas to the south, east and west, is currently characterized by rural residential uses and vacant parcels (see Chapter 6). Future low density residential development within the North UGA would entirely displace existing rural uses. No other uses with higher potential for environmental noise are proposed. As such, the character of environmental noise within the North UGA would be generally consistent with other existing residential neighborhoods within adjacent areas of the city.

Vehicle generated noise is not anticipated to impact existing or future residences within the North UGA. Road use would be primarily associated with local trips in and out of the residential area (which would likely be developed without thru-street connectivity due to landslide hazards mapped to the north), with low traffic volumes occurring on low-speed residential streets. Future residential uses and traffic within the North UGA would result in minor increases in environmental noise with minor adverse impacts to residences and other noise-sensitive receptors.

8.4.2 Alternative 1: 2015 Comprehensive Plan Alternative

Under Alternative 1, areas of the southwest portion of the City along Main Street NE would be designated for commercial and mixed-use, with higher density residential uses located farther east. As with all alternatives, much of the future increase in vehicular traffic is expected to be associated with new commercial development, primarily occurring along Main Street in the southwest portion of Duvall. The separation from Main Street NE for ground-floor residential uses would reduce road-generated noise for future residential development in this area. Mixed-use buildings are unlikely to develop along Main Street NE because of market conditions. As such, increases in traffic-related noise from Main Street NE would likely result in a minor adverse impact to adjacent residential uses within this area. For other areas of the city, noise impacts under Alternative 1 would be largely consistent with impacts common to all alternatives described in Section 8.4.1.

Alternative 1 includes annexation of the North and Southwest UGA. Noise impacts associated with annexation of the North UGA would be consistent with impacts described under Section 8.4.1. Proposed Comprehensive Plan land use designations for the Southwest UGA include commercial for the northern portion of the UGA and Parks and Open Space for the southern portion. Parks are

considered noise sensitive receptors, with the degree of noise sensitivity dependent on the nature of the intended recreational use. Noise generated by Main Street NE to the west and future commercial and industrial uses to the north could impact future park use. While uses and design considerations determined appropriate for this park could provide opportunity to minimize noise impacts, adjacent noise generated from commercial uses and traffic could result in minor to moderate adverse impacts to future park uses.

8.4.3 Alternative 2: Urban Growth Area Reserve

There would be more properties zoned for ground floor residential uses along Main Street NE under Alternative 2 than under Alternative 1. While site design, setbacks and screening considerations would likely limit the number of new residential units directly along Main Street NE, there is potential for minor to moderate adverse impacts from traffic-related noise increases along Main Street NE in the southeast area of the city. For other areas of the city, noise impacts under Alternative 2 would be largely consistent with impacts common to all alternatives described in Section 8.4.1.

Alternative 2 includes annexation of the City's North UGA and the UGA-Reserve, with future land use designation allowing for low density single family residential development. Noise impacts associated with annexation of the North UGA would be consistent with impacts described under Section 8.4.1. The UGA-Reserve, located to the east and southeast of the city, is currently characterized by rural residential uses and vacant parcels (see Chapter 6 Land Use and Housing). Lots are generally large, with existing residential structures separated by wide setbacks from any neighboring property. Noise generated from property maintenance and use of future residential development within this area would result in minor adverse noise impacts to neighboring rural properties. Generally however, residential use is not considered a major source of environmental noise. Vehicle generated noise is not anticipated to impact existing or future residences within the UGA-Reserve. Road use would be primarily associated with local trips in and out of these residential areas, with low traffic volumes occurring on low-speed residential streets.

8.4.4 Alternative 3: Revised Urban Growth Area Boundaries

There would be more properties zoned for ground floor residential uses along Main Street NE under Alternative 3 than under Alternative 1. While site design, setbacks and screening considerations would likely limit the number of new residential units directly along Main Street NE, there is potential for minor to moderate adverse impacts from traffic-related noise increases along Main Street NE in the southeast area of the city. For other areas of the city, noise impacts under Alternative 3 would be largely consistent with impacts common to all alternatives described in Section 8.4.1.

Alternative 3 would provide opportunity for new development south of existing city limits along NE Big Rock Road. Existing rural residential and undeveloped properties would transition to high intensity commercial use in areas along NE Big Rock Road, and low density single-family residential for areas farther to the east. Proposed new commercial uses along the south side of NE Big Rock Road

would result in the highest potential for new commercial uses compared to other alternatives. New commercial uses would create increases in traffic-generated noise primarily along NE Big Rock Road.

Commercial uses generally have more environmental noise than residential uses; as such, noise from future commercial activities along NE Big Rock Road could moderately impact adjacent residential uses to the south. New intensified land uses throughout the revised UGA area could also moderately impact existing rural residential properties located farther to the south.

Noise impacts associated with annexation of the North UGA would be consistent with impacts described under Section 8.4.1.

8.4.5 Alternative 4: No Action Alternative

There would be more properties zoned for ground floor residential uses along Main Street NE under Alternative 4 than under Alternative 1. While site design, setbacks and screening considerations would likely limit the number of new residential units directly along Main Street NE, there is potential for moderate adverse impacts from traffic-related noise increases along Main Street NE. For other areas of the city, noise impacts under Alternative 4 would be largely consistent with impacts common to all alternatives described in Section 8.4.1 and result in minor adverse impacts.

8.5 Mitigation Measures

Future land use and development activities that occur consistent with any of the proposed Comprehensive Plan alternatives would be required to follow City policies and standards to ensure that noise sensitive uses are compatible with adjacent uses. The updated Comprehensive Plan Land Use element establishes a policy that substantial landscape buffers are placed between commercial and industrial zones and neighboring single- and multi- family zones (Land Use Element Policy 6.7).The City's Unified Development Regulations (DMC Title 14) requires building setbacks and site design considerations for all residential uses. Residential development occurring along Main Street NE, NE Big Rock Road and other arterials would be required to comply with these development standards. To mitigate for minor to moderate adverse impacts, the City should consider also incorporating additional screening considerations such as orientation, use of vegetation, and building techniques to minimize noise impacts. Similar approaches could be considered where future residential uses would occur adjacent to commercial development.

In addition, all infrastructure, civic, and private development activities would be required to comply with local and state noise regulations. Any road project adding additional travel capacity would be required to complete evaluation to ensure that noise generated from future use would not exceed environmental noise standards for adjacent noise sensitive receptors.

8.6 Significant Unavoidable Adverse Impacts

No significant unavoidable adverse noise impacts are expected to result from any of the proposed alternatives.

CHAPTER 9. PUBLIC SERVICES AND UTILITIES

9.1 Relevant Plans, Policies, and Regulations

The Duvall Comprehensive Plan (City of Duvall, 2006) includes a chapter on Capital Facilities (draft prepared in 2013; City of Duvall, 2013) that describes existing infrastructure systems managed and operated by Duvall or other providers and planned improvements to address increased demand. The Capital Facilities element also describes service providers, including police, fire, schools, and other public and private utilities. The Duvall-King County Fire District 45 and the Riverview School District have strategic plans that identify service needs based on existing and projected demands (Duvall Fire, King County Fire District 45, 2014 and Riverview School District No. 407, 2015). The City also plans for their parks, recreation and open space system based on the City of Duvall Parks, Trails, and Open Space Plan (City of Duvall, 2008).

9.2 Affected Environment

9.2.1 Police

9.2.1.1 Inventory of Existing Police Facilities

The Duvall Police Department is a City agency working to promote safety through quick response to crime, community partnerships, and crime prevention. The Department offers a number of services which support this goal including a block watch program, crime prevention program, community crime mapping, concealed pistol license (CPL) and fingerprinting, D.A.R.E. Program, R.A.D. Women's Self Defense Course, collision report forms, bicycle program, traffic calming program, domestic violence, child car seat installation, and school resource officers. The Department also handles public records requests, sex offender searches, and responses to animal complaints. These operations are based out of the Duvall Police Station located in Mid Town near McCormick Park, in a 3,900 square foot modular building on an approximately 6.7 acre shared park property, and includes nearly 50 parking spaces for both public and police use (see Figure 9-1) (City of Duvall, 2015). This facility was constructed in 2004 and was intended to meet the Department's facility needs for 10 years. Major maintenance costs associated with their current facility is expected in the near-term.

9.2.1.2 Duvall Police Department Service Calls and Response Time

Table 9-1 provides the number of service calls the Duvall Police Department received between 2009 and 2013. In 2010, the number of service calls dropped by 12 percent from the previous year. In 2011 and 2012 the service calls increased slightly with a nominal decrease in 2013. Response times in Duvall are typically 2-3 minutes during non-peak periods. During peak times, response times go up to 4-5 minutes (Hert, 2014).

Figure 9-1. Public Facilities

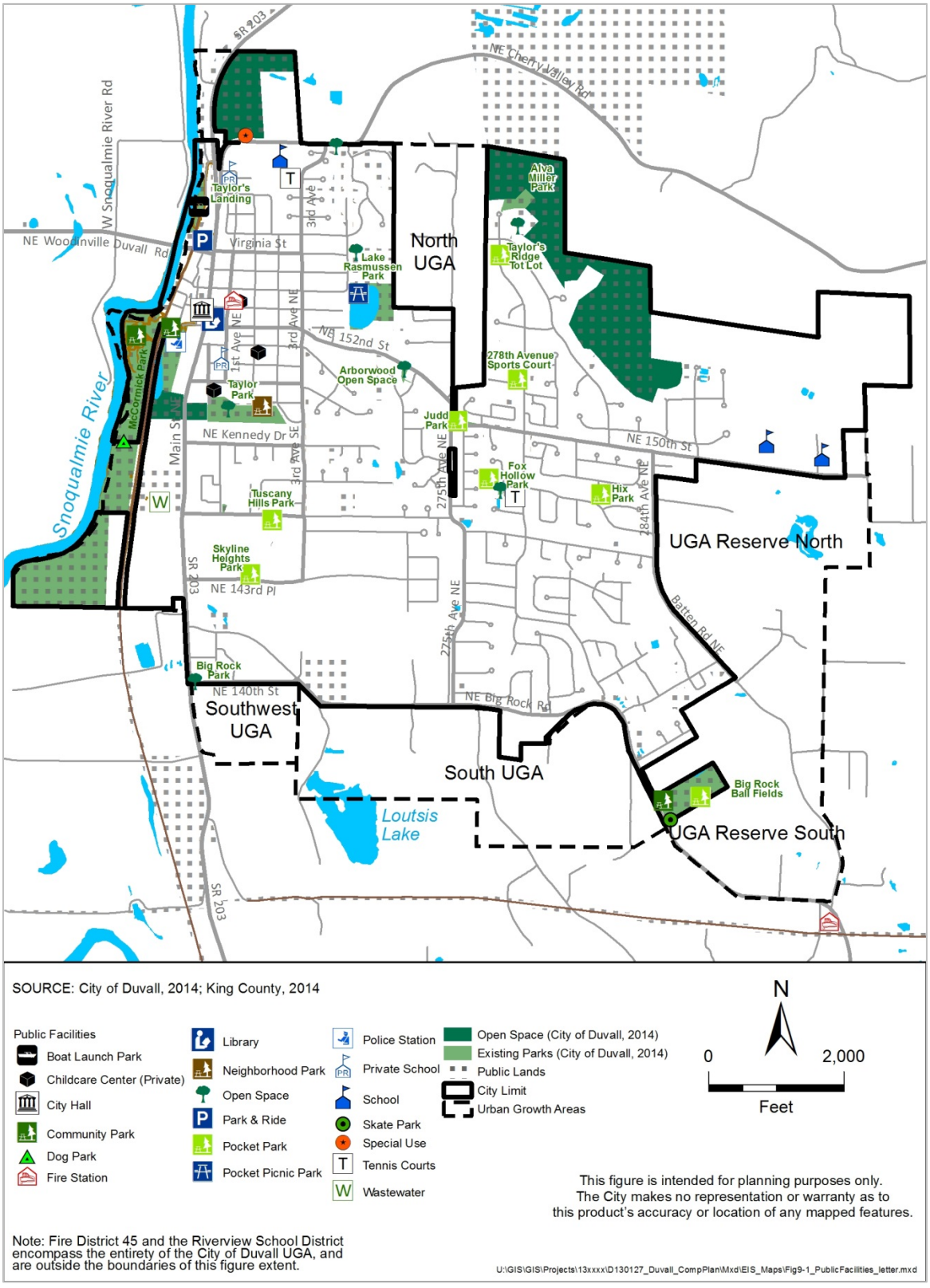


Table 9-1. Duvall Police Department Service Calls City-wide 2009-2013

Year	Service Calls	Percent Change from Previous Year
2009	2,753	N/A
2010	2,419	-12%
2011	2,453	1%
2012	2,524	3%
2013	2,519	0%

Source: Hert, 2014

Duvall has a very low crime rate, which according to the Duvall Police Department is primarily because of the standards that have been in place, including: zoning, building requirements and limitations, emphasis on street and park maintenance, and dedicated and alert police staffing (Hert, 2015). The crime that occurs in Duvall is typically committed by transient populations, which is why police officers maintain a strong presence along the Main Street corridor as a deterrent (Hert, 2015).

9.2.1.3 Improvement goals

An approximately 1,400 square foot Sally Port was constructed at the east end of the Police Department building in 2014. The completed Sally Port added secure access, evidence storage, and prisoner transfer. The Duvall Police Department does not currently have plans for additional facilities but expects to outgrow the Duvall Police Station in the immediate future. The Police Department is working with the Duvall-King County Fire District 45 on conducting a feasibility study for a new, joint facility that would accommodate their current, future and long-term needs.

9.2.2 Fire

9.2.2.1 Inventory of Existing Fire Facilities

The Duvall-King County Fire District 45 covers nearly 50 square miles and serves approximately 13,000 residents within the City of Duvall and surrounding unincorporated King County. The District provides 24-hour fire and emergency medical services based out of three fire stations, one of which is located in the Duvall city limits (see Figure 9-1). The Duvall Station (Station 66) also contains the administrative headquarters for the District. This station is located just east of Old Town and houses a fire engine, aid unit, rescue unit, water tender, brush unit, and rescue boat. The other two stations in the district are Mountain View Road (Station 68) and the Big Rock Station (Station 69), which are currently staffed only part-time. Both stations are located outside of Duvall city limits and UGA boundaries, although Big Rock Station is just south of the UGA-Reserve South. Fire personnel include both volunteer and full-time staff.

9.2.2.2 Duvall-King County Fire District 45 Emergency Service Calls and Response Time

The Fire District conducted a two-year analysis of emergency incidents from 2011 through 2012 to identify the average reflex time for both emergency medical service (EMS) and fire incidents. Reflex time is the amount of time it takes for the emergency response unit to receive notification and begin traveling *en route.*

Table 9-2. King County Fire District 45 Average Response Time 2011-2012

Type	Reflex Time
EMS	1 minute 25 seconds
Fire	1 minute 49 seconds

Source: Duvall Fire, King County Fire District 45, 2014.

To determine the travel time for the emergency response unit to reach the scene, the fire district reviewed call data from 2008-2012. Maps were produced for each station. Travel time from all stations in Duvall typically took 2-4 minutes (Duvall Fire, King County Fire District 45, 2014). The Fire District typically responds to 900-1,100 calls a year (Kuhnhenn, 2014).

9.2.2.3 Improvement goals

The District is planning to shift their headquarters from Duvall to a new station in the Kelly Road/Lake Margaret area (located several miles southeast of Duvall) or joint Fire-Police facility in the next two years. Staffing increases at the new station are expected to be incremental and dependent on the continued success of their volunteer program. The new station or joint Fire-Police facility will be constructed to respond to current and projected population growth in their service area. The District also projects a need to expand the Big Rock Station but has found building and wetland limitations that would limit their ability to expand on that property. Another site will have to be identified within the next 10 years to meet future growth. (Burke, 2015)

9.2.3 Parks and Recreation

9.2.3.1 Inventory of Existing Facilities

The City of Duvall's Public Works Department operates 188 acres that includes 18 parks, open spaces, and other recreational facilities. These spaces include both active and passive recreational features such as picnic areas, basketball courts, soccer fields, a skate park, playgrounds, local trails, a summer stage, a boat launch and riverfront beach area, and one historical farmstead. In addition to these City-operated parks, there is one park and two regional trails operated by King County; three active recreational facilities operated by the Riverview School District; and two playgrounds and one open space area which are privately owned and operated. These parks and recreational spaces are mostly concentrated on the western and northern sides of the City, with some smaller neighborhood and pocket parks scattered throughout (see Figure 9-1).

9.2.3.2 Improvement goals

In 2008, the City of Duvall adopted level of service (LOS) standards based on the National Recreation and Parks Associations recommended standards. The LOS standards are calculated based on population size and spatial distribution of parks. These standards were used to examine Duvall's existing Parks and Recreation facilities, which revealed a deficit of neighborhood and community parks, trails, and certain active recreational facilities. As a result, the City established a 20-year Parks, Trails, and Open Space System to address these deficits which included the North UGA and the UGA-Reserve. Among these goals are an additional 35 acres of neighborhood and community parks, 4.2 miles of trail system, a baseball/softball field, a football/soccer field, 5 tennis courts, 1 basketball court and 1 playground. These additional facilities will be implemented through a phased process over the 20-year period (City of Duvall, 2008).

9.2.4 Government

9.2.4.1 Inventory of Existing Facilities

Duvall's government facilities include City Hall, located at 15535 Main Street, the Public Works Building, located at 14525 Main Street, and the Public Works Yard located between Stella and Cherry Streets at Riverside Avenue (see Figure 9-1). The Duvall Community Center, located on Stella Street between 1st and 2nd Avenues, has been used as a temporary police department and City Hall in the past. The center is currently used for public meetings and leased for private daycare use (City of Duvall, 2015). The City-owned Old Duvall Library site, located on Main Street NE between Stella and Cherry Streets, is currently used as a Visitor Center (City of Duvall, 2015).

9.2.4.2 Improvement goals

In anticipation of population growth, the City has a goal to construct a new City Hall, which could streamline City departments and customer services from the existing three separate locations into one single facility. An exact location of the new City Hall has not yet been determined, though residents indicated a preference for it to be located in Old Town. (City of Duvall, 2013)

9.2.5 Schools

9.2.5.1 Inventory of Existing School Facilities

There are 3 public schools located in Duvall (see Figure 9-1). These include Cedarcrest High School, Eagle Rock Multi-Age School, and Cherry Valley Elementary School. These schools are part of the Riverview School District, which also services schools in Carnation and King County. The district covers 250 square miles and has a total enrollment of approximately 3,011 students. The current inventory of facilities in the whole District indicates a permanent capacity of 2,537 students, with an additional 432 student capacity available in interim facilities. (City of Duvall, 2013; Riverview School District, 2015)

9.2.5.2 Student Enrollment

To plan for future student enrollment, Riverview School District uses the cohort survival model, which projects a "survival rate" for each grade, based on the proportion of students who historically continue from one grade to the next. Historical kindergarten enrollment patterns and district enrollment growth patterns are used to project future kindergarten enrollment. The Draft 20-Year Capital Facilities Plan identified enrollment projection by school grade based on the cohort survival model. Over 4,000 students are estimated to attend Riverview School District schools in the 2034-2035 school year. The Riverview School District determined that a growth of around 1,000 students would outstrip the capacity of the schools at all grade levels. To meet these capacity deficiencies, the Riverview School District identified the need for the following improvements:

- A new K-5 elementary school in the Duvall area within the next six years
- Acquisition of portable classrooms for all grade levels
- An eight-classroom addition to Cedarcrest High in 2025
- A new 750-student capacity middle school in the Duvall area in 2031

These improvements and additions will help meet the need anticipated from projected growth. Transferring students to schools with excess capacity is not a preferred approach for the Riverview School District because involuntary transfer may result in difficulties in the community with staffing and with transportation. The District also prefers to serve students at small schools based on evidence that suggests this practice benefits student learning and school culture. (Riverview School District, 2015)

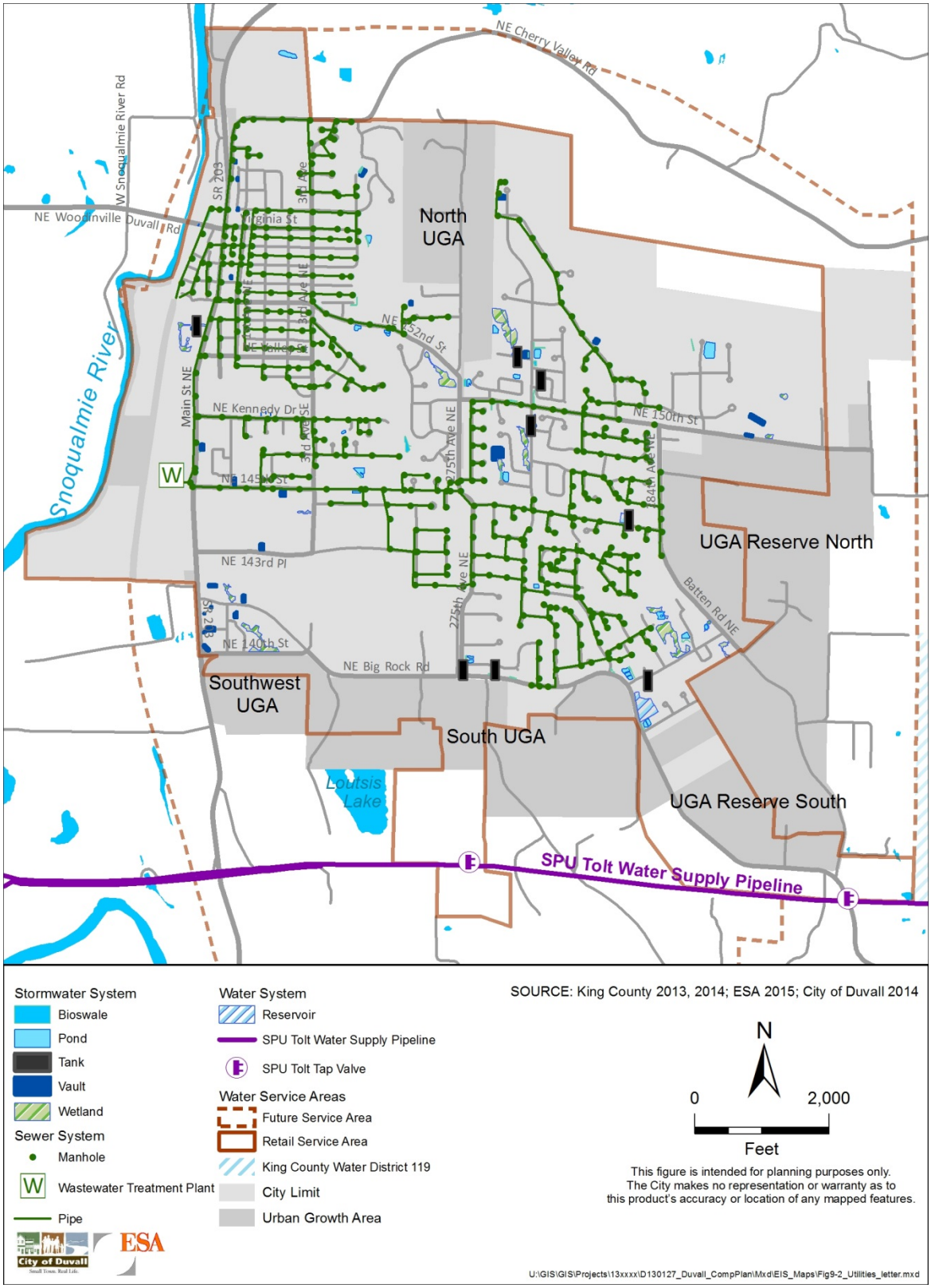
9.2.6 Utilities

9.2.6.1 Inventory of Existing Utilities

The City of Duvall's utility system is provided through local and regional agencies and private service provider companies (see Figure 9-2 for location of utility infrastructure). The following information is based on the Duvall Comprehensive Plan, the Duvall Draft Capital Facilities Element prepared in 2013 and the Duvall Comprehensive Water System Plan (City of Duvall, 2006; 2012; 2013).

- **Water:** Seattle Public Utilities provides wholesale water to the City of Duvall via the Tolt transmission main. The City's system includes two Tolt transmission main supply stations, two reservoirs, a booster pump station, and a total of 39 miles of water main.
- **Wastewater:** The City of Duvall provides wastewater services to approximately 2,350 customers within Duvall city limits. The citywide sewer system was constructed in 1976, and consists of approximately 32 miles of gravity and force mains and five City-owned submersible pump stations. Pipes are made of concrete, asbestos cement, and PVC. The current wastewater treatment plant was upgraded in 2004 to provide capacity for up to 13,100 people located in Duvall city limits.

Figure 9-2. Utility Infrastructure



- **Stormwater**: the City of Duvall provides stormwater services within the City. The system consists of 9 drainage basins, flowing into Cherry Creek and Snoqualmie River. There are currently 30 stormwater detention ponds, bioswales and ditches, and approximately 40 detention tanks, pipes, and filters.
- **Electricity:** Electricity is provided by Puget Sound Energy via the Duvall Substation (located at 13201 277th Ave NE), which is fed by Stillwater, Stillwater-Cottage Brook, and Bonneville Power Administration overhead transmission lines.
- **Gas:** Gas is provided by Puget Sound Energy via the Northwest Pipeline. 4- and 6-inch intermediate pressure supply lines feed the Duvall planning area, and are controlled by 24 main valves along pressure lines.
- **TV and Internet:** Private communication utilities provide Duvall residents TV and internet service via overhead and underground cables, and rents pole space and shares trenches with Puget Sound Energy and Verizon Communications.
- **Telephone and DSL:** Private communication utilities provide phone and DSL services to the City via 10 electronic serving area sites and fiber optic cable. There is a Verizon office on West Snoqualmie Valley Road and NE Woodinville-Duvall Road, a Verizon remote switch in West Duvall, and Verizon and AT&T cell stations at the Crestview 0.5MG Tank.

9.2.6.2 Improvement goals

The utility infrastructure in Duvall is generally adequate for the current population demand, though the existing electricity transmission line is 98 years old and reaching energy use capacity. System improvements are summarized in the Capital Improvement Program within the Comprehensive Plan and supporting documentation. Major upgrades to utilities are identified below (City of Duvall, 2006; 2012; 2013):

- **Water:** Major improvements include additional water pipe looping to provide increased reliability and protect water quality, seismic retrofits at the two storage reservoirs, and replacement of the Tolt 2 supply line. Certain other improvements to Duvall's water system have been identified in order to accommodate the projected 20-year population growth. Additionally, Duvall has contracted with SPU to purchase water supply at wholesale rates until 2062.
- **Wastewater:** The City has proposed improvements and upgrades to sewer mains and pump stations, infiltration and inflow projects, frontage improvements near the waste water treatment plant, and certain sewer main repairs and replacements. Pump and treatment train improvements are proposed for the existing wastewater treatment plant to provide sufficient capacity for the 20-year projected population growth as well as to take advantage of new and more efficient technologies.
- **Stormwater:** Stormwater facilities vary within the city and include older, detention-only systems, and new water quality and low impact development (LID) systems. Several retrofits

have been identified to improve stormwater quality along with other system-wide drainage improvements.

- **Electricity:** There is a plan to rebuild the existing power line between Duvall, Stillwater and Novelty Hill substations to increase capacity.
- **Gas:** Increased size and capacity is planned at portions of the SR-203 transmission main along with minor distribution improvements and extensions.
- **TV and Internet:** Systems will be upgraded as demand increases.
- **Telephone and DSL:** There are future plans to upgrade to DSL and fiber.

9.3 Impacts

9.3.1 Impacts Common to All Alternatives

9.3.1.1 Police

Population and job growth are not presumed to cause a citywide increase in reported crime. However, the Police Department expects to see an increase in community demand as a result of development in the North UGA and NE 143rd Street / Main Street NE / NE Big Rock Road area which will require the addition of two police officers and clerical staff in order to maintain their current commitment to community outreach and policing (Hert, 2015). Demand is expected to be associated with increased parking management and vehicular/pedestrian accidents. Population and employment increases may result in an increase in police response time to service calls because of an increase in traffic congestion. The Police Department would also need a larger Police Station to accommodate an increase in staff. Mitigation measures addressing these needs are identified below and would serve to avoid moderate adverse impacts, as defined in Chapter 1, to police services.

9.3.1.2 Fire

Although population and job growth do not directly result in additional calls for service, the Duvall-King County Fire District 45 expects to see an increase in service calls. Typically, population demographics (e.g., age and socio-economic characteristics) and buildings (age, processes, and construction) play the biggest role in driving an increase in call numbers (Burke, 2015). The District has already identified a need for two new fire stations to address projected increase in demand. Provided the District obtains the funding and proceeds with their plans, moderate adverse impacts on fire services from population and job growth in Duvall are not anticipated.

All new buildings associated with projected growth would be constructed consistent with the International Fire Code, adopted by reference in Duvall Municipal Code Title 10. Adequate fire flow and emergency access would be provided in new structures as required by the fire code.

9.3.1.3 Parks and Recreation

Population and job growth over the 20-year planning period would generate more demand for parks, recreation facilities and open space across the city. Current deficiencies in meeting City-established LOS standards will likely continue under all alternative scenarios and result in moderate adverse impacts unless mitigation measures identified in Section 9.4.2 are implemented. Parks and open space would be constructed in the North UGA consistent with City code requirements and would therefore not result in any additional impacts.

9.3.1.4 Government

Population and job growth would generate more demand for government services. The City has already identified a need for a new City Hall. A mitigation measure addressing this need is identified below and would serve to avoid moderate adverse impacts to government services.

9.3.1.5 Schools

Enrollment forecasts have been calculated by the Riverview School District to the 2034-2035 school year. The improvements identified in the 20-Year Capital Facilities Plan would address the capacity deficiencies identified as a result of increased enrollment, assuming the District receives voter-approved funding. If approved, population and employment growth under any alternatives would not result in moderate adverse impacts. If these improvements are not approved, transfers to other schools with capacity and other interim measures could provide adequate school capacity. The City of Duvall annually adopts the Riverview School District annual Capital Facilities Plan ensuring ongoing coordination between the City and the School District (Thomas, 2015).

Potential locations for new elementary and middle schools in Duvall include existing school district property adjacent to Cedarcrest High School, along the Big Rock Road corridor, or outside Duvall city limits. While specific locations are currently undetermined, the placement of the new schools could influence transportation and residential development patterns, because these types of schools are considered to be especially desirable to be within walking distance of homes. School transportation services would not be adversely impacted under all of the alternatives.

9.3.1.6 Utilities

Population and commercial growth would increase demand on public and private utility infrastructure. Major improvements, as summarized under Section 9.2.6.2 under should be implemented to support growth under all alternatives and to avoid moderate adverse impacts.

9.3.2 Alternative 1: 2015 Comprehensive Plan Alternative

9.3.2.1 Police

Impacts to police services under Alternative 1 would occur consistent with those described in Section 9.3.1 (Impacts Common to All Alternatives). The majority of the population and commercial growth

that would occur under Alternative 1 is focused along the Main Street NE corridor and in the North UGA, both of which are easily accessed via major roadways with little anticipated police response time impacts.

9.3.2.2 Fire

Impacts to fire services under Alternative 1 would occur consistent with those described in Section 9.3.1 (Impacts Common to All Alternatives). The majority of the population and commercial growth associated with Alternative 1 is focused along the Main Street NE corridor and the North UGA, both of which are easily accessed via major roadways with little anticipated Fire Department response time impacts. Currently, the majority of these areas are served by the City's water system. Sufficient water service and pressure is available to respond to potential structural fires assuming continued implementation of the City's Capital Improvement Plan.

9.3.2.3 Parks and Recreation

Impacts to parks and recreation under Alternative 1 would occur consistent with those described in Section 9.3.1 (Impacts Common to All Alternatives). The annexation of the Southwest UGA with a portion designated as Parks and Open Space would alleviate some of the deficiency once the property is developed into a park or set aside as open space.

9.3.2.4 Government

Impacts to government services under Alternative 1 would occur consistent with those described in Section 9.3.1 (Impacts Common to All Alternatives).

9.3.2.5 Schools

Impacts to schools under Alternative 1 would occur consistent with those described in Section 9.3.1 (Impacts Common to All Alternatives).

9.3.2.6 Utilities

Sufficient sewer, water, and stormwater services are present to accommodate growth under Alternative 1 assuming that development is consistent with Public Works Standards and the City's Capital Improvement Program.

9.3.3 Alternative 2: Urban Growth Area Reserve

9.3.3.1 Police

Impacts to police services under Alternative 2 would occur consistent with those described in Section 9.3.1 (Impacts Common to All Alternatives). The majority of the population growth would occur along Batten Road in the UGA-Reserve. This area does not have a direct, major roadway access from the existing Duvall Police Station. Therefore, a moderate increase in police response time is anticipated under Alternative 2. The extent of the increase in response time would depend on future roadway

connections, population growth distribution, police department staffing, and location of future police station.

9.3.3.2 Fire

Impacts to fire services under Alternative 2 would occur consistent with those described in Section 9.3.1 (Impacts Common to All Alternatives). Similar to the impacts described under Police in Section 9.3.3.1, additional population in the UGA-Reserve may result in a moderate increase in Fire Department response time due to the lack of major roadway access. The extent of the increase in response time would depend on future roadway connections, population growth distribution, fire department staffing, and location of future fire station location(s).

Currently, the majority of the UGA-Reserve area is not served by the City's water system. However, sufficient water service and pressure is available to accommodate growth assuming implementation of the City's Capital Improvement Plan.

9.3.3.3 Parks and Recreation

Impacts to parks and recreation under Alternative 2 would occur consistent with those described in Section 9.3.1 (Impacts Common to All Alternatives). Encouraging population growth in the UGA-Reserve will likely make it more difficult for the City to meet the LOS standards that are based on spatial distribution than the other alternatives because of the sheer size of the area and its distance from existing parks and recreation facilities.

9.3.3.4 Government

Impacts to government facilities under Alternative 2 would occur consistent with those described in Section 9.3.1 (Impacts Common to All Alternatives).

9.3.3.5 Schools

Impacts to schools under Alternative 2 would occur consistent with those described in Section 9.3.1 (Impacts Common to All Alternatives). The school district property located next to Cedarcrest High School would be designated Public Facilities, a land use designation consistent with a proposed school use. This would make the annexation process easier for the school district when they decide to develop the site. Compare to the other alternatives, population growth in the UGA-Reserve would occur in closest proximity to the school district property which could result in less reliance on car and bus trips.

9.3.3.6 Utilities

Sufficient sewer, water, and stormwater services are present to accommodate growth associated with this alternative provided that growth is completed in accordance with Public Works Standards and the City's Capital Improvement Program. However, specific improvements will be required to accommodate growth within this alternative including installation of sewer lift station(s) in areas that

do not gravity drain to the Wastewater Treatment Plant and possible improvements to the water system pumping station.

9.3.4 Alternative 3: Revised Urban Growth Area Boundaries

9.3.4.1 Police

Impacts to police services under Alternative 3 would occur consistent with those described in Section 9.3.1 (Impacts Common to All Alternatives). The majority of the population and commercial growth associated with this alternative is focused along the Big Rock Road corridor which has direct, major roadway access from the existing police station. An increase in police response time is not anticipated for growth associated with this alternative.

9.3.4.2 Fire

Impacts to fire services under Alternative 3 would occur consistent with those described in Section 9.3.1 (Impacts Common to All Alternatives). The majority of the population and commercial growth associated with this alternative is focused along the Big Rock Road corridor which has direct, major roadway access from the existing Fire Station. An increase in Fire Department response time is not anticipated for growth associated with this alternative. Currently, the Big Rock Road corridor is served by the City's water system. Sufficient water service and pressure is available to accommodate growth within these areas provided continued implementation of the Capital Improvement Plan.

9.3.4.3 Parks and Recreation

Impacts to parks and recreation under Alternative 3 would occur consistent with those described in Section 9.3.1 (Impacts Common to All Alternatives).The impacts under Alternative 3 would be slightly less than Alternative 2 because, although the total land area would be the same, the locations of the UGA-Reserve South and South UGA would be easier to serve under Alternative 3 because of their closer proximity to the Big Rock Ball Fields and Main Street.

9.3.4.4 Government

Impacts to government facilities under Alternative 3 would occur consistent with those described in Section 9.3.1 (Impacts Common to All Alternatives).

9.3.4.5 Schools

Impacts to schools under Alternative 3 would occur consistent with those described in Section 9.3.1 (Impacts Common to All Alternatives). Similar to Alternative 2, designating the school district property located next to Cedarcrest High School as Public Facilities would make the annexation process easier for the school district when they decide to develop the site.

9.3.4.6 Utilities

Sufficient sewer, water, and stormwater services are present to accommodate growth associated with this alternative provided that growth is completed in accordance with Public Works Standards and the City's Capital Improvement Program. However, specific improvements will be required to accommodate growth within this Alternative including installation of sewer lift station(s) in areas that do not gravity drain to the Wastewater Treatment Plant.

9.3.5 Alternative 4: No Action Alternative

Impacts to public services and utilities under Alternative 4 would occur consistent with those described in Section 9.3.1 (Impacts Common to All Alternatives) and result in minor to moderate adverse impacts.

9.4 Mitigation Measures

Mitigation measures to minimize adverse impacts are identified below for applicable services and utilities:

9.4.1 Police

In order to avoid moderate adverse impacts to police services, the City should provide funding to address the following needs:

1. Additional police officers and clerical staff
2. Bigger police station to accommodate additional staff

9.4.2 Fire

In order to avoid moderate adverse impacts to fire services, the City should work with Duvall-King County Fire District 45 to identify appropriate sites for building new fire stations if any should occur within city limits or UGA boundaries. The City could also facilitate conversations between Police and Fire to explore co-location options.

9.4.3 Parks and Recreation

Given that future growth across the city and its UGA would continue to generate additional demands upon parks, recreation, and open spaces in relation to its spatial and population LOS standards, the City should consider revising the LOS standards so that they more closely align with their ability to obtain adequate funding and mitigation fees from developers to help avoid moderate adverse impacts. The City should also work with developers as part of the Master Plan annexation process to identify and set aside land for parks and open space.

9.4.4 Government

The City should identify funding sources to design and construct a new City Hall to avoid adverse moderate impacts.

9.4.5 Schools

The City should work with the Riverview School District to identify appropriate sites for building a new elementary and middle school to meet projected student enrollment needs.

9.4.6 Utilities

The City should continue to fund and implement the Utility Capital Improvement Plan to avoid moderate adverse impacts to water, sewer, and stormwater service. Specific improvements, such as sewer lift stations, should be constructed consistent with the alternative selected by the City Council.

9.5 Significant Unavoidable Adverse Impacts

No significant unavoidable adverse noise impacts are expected to result from any of the proposed alternatives.

CHAPTER 10. TRANSPORTATION

10.1 Relevant Plans, Policies, and Regulations

Existing state, regional and local planning documents establish a policy framework intended to guide Duvall's approach to transportation service and infrastructure provision (Table 10-1).

Table 10-1. Long Range Planning Documents

Plan	Agency	Description
Growth Management Act	Washington State Department of Commerce	Adopted in 1990, the Growth Management Act (GMA) requires state and local governments to inventory their transportation infrastructure and needs to ensure adequate transportation facilities for current and future residents.
Vision 2040	Puget Sound Regional Council	Updated in 2008, Vision 2040 provides a long-range transportation strategy for the central Puget Sound region that considers critical transportation functions in the context of regional growth, economics, the environment and public health. The Duvall Comprehensive Plan update must ensure consistency with Vision 2040.
Countywide Planning Policies	King County	Adopted in 2013 by the Growth Management Planning Council, this document outlines a county-wide vision and serves as a framework for each jurisdiction to develop a balanced transportation element that is consistent with VISION 2040 and proposed regional mobility. High capacity transit, non-motorized transportation, high-occupancy vehicle travel, mode-split goals, preservation and maintenance of existing transportation facilities, and development of financing strategies are encouraged to meet future transportation needs.
Clean Air Conformity Act	Washington State	The Washington State Clean Air Conformity Act was adopted in 1993 and implements the directives of the Federal Clean Air Act. The Transportation Element of the City's Comprehensive Plan must support guidance contained within, as required by Washington Administrative Code 173-420-080.
Healthy Communities	Washington State Department of Health	The GMA was amended in 2005 to include the Healthy Communities Amendment, ESSB 5186. Comprehensive plans are directed to address the promotion of Healthy Communities through urban planning and transportation approaches that promote physical activity and include bicycle and pedestrian components.

Plan	Agency	Description
Comprehensive Plan, Transportation Element	City of Duvall	The City adopted a Transportation Element for the Comprehensive Plan in 2009. The 2009 Transportation Element includes land use projections establishing transportation needs, and identifies the specific transportation projects for the Capital Facilities Element, another chapter of the Duvall Comprehensive Plan. It also addresses street classifications, levels of service, travel forecasts, travel improvements, alternative modes, funding strategies and concurrency management (see Section 10.2.1.3).

Source: Washington State Legislature, 1990, 1993, 2005; Puget Sound Regional Council, 2009; King County 2012; City of Duvall, 2009.

10.2 Affected Environment

10.2.1 Existing Roadway Network

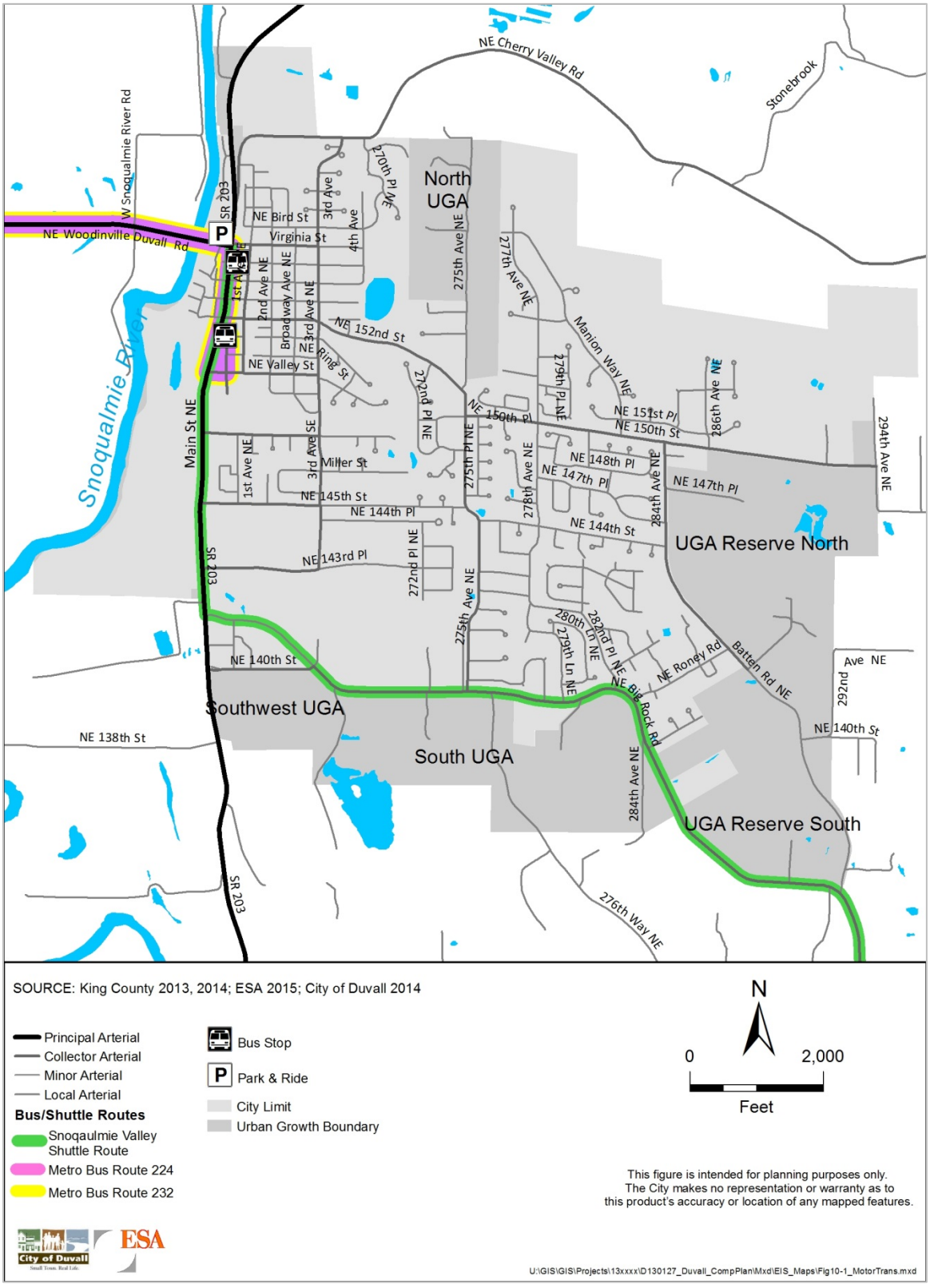
10.2.1.1 Roadway Types

Functional classification of roadways categorizes highways, streets and roads according to the character of traffic service that they are intended to provide and the degree of access to adjacent properties they allow. Duvall's roadway system is comprised of principal arterials, minor arterials, collector arterials and local access streets (see Figure 10-1). Together, the roadway network provides a connected framework that supports transportation to, from, and within the city. The following definitions of roadway types are based on Duvall's Transportation Element (City of Duvall, 2009):

Principal Arterial: Principal arterials can be highways connecting major community centers and outlying areas, or roads that have relatively high traffic volumes within the city. They are between two and five lanes in width and usually carry the highest traffic volumes of city roadways. They are constructed with partial limitations on access through intersections and common driveways, and are generally intended to serve "through" traffic. Major bus routes are usually located on principal arterials. Principal arterials in Duvall include Main Street (SR-203) and Woodinville-Duvall Road.

Minor Arterial: Minor arterials are roads and highways that connect centers and facilities within the community, provide connections to outlying areas of the community, and distribute traffic to and from principal arterials. Minor arterials can vary from two to five travel lanes. This type of facility stresses mobility and circulation needs over providing specific access to properties. Minor arterials allow densely populated areas easy access to principal arterials and adjacent land uses, and have lower traffic volumes than principal arterials. Cherry Valley Road and Big Rock Road are classified as minor arterials within the city. East of the city, these two roads are classified as collector arterials by King County.

Figure 10-1. Motorized Transportation



Collector Arterial: Collector arterials connect two or more neighborhoods and carry traffic within neighborhoods. They serve very little through traffic, but provide connections to principal and minor arterials and provide high access to adjacent land uses. Collector arterials are limited to a maximum of three lanes. Several north-south and east-west trending collector arterials serve to connect different neighborhood areas within the City.

Local Access Street: This category consists of streets that have the sole purpose of providing direct access to specific abutting properties, such as residences. Local access streets usually connect with a minor arterial and enable access between a place of residence and a commercial business or place of employment. Typically, traffic moves at low speeds (20 to 25 miles per hour) and turning movements are frequent.

Roadway Traffic Volumes

The roadway with the highest amount of traffic in Duvall is Main Street/SR-203. Traffic volumes along SR-203 have been steadily increasing over time. The volume of vehicles per day within the city has increased from approximately 9,800 Average Annual Daily Traffic (AADT) trips in 1993 to approximately 12,100 AADT trips in 2013 as documented in the Annual Traffic Reports prepared by the Washington State Department of Transportation (WSDOT) (WSDOT, 1993; 2013). This represents a 23 percent increase in SR-203 traffic during the last two decades. However, the majority of the increase occurred within the 1993-2003 timeframe with relatively flat growth over the last 10 years.

Roadway traffic is also measured during the PM peak hour (the 60-minute interval that contains the largest volume of traffic during the PM time period) as an indication of peak congestion. Based on the City's 2015 development capacity analysis and Transpo Group's traffic model there are up to approximately 5,600 PM peak hour vehicle trips generated for 2015 throughout the city's entire roadway network (including city limits, urban growth areas and urban growth area reserves) (City of Duvall, 2015; Turley, 2015a; 2015b). The PM peak hour volumes account for a high percentage of the total daily traffic, which is typical for outlying residential areas of an urbanized area. Based on 2015 Woodinville-Duvall Road traffic counts, eastbound traffic entering the city comprises 70 percent of the total PM peak hour traffic while westbound traffic leaving the city accounts for only 30 percent of the total PM Peak hour traffic. These values are indicative of the travel patterns due to regional jobs and other activities being located west or southwest of the city.

The City of Duvall hired Transpo Group, a transportation planning consulting firm, to help identify the potential impacts of population growth on Duvall's transportation system (Turley, 2015a; 2015b). Transpo Group prepared a traffic model based on recent traffic counts, land use, and trip data to establish current conditions and to run scenarios for future roadway network conditions. More information on the results of the model is included in Section 10.3 below.

10.2.1.2 Concurrency and Level of Service Standards

A defining feature of the Washington State Growth Management Act (GMA) is its concurrency requirement. As it specifically relates to transportation, any needed improvements, programs, or financial commitments to complete improvements or strategies must be in place at the time development occurs. While the GMA leaves the implementation of concurrency to local discretion, it requires the provision of adequate facilities to serve new growth. As a result, jurisdictions have developed a wide range of programs that are compatible with their own unique transportation, land use, and other planning goals.

Vision 2040 considers recent amendments to state law that encourage concurrency solutions such as non-motorized transportation, transit, improved system efficiencies, and transportation demand management as a response to concurrency challenges. It encourages improved inter-jurisdictional coordination to help address the common and shared impacts of development and facility needs. Concurrency programs and methods should be developed that fully consider growth targets, service needs, and level-of-service standards. The level of service standards should be focused on the movement of people and goods instead of solely on vehicles. Non-motorized, pedestrian, and other multimodal types of transportation options should be addressed in concurrency programs, both in assessment and mitigation. Also, concurrency programs should be tailored for centers and other subareas to encourage development that can be supported by transit.

The GMA requires the City to establish service levels for the street network and to provide a means for correcting current deficiencies and meeting future needs. The term "level of service" is used to describe the performance of a transportation facility. Level of service, or LOS, is a qualitative measure used to describe operational conditions, and the perception of these conditions by drivers and passengers. LOS are given letter designations, from A to F, and assigned based on operating conditions. LOS A represents the best operating conditions and LOS F represents the worst. Motorist and passenger perceptions are influenced by travel conditions such as speed, time, freedom to maneuver, traffic interruptions and delays, comfort, and convenience.

The City has adopted LOS standards for all intersections, and evaluates service levels at weekday PM peak hours, which represent the worst traffic conditions. The City's standard for intersections with a functional classification of principal, minor, or collector arterial is LOS C. The standard for intersections along SR-203 is LOS D. The LOS standard for SR-203 is only established as a guideline for WSDOT to evaluate capacity deficiencies. The City does not apply concurrency requirements to SR-203 because the City does not have the authority to alter the level of service on a state highway, the final responsibility for making decisions concerning improvements to the highway, or the ability to raise necessary funding (City of Duvall, 2009).

Of the 22 intersections evaluated as part of Transpo Group's 2015 model, all operated at or above the City's LOS standard except the intersection of NE 143rd Place and SR-203 which operated at LOS E (this

intersection has operated at LOS E for more than 6 years). The lower LOS rating at this location is due to high amounts of through traffic along Main Street, causing delays at intersections (Turley, 2015a; 2015b).

10.2.1.3 Freight Mobility

The movement of freight through Duvall's roadway system is a major consideration for transportation planning for the City of Duvall. Trucks from as far away as British Columbia and eastern Washington use SR-203 to bypass congestion on I-5 and I-405. The Washington State Freight and Goods Transportation System classifies roadways, freight railroads and waterways based on the amount of annual freight tonnage they carry. In Duvall, SR 203 is classified as a T-2 roadway, which means between 4 million and 10 million gross tons of freight is carried a year. NE Cherry Valley Road and NE Big Rock Road are classified as T-3 roadways (between 300,000 and 4 million gross tons per year). The annual truck tonnage for a specific route is estimated using the average annual daily traffic, truck percentage, truck type, average truck type tonnage, and working days per year (WSDOT, 2014).

10.2.2 Transit Services

King County Metro services Duvall with two bus routes: Metro Routes (MR) 232 and 224 (see Figure 10-1). Both routes go to Redmond Town Center and Bellevue Transit Center. The Snoqualmie Valley Shuttle Route also provides service to Duvall, linking the city to Carnation, Fall City, and Snoqualmie. King County and the City of Duvall jointly operate a park and ride on the east bank of the Snoqualmie River at NE Woodinville Duvall Road. See Figure 10-1 for location of bus stops and bus and shuttle routes.

Figure 10-1 shows the street network and bus routes that serve the Duvall community based on King County and City GIS data. According to the U.S. Census, the majority of the working population in Duvall drives to work alone (77 percent) (see Table 10-2). This is a higher percentage than King County overall. Twelve percent carpool, likely using the Microsoft Connector Commute Shuttle (Duvall Express) and King County Rideshare services. The Connector transports Microsoft Employees from neighborhood stops to the Redmond Campus (Washington State Transportation Commission, 2014). The Duvall Express serves the Duvall and Cottage Lake communities. People who use the King County Rideshare meet at the Duvall Park and Ride located at SR-203 and NE Duvall/Woodinville Road.

Table 10-2. Commuting to Work (2012)

Employment Categories and Means of Transportation to Work	Duvall		King County
	Number	Percentage	
Workers 16 years and older	3,330		
Car, truck, or van	2,954		
Drove alone		77%	65%
Carpooled		12%	11%
In 2-person carpool		10%	9%
In 3-person carpool		0.8%	1%
In 4-or-more person carpool		1%	1%
Public Transportation	127	4%	11%
Walked	1	0.03%	5%
Bicycle	0	0%	2%
Taxicab, motorcycle, or other means	30	1%	1%
Worked at home	210	6%	6%

Source: US Census. 2008-2012 American Community Survey 5 Year Estimates, Table S0801[1]

10.2.3 Pedestrian and Bicycle Network

Duvall's transportation infrastructure includes distinct elements for non-motorized travel, including sidewalks, crosswalks, striped bicycle lanes, staircases, pedestrian bridges, curb ramps, and multi-use trails. Street system design includes features that encourage non-motorized connectivity, such as crosswalks and traffic calming elements, which support safe travel for non-motorized users.

Figure 10-2, Walking Routes and Bicycle Lanes, maps the walking routes and roadways with painted bicycle lanes throughout Duvall. Pedestrian crosswalks are incorporated into the walking routes design where Main Street intersects with Stephens Street, Cherry Street, and Woodinville-Duvall Road. The Snoqualmie Valley Trail (SVT) provides opportunities for non-motorized recreation, including equestrian and off-road bicycling.

The City's Development Design Standards set specific standards for the development of bicycle facilities, varying from bicycle lanes to shared roadway bicycle ways. Many of the City's facilities are deficient in these standards. As growth, development and traffic increase, facility availability and design become more important. Bicyclists generally share the roadway with automobiles in the City of Duvall, with SR-203, Big Rock Road, Cherry Valley Road and Woodinville-Duvall Road indicated as preferred routes in King County's Bicycling Guidemap. However, these roads have high volumes of

[1] Note that in some cases the data from the American Community Survey can have a high margin of error because it is based on a sample of Duvall's population.

traffic and are without a curb lane or shoulder (City of Duvall, 2009). The existing bicycle network is depicted in Figure 10-2

The City strives to improve pedestrian connectivity by incorporating pedestrian facilities into roadway improvement projects and new development. In new projects, concrete sidewalks are required on both sides of all arterials, neighborhood collectors, local access streets, multiple-dwelling and business access streets; however, connectivity outside of newer developments is lacking throughout the city. Existing sidewalks are depicted in Figure 10-3 Sidewalks, which identifies the location of sidewalks within public rights of way, including along of Main Street, NE Stephens Street, Bruett Road, 3rd Avenue, and NE 150th Street.

10.2.4 Safety

Traffic accidents are an indication of where safety issues may exist within a transportation system. Traffic accident data are available from 2007 thru the middle of 2014 from the City of Duvall (Benson, 2014b). Over this period, there were a total of 278 reported auto accidents on public roads within Duvall, an average of just over 37.5 per year. The totals for which data has been assembled have been 42 (2011), 48 (2012) and 32 (2013). Of all accidents over the 7.5 year period, 66 (24 percent) were rear-end collisions, and 42 (15 percent) reported as related to loss of vehicular control. There were only three reported car vs. pedestrian accidents, and only two bike-involved vehicular accidents (there was also one car vs. bear accident). Other accidents were reported as occurring for a variety of reasons.

Although sidewalk infrastructure in the city is not comprehensive, the low rate of pedestrian accidents may be attributed to the relatively well-connected and complete sidewalk systems within residential neighborhoods with high pedestrian trip generation and relatively low vehicle traffic volumes. However, poorly connected incomplete sidewalk systems are present along SR-203 and many minor arterials (see Figure 10-3). The lack of sidewalks within these areas pose a high pedestrian safety risk that may not be documented at this time because of associated low pedestrian traffic.

Figure 10-2. Walking Routes and Bicycle Lanes

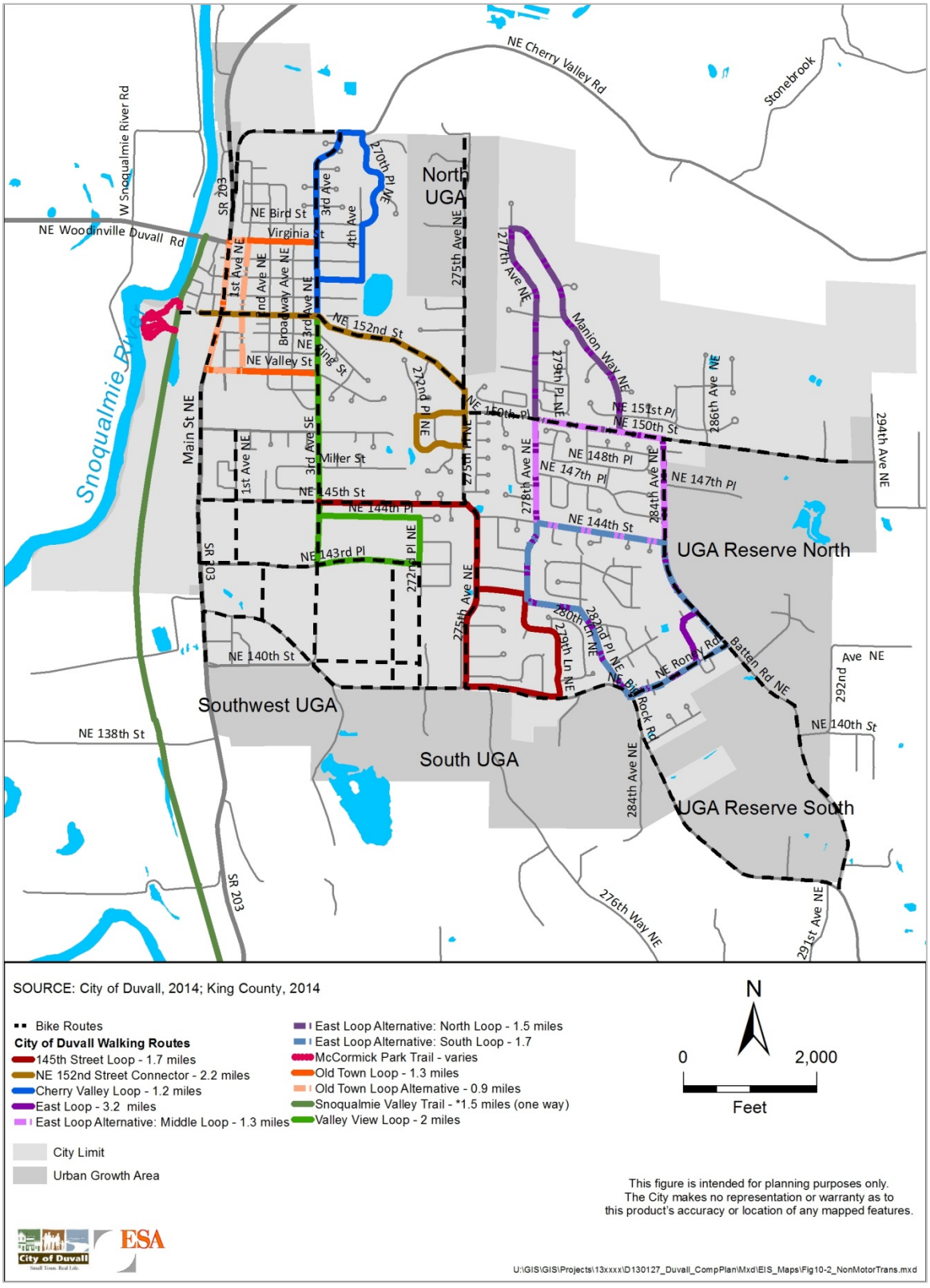
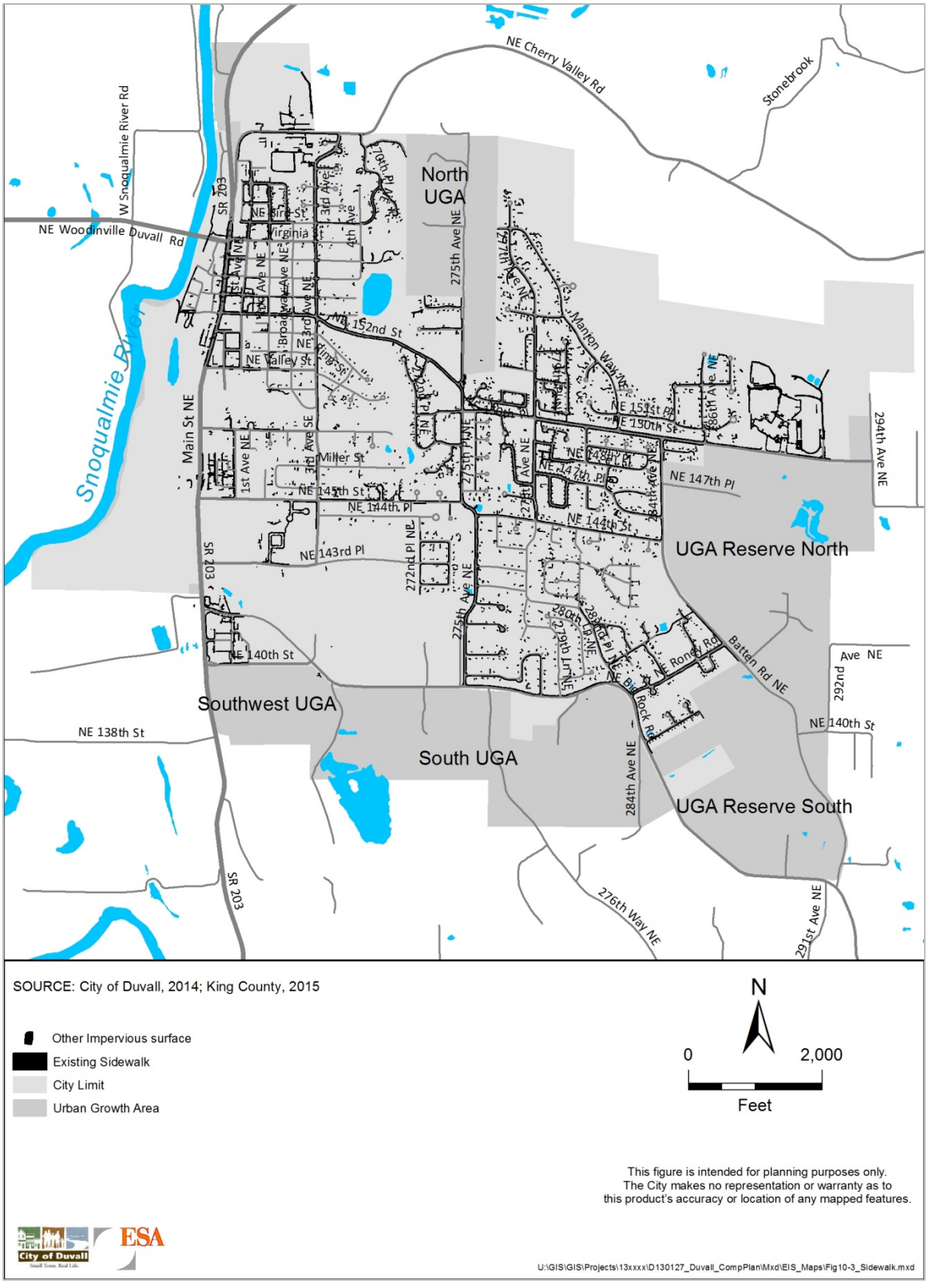


Figure 10-3. Sidewalks



10.2.5 Major Planned Upgrades to Transportation System

The City of Duvall annually adopts a Six-Year Transportation Improvement Program (TIP) that documents anticipated major planned system-wide transportation upgrades. The City's TIP is based on the 2009 Transportation Element contained within the City of Duvall's current Comprehensive Plan. Project types within the TIP generally include: intersection improvements; new roadways and major widening projects; minor widening and reconstruction projects; non-motorized improvements; and citywide programs. These projects would be constructed in association with new development or by the City for system-wide improvements. The following summarize major planned improvements for the 2016-2021 timeframe:

Intersection Improvements: These improvements are primarily associated with intersections along Main Street NE (SR-203). The majority of these improvements include installation of dedicated turn lanes that will be accomplished as part of the planned 2016 SR-203 Safety Improvement Project between NE Valley Street and NE Big Rock Road (TIP Project R-2).

New Roadways and Major Widening Projects: The majority of these projects are new roadways associated with anticipated private development. Both 3rd Avenue NE from NE Big Rock Road to NE 143rd Place (TIP Project M-2) and 1st Avenue NE from NE Anderson Street to NE Cherry Valley Road (TIP Project M-1) are examples of near-term new public roadways to be installed as part of private development.

Minor Widening and Reconstruction: These projects are primarily along major and minor arterials to accommodate growth in both vehicular and non-motorized traffic. The improvements include City projects, such as the planned 2016 SR-203 Safety Improvement Project (TIP Project R-2)., and private development projects, such as NE Big Rock Road from Main Street NE to NE Roney Road (TIP Projects R-11 and R-17) .

Non-Motorized Improvements: All of the TIP projects identified above include non-motorized connectivity and safety improvements (e.g., raised curbs and sidewalks, striped bicycle lanes). However, several stand-alone projects have been identified to connect missing links along priority non-motorized routes including the NE 145th Street/NE 144th Street Corridor (TIP Projects M-5, N-3, and R-12) and 275th Avenue NE corridors (TIP Project N-1).

Citywide Programs: On-going citywide improvements include traffic calming, minor sidewalk and ADA improvements, and general operations and maintenance.

10.3 Impacts

10.3.1 Impacts Common to All Alternatives

The City of Duvall hired Transpo Group, a transportation planning consulting firm, to help identify the potential impacts of population growth on Duvall's transportation system (Turley, 2015a; 2015b).

10.3.1.1 PM Peak Hour Trips

Transpo Group determined the PM peak hour trips associated with existing conditions and future (developed) conditions by assigning vehicle trips to single-family dwelling units, multi-family dwelling units, and commercial businesses (see Chapter 6 for Duvall's economic profile). Transpo Group relied on the development capacity analysis prepared by the City of Duvall Public Works and Planning Departments to identify the existing PM peak hour trips (see Chapter 2) and assumed all projects identified in the City's TIP would be implemented. The analysis results were used to extrapolate the PM peak hour trips associated with each of the EIS alternatives (Table 10-3).

Table 10-3. PM Peak Hour Trips

Land Use Type	2015 PM Peak Hour Trips[1]	2035 PM Peak Hour Trips*			
		Alternative 1: 2015 Comprehensive Plan Alternative	Alternative 2: Urban Growth Area Reserve	Alternative 3: Revised Urban Growth Area Boundaries	Alternative 4: No Action Alternative
Single Family Residential	2,268	3,068	3,667	3,652	3,108
Multi-Family Residential	350	695	600	600	600
Commercial	2,990	9,235	9,216	10,903	9,121
Total	**5,608**	**12,999**	**13,484**	**15,155**	**12,829**

*Includes results for city limits, urban growth areas (UGA), UGA-Reserves, and proposed South UGA
Source: City of Duvall, 2015; Turley, 2015a; 2015b.

Under all alternatives, traffic increases along the entire roadway system within Duvall would increase 2.3 to 2.7 times during the PM peak hour by 2035 depending on the alternative. Much of the future generated traffic would increase as a result of new residential housing (see Chapter 2 for Duvall's housing development capacity under each alternative).

10.3.1.2 Roadway Capacity, Improvements, and TIP

The results of Transpo Group's traffic model were used to determine future road capacity, intersection level of service, and need for additional TIP projects. In general, the 2015 results were generally similar to the results of a similar effort conducted as part of the 2009 Transportation Element.

In order to assess potential impacts associated with future population growth, Transpo Group completed traffic models for existing 2015 conditions and two 2035 scenarios: Alternative 4 (No Action) and a "worst case" scenario. The "worst case" scenario was a combination of Alternatives 1

and 3, assuming the North UGA, Southwest UGA, and South UGA would annex and zoning changes proposed under Alternative 1 within city limits would be implemented. The "worst case" scenario has the highest cumulative potential number of PM peak hour trips and was intended to evaluate the maximum potential impact on Duvall's roadway system. Transpo Group also assumed the transportation improvements as identified under Section 10.2.5 would have occurred by 2035.

No new roadway TIP improvement projects were identified based on the results of the two 2035 scenarios. The projected volume of vehicles using the roadway system would not exceed roadway capacity (which typically triggers the need for additional lanes) with the exception of two roads: Main Street and NE Woodinville-Duvall Road. Exceeding the volume to capacity ratio for the two roads would mean that during the PM peak hour there would be enough congestion to slow down traffic considerably through the city's only major north-south roadway corridor and only bridge across the Snoqualmie River, resulting in moderate adverse impacts. As described in Section 10.2.1.3, the City established LOS standards for intersections (as opposed to roadway segments) and does not apply LOS to Main Street because it is a state highway and experiences a great amount of pass-through traffic that the City has no control over. In addition, there is a low potential of providing additional lane capacity on Main Street and NE Woodinville-Duvall Road as both roadways are limited to two lanes outside of the city and are constrained by extensive private and public improvements within the city.

Moderate adverse impacts to transit services during the PM peak hour would result from the anticipated congestion, and mitigation measures in Section 10.4 have been identified to minimize those impacts.

10.3.1.3 Intersection LOS and TIP

Transpo Group also modeled the LOS for major intersections under Alternative 4 and the "worst case" scenario. In general, intersection LOS results were consistent with results from the 2009 Transportation Element and all deficiencies were located along Main Street NE. However, the LOS evaluation revealed that the SR-203 intersections at NE Cherry Valley Road and NE Kennedy Drive exceed the adopted standards under the "worst case" scenario (see Table 10-4). The" worst case" scenario is a cumulative result of all of the alternatives. Table 10-4 identifies the major intersections that would exceed the City's current LOS standards and would require improvements. Although potential LOS impacts from specific alternatives were not analyzed separately, the impacts anticipated for Alternatives 1, 2 and 3 would likely be equal to or exceed Alternative 4 but be less than the "worst case" scenario. To reduce the potential for moderate adverse impacts, improvements necessary to avoid exceeding intersection LOS standards is included as a mitigation measure in Section 10.4.

Table 10-4. Intersections that Exceed City's Level of Service Standards in 2035

Intersection	Adopted Level of Service Standard	2015 Level of Service	Alternative 4: No Action Alternative	"Worst Case" Scenario
SR 203 & NE Cherry Valley Road	D	C	D	**F**
SR 203 & NE Stella Street	D	C	**F**	**F**
SR 203 & NE Kennedy Drive	D	C	D	**F**
SR 203 & NE 143rd Place	D	E	**F**	**F**

Note: Items highlighted in bold exceed the City's LOS standard in 2035
Source: City of Duvall, 2015

10.3.2 Alternative 1: 2015 Comprehensive Plan Alternative

Transportation impacts under Alternative 1 are identified under impacts common to all alternatives described in Section 10.3.1. Alternative 1 concentrates housing and job growth in the NE 143rd Street / Main Street NE / NE Big Rock Road area and the southwest UGA. Focused growth typically is easier to serve from both a transit and non-motorized perspective. Alternative 1 would have the second lowest number of peak hour trips compared to the other alternatives. The largest increase in roadway traffic is expected along Main Street NE with associated impacts to transit service, pedestrian safety, and bicycle safety. However, TIP project improvements, including the planned 2016 SR-203 Safety Improvement Project (TIP Project R-2) along with the other mitigation measures stipulated under Section 10.4, would mitigate all of these impacts.

10.3.3 Alternative 2: Urban Growth Area Reserve

Transportation impacts under Alternative 2 are identified under impacts common to all alternatives described in Section 10.3.1. Alternative 2 would have the second highest number of peak hour trips compared to the other alternatives. The largest increase in roadway traffic is expected along Main Street NE and NE Big Rock Road with associated moderate adverse impacts to transit service, pedestrian safety, and bicycle safety. However, TIP project improvements, including the planned 2016 SR-203 Safety Improvement Project (TIP Project R-2) and proposed NE Big Rock Road Improvements (TIP Project R-17) along with the other mitigation measures stipulated under Section 10.4, would mitigate all of these impacts.

10.3.4 Alternative 3: Revised Urban Growth Area Boundaries

Transportation impacts under Alternative 3 are identified under impacts common to all alternatives described in Section 10.3.1. Alternative 3 would have the highest number of peak hour trips compared to the other alternatives. The largest increase in roadway traffic is expected along Main Street NE and NE Big Rock Road with associated moderate adverse impacts to transit service, pedestrian safety, and bicycle safety. However, TIP project improvements, including the planned 2016 SR-203 Safety Improvement Project (TIP Project R-2) and proposed NE Big Rock Road

Improvements (TIP Project R-17) along with the other mitigation measures stipulated under Section 10.4, would mitigate all of these impacts.

10.3.5 Alternative 4: No Action Alternative

Transportation impacts under Alternative 4 are identified under impacts common to all alternatives described in Section 10.3.1 and result in moderate adverse impacts. Alternative 4 would have the lowest number of peak hour trips compared to the other alternatives. The largest increase in roadway traffic is expected along Main Street NE with associated moderate adverse impacts to transit service, pedestrian safety, and bicycle safety. However, TIP project improvements, including the planned 2016 SR-203 Safety Improvement Project (TIP Project R-2) along with the other mitigation measures stipulated under Section 10.4, would mitigate all of these impacts.

10.4 Mitigation Measures

As development occurs, project proponents will be required to install sidewalk infrastructure as part of their frontage improvement requirements. This will help mitigate impacts associate with growth and establish the infrastructure needed to support the new housing and commercial developments over time, albeit in an uncoordinated and potentially disconnected manner. Transit providers may also increase service and number of bus stops overtime should there be an increase in demand.

In order to minimize moderate adverse impacts to the transportation system as a result of all alternatives, the City of Duvall should:

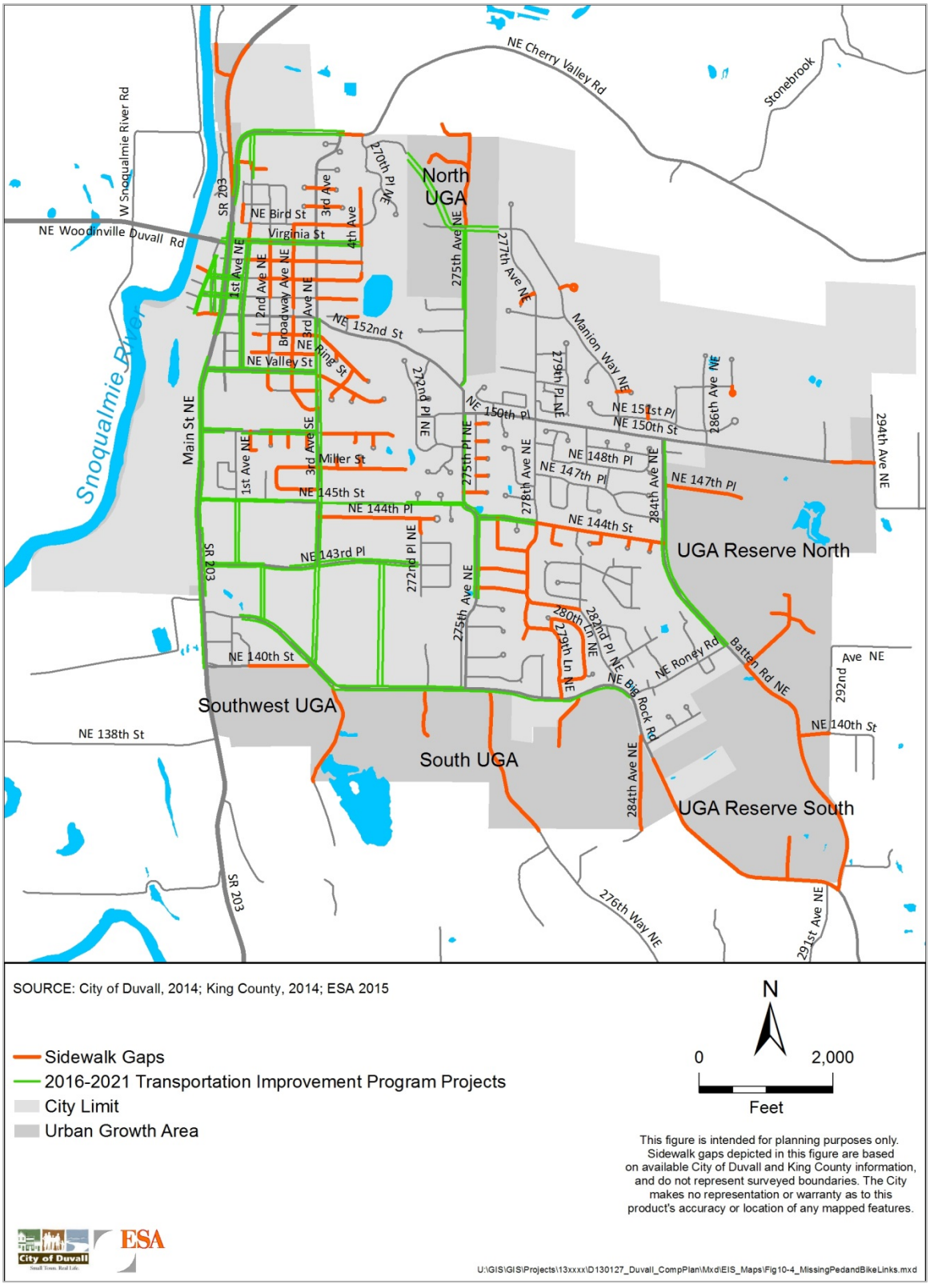
1. Identify funding and construct the major planned upgrades to the transportation system identified in Section 10.2.5.
2. Work with the transit providers to identify potential changes to routes, bus stops, and/or on-street parking limits that allow busses to load/unload passengers without blocking traffic to limit impacts to their schedule during the PM peak hour.
3. Address intersection LOS deficiencies identified in Table 10-4 to ensure compliance with the City's LOS standards or revise the City's LOS standards.
4. Support continued requirements for developers to install frontage improvements, including non-motorized facilities, for new development and redevelopment.
5. Identify and develop a funding and construction approach for non-motorized system "missing link" improvements for frontages that are not part of the TIP project list or located along properties with low development or redevelopment potential. Figure 10-4 Sidewalk Infrastructure Gaps identifies the possible locations of missing links for public sidewalks assuming all TIP projects would be built. Gaps shown on the map outside city limits may be associated with private roadways or unimproved rights-of-way and likely do not reflect future roadway connections.

6. Evaluate options to reduce impacts from forecasted increases in traffic congestion along the SR-203 (Main Street NE) corridor and/or revise intersection Level of Service standards.
7. Consider a Transportation Benefit District to partially fund TIP, Operations and Maintenance, and non-motorized/missing link projects.

10.5 Significant Unavoidable Adverse Impacts

For each of the proposed Alternatives, there are no apparent significant unavoidable adverse impacts.

Figure 10-4. Sidewalk Infrastructure Gaps



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