

I-405, Tukwila to I-90 Vicinity Express Toll Lanes Project (MP 0.0 to 11.9)

Environmental Assessment



DEDICATION

The I-405 Project Team dedicates this EA to Ross Fenton, P.E. Ross recently retired from the I-405 Program, and we thank him for the 22 years of engineering expertise, mentoring, and leadership that he provided as the lead project engineer for numerous successful projects associated with the I-405 Corridor Program. While he may no longer work on the I-405 Program, we carry all of the positive additions he brought to our team with us each day as we deliver these transportation projects for the state of Washington.

I-405, TUKWILA TO I-90 VICINITY EXPRESS TOLL LANES PROJECT

King County, Washington

Environmental Assessment

Submitted pursuant to Section 42 U.S.C. 4332 (2) (c) and 23 CFR Part 771

By the U.S. Department of Transportation, Federal Highway Administration, Washington Division, and the Washington State Department of Transportation

7/3/18

(Date of Approval)

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In compliance with the National Environmental Policy Act, this environmental assessment describes the environmental consequences of the **I-405, Tukwila to I-90 Vicinity Express Toll Lanes Project (Milepost 0.0 to 11.9)** that proposes to make roadway, structural, trail, and transit improvements on I-405 from I-5 to north of the I-90 interchange. The Project would add an additional lane in each direction by widening or restriping. The existing high-occupancy vehicle lane and this additional lane would be tolled to create a two-lane express toll lane (ETL) system. When combined with other I-405 projects, the I-405, Tukwila to I-90 Vicinity Express Toll Lanes Project would result in a continuous ETL system from State Route (SR) 167 in Renton to I-5 in Lynnwood.

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Bellevue, Washington 98004

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14380 Tukwila International Boulevard
Tukwila, Washington 98168

Renton Library

100 Mill Avenue S
Renton, Washington 98057

Newcastle Library

12901 Newcastle Way
Newcastle, Washington 98056

Bellevue Regional Library

1111 110th Avenue NE
Bellevue, Washington 98004

Bellevue College

3000 Landerholm Circle SE
Bellevue, Washington 98007

Renton Technical College

3000 NE 4th Street
Renton, Washington 98056

Comments must be submitted by August 9, 2018, and should be returned to:

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Washington State Department of Transportation
600 108th Avenue NE, Suite 405
Bellevue, Washington 98004

Or emailed to: I405comments@wsdot.wa.gov

A public hearing on this environmental assessment will be held on July 17, 2018, at Renton High School, 400 S 2nd Street, Renton, Washington 98057, from 5:30 p.m. to 7:30 p.m.



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ATTACHMENTS

The following attachments are available by downloading from the project website (<http://www.wsdot.wa.gov/Projects/I405/rentontobellevue>) and are also included within this document:

Attachment A.	Transportation Discipline Report
Attachment B.	Air Quality Discipline Report
Attachment C.	Noise Discipline Report
Attachment D.	Environmental Justice Discipline Report
Attachment E.	Cultural Resources Survey
Attachment F.	Visual Impact Assessment Discipline Report
Attachment G.	Water Resources Discipline Report
Attachment H.	Hazardous Materials Analysis
Attachment I.	Recreational, Section 4(f), and Section 6(f) Resources Technical Memorandum
Attachment J.	Geology, Soils, and Groundwater Technical Memorandum

The following attachments are included in this document:

Attachment K.	Glossary
Attachment L.	Acronyms and Abbreviations

The following attachments are available by downloading from the project website (<http://www.wsdot.wa.gov/Projects/I405/rentontobellevue>) and are also included within this document:

Attachment M.	Agency and Tribal Correspondence
Attachment N.	Cross Reference of NEPA Elements
Attachment O.	Logical Termini
Attachment P.	Wetland and Water Resources Maps
Attachment Q.	Endangered Species Act Summary

SUMMARY

This section introduces the I-405, Tukwila to I-90 Vicinity Express Toll Lanes Project (milepost [MP] 0.0 to 11.9), referred to as the Project, and provides a summary of this Environmental Assessment (EA).

Where is the Project located?

The Project begins at the I-5/I-405 interchange in Tukwila and continues about a mile north of the I-90/I-405 interchange in Bellevue as shown in Exhibit 1.

What is the I-405, Tukwila to I-90 Vicinity Express Toll Lanes Project?

The Project would make roadway, structural, trail, and transit improvements in the I-405 corridor from Tukwila (MP 0.0) to north of I-90 (MP 11.9). The Project proposes the following improvements, as shown in Chapter 3, Project Description Exhibit 3-2, sheets 1 through 8.

- **I-405/I-5 Interchange (MP 0.0 to 2.9)**—Extend the southbound left lane at the I-5 interchange west for approximately 500 feet to provide additional merge distance.
- **Northbound I-405, State Route (SR) 167 to north of I-90 (MP 2.9 to 11.9)**—Add one lane on I-405 in the northbound direction from MP 2.9 to 11.9. Convert the existing high-occupancy vehicle (HOV) lane to an express toll lane (ETL). The HOV lane and an additional lane would be operated as a two-lane ETL system.
- **Southbound I-405, SR 167 to north of I-90 (MP 2.9 to 11.9)**—Add one lane on I-405 in the southbound direction from MP 2.9 to 11.9. Convert the existing HOV lane to an ETL. The HOV lane and an additional lane would be operated as a two-lane ETL system. Add an additional general purpose (GP) auxiliary lane on southbound I-405 between MP 6.7 and 7.1 and MP 9.4 to 10.5.
- **Cedar Avenue**—Reconstruct the bridge over I-405.
- **Renton Avenue**—Reconstruct the bridge over I-405.

Exhibit 1. Project Area



- **Cedar River Bridge**— Widen the southbound I-405 bridge over the Cedar River.
- **Sunset Boulevard N Interchange Area**— Widen the I-405 northbound and southbound bridges over Sunset Boulevard N.
- **NE Park Drive Interchange Area**— Widen the I-405 southbound bridge over NE Park Drive.
- **N 30th Street Interchange Area**— Replace the local road overpass abutment slopes with retaining walls on both sides of I-405 and lower the southbound I-405 roadway.
- **NE 44th Street Interchange Area**— Replace the northbound and southbound I-405 bridges over May Creek with two new bridges and provide habitat improvements. Replace the NE 44th Street bridge over I-405. Construct new direct access ramps in the I-405 median with inline transit stations. Realign and reconstruct the northbound access to I-405 from a loop ramp to a new on-ramp from Lake Washington Boulevard NE. Build four roundabouts along local arterials. Construct an at-grade park-and-ride lot at Lake Washington Boulevard N and N 43rd Street with a minimum of 200 parking stalls and a roundabout.
- **112th Avenue SE Interchange Area**— Replace the 112th Avenue SE bridge over I-405. Construct new direct access ramps with inline transit stations in the I-405 median and reconfigure the interchange. Construct a roundabout on 112th Avenue SE. Reconfigure the Newport Hills Park-and-Ride.
- **Coal Creek Parkway Interchange Area**— Construct a new southbound I-405 bridge on a new alignment. Convert the existing southbound I-405 bridge to northbound ETLs. Convert the four local road intersections on Coal Creek Parkway SE to roundabouts.
- **I-405/I-90 Interchange Area**— Reconfigure the I-405 southbound to I-90 eastbound ramp from one to two lanes. Realign the I-405 northbound to I-90 eastbound ramp. Construct two new bridges over the eastbound

What are the differences between freeway lane types on I-405?

General purpose (GP) lanes are available to all traffic and are free at all times.

High-occupancy vehicle (HOV) lanes are available to buses, motorcycles, vanpools, and vehicles carrying a specified number of occupants.

High-occupancy toll (HOT) lanes and express toll lanes (ETLs) are generally available for use by eligible HOV users without a toll and *single-occupant vehicle (SOV)* users who choose to pay a variable toll. HOT lanes and ETLs are similar, though they have different operating parameters depending on where they are located. Currently, WSDOT operates HOT lanes on SR 167 and ETLs on I-405 between Bellevue and Lynnwood. Both systems allow SOVs to choose to pay a toll to use the lanes or remain in the GP lanes.

I-90 ramp to Factoria Boulevard and over Factoria Boulevard.

Other improvements that would be made as part of the Project include constructing new stormwater facilities, fish passage improvements, noise walls, drainage improvements, and tolling gantries. A detailed project description is provided in Chapter 3, Project Description.

What is the purpose of the Project?

WSDOT's purpose for the Project is to:

- Provide a reliable trip choice for I-405 users
- Increase vehicle capacity and person throughput
- Improve reliability for transit
- Improve access for I-405 users
- Reduce project-wide congestion
- Improve safety performance

Why is the Project needed?

Our region needs the Project to improve mobility and reduce traffic congestion in ways that are reliable and improve safety performance. I-405 is one of the most congested routes in the state, particularly during peak travel times.

What are express toll lanes?

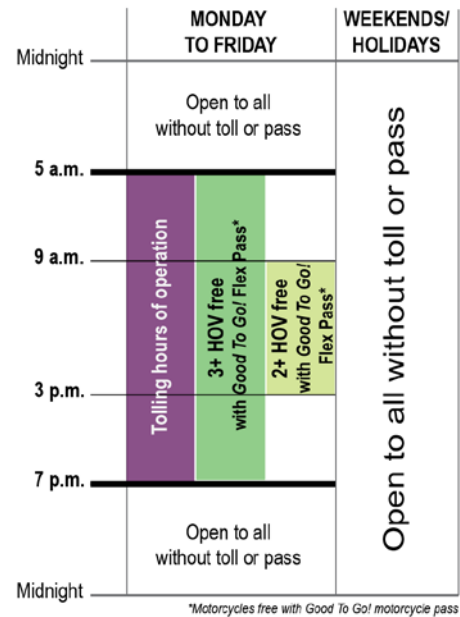
ETLs are express travel lanes that are managed through a variable user fee to regulate their use and thereby maintain reliable express travel speeds. ETLs preserve trip reliability for transit and HOV users, and provide a new option for other motorists to pay a toll to receive an express trip when lane capacity is available.

When would tolls be charged to use the express toll lanes?

Operating parameters for the toll lanes have not been determined; however, based on the tolling parameters for the

existing ETLs on I-405 between Bellevue and Lynnwood, this analysis assumes the following:

- The ETL system would operate from 5 a.m. to 7 p.m. on weekdays. At all other times and major holidays, the lanes would be free and open to all without a *Good To Go!* pass.
- Transit vehicles, motorcycles, and carpools with three or more persons (HOV 3+) would be able to use the ETLs for free with a *Good To Go!* pass.
- HOVs with two or more people (HOV2+) would travel for free from 9 a.m. to 3 p.m. with a *Good To Go!* pass. From 5 a.m. to 9 a.m. and 3 p.m. to 7 p.m. HOV2+ would pay a toll to use the ETLs with or without a *Good To Go!* pass.
- Single-occupant vehicles (SOVs) would be charged a toll to use the ETLs from 5 a.m. to 7 p.m. on weekdays (except for major holidays). SOVs could use the ETLs for free at all other times.
- Large vehicles over 10,000 pounds gross vehicle weight would not be able to use the ETLs at any time.



Toll rates would be based on speeds and traffic volumes in the ETLs. As more vehicles enter or exit the lanes at designated access points, toll rates would adjust so that traffic moves at least 45 miles per hour (mph) in the ETLs.

What would be the benefits of the Project?

The Project would improve multi-modal transportation choices on I-405 for SOVs, HOVs, transit, bicyclists, and pedestrians. All drivers would benefit from new capacity on I-405. The additional capacity would reduce congestion between Tukwila and Bellevue, improve overall safety performance, and improve trip reliability for transit, including planned new bus rapid transit service. The addition of direct access ramps and inline transit stations at NE 44th Street and 112th Avenue SE would improve access for travelers in the ETLs, particularly transit, and would support the development of bus rapid transit in the corridor. Moving the non-motorized trail from its existing location to the Eastside Rail Corridor would create a more contiguous trail and improved visual conditions for trail users.

The Project would treat stormwater to address the new expanded highway area plus about half of the existing roadway that is not currently being treated. The Project would reduce pollutant loading for most pollutants compared to existing conditions. The Project would replace five existing culverts with fish passable structures, which would improve fish habitat.

What is the purpose of this Environmental Assessment?

The purpose of this EA is to inform the public about environmental effects anticipated from the Project. This EA compares two alternatives: the Project as the Build Alternative and a No Build Alternative (i.e., status quo). This document fulfills WSDOT's obligation under the National Environmental Policy Act (NEPA) and the State Environmental Policy Act (SEPA) to disclose project effects and mitigation. Once all final approvals are received, the Project would go through final design and would then be constructed.

What environmental resources did WSDOT study?

WSDOT studied the potential effects of the Project on the built and natural environment for the following environmental resources:

- Transportation
- Noise
- Land use, socioeconomics, and environmental justice
- Recreational, Section 4(f), and Section 6(f) resources
- Visual quality
- Water resources
- Ecosystems
- Air quality
- Energy and greenhouse gas emissions
- Historic, cultural, and archaeological resources
- Geology and soils
- Hazardous materials
- Public services and utilities

When would construction begin and how long would it take?

Project construction would begin in 2019 and be completed in 2024.

How has the public had input on the Project?

Public involvement for this Project began in August 2015, and has continued through publication of this EA. During this time, WSDOT has held numerous neighborhood meetings and public open houses. In addition, WSDOT has distributed materials to the public and worked closely with the public; elected officials, local, state, and federal agencies; and tribes. We will continue to meet with those groups as the project moves to construction.



Public Open House in Renton

How can you stay involved?

WSDOT will continue to provide the public with opportunities to comment on the Project and interact with members of our project team. We will hold a formal public hearing on this EA on the following date and at the following time and location:

- July 17, 2018
- 5:30 p.m. to 7:30 p.m.
- Renton High School, 400 S 2nd Street, Renton, Washington 98057

The hearing will provide the public with an opportunity to learn more about the Project and submit formal comments on this EA during a 30-day comment period that begins on July 9, 2018, and continues through August 9, 2018. Written and oral comments will be given equal weight, and all comments received or postmarked by August 9, 2018 will be considered by WSDOT and FHWA in the final NEPA documentation.

What are the next steps for the Project?

After the comment period ends, WSDOT will review the comments and provide responses. Then the comments and responses will be reviewed by the FHWA and they will determine if the Project qualifies for a Finding of No Significant Impact (FONSI) or if effects are significant and an Environmental Impact Statement (EIS) is needed. If the Project qualifies for a FONSI, the public comments, responses, and

project findings would be published in a FONSI and the Project would move into final design and then construction once all final approvals are received. If an EIS is needed, additional environmental analysis would be completed and an EIS would be published at a future date.

How is this EA organized?

This EA document is organized under the following chapters:

- Summary – Summarizes the information contained in the EA document.
- Chapter 1, Project Purpose and Need – Explains why the Project is needed.
- Chapter 2, Alternatives Considered – Provides background into the alternatives considered as part of the I-405 Corridor Program.
- Chapter 3, Project Description – Describes what this Project would build.
- Chapter 4, Project Effects – Discusses existing conditions and potential effects by individual topics.
- Chapter 5, Cumulative Effects – Discusses cumulative effects from the Project in combination with other planned projects in the area.
- Chapter 6, Measures to Avoid or Minimize Effects – Presents the measures for avoiding or minimizing effects.
- Chapter 7, List of Preparers – Lists the people involved in the preparation of this EA.
- Chapter 8, References – Provides the source references for the analysis.

In addition, this document contains several attachments that contributed technical information to this EA.

CHAPTER 1 PROJECT PURPOSE AND NEED

This chapter describes the Project's history and purpose and explains why it is needed.

Where is the Project located?

The I-405, Tukwila to I-90 Vicinity Express Toll Lanes Project (milepost [MP] 0.0 to 11.9), referred to as the Project, is located between Tukwila and Bellevue. The Project begins at the I-5/I-405 interchange in Tukwila and continues about a mile north of the I-90/I-405 interchange in Bellevue as shown on Exhibit 1-1.

The project limits meet the Federal Highway Administration (FHWA) criteria identified in 23 Code of Federal Regulations (CFR) 771.111(f) for establishing the project limits. The project limits meet these criteria because they connect to, but are independent of, other improvements proposed on the Interstate 405 (I-405) corridor. Furthermore, the project limits allow for full consideration of the Project's direct, indirect, and cumulative effects. Attachment O provides a detailed explanation of how the project limits meet the FHWA criteria.

What is the purpose of the Project?

The Washington State Department of Transportation's (WSDOT's) purpose for the Project is to:

- Provide a reliable trip choice for I-405 users
- Increase vehicle capacity and person throughput
- Improve reliability for transit
- Improve access for I-405 users
- Reduce project-wide congestion
- Improve safety performance

Why do we need the Project?

Our region needs this Project to improve mobility and reduce traffic congestion in ways that are reliable and improve safety performance. I-405 is one of the most congested routes in the state, particularly during peak travel times. On an average weekday morning, motorists and transit users currently experience northbound traffic congestion between 6 a.m. and 9 a.m. Likewise, on a typical weekday afternoon, motorists

Exhibit 1-1. Project Area



What is traffic congestion?

Traffic congestion is a condition on road networks that occurs as use increases, and is characterized by slower speeds, longer trip times, and increased vehicular queuing.

and transit users experience traffic congestion heading southbound beginning as early as 3 p.m. and lasting until 7 p.m. Traffic continues to increase in the corridor. Between 2014 and 2016, the average weekday vehicle delay on I-405 increased by about 8 percent, and transit travel times have increased by 12 minutes during the morning commute (WSDOT 2017a). Capacity and operational improvements are needed on I-405 today to improve reliability for general purpose (GP) and high-occupancy vehicle (HOV) traffic.

What would happen if WSDOT did not build the Project?

I-405 experiences congestion many hours of the day in both the GP and HOV lanes due to high regional traffic demand. We expect these traffic conditions to worsen and travel speeds to decrease if the Project is not built.

For example, in 2016, the section of I-405 in Renton between State Route (SR) 169 and NE Park Drive carried 141,000 vehicles per weekday (i.e., the total vehicles in both directions and all lane types). In 2025, I-405 in this same area is projected to carry 170,000 vehicles per day, an increase of 21 percent over 2016 conditions.

In the future, we anticipate most of the daily traffic volume growth to occur outside the peak travel periods. This could potentially cause freeway drivers to seek alternative routes on the limited number of local and regional roadways, leading to increased bypass traffic that would cause additional congestion on those routes. Many study area intersections already operate under congested conditions during the morning and afternoon peak hours today.

Furthermore, the HOV lanes are already over capacity and experience congestion in the peak travel direction, and congestion is expected to increase in the future. Transit vehicles also have reduced reliability and greater travel time variability due to this congestion.

Lastly, increased congestion over time would increase the number of congestion-related crashes in the study area.

What is the history of the Project?

In 1998 WSDOT joined with FHWA, the Federal Transit Administration (FTA), the Central Puget Sound Regional

What are the differences between freeway lane types on I-405?

General purpose (GP) lanes are available to all traffic and are free at all times.

High-occupancy vehicle (HOV) lanes are available to buses, motorcycles, vanpools, and vehicles carrying a specified number of occupants.

High-occupancy toll (HOT) lanes and *express toll lanes (ETLs)* are available for use by eligible HOV users without a toll and *single-occupant vehicles (SOV)* users who choose to pay a variable toll. HOT lanes and ETLs are similar, though they have different operating parameters depending on where they are located. Currently, WSDOT operates HOT lanes on SR 167 and ETLs on I-405 between Bellevue and Lynnwood. Both systems allow SOVs to choose to pay a toll to use the lanes or remain in the GP lanes.

Transit Authority (Sound Transit), King County, and local governments to develop strategies to reduce traffic congestion and improve mobility in the I-405 corridor. In Fall 2002, the combined efforts of these entities culminated in the *I-405 Corridor Program Final Environmental Impact Statement (EIS)* (FHWA and FTA 2002a) and a *Record of Decision (ROD)* (FHWA and FTA 2002b).

The I-405 Corridor Program purpose as described in the EIS is to help create an efficient, integrated, and multimodal system of transportation solutions that will:

- Maintain and enhance livability for communities within the corridor
- Maintain and improve air quality, protect or enhance fish-bearing streams, and promote regional environmental values
- Support a vigorous state and regional economy by responding to existing and future travel needs
- Accommodate planned regional growth

The ROD identified a Selected Alternative that would widen I-405 by up to two lanes in each direction for 30 miles. The ultimate configuration of the Selected Alternative includes a buffer separating the GP lanes and the HOV lane to improve safety performance and provide more reliable HOV and transit operations. The Selected Alternative presented in the ROD allowed for the future consideration of managed lane operations on I-405, including managing up to two lanes in each direction as well as providing for high-capacity transit. The *I-405 Corridor Program Final EIS* and ROD did not specify how the lanes would be managed.

In January 2010, WSDOT completed the *I-405/SR 167 Eastside Corridor Tolling Study* (WSDOT 2010), which proposed a tolling strategy for managed lanes in the I-405/SR 167 corridor. The I-405/SR 167 Executive Advisory Group composed of elected officials and transportation agencies from the corridor, endorsed a 40-mile toll system between Auburn and Lynnwood based on that study.

This Project is one of several projects now being advanced as part of a phased implementation of the Selected Alternative. The 2015 Connecting Washington funding package passed by

How do regional policies support tolling on I-405?

The *Puget Sound Regional Council (PSRC) Transportation 2040*, published in 2010, supports regional tolling. Similarly, King County's long-range plans call for policies that support urban growth areas by calling for congestion pricing such as HOT lanes, ETLs, corridor tolling, system-wide tolling, and charges for vehicle miles traveled.

the Washington State Legislature provides funding for constructing the Project.

Environmental impacts of portions of this Project were evaluated in 2006 and 2008 as part of two distinct projects that proposed larger-scale improvements than those proposed with this Project. Those two projects are called the I-405 Tukwila to Renton Improvement Project (TRIP), (I-5 to SR 169) and the I-405, SR 169 to I-90 Renton to Bellevue Project (Renton to Bellevue Project). The environmental impacts of these two projects were evaluated in the following documents:

- *I-405, Tukwila to Renton Improvement Project (I-5 to SR 169 – Phase 2) Environmental Assessment and Draft Section 4(f) Evaluation (2008 TRIP EA), March 2008 (WSDOT and FHWA 2008a).*
- *I-405, Tukwila to Renton Improvement Project (I-5 to SR 169 – Phase 2) Finding of Significant Impact and Final Section 4(f) Evaluation (2008 TRIP FONSI), July 2008 (WSDOT and FHWA 2008b)*
- *I-405, Tukwila to Renton Improvement Project (I-5 to SR 169 Phase 2) National Environmental Policy Act Re-Evaluation, August 2015.*
- *I-405, SR 169 to I-90 Renton to Bellevue Project Environmental Assessment (2006 Renton to Bellevue EA), March 2006 (WSDOT and FHWA 2006).*
- *I-405, SR 169 to I-90 Renton to Bellevue Project Finding of No Significant Impact and Programmatic Section 4(f) Evaluation (2008 Renton to Bellevue FONSI), November 2008 (WSDOT and FHWA 2008c).*

Tolling was not proposed or evaluated in the environmental documents listed above. Because of this, WSDOT is evaluating the current, funded improvements, which include tolling, in this Environmental Assessment (EA). This new EA does not supersede previous environmental documentation listed above.

Tukwila to Renton Improvement Project

The TRIP proposed several improvements along I-405 between Interstate 5 (I-5) and SR 169, and SR 167 between SW 43rd Street and I-405. Proposed improvements included adding lanes to I-405 and SR 167, modifying and expanding interchanges, and reconstructing and expanding local

roadways. The following improvements associated with the TRIP evaluated in 2006 and 2008 have been constructed or construction is nearly complete:

- **TRIP Stage 1** – Added a ½-diamond interchange at SR 515 (Talbot Road). Construction was completed in 2011.
- **TRIP Stage 2** – Adds HOV direct-connector ramps from southbound I-405 to southbound SR 167 and northbound SR 167 to northbound I-405. Construction is underway and is expected to be complete in 2019.

Chapter 3, Project Description, discusses additional elements of the TRIP that were funded as part of the 2015 Connecting Washington funding package and are part of this Project.

Renton to Bellevue Project

The Renton to Bellevue Project evaluated in 2006 and 2008 included constructing two new GP lanes for most of I-405 between the SR 169 interchange (MP 3.8) in Renton to north of the Interstate 90 (I-90) interchange (MP 11.9) in Bellevue. The Renton to Bellevue Project also included improvements at eight interchanges and local roadways as well as construction of noise walls, stormwater management facilities, and fish passage improvements.

To date, none of the Renton to Bellevue Project improvements have been constructed. The Renton to Bellevue Project did not receive funding until the 2015 Connecting Washington funding package was approved. Elements of the Renton to Bellevue Project that were funded as part of 2015 Connecting Washington and are part of this current Project are discussed in Chapter 3, Project Description.

What other improvements are being considered between Tukwila and Bellevue on I-405?

The I-405 Corridor Program is a broad term for a program of more than 150 unique, coordinated projects to relieve congestion and improve mobility for motorists, transit users, and freight users along the 30-mile, I-405 corridor. Additional funded improvements between Tukwila and Bellevue going through environmental review include the I-405, Downtown Bellevue Vicinity Express Toll Lanes Project (MP 11.9 to 14.6),

which extends north of I-90 up to the vicinity of the NE 6th Street interchange. Construction of the I-405, Downtown Bellevue Vicinity Express Toll Lanes Project and this Project is anticipated to occur at the same time. When completed, both projects would connect to other express toll lanes on the north and south to create a 40-mile toll system on SR 167 and I-405 between Auburn and Lynnwood, as shown in Exhibit 1-2.

In addition, as part of the Sound Transit 3 funding package, Sound Transit plans to provide bus rapid transit service on the SR 518 and I-405 corridors between Burien and Lynnwood by 2024. Sound Transit will be making transit-related improvements in these corridors as needed to implement a bus rapid transit system. Some of these improvements would be separate projects funded by Sound Transit that would go through a separate environmental review process. Other improvements on I-405, such as the express toll lanes (ETLs) proposed with this Project and direct access ramps and inline transit stations at NE 44th Street and 112th Avenue SE, would support the implementation of bus rapid transit in the SR 518 and I-405 corridors.

CHAPTER 2 ALTERNATIVES CONSIDERED

This chapter explains how the Project was developed and the alternatives considered in this EA.

How did WSDOT develop the Project?

WSDOT developed the Project to meet the needs and purposes listed in Chapter 1 and considered how best to:

- Improve the worst congestion choke points along I-405
- Improve system and safety performance
- Increase travel speeds during peak commute hours
- Reduce congestion and improve reliability, particularly in the HOV lanes

The Project was developed using current design practices and by engaging the public, agencies, and tribes. WSDOT conducted outreach to stakeholders, such as the Washington State Patrol, WSDOT Maintenance, Sound Transit, and local agencies, to understand the needs of each group and incorporate lessons learned from previous projects.

Throughout the planning process, we reviewed and evaluated methods to avoid or minimize potential effects and incorporated them into the Project design as appropriate.

As part of the preliminary design, WSDOT has taken steps to incorporate practical solutions as required for all WSDOT projects. Practical solutions are a performance-based approach to transportation decision-making. The goal of the practical solutions approach is to optimize each project to deliver needed improvements, while minimizing impacts on the environment, traveling public, and corridor neighbors.

How has input from the public, agencies, and tribes shaped the Project to date?

WSDOT has engaged the public, agencies, and tribes in the design process on I-405 from the beginning of the I-405 Program. Listed below are examples for this Project where the design was modified based on stakeholder input:

- Due to input received from area residents and property owners, WSDOT will not build a noise wall in the Renton area located on the east side of I-405 between just north of NE 3rd Street and Sunset Boulevard NE.

This wall is warranted based on the noise evaluation conducted for the Project. However, the residents and property owners who would be affected indicated that they do not want the wall to be built. To confirm this direction, WSDOT organized a voluntary poll. Ballots were mailed via certified mail to 40 addresses (4 property owners, 36 current residents) behind the proposed wall. Of those 40 ballots, 13 were returned: 11 participants did not want the wall and 2 residents wanted the wall. Based on these results, WSDOT is no longer proposing to build the wall in that location.

- WSDOT hosted an award-winning stormwater design charrette in July 2016 for participants to learn about the Project, WSDOT's stormwater strategy, and local conditions that would affect stormwater options. Ideas from the charrette were used to develop the solution to divert stormwater from areas of concern (such as Coal Creek and Newcastle Beach Park) to other areas within the I-405 corridor, such as the former WSDOT maintenance facility under I-90. The charrette included participation from the I-405 design team, key WSDOT staff, an independent expert, the City of Bellevue, the Washington State Department of Ecology (Ecology), and two local residents.
- WSDOT hosted a fish passage design workshop in March 2017 to discuss the fish passage alignment for unnamed tributary (UNT) 08.LW.0283 (formerly Gypsy Creek). Ideas were presented by meeting attendees that were incorporated into the fish passage design at UNT 08.LW.0283. Attendees included the Muckleshoot Tribe, Washington Department of Fish and Wildlife (WDFW), King County, U.S. Army Corps of Engineers, Ecology, I-405 design team, WSDOT, City of Renton, and an independent expert.
- WSDOT and agency stakeholders have participated in meetings and field visits to identify avoidance and minimization measures for natural resource impacts and potential mitigation sites. These mitigation measures and mitigation sites have been incorporated into the Project where feasible.

What alternatives did WSDOT study?

WSDOT evaluated two alternatives in this EA: (1) Build Alternative (i.e., the proposed Project); and (2) No Build Alternative (i.e., status quo).

Build Alternative

The Build Alternative would make roadway, structural, trail, and transit improvements in the I-405 corridor from Tukwila (MP 0.0) to north of the I-90 interchange (MP 11.9). The Project would create a dual ETL system from MP 2.9 (at the I-405/SR 167 interchange) and MP 11.9 by adding one new lane in each direction and converting the existing HOV lane to an ETL. The existing HOV lane would be converted to a single ETL from MP 2.4 to 2.9 on northbound I-405 and from MP 1.6 to 2.9 on southbound I-405.

Between MP 0.0 and the beginning of the ETL system, the Project proposes to install signage and associated tolling infrastructure to facilitate the transition between tolled and non-tolled lanes. When combined with other I-405 projects, this Project would create a continuous tolling system from Auburn to Lynnwood. The Project would also add a GP (auxiliary) lane to southbound I-405 between MP 6.7 and 7.1 and MP 9.4 and 10.5 and transit improvements. A detailed description of the Build Alternative is presented in Chapter 3, Project Description.

No Build Alternative

We evaluated a No Build Alternative to compare the effects of maintaining the status quo to the effects of the Build Alternative. With the No Build Alternative, only routine activities such as road maintenance, repair, and safety performance improvements would take place over the next 20 years and this section of I-405 would not have ETLs. The No Build Alternative does not include improvements that would increase vehicle capacity and person throughput, improve access, improve reliability for transit, reduce project-wide congestion, or improve safety performance.

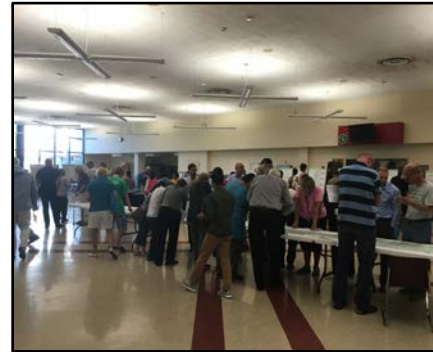
How has the public been involved?

Members of the public have had an opportunity to review and provide input, starting in 1998 when WSDOT, FHWA, King County Metro Transit, and local jurisdictions came together to address congestion and improve mobility in the I-405 corridor.

Extensive public involvement with communities along the I-405 corridor continues today.

Outreach activities specific to the proposed improvements are listed below:

- Holding four public open houses in both Bellevue and Renton in August 2015 and September 2016. These open houses were attended by 316 people. Most comments and questions at the 2015 and 2016 open houses were regarding the construction timeline, property acquisitions, noise walls, and Project elements. Public outreach to inform people of the meeting include:
 - Mailing 4,606 postcards announcing the public open houses
 - Publishing display ads in area papers and online publications announcing the open houses. This included translating and placing display ads in the following publications to communicate with persons with limited English proficiency: La Raza, Seattle Viet Times, The Korea Daily, and the Seattle Chinese News. The display ads for the hearing for this EA were translated into Spanish, Korean, Chinese, and Vietnamese.
 - Hanging posters and distributing postcards to community gathering places, such as libraries, throughout the corridor announcing the open houses
 - Emailing notice of the open houses to WSDOT project listservs and other agency or community group lists
 - Sending press releases announcing the open houses to local and regional media outlets
- Providing briefings to community groups and councils, such as the Bellevue Downtown Association, Bellevue Chamber of Commerce, Bellevue Sunrise Rotary, Newcastle Chamber of Commerce, and Renton, Bellevue, and Newcastle city councils. These presentations presented the latest information about the Project status and data on existing ETL performance.



*Public Open House at Renton City Hall
in September 2016*

- Participating in public open houses hosted by King County for the Eastside Rail Corridor Regional Trail Project in 2017 in Renton and Bellevue to discuss the scope and schedule of trail work associated with this Project.
- Hosting targeted meetings with eight neighborhood organizations along the alignment, including Greenwich Crest, Newport Shores, Kimberlee Park, and Woodridge in Bellevue; Lake Lanes in Renton/Bellevue; and Kennydale, Monterey Terrace, and Renton Hill in Renton, with additional meetings planned throughout the study area in 2018. The primary topics of interest included project scope and schedule; preliminary designs for highway, local street and interchange work; noise walls and analysis; vegetation and landscaping; air quality; effects on future traffic levels; drainage and stormwater treatment; changes to transit infrastructure and access; expectations during construction (phasing, timeline, neighborhood access); and bicycle/pedestrian infrastructure.
- Responding to area residents' and commuters' questions and comments through telephone, email, and in-person conversations. Major topics of interest have included preliminary Project designs, with a focus on individual property owner impacts (right of way acquisition, walls, etc.); potential noise walls and analysis; vegetation and landscaping; ETL operations; and clarifications regarding the funded Project versus Master Plan improvements.
- Providing a project website with information on issues such as project scope and status, design, public involvement opportunities, finances, benefits, timeline, and more.
- Translating noise wall information into Spanish for the Monterey Terrace neighborhood in Renton due to advice from a local property manager. The purpose of communication was to seek input from property owners and tenants on whether to build a noise wall in this area.

How does WSDOT communicate with the public?

WSDOT communicates with the public in several ways. Ongoing communication methods include:

Speaker's Bureau: WSDOT meets and gives presentations to community organizations.

Environmental Outreach: Fieldwork and on-site review puts I-405 environmental team members in touch with neighbors in the corridor.

Project Website: www.wsdot.wa/projects/I-405 was designed as a resource for the public and is updated regularly.

Newsletters/Project Updates: Newsletter mailings and email updates offer an ideal opportunity to inform the public on project progress.

From 2014 to the present, WSDOT has been conducting public involvement throughout the I-405 corridor regarding ETLs.

This includes the following:

- Holding over 200 briefings with community and neighborhood organizations, local jurisdictions (staff and elected officials), and other interested groups
- Staffing booths at 10 fairs and festivals in the corridor, including Renton River Days and Bellevue Strawberry Festival

To supplement this, WSDOT conducted additional outreach focused on engaging low-income and minority populations in the summer and fall of 2016. As part of this effort, WSDOT conducted seven interviews with social service providers who serve low-income and minority populations, including:

- City of Bellevue Human Services Division
- City of Burien Department of Human Services
- City of Redmond Human Services
- City of Renton Department of Human Services
- Coal Creek YMCA
- Hopelink
- Youth Eastside Services

The purpose of these interviews was to share information—including information on ETLs—and gather insights on how low-income and minority populations may experience effects (positive or negative) because of the Project. Most questions and concerns raised in these interviews were about how ETLs might affect low-income persons or persons with limited English proficiency.

In addition, WSDOT reached out to communities of persons with limited English proficiency by contacting the following organizations but they either declined or did not respond:

- Ukrainian Community Center of Washington
- El Centro de la Raza
- Eastside Latino Leadership Forum
- Eastside Refugee and Immigrant Coalition

- Organization of Chinese Americans, Greater Seattle Chapter
- Japanese American Citizens League, Lake Washington Chapter
- East African Community Services

The following themes emerged from the meetings held in the summer and fall of 2016:

- General concerns about equity and tolling effects on lower income populations
- Complaints about \$10 tolls
- System is confusing (signage, access points, how pricing works, *Good To Go!* passes needed)
- Awareness of express toll lanes between Bellevue and Lynnwood is fairly good, but there is not a lot of awareness about the upcoming Renton to Bellevue section
- Lack of awareness that there is a free GP lane option
- Concerns that commute times could increase for those who stay in the GP lanes
- Desire to explore low-income subsidies for tolls and *Good To Go!* passes
- Desire to explore outreach to encourage transit use
- Desire to create better ways to match people for carpools
- Optimism that ETLs could improve transit travel times
- Concerns about system-wide impacts during Renton to Bellevue construction
- Desire for robust communication about construction closures/tolling system in many languages, formats (in-person meetings, email, and advertising).

WSDOT received recommendations from the interviews in summer and fall of 2016 about how to stay connected through email and printed materials about project updates. The Project team has developed a listserv of other organizations to include in outreach based on these interviews.

As part of ongoing educational efforts regarding the existing ETLs, WSDOT's Toll Division has translated educational/instructional videos about ETLs into Chinese, Filipino, Korean, Russian, Spanish, and Vietnamese. Information about the ETL hours of operation has been translated into Arabic, Chinese, Russian, Spanish, and Vietnamese.

How did WSDOT involve agencies?

Government agencies have played major roles in the development of the *I-405 Corridor Program Final EIS*. Specific to this Project, WSDOT has involved numerous local, state, and federal agencies. WSDOT holds regular meetings with various jurisdictions in the area, such as the cities of Renton, Bellevue, King County, and Sound Transit. In addition, WSDOT works with federal, state, and local governments to obtain the permits and approvals needed to construct the Project. Specifically, WSDOT has worked with the Department of Archaeology and Historic Preservation (DAHP), the United States Army Corps of Engineers, the National Marine Fisheries Service, the U.S. Fish and Wildlife Service (USFWS), Ecology, WDFW, and other local agencies. WSDOT is coordinating with Sound Transit on transit improvements proposed with the Project at NE 44th Street and 112th Avenue SE.

How did WSDOT involve tribal governments?

WSDOT has participated in government-to-government consultation with the following four federally recognized tribes since the beginning of the I-405 Corridor Program: Muckleshoot Indian Tribe, Snoqualmie Tribe, Tulalip Tribes, and the Confederated Tribes and Bands of the Yakama Nation. WSDOT also consulted with the Duwamish Tribe (non-federally recognized) as an interested party.

Consultation with tribes continues, as WSDOT involves tribal governments in each stage of the environmental analysis. Tribal representatives have been given opportunities to review and comment on the Areas of Potential Effects (APE) and draft survey reports for cultural resources. In addition, WSDOT invited representatives from the Muckleshoot Indian Tribe to meet with WSDOT, King County Department of Natural Resources, the City of Renton, the Ecology, and WDFW to discuss fish passage at UNT 08.LW.0283.

WSDOT continues to consult with the Muckleshoot Tribe regarding fish passage.

How can the public, agencies, and tribes stay involved in the Project?

Public engagement is ongoing in the corridor. WSDOT will continue meeting with affected agencies and tribes to get their input on the Project. People can stay involved by:

- Reviewing and submitting formal comments on the EA or attending a public open house
- Attending coordination meetings with city councils, businesses, neighborhood associations, and community groups as the Project advances toward construction
- Checking project progress on WSDOT's website located at <http://www.wsdot.wa.gov/Projects/I405/RentontoBellevue/home>

CHAPTER 3 PROJECT DESCRIPTION

This chapter describes the Project. The Project is designed to improve a nearly 12-mile section of I-405 between I-5 in Tukwila to just north of I-90 in Bellevue.

What improvements are proposed with the Project?

The 2015 Connecting Washington package funded a portion of the remaining improvements for the TRIP and the I-405, Renton to Bellevue Project. In addition, the current Project proposes tolling, which was not evaluated in the previous environmental analysis. Because tolling was not previously evaluated, the current proposal, which includes tolling, is evaluated in this EA as a single project, called the I-405, Tukwila to I-90 Vicinity Express Toll Lanes Project (the Project). The remaining elements of the TRIP and Renton to Bellevue Project are discussed under “What are the remaining improvements for the TRIP and Renton to Bellevue Project?” at the end of this chapter.

Exhibit 3-1 describes in detail the improvements proposed with the Project. Exhibit 3-2, sheets 1 through 8, show the proposed improvements on a series of maps. In general, the Project proposes to add one lane to I-405 in each direction for about 9 miles beginning on I-405 near SR 167 and continuing approximately 1 mile north of I-90. The Project would also add a GP (auxiliary) lane to southbound I-405 between MP 6.7 (north of N 30th Street) and 7.1 (south of NE 44th Street) and MP 9.4 (north of 112th Avenue SE) to 10.5 (north of Coal Creek Parkway). The existing HOV lane on I-405 and the additional lane would be operated as a two-lane ETL system. Additional details describing the ETLs are provided in the next question, “How would the express toll lanes work?”.

Exhibit 3-1. Improvements Proposed with the I-405, Tukwila to I-90 Vicinity Express Toll Lanes Project

Project Element	I-405, Tukwila to I-90 Vicinity Express Toll Lanes Project
I-405/I-5 Interchange Exhibit 3-2, Sheet 1	<ul style="list-style-type: none"> – Extend the southbound left lane at the I-5 interchange west for approximately 500 feet to provide additional merge distance.
I-405 Lanes and Shoulders from SR 167 to north of I-90 Exhibit 3-2, Sheets 2 through 8	<ul style="list-style-type: none"> – Create a dual ETL system from MP 2.9 (northeast of the I-405/SR 167 interchange) and MP 11.9 (north of the I-405/I-90 interchange) by adding one new lane in each direction and converting the existing HOV lane to an ETL. – Convert the existing HOV lane to a single ETL from MP 2.4 (at the I-405/SR 167 interchange) to MP 2.9 on northbound I-405 and from MP 1.6 (in Renton over Springbrook Creek) to MP 2.9 on southbound I-405. – Add an additional GP (auxiliary) lane on southbound I-405 between MP 6.7 (north of 30th Street) and MP 7.1 (south of NE 44th Street) and MP 9.4 (north of 112th Avenue SE) to MP 10.5 (north of Coal Creek Parkway). – Bring I-405 up to current freeway standards where feasible.
I-405 Tolling from SR 167 to north of I-90 Exhibit 3-2, Sheets 2 through 8	<ul style="list-style-type: none"> – Construct tolling gantries to collect the tolls for the ETL system (see description in the row above).
Cedar Avenue Exhibit 3-2, Sheet 4	<ul style="list-style-type: none"> – Reconstruct the bridge over I-405 to widen southbound I-405.
Renton Avenue Exhibit 3-2, Sheet 4	<ul style="list-style-type: none"> – Reconstruct the bridge over I-405 to widen southbound I-405.
Cedar River Bridge Exhibit 3-2, Sheet 4	<ul style="list-style-type: none"> – Widen the southbound I-405 bridge over the Cedar River.
Sunset Boulevard N Interchange Area Exhibit 3-2, Sheet 4	<ul style="list-style-type: none"> – Widen the I-405 northbound and southbound bridges over Sunset Boulevard N.
NE Park Drive Interchange Area Exhibit 3-2, Sheet 5	<ul style="list-style-type: none"> – Widen the I-405 southbound bridge over NE Park Drive.
N 30th Street Interchange Area Exhibit 3-2, Sheet 5	<ul style="list-style-type: none"> – Replace the local road overpass abutment slopes with retaining walls on both sides of I-405 and lower the southbound I-405 roadway by approximately one foot.
NE 44th Street Interchange Area Exhibit 3-2, Sheet 6	<ul style="list-style-type: none"> – Replace the northbound and southbound I-405 bridges over May Creek with two new single span bridges and provide habitat improvements. – Replace the NE 44th Street bridge over I-405. Construct new direct access ramps and two inline transit stations (one for each direction) in the I-405 median. Transit stations would include station platforms, signage, artwork, lighting, fare machines (ORCA), and site furnishings such as shelters, lean rails, benches, bollards, bicycle parking, and trash receptacles. – Realign and reconstruct the northbound access to I-405 from a loop ramp to a new on-ramp from Lake Washington Boulevard NE. – Build four roundabouts along local arterials. – Construct an at-grade park-and-ride lot at Lake Washington Boulevard N and N 43rd Street with a minimum of 200 parking stalls and a roundabout (improvements would be built, but may be built by Sound Transit or others).

Exhibit 3-1. Improvements Proposed with the I-405, Tukwila to I-90 Vicinity Express Toll Lanes Project

Project Element	I-405, Tukwila to I-90 Vicinity Express Toll Lanes Project
112th Avenue SE Interchange Area Exhibit 3-2, Sheet 7	<ul style="list-style-type: none"> – Replace the 112th Avenue SE bridge over I-405. – Construct new direct access ramps, two inline transit stations (one for each direction) in the I-405 median. Transit stations would include station platforms, signage, artwork, lighting, fare machines (ORCA), and site furnishings such as shelters, lean rails, benches, bollards, bicycle parking, and trash receptacles. – Construct a roundabout on 112th Avenue SE. – Reconfigure the Newport Hills Park-and-Ride.
Coal Creek Parkway Interchange Area Exhibit 3-2, Sheet 7	<ul style="list-style-type: none"> – Construct a new southbound I-405 bridge on a new alignment. Convert the existing southbound I-405 bridge to northbound ETLs. – Convert the four local road intersections on Coal Creek Parkway SE to roundabouts.
I-405/I-90 Interchange Area Exhibit 3-2, Sheet 8	<ul style="list-style-type: none"> – Reconfigure the I-405 southbound to I-90 eastbound ramp from one to two lanes. – Realign the I-405 northbound to I-90 eastbound ramp. As part of this work, construct two new bridges over the eastbound I-90 ramp to Factoria Boulevard and over Factoria Boulevard.
Fish Passage Exhibit 3-2, Sheet 6	<ul style="list-style-type: none"> – Construct four fish passage crossings for unnamed tributary (UNT) 08.LW.0283 (formerly Gypsy Creek). – Construct a fish passage crossing under I-405 mainline for Stream UNT 08.LW.7.7A.^a – Construct a fish passage crossing under I-405 mainline for Stream UNT 08.LW.7.8.^a
Lake Washington Trail Exhibit 3-2, Sheets 6 and 7	<ul style="list-style-type: none"> – Realign and reconstruct the existing trail west of its current location to reside in the King County's Eastside Rail Corridor property between Ripley Lane in Renton (MP 7.7) and Coal Creek Parkway in Bellevue (MP 10.2). As part of this work, widen a portion of the King County's Eastside Rail Corridor Regional Trail.
Noise Walls Exhibit 3-2, Sheets 4, 6, 7 and 8	<ul style="list-style-type: none"> – Construct 4 new noise walls. – Relocate 2 existing noise walls.
Stormwater Management Exhibit 3-2, Sheets 1 through 8	<ul style="list-style-type: none"> – Add 46.92 acres of new PGIS and 5.7 acres of non-PGIS. – Provide enhanced treatment for 100 percent of new impervious surfaces. – Retrofit 51 percent (111.5 acres) of existing untreated PGIS and continue to treat stormwater from the 21.27 acres of PGIS that currently receives treatment. – Treat a total of 179.69 acres of PGIS.
Construction Duration	<ul style="list-style-type: none"> – 5 years of construction is expected from 2019 through 2024. – The direct access ramps and associated transit improvements at 112th Avenue SE, reconfiguring the Newport Hills Park-and-Ride lot, and building four roundabouts on Coal Creek Parkway SE may be constructed after 2024, depending on when allocated funds for these elements become available.

ETL = express toll lane GP = general purpose; HOV = high-occupancy vehicle; PGIS = pollutant generating impervious surfaces

^a For these culverts, a restrictor plate will be put in place to prevent flooding until a downstream barrier is removed, at which time the restrictor plate will be removed.

How would the express toll lanes work?

At this time, the Washington State Transportation Commission (WSTC) has not established operational hours, user exemptions, occupancy requirements, and operating parameters for the ETLs proposed with the Project. The WSTC would set operational requirements for the ETLs prior to opening day. For this analysis, we assumed the requirements for the current I-405, Bellevue to Lynnwood ETL system would be used for this project. These assumptions, listed below, represent the most recent operating guidance from the WSTC for ETLs:

- **Limited Access** – The system would have designated entry and exit points, with a buffer between the ETLs and the GP lanes. These access points would vary in length, depending on the location.
- **Dynamic and Destination Pricing** – The I-405 ETL system would use both dynamic and destination pricing to determine a driver’s toll at the time they enter the ETL. With *dynamic pricing*, toll rates vary based on congestion within the corridor to maintain performance. Electronic signs would be used to communicate the current toll rate for drivers. Toll rates are updated every few minutes, but the driver’s price is set when they enter the system. With *destination pricing*, the toll is based on the driver’s destination. Toll signs would show up to three toll rates for different toll zones, or destinations. Drivers would pay the rate they see upon entering the ETLs to reach their destination, even if they see a different toll rate for their destination further down the road. When both of these pricing approaches are used together, it means that the toll that drivers pay is based both on the congestion in the corridor and the distance they are traveling.
- **Operating Hours and Good To Go! Passes** – The ETL system is expected to operate from 5 a.m. to 7 p.m. on weekdays, with the system toll-free and open to all at other hours and on major holidays. Transit, HOVs, and motorcycles would need to have a *Good To Go!* pass to use the ETLs for free during operating hours. Eligible HOV users would be required to set the *Good To Go!* pass to the HOV mode to avoid charges. Single-occupancy vehicles (SOVs) could choose to pay a toll to

How does dynamic pricing work?

Electronic monitors along the roadway measure real-time information on the speed, congestion, and number of vehicles in the ETLs. This information is used to determine whether tolls go up or down to optimize lane use.

As the ETLs become congested, toll rates increase, and as congestion decreases, toll rates decrease. The use of dynamic pricing allows the lanes to operate with high volumes but avoid becoming congested.

When would tolls be charged to use the ETLs?

It is assumed the ETLs would operate from 5 a.m. to 7 p.m. on weekdays. At all other times and major holidays, the lanes would be free and open to all without a *Good To Go!* pass.

During operating hours:

- **SOVs** would pay a toll to use the lanes.
 - **Transit, HOV 3+, and Motorcycles** would travel for free with a *Good To Go!* pass.
 - **HOV 2+** would travel for free from 9 a.m. to 3 p.m. with a *Good To Go!* pass. From 5 a.m. to 9 a.m. and 3 p.m. to 7 p.m. HOV2+ would pay a toll to use the ETLs with or without a *Good To Go!* pass.
 - **Large vehicles** over 10,000 pounds gross vehicle weight would not be able to use the ETLs at any time.
-

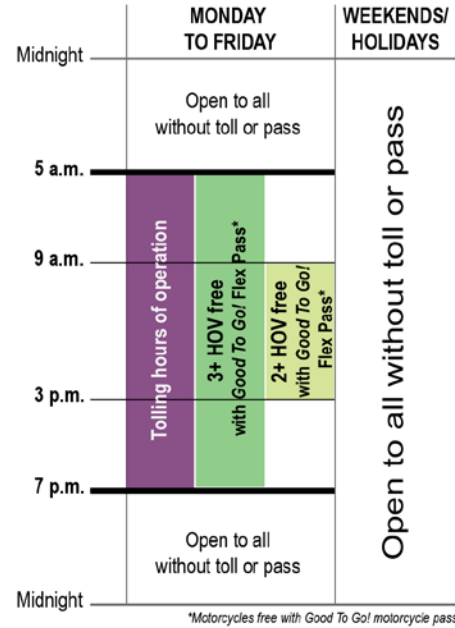
use the ETLs during operating hours with or without a *Good To Go!* pass.

- Occupancy Requirements** – During the peak periods (weekdays from 5 a.m. to 9 a.m. and 3 p.m. to 7 p.m.), transit vehicles and carpools with three or more persons (HOV 3+) would be able to use the lanes for free with a *Good To Go!* pass. From 9 a.m. to 3 p.m., the system would be open toll-free to those with two or more passengers (HOV2+) with a *Good To Go!* pass. Motorcycles ride toll-free in the ETLs with a *Good To Go!* pass. During non-operating hours, SOVs will not be permitted to enter the ETLs from ramps where access is provided directly from local streets. SOV access would only be permitted from freeway GP entry and exit points.
- Vehicle Weight** – Vehicles over 10,000 pounds gross vehicle weight will be prohibited, which is consistent with HOV lane restrictions throughout Washington.
- Electronic Tolling** – Payments would be made via electronic tolling with a *Good To Go!* pass. For drivers who choose not to use a *Good To Go!* Pass, WSDOT offers optional photo billing (pay by mail) for an extra fee.

How could toll revenue be used?

Federal law and state law provide specific requirements on how toll revenues can be used. Federal law regarding the use of toll revenues is contained in 23 United States Code (U.S.C.) Section 129 (a)(3). This law allows toll revenues received from operation of the toll facility to be used for such things as debt service, a reasonable return on investment for any private financiers of the project, operations and maintenance costs, and payments associated with any public-private partnership agreements. Current state law is more restrictive on how toll revenue can be used.

In addition to these federal requirements, the Revised Code of Washington (RCW) 47.56.820 requires that all revenue from an eligible toll facility must be used only to construct, improve, preserve, maintain, manage, or operate the eligible toll facility on or in which the revenue is collected. Currently in Washington State, expenditures of toll revenues must be



What is a *Good To Go!* Account?

A *Good To Go!* account is the cheapest and easiest way to pay tolls in Washington. With an account, your tolls will be paid automatically without having to stop at a toll booth or worry about bills in the mail. For more information please go to:

<http://www.wsdot.wa.gov/GoodToGo/default.htm>

approved by the state legislature and must be used only to cover operations and maintenance costs; to repay debt, interest, and other financing costs; and to make improvements to the eligible toll facilities.

As required by state law, all toll revenue generated from the Project ETLs will be used to construct, improve, preserve, maintain, manage, or operate the I-405 corridor.

How would the Project be constructed?

WSDOT expects to construct the Project using a design-build contract. Design-build is a method of project delivery in which WSDOT executes a single contract with one entity for design and construction services to provide a finished product. With design-build projects, contractors have the flexibility to offer innovative and cost-effective alternatives to deliver the Project, improve project performance, and reduce project effects. Some design modifications that the contractor may propose could affect the Project footprint and design details described in this EA; however, if the contractor proposes modifications not covered by this EA, environmental review would be conducted as needed.

Construction work would include the removal of existing asphalt and concrete surfaces, clearing and grading adjacent areas, laying the aggregate roadway foundation, and placing of asphalt and concrete surfaces. Changing the vertical and horizontal alignments of the I-405 mainline would require earthwork, with approximately 780,000 cubic yards of excavation and approximately 700,000 cubic yards of fill.

Construction equipment such as backhoes, excavators, front loaders, pavement grinders, jack hammers, pile drivers, trucks, as well as grading and paving equipment would be used. Equipment used for construction would include cranes, pile drivers, drilling rigs and augers, backhoes and excavators, jack hammers, concrete pumping equipment, and slurry processing equipment.

Staging areas in unused right of way would provide room for employee parking, large equipment storage, and material stockpiles. The contractor may also find other locations for construction staging.

What are the remaining improvements for the TRIP and Renton to Bellevue Project?

Once this Project is built, WSDOT assumes that the remaining improvements from the TRIP and Renton to Bellevue Project would be constructed as funds become available. A brief summary of the remaining improvements is provided below. Because the remaining improvements of the TRIP and the Renton to Bellevue Project were evaluated in EAs completed in 2008 and 2006, respectively, much of the analysis is complete. Updates to previous environmental documentation will be made as needed when future construction stages are proposed.

Tukwila to Renton Improvement Project

Most of the remaining improvements associated with the TRIP were not included in the 2015 Connecting Washington funding package. The remaining elements of the TRIP that are not yet funded are discussed in detail in Chapter 4 of the 2008 TRIP EA and they are summarized below. They include the capacity improvements listed below in addition to associated improvements to modify and expand interchanges and local roadways, build noise walls, and construct stormwater management facilities:

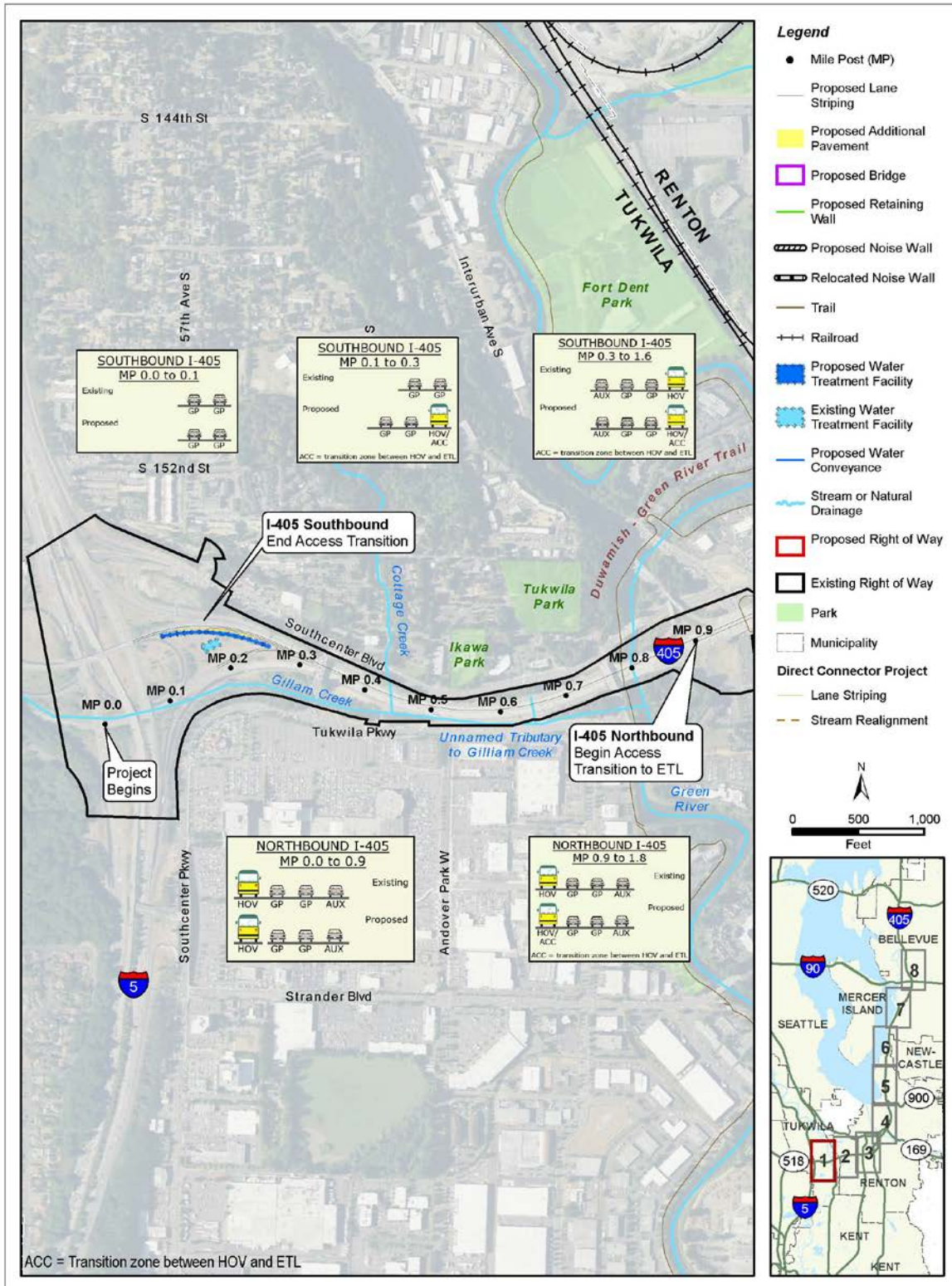
- Constructing one additional GP lane in both directions on I-405 from SR 181 through SR 167
- Constructing an auxiliary lane on northbound SR 167 from S 43rd Street to I-405
- Constructing one additional GP lane in each direction on I-405 from SR 167 through SR 169

Renton to Bellevue Project

The remaining elements of the Renton to Bellevue Project are discussed in detail in Chapter 4 of the 2006 Renton to Bellevue EA. These improvements include constructing an additional GP lane in each direction on I-405 between SR 169 and I-90 and associated improvements to interchanges, local roadways, noise walls, stormwater management facilities, and fish passage.

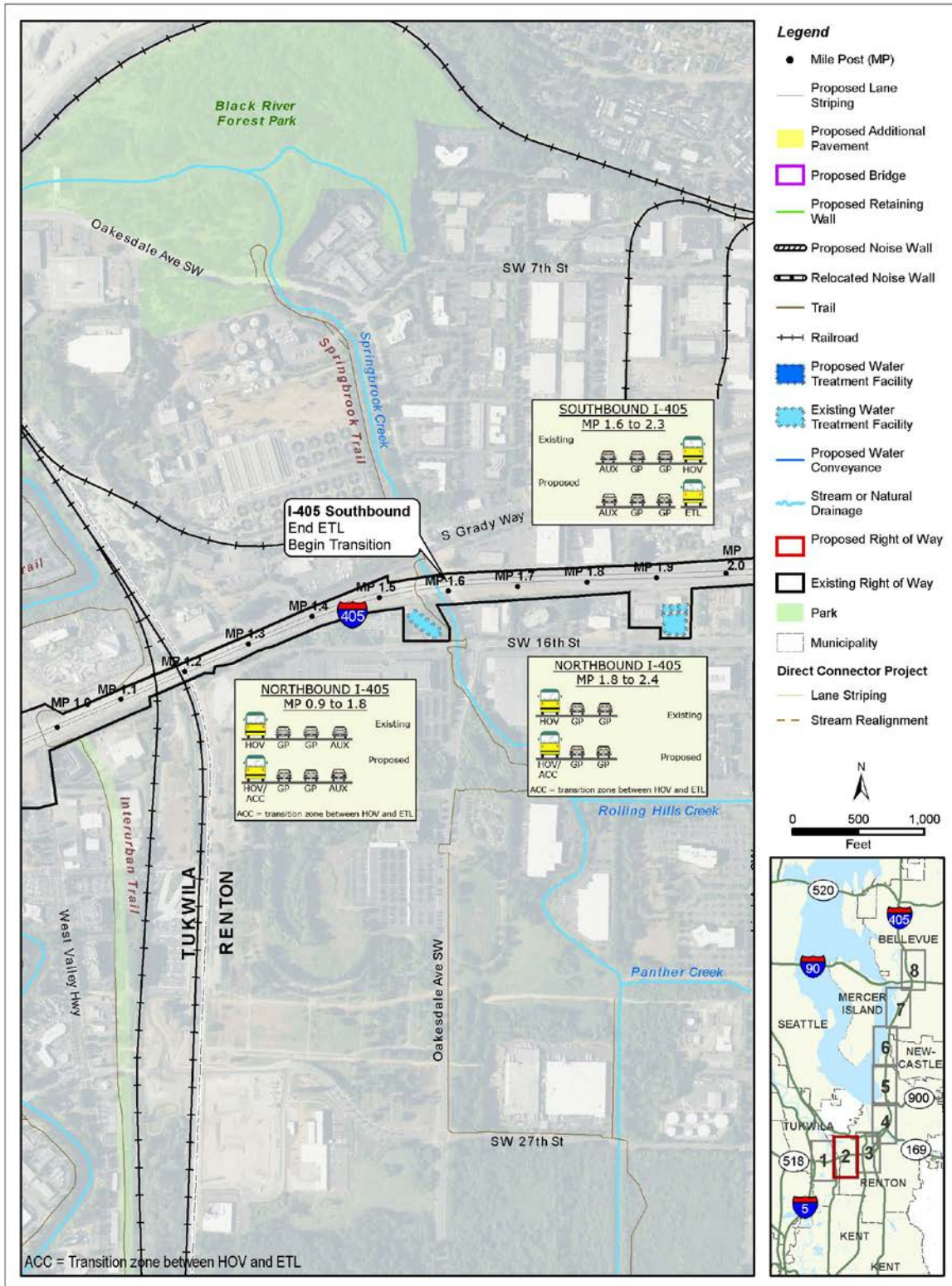
I-405, TUKWILA TO I-90 VICINITY EXPRESS TOLL LANES PROJECT (MP 0.0 TO 11.9)
 ENVIRONMENTAL ASSESSMENT

Exhibit 3-2. I-405, Tukwila to I-90 Vicinity Express Toll Lanes Project Improvements, Sheet 1 of 8



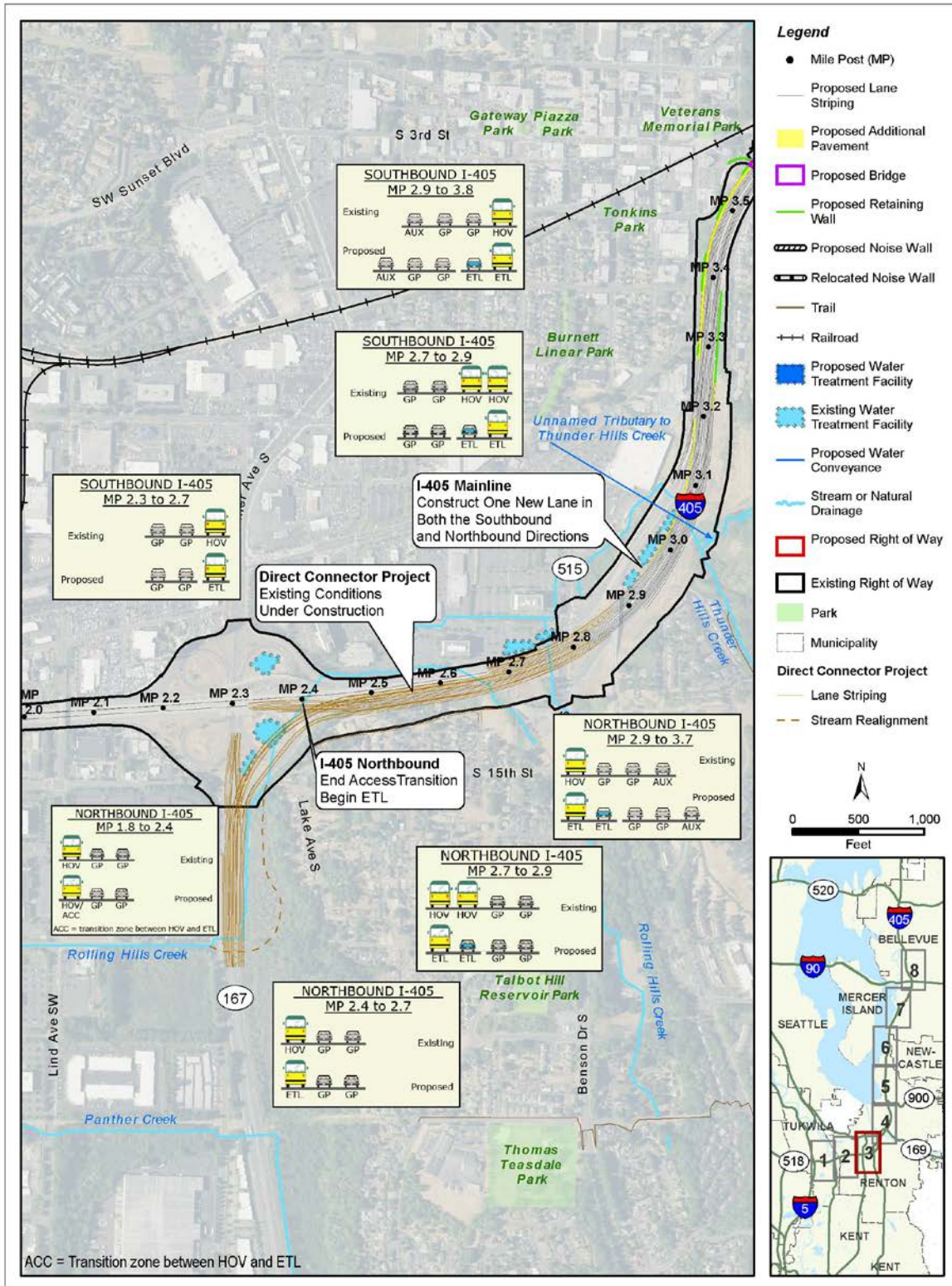
I-405, TUKWILA TO I-90 VICINITY EXPRESS TOLL LANES PROJECT (MP 0.0 TO 11.9)
 ENVIRONMENTAL ASSESSMENT

Exhibit 3-2. I-405, Tukwila to I-90 Vicinity Express Toll Lanes Project Improvements, Sheet 2 of 8



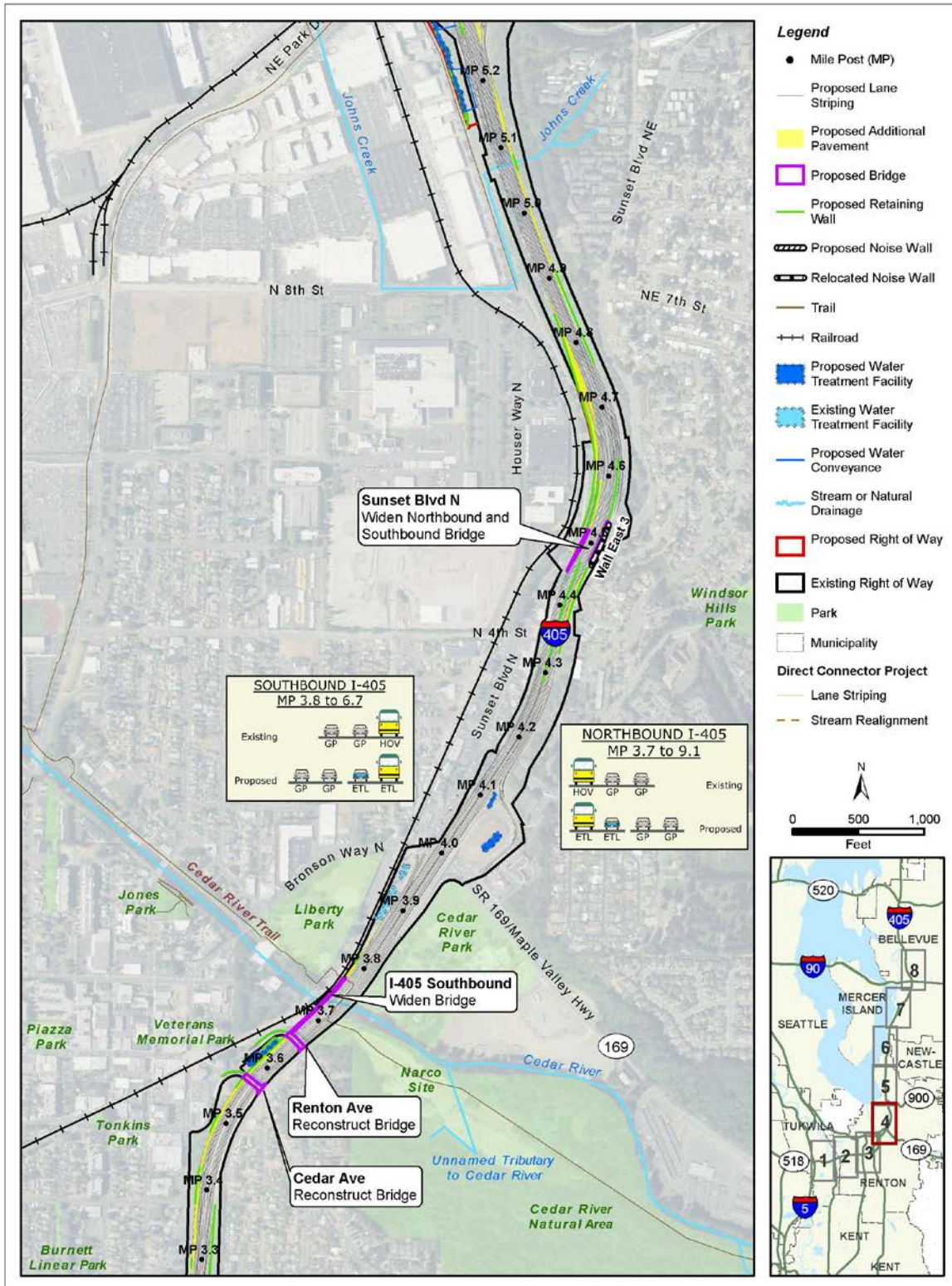
I-405, TUKWILA TO I-90 VICINITY EXPRESS TOLL LANES PROJECT (MP 0.0 TO 11.9)
 ENVIRONMENTAL ASSESSMENT

Exhibit 3-2. I-405, Tukwila to I-90 Vicinity Express Toll Lanes Project Improvements, Sheet 3 of 8



I-405, TUKWILA TO I-90 VICINITY EXPRESS TOLL LANES PROJECT (MP 0.0 TO 11.9)
 ENVIRONMENTAL ASSESSMENT

Exhibit 3-2. I-405, Tukwila to I-90 Vicinity Express Toll Lanes Project Improvements, Sheet 4 of 8



I-405, TUKWILA TO I-90 VICINITY EXPRESS TOLL LANES PROJECT (MP 0.0 TO 11.9)
 ENVIRONMENTAL ASSESSMENT

Exhibit 3-2. I-405, Tukwila to I-90 Vicinity Express Toll Lanes Project Improvements, Sheet 5 of 8

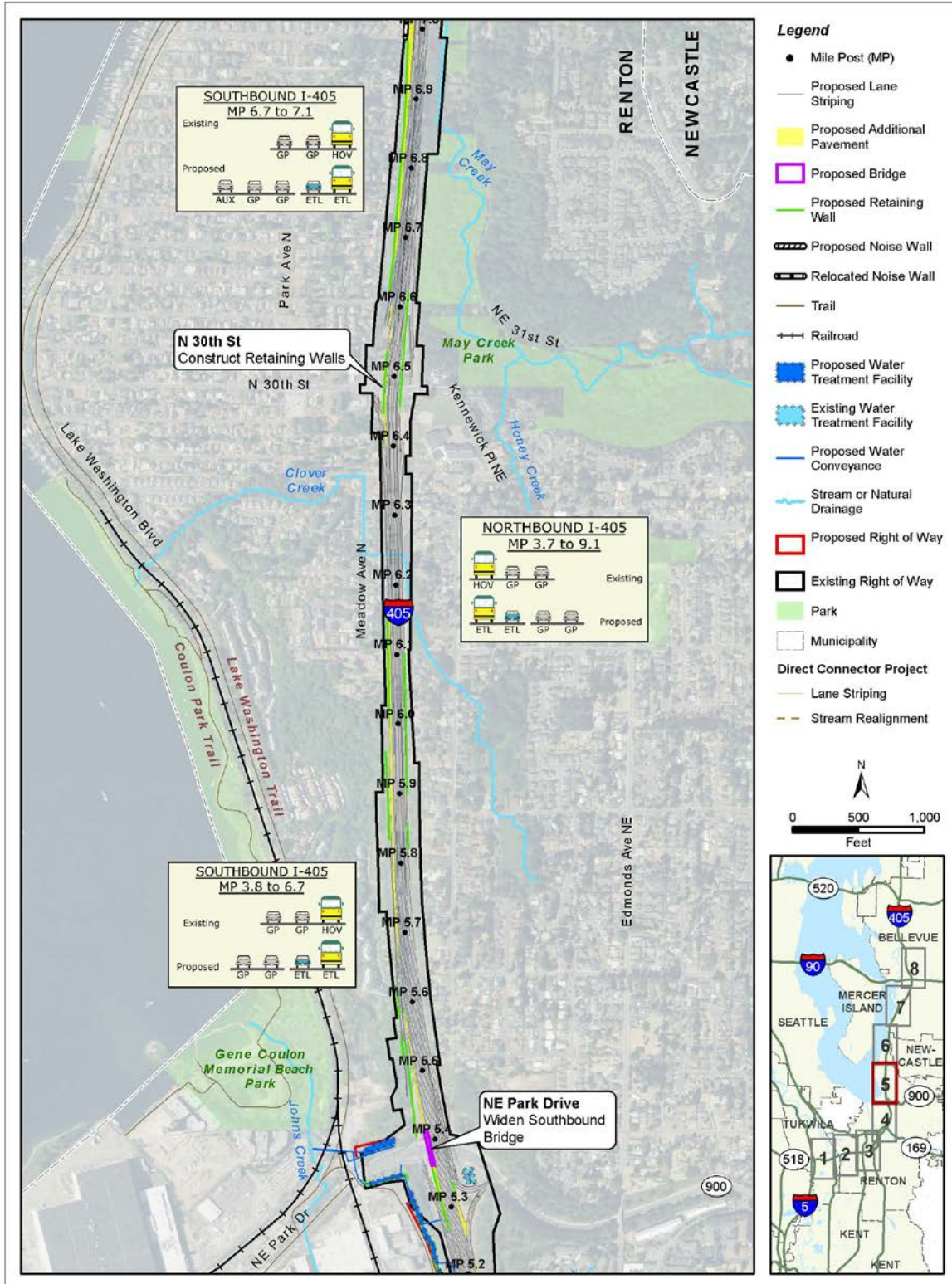
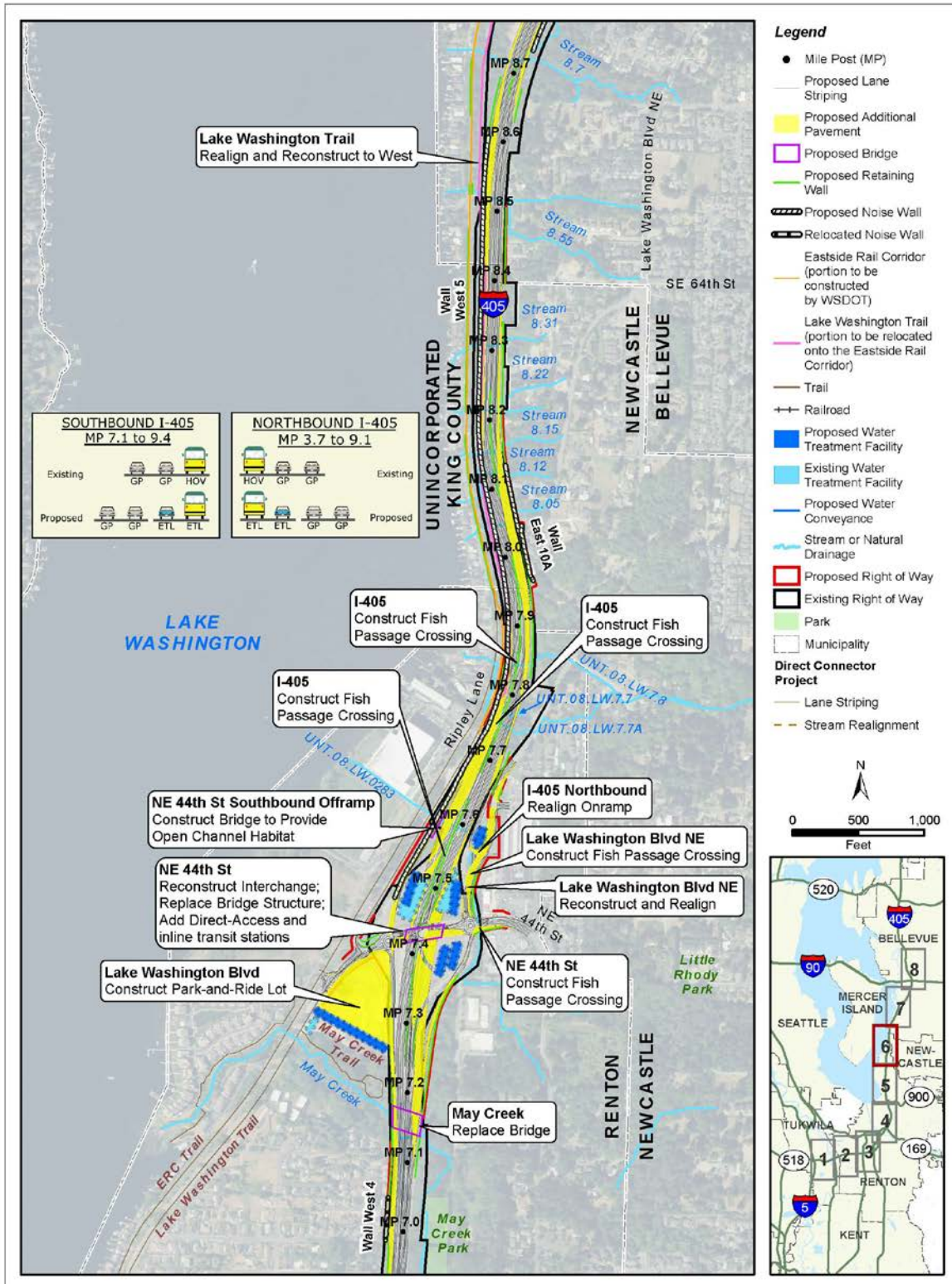
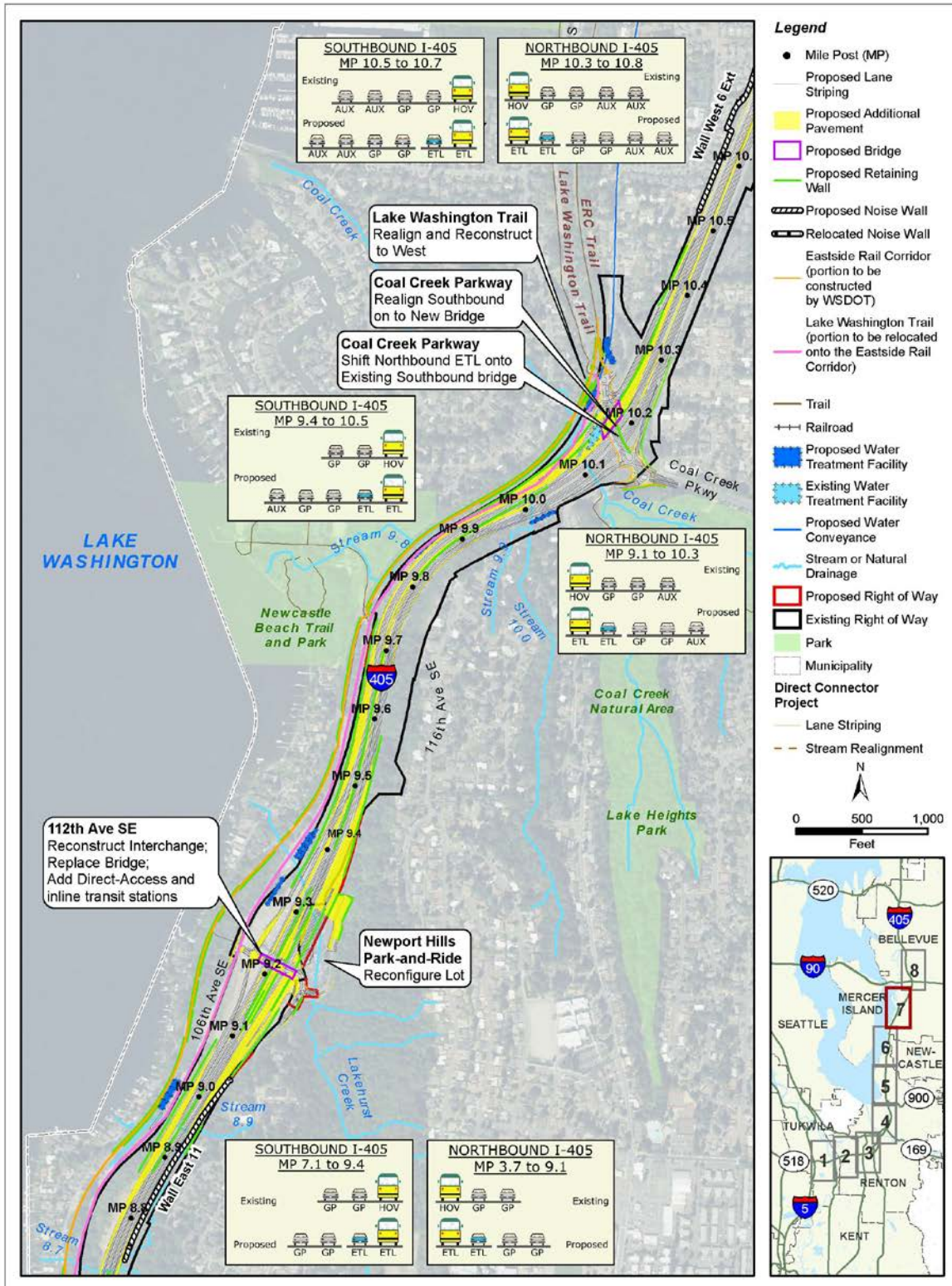


Exhibit 3-2. I-405, Tukwila to I-90 Vicinity Express Toll Lanes Project Improvements, Sheet 6 of 8



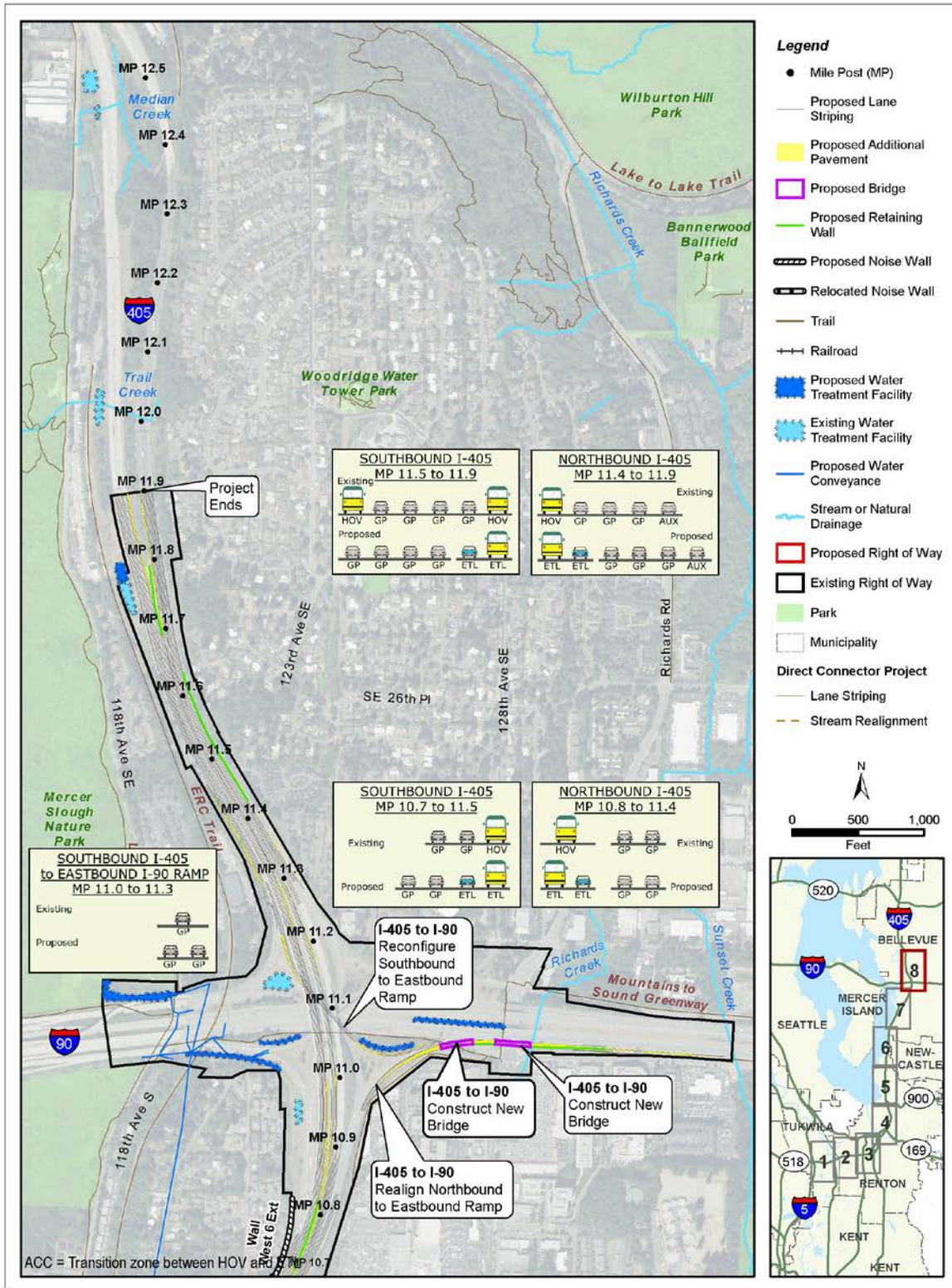
I-405, TUKWILA TO I-90 VICINITY EXPRESS TOLL LANES PROJECT (MP 0.0 TO 11.9)
 ENVIRONMENTAL ASSESSMENT

Exhibit 3-2. I-405, Tukwila to I-90 Vicinity Express Toll Lanes Project Improvements, Sheet 7 of 8



I-405, TUKWILA TO I-90 VICINITY EXPRESS TOLL LANES PROJECT (MP 0.0 TO 11.9)
 ENVIRONMENTAL ASSESSMENT

Exhibit 3-2. I-405, Tukwila to I-90 Vicinity Express Toll Lanes Project Improvements, Sheet 8 of 8



CHAPTER 4 PROJECT EFFECTS

This chapter examines the potential effects of the I-405, Tukwila to I-90 Vicinity Express Toll Lanes Project on people and environment. This chapter summarizes the analyses contained in technical reports to explain how the Project might affect study area resources.

How did we evaluate Project effects on the environment?

The following technical reports are summarized in this EA and are:

- Attachment A – *Transportation Discipline Report*
- Attachment B – *Air Quality Discipline Report*
- Attachment C – *Noise Discipline Report*
- Attachment D – *Environmental Justice Discipline Report*
- Attachment E – *Cultural Resources Survey*
- Attachment F – *Visual Impact Assessment Discipline Report*
- Attachment G – *Water Resources Discipline Report*
- Attachment H – *Hazardous Materials Analysis*
- Attachment I – *Recreational, Section 4(f), and Section 6(f) Resources Technical Memorandum*
- Attachment J – *Geology, Soils, and Groundwater Technical Memorandum*

These documents are available within this Environmental Assessment (EA) and on the Project website at:

<http://www.wsdot.wa.gov/Projects/I405/rentontobellevue>.

The project team analyzed other environmental topics within this EA, but these topics did not warrant a separate technical report. These included land use and socioeconomics, ecosystems; energy and greenhouse gases; and public services and utilities, and they are discussed in this EA.

Other supporting documentation attached to this EA include the following:

- Attachment K – Glossary

What is the study area for the Project?

The study area for the Project varies among individual resources as scientific convention and practice dictate.

What are potential effects?

Potential effects are impacts or changes that could occur because of the proposed action. The effects may be ecological, aesthetic, historic, cultural, economic, social, or health-related. Examples might include encroachment on nearby wildlife habitat from widening a roadway or elevated noise levels for adjacent land uses due to increased traffic.

- Attachment L – Acronyms and Abbreviations
- Attachment M – Agency and Tribal Correspondence
- Attachment N – Cross Reference of National Environment Policy Act (NEPA) Elements
- Attachment O – Logical Termini
- Attachment P – Wetland and Water Resources Maps
- Attachment Q - Endangered Species Act (ESA) Summary

How would the Project affect the environment?

Because the Project would be built mostly within existing right of way in a highly urbanized area, Washington State Department of Transportation (WSDOT) found that the Project would have few effects on many elements of the natural and built environment. These elements include air quality; energy and greenhouse gases; land use, historic, cultural, and archaeological resources; geology and soils; hazardous materials; and public services and utilities. As such, we include only a brief discussion of these environmental topics in this section. The remaining environmental topics that required deeper analysis to determine potential effects are discussed in more detail in the sections listed below:

- Section 4.1, Transportation
- Section 4.2, Noise
- Section 4.3, Land Use, Socioeconomics, and Environmental Justice
- Section 4.4, Recreational, Section 4(f), and Section 6(f) Resources
- Section 4.5, Visual Quality
- Section 4.6, Water Resources
- Section 4.7, Ecosystems

The potential cumulative effects of the Project are discussed in Chapter 5, Cumulative Effects. The mitigation measures, design elements, and best management practices (BMPs) to minimize or avoid potential effects during the construction and operation phases of the Project can be found in Chapter 6, Measures to Avoid or Minimize Effects.

Air Quality

The air quality analysis evaluated possible effects on air quality from this Project and the I-405, Downtown Bellevue Vicinity Express Toll Lanes Project (MP 11.9 to 14.6) together because these projects are anticipated to be built at the same time and are located next to each other. We have provided a summary of the air quality findings in this section, with more details found in Attachment B, *Air Quality Discipline Report*.

The Interstate 405 (I-405) corridor is in compliance (attainment) with all National Ambient Air Quality Standards (NAAQS). Recent air quality monitoring data from one monitoring station near the Project vicinity measures concentrations of carbon monoxide (CO), particulate matter (PM₁₀ and PM_{2.5}), and ozone. Exhibit 4-1 indicates that the air pollutant concentrations for the past three years have remained below the NAAQS.

Exhibit 4-1. Ambient Air Quality Monitoring Data at Kent and Beacon Hill Stations

Pollutant	NAAQS	2014 Maximum Concentration	2015 Maximum Concentration	2016 Maximum Concentration
Carbon Monoxide (CO)^a				
1-hour average (ppm)	35	1.0	1.1	1.1
8-hour average (ppm)	9	1.0	0.9	0.9
Ozone^a				
1-hour average (ppm)	0.070	0.048	0.062	0.060
8-hour average (ppm)	0.070	0.058	0.050	0.050
Particulate Matter (PM₁₀)^a				
24-hour average (µg/m ³)	150	25.0	37.0	PM ₁₀ is no longer being monitored.
Particulate Matter (PM_{2.5})^b				
24-hour average (98th Percentile) (µg/m ³)	35	22	26	18
Annual arithmetic average (µg/m ³)	12	6.2	6.7	5.5

Source: EPA 2016.

Notes: Beacon Hill Station is located at 4103 S Beacon Hill in Seattle, Washington. Kent Station is located at 614 N Railroad Avenue in Kent, Washington.

^a Concentrations of CO, ozone, and PM₁₀ are from the Beacon Hill station.

^b Concentrations of PM_{2.5} are from the Kent station.

ppm = parts per million; µg/m³ = micrograms per cubic meter

As shown in Exhibit 4-2, the 2025 and 2045 Build and No Build Alternatives would have lower emissions than existing conditions. Emissions in 2025 and 2045 are expected to be lower because of improved vehicle technology. With the exception of CO in 2025, emissions with the Build Alternative are expected to be lower than emissions with the No Build Alternative in both 2025 and 2045. CO emissions for the 2025 Build Alternative would be only slightly higher (about 1 percent) than the 2025 No Build Alternative due to traffic changes. For both the Build or No Build Alternatives, emissions would be substantially reduced compared to existing conditions due to the implementation of the U.S. Environmental Protection Agency (EPA) vehicle and fuel regulations.

Exhibit 4-2. Criteria Pollutants Daily Regional Emission Burden Assessment for 2025 and 2045

Criteria Pollutant (lb/day)	Existing 2016	2025 No Build	2025 Projects ^a	2045 No Build	2045 Projects ^a
Daily VMT ^b	4,129,899	4,336,881	4,428,518	5,027,883	4,858,118
CO ^b	38,039	20,260	20,485	9,499	9,105
PM _{2.5} ^b	639	171	169	93	92
PM ₁₀ ^b	699	187	185	102	101
VOCs ^b	1,898	599	598	376	357
NO _x ^b	16,974	4,828	4,813	3,173	3,174

VMT = vehicle miles traveled; lb/day = pounds per day; CO = carbon monoxide; PM = particulate matter; VOCs = volatile organic compounds; NO_x = oxides of nitrogen

^a Air quality modeling shows the results of building both the I-405 Tukwila to I-90 Vicinity Express Toll Lanes Project and the I-405 Downtown Bellevue Vicinity Project.

^b The percent change is available in Attachment B, Exhibit 6-1.

In addition, we modeled emissions of mobile source air toxics (MSATs). Air quality standards have not been established for MSATs; however, the results of the regional analysis shown in Exhibit 4-3 demonstrate that MSAT emissions from the projects would substantially decrease in 2025 and 2045 as compared existing conditions.

Although the vehicle miles traveled (VMT) estimated for the projects in both 2025 and 2045 would increase compared to existing conditions, MSATs are estimated to be lower than existing conditions because of improved vehicle technology. In addition, because the estimated VMT with the projects in 2025 and 2045 would vary by less than 2 percent compared to No Build, we expect that there would be no appreciable difference in MSAT emissions between No Build and Build Alternatives.

Exhibit 4-3. MSAT Daily Regional Emission Burden Assessment for 2025 and 2045

Criteria Pollutant (lb/day)	Existing Conditions 2016	2025 No Build	2025 Projects ^a	2045 No Build	2045 Projects ^a
Daily VMT ^b	4,129,899	4,336,881	4,428,518	5,027,883	4,858,118
1-3-Butadiene ^b	6	1	1	0	0
Acrolein ^b	6	2	2	1	1
Acetaldehyde ^b	39	12	12	9	9
Benzene ^b	46	13	13	7	7
Ethyl Benzene ^b	24	8	8	5	5
Formaldehyde ^b	80	30	30	28	27
Diesel PM ^b	604	138	136	71	71
PAH ^b	9	3	3	2	2

lb/day = pounds per day; VMT = vehicle miles traveled; PM = particulate matter; PAH = polycyclic aromatic hydrocarbons

^a Air quality modeling shows the results of building both I-405 Tukwila to I-90 Vicinity Express Toll Lanes Project and the I-405 Downtown Bellevue Vicinity Project.

^b The percent change is available in Attachment B, Exhibit 6-2.

Project construction would temporarily affect air quality. Temporary construction effects would include increases in particulate matter (typically fugitive dust, including PM₁₀ and PM_{2.5}) from excavation and earth-moving and increased emissions from gas and diesel-fueled construction equipment. Engine and motor vehicle exhaust would result in emissions of CO, volatile organic compounds, oxides of nitrogen, PM₁₀, PM_{2.5}, MSATs, and greenhouse gases (discussed below).

Energy and Greenhouse Gases

Attachment B, *Air Quality Discipline Report*, provides additional details regarding energy and greenhouse gas emissions.

Vehicles are a significant source of energy consumption and greenhouse gas emissions, primarily through the burning of gasoline and diesel fuels. National estimates show that the transportation sector (including on-road vehicles, vehicles used for construction activities, airplanes, and boats) accounts for about 27 percent of total domestic carbon dioxide (CO₂) emissions. However, in Washington transportation accounts for nearly half of greenhouse gas emissions because the state relies heavily on hydropower for electricity generation, unlike other states that rely on fossil fuels such as coal, petroleum, and natural gas to generate

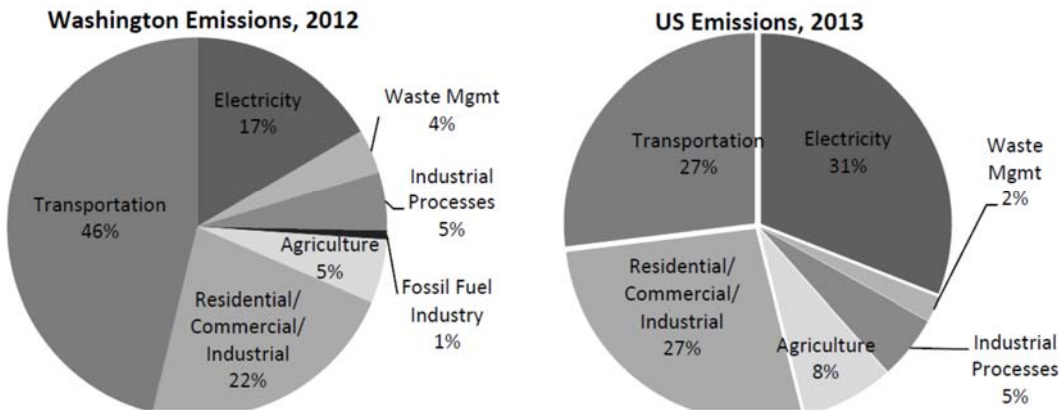
What are National Ambient Air Quality Standards?

The *Clean Air Act (CAA)* identified several air pollutants as being of concern nationwide. These pollutants are known as "criteria pollutants." The sources of these pollutants, their effects on human health and the nation's welfare, and their concentration in the atmosphere vary considerably. Under the CAA, the U.S. *Environmental Protection Agency (EPA)* has established *National Ambient Air Quality Standards (NAAQS)*, which specify maximum allowable concentrations for the six criteria pollutants: carbon monoxide, lead, nitrogen dioxide, particulate matter, ozone, and sulfur dioxide. Primary standards were created to protect public health and secondary pollutant standards were established to protect public welfare and the environment.

electricity. Exhibit 4-4 shows the gross greenhouse gas emissions by sector for Washington and the United States.

Congested conditions on I-405 affect energy consumption and greenhouse gas emissions in the study area. Excessive idling and stop-and-go traffic conditions substantially reduce fuel economy compared with free-flow traffic conditions. In the study area, I-405 experiences congestion many hours of the day in both the GP and HOV lanes. In addition, many study area intersections operate under congested conditions during the morning and afternoon peak hours.

Exhibit 4-4. Greenhouse Gas Emissions by Sector, Washington State (2012) and United States (2013)



Source: Washington State Department of Ecology 2016

As shown in Exhibit 4-5, we estimate that CO₂ emissions in 2025 with the No Build and Build Alternatives would be lower than existing conditions. Further, in 2025, modeling does not show any meaningful difference of greenhouse gas emissions between the No Build and Build Alternatives. In 2045, greenhouse gas emissions would be slightly higher than existing conditions with the Build and No Build Alternatives. In 2045, greenhouse gas emissions from the Build Alternative would be slightly lower than the No Build Alternative.

Exhibit 4-5. Greenhouse Gas Emissions in Terms of CO_{2e} for 2025 and 2045

	Existing 2016	2025 No Build	2025 Projects ^a	2045 No Build	2045 Projects ^a
Daily VMT ^b	4,129,899	4,336,881	4,428,518	5,027,883	4,858,118
Annual CO _{2e} (MT) ^b	2,803	2,571	2,568	2,872	2,817

VMT = vehicle miles traveled; CO_{2e} = carbon dioxide equivalent; MT = metric tons

^a Air quality modeling shows the results of building both I-405 Tukwila to I-90 Vicinity Express Toll Lanes Project and the I-405 Downtown Bellevue Vicinity Project.

^b The percent change is available in Attachment B, Exhibit 6-3.

Although weekday I-405 travel demand would be higher with the Build Alternative than with No Build Alternative, the express toll lanes (ETLs) would reduce stop-and-go conditions, improve roadway speeds, improve intersection traffic flow, and improve transit speeds. These project-related benefits would reduce idling, which would slightly lower energy consumption and greenhouse gas emissions.

Construction equipment would consume both gas and diesel fuels and produce greenhouse gas emissions.

WSDOT uses the Federal Highway Administration (FHWA) Infrastructure Carbon Estimator spreadsheet tool to calculate greenhouse gas emissions from fuel usage, traffic delays, and maintenance emissions resulting from project construction. Appendix F of the *Air Quality Discipline Report* provides a discussion of the inputs used in the ICE model. We predict that construction of this Project along with the I-405, Downtown Bellevue Vicinity Express Toll Lanes Project would emit a total of 6,343 metric tons of carbon dioxide equivalent (CO_{2e}) per year over the 5-year construction period.

Historic, Cultural, and Archaeological Resources

WSDOT conducted a cultural resources survey of the area of potential effects (APE) in compliance with Section 106 of the National Historic Preservation Act of 1966 (NHPA).

Attachment E, *Cultural Resources Survey*, provides details and findings of the cultural resource survey completed. Potential effects on cultural resources and a discussion of work done as part of the Section 106 consultation for the Project is summarized below. The Section 106 consultation

documentation can be found in Attachment M, Agency and Tribal Correspondence.

Fieldwork completed included a field survey of the APE, subsurface testing at locations within the APE that had not been previously tested and appeared to have potentially undisturbed soils, and a historic building/structure inventory and evaluation. No archaeological materials or features were identified during survey and shovel testing in the study area. The study area has a very low probability for archaeological sites due to extensive previous disturbance related to the original construction of I-405 (i.e., massive cuts and fills) and limited Holocene-era sediments.

Attachment E, *Cultural Resources Survey*, identified two historic resources: the Paukstis House (11620 Southeast 45th Place in Bellevue), which is eligible for the National Register of Historic Places (NRHP) and the Lake Washington Belt Line, a historic railway corridor, which was determined eligible in 2007. The Paukstis House is separated from proposed WSDOT construction activities by significant green space and, therefore, would not be affected by the Project. The planned conversion of the Lake Washington Belt Line route to a non-motorized trail (the Eastside Rail Corridor Regional Trail) would not be an adverse effect. Additional discussion about the Eastside Rail Corridor Regional Trail is contained in Section 4.4, Recreational, Section 4(f), and Section 6(f) resources. Historic resources would not be affected by construction or operations.

After the development of the *Cultural Resources Survey*, additional Project elements were further developed during preliminary engineering. These elements were detailed in updated APE consultation and coordination letters sent by WSDOT to the State Historic Preservation Officer (SHPO) and the affected Native American tribes for review. Attachment M contains the letters sent and received as part of this consultation process:

- The first letter was sent in June 21, 2017. On June 26, 2017, the SHPO concurred with WSDOT's determination of no adverse effect on historic properties. This letter also included concurrence that the Paukstis House is eligible for listing on the NHRP.

Why do we consider potential effects on cultural resources?

Under *Section 106 of the National Historic Preservation Act of 1966*, as amended, federal agencies must identify and evaluate cultural resources and consider how undertakings they fund, license, permit, or assist affect historic properties eligible for inclusion in the *National Register of Historic Places (NRHP)*.

What is an APE?

An *APE (area of potential effect)* is an area in which historic properties, if they are present, could be affected by the project either directly or indirectly.

- A second letter was sent in April 3, 2018 requesting concurrence that there would be no adverse effects related to work proposed MP 0.0 and 3.8, the Northern Pacific Lake Washington Beltline. The SHPO concurred with the no adverse effect determination in a letter dated April 9, 2018.

Geology and Soils

The Project is located along the west-facing slopes of a glacially carved trough that is occupied by Lake Washington. Within the study area, the geologic and soil conditions range from soft soil to dense and very dense glacial deposits. The general geologic characteristics are described as alluvium, which includes a wide range of deposits from soft organic rich clayey silt to very stiff sandy silt to loose to dense sand and gravel. Areas of tertiary sedimentary rocks are also expected to exist with the study area.

Groundwater levels are anticipated to be at or near the ground surface to approximately 25 feet below the ground surface. As the groundwater increases in depth, discontinuous perched aquifers can be expected and are likely to exhibit seasonal fluctuations.

The area is seismically active and potentially subjected to ground motions resulting from a Cascadia subduction event or rupture along the Seattle Fault. With the anticipated groundwater levels and ground conditions described above, the liquefaction potential within the study area ranges from low and moderate to high. Based on the site-specific explorations, WSDOT will conduct a liquefaction susceptibility analysis and develop and implement hazard mitigation measures in accordance with WSDOT design guidance.

Most of the soils within and adjacent to study area have been extensively modified by earlier construction activities, and temporary construction activities would disturb these soils again. Temporary effects during construction would include increased erosion, noise, vibration, excavation of soft wet soils, and dust during dry weather construction. Chapter 6, Measures to Avoid or Minimize Effects, lists mitigation measures that will be implemented during construction and operations of the Project.

Hazardous Materials

Attachment H, *Hazardous Materials Analysis*, contains information about the review of potentially hazardous sites located in the study area. The findings of the *Hazardous Materials Analysis* are summarized below.

Based on the search results provided by Environmental Data Resource Inc. and Washington State Department of Ecology (Ecology)'s online Facility Site Database, WSDOT identified 304 sites as potential Recognized Environmental Conditions (REC) located within or near the study area. Out of the 304 sites, 272 were eliminated from further consideration, because the Project was deemed unlikely to affect those sites during construction. However, the remaining 32 sites may qualify as RECs because of their historical land use and confirmed or suspected past release of contaminants that could be encountered during construction or properties proposed for acquisition that are known or suspected of having contamination.

Based on the risk analyses performed for the 32 sites, 22 sites have a low anticipated level of impact. Eight sites were designated a low to moderate level of impact. One site was a moderate to high level of impact and another site was assigned a high level of impact.

The sites designated as moderate to high impact are proposed for acquisitions as part of the study area. Project construction may have the potential to negatively impact the study area if excavations occur within or near the said sites. Based on the limited amount of planned excavation near the previously described sites, impacts to the study area are anticipated to be minimal.

Common contaminants of concern that may be found on contaminated sites within the study area may include, but are not limited to, asbestos-containing materials, lead-based paint, petroleum hydrocarbons, heavy metals, carcinogenic polycyclic aromatic hydrocarbons, and associated solvents. Mitigation measures will be implemented during construction to protect against spills and releases.

Public Services and Utilities

Public services and utilities in the study area are provided by a mix of local, regional, public, and private entities. These resources include:

- Police, fire, and emergency medical services
- Schools
- Transit services
- Hospital services at Valley Medical Center in Renton
- Utilities including water, sanitary sewer, storm sewer, electric power, gas, fuel, and telecommunications

With the Build Alternative, police, fire, emergency services, and transit services that travel on this section of I-405 between Interstate 5 (I-5) and north of Interstate 90 (I-90) would benefit from increased travel speeds and increased vehicle throughput on I-405 compared to the No Build Alternative. Periods of congestion would be shortened, and improvements to interchanges and adjacent local streets would improve traffic operations, which would reduce travel times compared to the No Build Alternative. As described below in Section 4.1, Transportation, increasing highway capacity and reducing congestion in this section of I-405 may shift traffic during peak travel times to areas farther south on State Route (SR) 167, which may increase travel times in that area.

During construction, effects on public and emergency services are expected to be minor. Travelers through the area could expect minor delays. Transit, school buses, and emergency response vehicles may experience temporary route detours during some of the construction period. WSDOT will prepare and implement a traffic management plan and post signs to clearly mark detour routes. WSDOT will also coordinate with all emergency service providers prior to and during construction to provide safe and efficient routes for emergency service providers.

The Project would have temporary and minor effects on utilities; however, any utility conflicts would be resolved, typically by relocating the utility prior to construction. WSDOT will continue to coordinate with utility providers to identify potential conflicts and resolve the conflicts before or during construction. Identified conflicts are summarized in Exhibit 4-6.

Exhibit 4-6. Utility Conflicts

Owner	Type	Description
CenturyLink	Telecommunication lines	Underground cables
City of Renton	Water mains and sanitary sewer	8- to 12-inch-diameter water mains, sanitary sewer lift station
Coal Creek Utility District	Sanitary sewer	8-inch-diameter sanitary sewer
Comcast	Telecommunication and cable	Underground and overhead cable
King County Wastewater	Sanitary sewer	78-inch-diameter sanitary sewer main
Puget Sound Energy	Overhead power, natural gas mains	6- to 12-inch-diameter gas mains, overhead and underground power lines

Inadvertent damage to underground utilities could occur during construction if utility locations are uncertain or misidentified. While such incidents do not occur frequently, they could temporarily affect services to customers served by the affected utility while emergency repairs are made. Efforts to minimize such effects would include potholing and preconstruction surveys to identify utility locations and outreach to customers to inform them of potential service disruptions.

4.1 Transportation

Attachment A, *Transportation Discipline Report*, assesses the Project’s potential operational and construction effects on the transportation network. This section summarizes the findings of that report. The report analyzed traffic effects from this Project and the I-405, Downtown Bellevue Vicinity Express Toll Lanes Project (MP 11.9 to 14.6) together because the projects are anticipated to be built at the same time and are located next to each other.

How did WSDOT evaluate transportation?

We used existing and forecasted traffic data to identify how the current transportation system is performing, how traffic levels are expected to grow in the future, and how the improvements proposed with the Build Alternative would affect traffic conditions for the following years:

- 2016 (existing conditions)
- 2025 (anticipated Project year of opening)

- 2045 (design year)

On I-405, the morning and evening peak periods last for several hours each day. Because of this, we analyzed data for a 3-hour period during the weekday morning commute (7 a.m. to 10 a.m.) and afternoon commute (4 p.m. to 7 p.m.). For the intersection analysis, a one-hour peak period was used. The intersection morning peak hour occurs from 7 a.m. to 8 a.m. and the afternoon peak hour occurs from 4 p.m. to 5 p.m.

For this transportation analysis, we compared the No Build and Build Alternatives to understand how the Project would affect traffic volumes, freeway operations, person throughput, travel times, local street intersections, and safety performance.

What are traffic conditions like along I-405 today?

Today, traffic in the study area on I-405 is congested many hours of the day due to high traffic demand in both directions. During peak commute hours, high traffic volumes in the general purpose (GP) and high-occupancy vehicle (HOV) lanes cause drivers to travel at reduced speeds. Many intersections on adjoining local and regional streets are also congested due to high traffic volumes.

In 2016, the average weekday traffic volumes on I-405 in the study area were:

- Approximately 174,000 vehicles per weekday between I-5 and SR 167
- Approximately 141,000 vehicles per weekday between SR 169 and NE Park Drive
- Approximately 155,000 vehicles per weekday near NE 44th Street
- Approximately 176,000 vehicles per weekday just south of I-90

HOV traffic made up approximately 16 percent of the average weekday traffic volume, and truck traffic accounted for approximately 8 percent of average weekday traffic volumes.

The HOV lanes are currently over capacity in the study area in the peak travel direction. The capacity of these HOV lanes is

Which peak hours did we evaluate for intersections and highway operations?

Intersection and highway analysis focus on peak traffic conditions. For intersections, the hour in the morning and evening with the single highest volume is evaluated. For this Project, the morning peak hour occurs from 7 a.m. to 8 a.m. and the afternoon peak occurs from 4 p.m. to 5 p.m.

For highways, there are often multiple hours of high demand. For this Project, these timeframes occur in the morning from 7 a.m. to 10 a.m. and 4 p.m. to 7 p.m. We also show traffic conditions over a 6-hour period in the morning from 5 a.m. to 11 a.m. to provide a snapshot of overall corridor operations.

further reduced when the adjacent GP lanes are congested because slower GP lanes cause HOV drivers to drive more cautiously. The HOV lane in the study area currently operates with open access, meaning that drivers on I-405 can move in and out of the HOV lanes anywhere along the freeway. This unrestricted access often causes HOV drivers to reduce speeds out of concern of sudden lane changes. The reliability of transit service is reduced during peak hours due to congestion-related delays. During off-peak hours, the HOV lane generally operates well and meets WSDOT's performance standard.

Congestion on I-405 in the Morning Peak Period

During the morning peak period, there are specific locations that experience recurring congestion (traffic bottlenecks). These bottlenecks affect operations in both the GP and HOV lanes and are listed below:

- A bottleneck begins on northbound I-405 at the NE 44th Street interchange, with congestion extending south through the SR 167 interchange. This congestion frequently extends onto northbound SR 167.
- A bottleneck begins on northbound I-405 at the SR 520 off-ramp, with congestion extending south to the I-90 interchange area.
- A bottleneck begins on southbound I-405 at the NE 30th interchange area, with congestion extending north through the NE 44th Street interchange.

Congestion on I-405 in the Afternoon Peak Period

During the afternoon peak period, bottlenecks affect operations in both the GP and HOV lanes at the following locations:

- A bottleneck begins on northbound I-405 at the NE Park Drive interchange, with congestion extending south through the I-5 interchange in Tukwila.
- A bottleneck begins on southbound I-405 at the Coal Creek Parkway interchange, with congestion extending north through the SR 520 interchange.

How does open access work?

An HOV lane with open access means motorists can weave into and out of the lane at any point. This differs from a limited access lane (such as express toll lanes), where motorists may only access the lane at designated points.

What is a recurring bottleneck?

A recurring bottleneck is a localized constriction of traffic flow that occurs on a frequent and predictable basis, regardless of weather conditions, crashes, or events.

A bottleneck causes congestion because of too much traffic in one area. It can be exacerbated by roadway conditions, such as a narrow roadway or the presence of on- or off-ramps.

Generally, slower than posted speeds form upstream of a bottleneck, while speeds closer to posted limits occur downstream of a bottleneck.

- A bottleneck begins on southbound I-405 at the NE 30th Street interchange, with congestion extending north through the NE 44th Street interchange.

Safety Performance

From 2012 to 2016, approximately 1,060 crashes per year occurred on I-405 between I-5 in Tukwila and I-90 in Bellevue. Rear-end and sideswipe crashes make up the majority of the crashes on this section of I-405. These types of crashes are typically associated with congested roadway conditions. Approximately 47 percent of all crashes occurred during peak weekday travel times (6 a.m. to 10 a.m. and 3 p.m. to 7 p.m.), with the remaining 53 percent of crashes occurring outside of these times on weekdays and on weekends. Crashes occurring during weekday peak periods account for almost half of the total crashes, even though weekday commute hours make up about one quarter of the total hours in a week.

Bicycle and Pedestrian Facilities

Pedestrian and bicycle travel is prohibited on I-405, although several non-motorized facilities are located within and adjacent to the study area. The Lake Washington Trail runs along the west side of I-405 between the NE 44th Street interchange and the Coal Creek Parkway interchange.

Several pedestrian crossings of I-405 in the study area are served by off-street paths. These include the Duwamish-Green River Trail, Interurban Trail, Springbrook Trail, Cedar River Trail, and Mountains to Sound Greenway.

For roads that cross I-405 in the study area, sidewalks are provided on one or both sides of the road except along 112th Avenue SE, which does not have sidewalks. Currently, 112th Avenue SE has a wide shoulder along the north side of its interchange with I-405. Dedicated bicycle lanes are provided on some roads crossing I-405, including Benson Road and N 30th Street in Renton.

Additional information about bicycle and pedestrian facilities are provided in Section 4.4, Recreational, Section 4(f), and Section 6(f) Resources.

How did we evaluate safety?

We looked at historical crashes on I-405 between I-5 and I-90 over a 5-year period (2012 to 2016). When conducting this analysis, we are able to assess the number of crashes that are congestion related. Occasionally, congestion and associated crashes occur outside of the 3-hour peak periods due to extreme weather, incidents, or special events. To capture these non-recurring congestion periods, the crash analysis included 4-hour morning and peak period.

What is an off-street path?

WSDOT defines an off-street path as a facility physically separated from motorized vehicular traffic within the highway right of way or on an exclusive right of way. It is designed and built primarily for bicycles but can be used by other non-motorized users.

What is expected to happen to transportation if WSDOT does not build the Project?

With the No Build Alternative, there would be no capacity improvements made and this section of I-405 would not have ETLs. Traffic volumes would increase on I-405 in the future. Traffic volumes would increase mostly during times outside of the peak travel periods because the level of traffic demand already exceeds the capacity of the highway during peak travel periods.

With the No Build Alternative, average weekday traffic volumes on I-405 are expected to increase as follows:

- Between I-5 and SR 167, traffic volumes are expected to be 191,000 by 2025, which is an increase of 10 percent compared to existing conditions. By 2045, traffic volumes of 203,000 vehicles per day are expected.
- Between SR 169 and NE Park Drive, traffic volumes are expected to be 170,000 by 2025, which is an increase of 21 percent compared to existing conditions. By 2045, traffic volumes of 179,000 vehicles per day are expected.
- Near NE 44th Street, traffic volumes are expected to be 173,000 by 2025, which is an increase of 12 percent compared to existing conditions. By 2045, traffic volumes of 182,000 vehicles per day are expected.
- Just south of I-90, traffic volumes are expected to be 203,000 by 2025, which is an increase of 15 percent compared to existing conditions. By 2045, traffic volumes of 212,000 vehicles per day are expected.

The increased traffic volumes expected with the No Build Alternative would reduce travel speeds, extend the traffic bottlenecks that already occur, and negatively affect transit reliability and travel times. If the Project were not built, transit service would continue to operate primarily in the existing I-405 HOV lanes between Renton and Bellevue. Due to congestion in the HOV lanes, Sound Transit would likely not be able to meet travel times and reliability standards for bus rapid transit service, and Sound Transit would need to evaluate this impact on planned bus rapid transit service. The

number of congestion-related crashes would also be expected to increase in the study area.

Exhibits 4.1-1 and 4.1-2 provide a visual representation of freeway operations for northbound traffic on I-405 from 5 a.m. to 11 a.m. Exhibit 4.1-1 compares travel conditions in the GP lanes for 2016 existing conditions, 2025 No Build Alternative, and 2025 Build Alternative. Exhibit 4.1-2 compares travel conditions in the HOV lanes or ETLs for 2016 existing conditions, 2025 No Build Alternative, and 2025 Build Alternative. As shown in these exhibits, in 2025 with the No Build Alternative, congestion would increase in both the GP and HOV lanes compared to existing conditions, and travel speeds would decrease. Congestion from the existing bottleneck that begins for northbound traffic at the NE 44th Street interchange would extend further south and spill back on to SR 167 and I-5. In 2045, with No Build, congestion would occur for more hours of the day and travel speeds would continue to decrease compared to 2025 and 2016 existing conditions.

Exhibits that show the evening peak period for southbound trips as well as conditions in 2045 are presented in Attachment A, *Transportation Discipline Report*. In general, with the 2025 No Build, southbound travelers during the evening commute would experience congestion in the GP and HOV lanes beginning at NE 112th Avenue SE, extending back to SR 520 and then picking up again from NE 44th Street to NE 30th Street. In 2045, with No Build, congestion would occur for more hours of the day and travel speeds would continue to decrease compared to 2025 and 2016 existing conditions. The Build Alternative would greatly reduce the congestion on I-405 between Bellevue and Renton, but because more vehicles would be traveling on I-405, congestion would increase between SR 167 and I-5 compared to the No Build.

Exhibit 4.1-1. I-405 Traffic Operations Comparison in the GP Lanes for Northbound Traffic (5 a.m. to 11 a.m.)

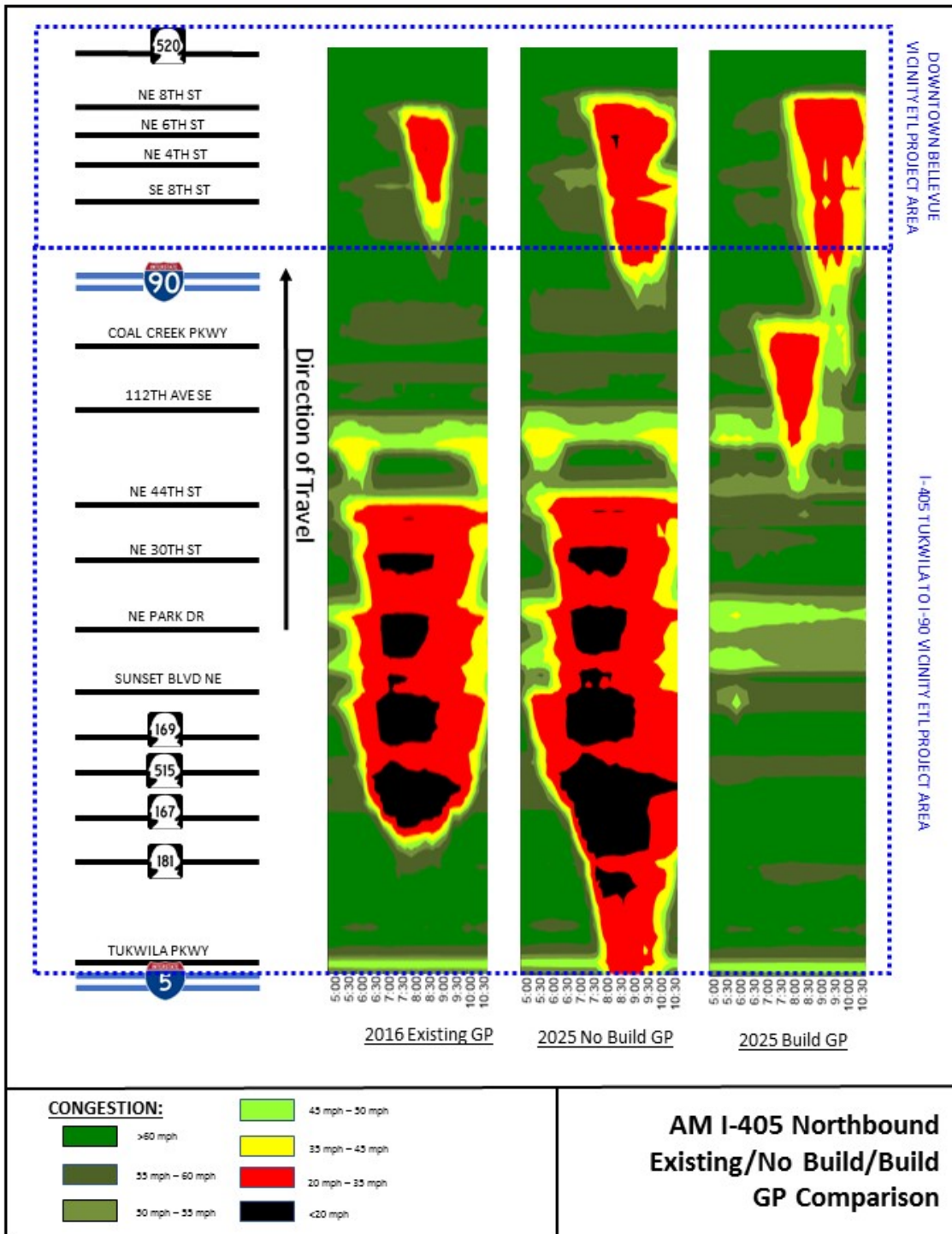
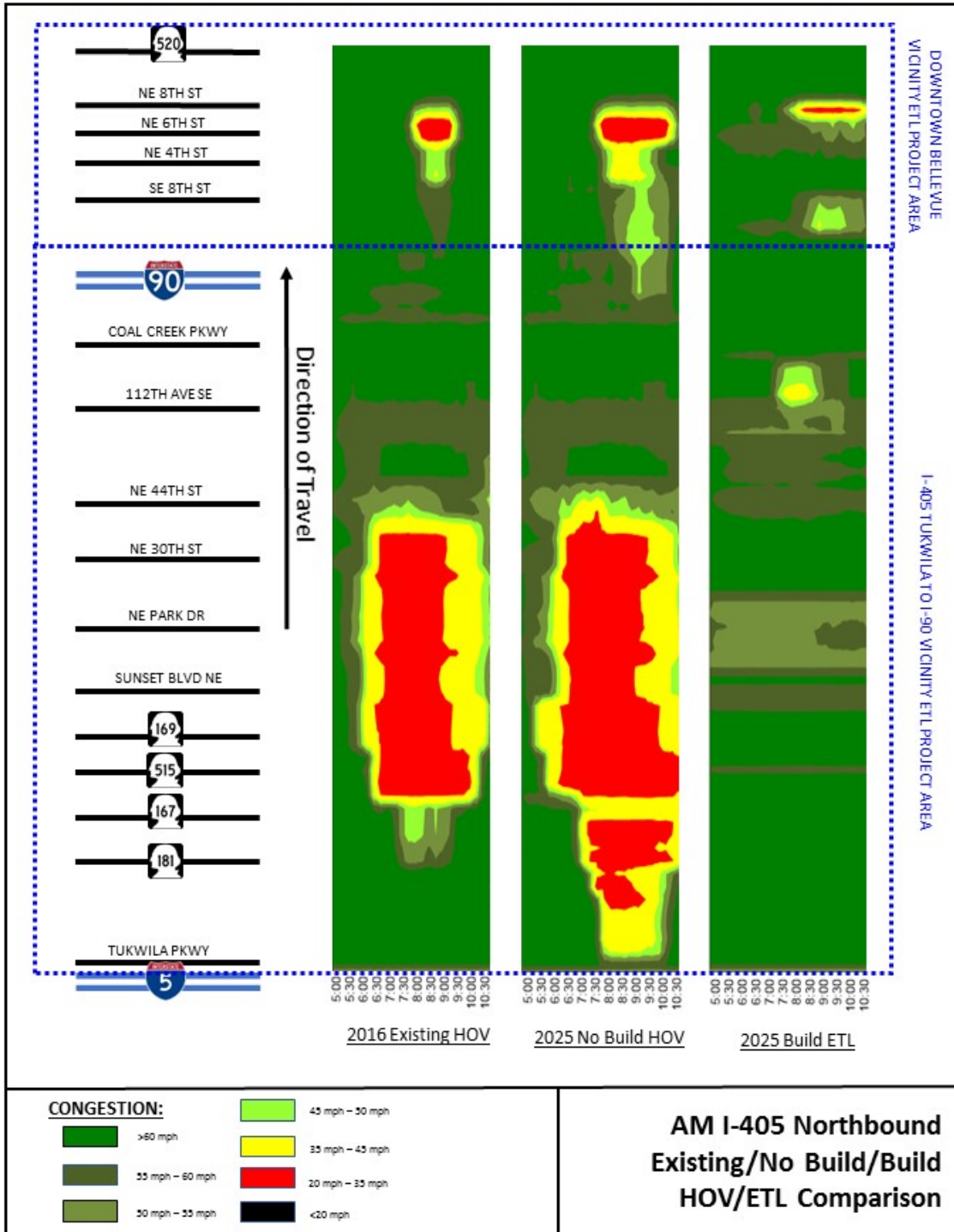


Exhibit 4.1-2. I-405 Traffic Operations Comparison in the HOV/ETLs for Northbound Traffic (5 a.m. to 11 a.m.)



What are the expected long-term traffic effects if WSDOT builds the Project?

Chapter 5 in Attachment A, *Transportation Discipline Report*, provides detailed graphics and information explaining differences in the following metrics:

- Daily traffic volumes
- Peak-period traffic volumes
- Freeway person throughput
- Freeway travel times
- Freeway operations
- Local intersection operations
- Safety performance

Key findings of this analysis are summarized below.

Daily and Peak-Period Traffic Volumes

All travel lanes on I-405 would operate with faster and more reliable trips with the Build Alternative. The total volume of daily, peak-period traffic and total person throughput would increase with the Build Alternative as compared with No Build due to the proposed Project capacity improvements. For example, with the Build Alternative:

- Between I-5 and SR 167, total daily traffic volumes are expected to be 200,000 by 2025, which is an increase of 5 percent compared to 2025 No Build. By 2045, traffic volumes of 206,000 vehicles per day are expected.
- Between SR 169 and NE Park Drive, traffic volumes are expected to be 200,000 by 2025, which is an increase of 18 percent compared to No Build. By 2045, traffic volumes of 215,000 vehicles per day are expected.
- Near NE 44th Street, traffic volumes are expected to be 197,000 by 2025, which is an increase of 27 percent compared to No Build. By 2045, traffic volumes of 203,000 vehicles per day are expected.
- Just south of I-90, traffic volumes are expected to be 230,000 by 2025, which is a 13 percent increase compared to No Build. By 2045, traffic volumes of 236,000 vehicles per day are expected.

What is person throughput?

Person throughput is the number of persons traveling through a specific section of a freeway.

Freeway Person Throughput

Similarly, total person throughput would increase with the Build Alternative as compared to the No Build. For example, in 2025 during the morning peak period, I-405 near the NE 44th Street interchange in Renton would carry approximately 5,400 more people with the Build Alternative than with No Build. In 2045, that same area would carry about 5,500 more people with the Build Alternative than the No Build during the morning peak. Exhibits 4.1-3 and 4.1-4 compare person throughput for the two alternatives and show how person throughput is expected to increase. The morning peak period is from 7 a.m. to 10 a.m., the afternoon peak period is from 4 p.m. to 7 p.m.

Exhibit 4.1-3. Person Throughput near NE 44th Street during the Morning Peak Period

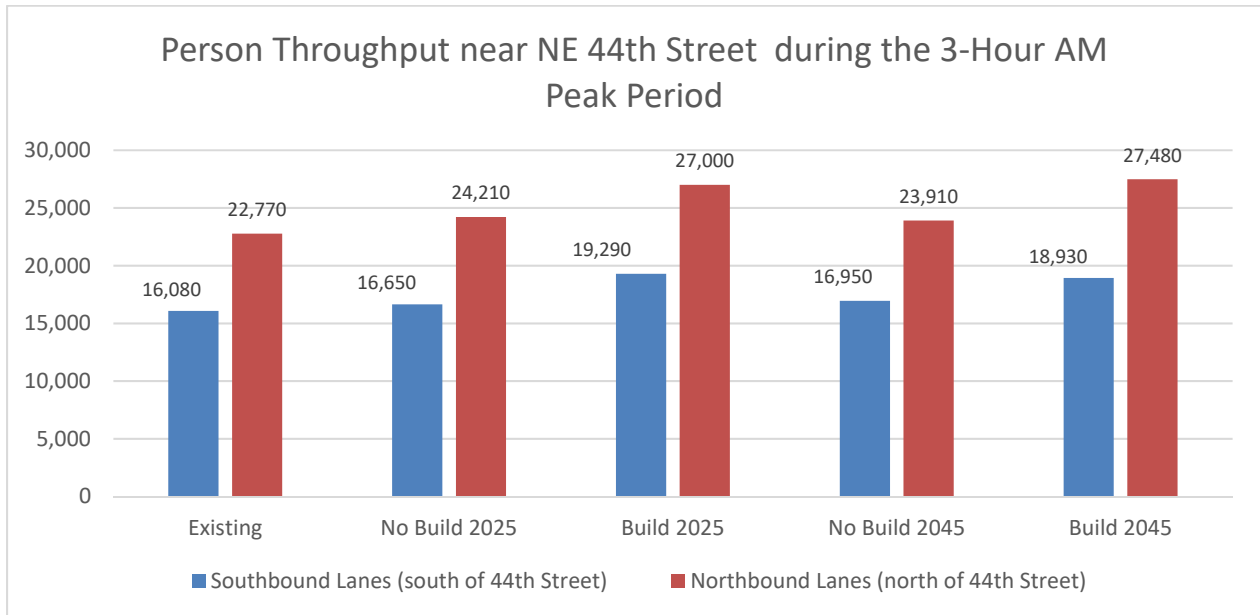
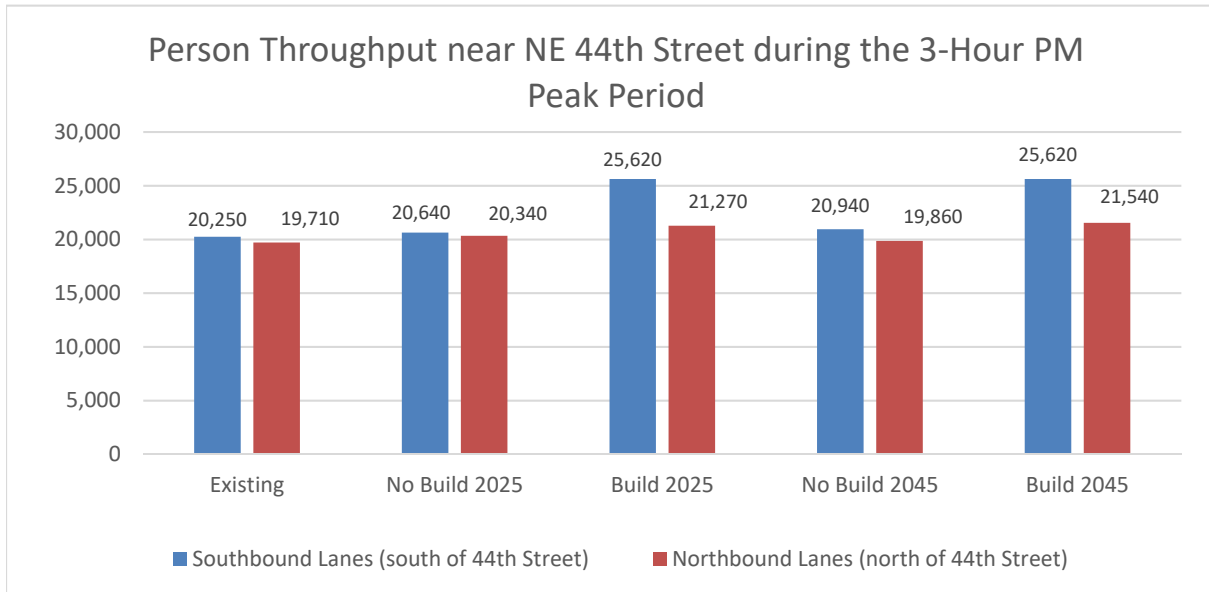


Exhibit 4.1-4. Person Throughput near NE 44th Street during the Afternoon Peak Period



Freeway Travel Times

Exhibit 4.1-5 shows expected travel times during the morning and afternoon peak periods for the No Build and Build Alternatives. When traveling the posted speed limit (60 miles per hour [mph]), the trip between I-5 and I-90 should take about 12 minutes.

Exhibit 4.1-5. Comparison of Average Travel Times for GP and ETLs from I-5 to I-90 in 2025 and 2045 (minutes)

		2025 No Build		2025 Build		2045 No Build		2045 Build	
		GP	HOV 2+	GP	ETL	GP	HOV 2+	GP	ETL
I-405 Northbound	Morning Peak	33.5	17.2	16.0	11.9	35.9	17.6	22.7	12.5
	Afternoon Peak	15.7	13.4	12.4	12.1	16.9	13.9	14.7	12.4
I-405 Southbound	Morning Peak	14.0	12.0	12.0	11.5	17.5	12.9	14.4	12.3
	Afternoon Peak	21.8	14.8	14.1	12.4	21.9	14.8	19.0	13.3

ETL = express toll lane; GP = general purpose; HOV = high-occupancy vehicle

As shown in Exhibit 4.1-5, travel times would improve in both the GP lanes and the ETLs with the Build Alternative compared to No Build. The greatest improvement would occur for northbound travelers during the morning peak period. For this trip in 2025, travel times would be reduced by about 18 minutes in the GP lanes and about 5 minutes in the ETLs with the Build Alternative compared to the No Build

HOV2+ lane. We recognize that individual trip travel times could vary. As shown in Exhibit 4.1-5, most users would experience improved travel times. The exception is that carpools with two people who choose not to pay a toll, would see increased in travel times in 2045 because they would be traveling in the GP lanes.

Freeway Operations

The Build Alternative would add freeway capacity to I-405, which would improve freeway operations and reduce congestion. I-405 would operate at higher speeds and accommodate more vehicles with the Build Alternative than the No Build. Congestion at existing bottlenecks would decrease and allow more vehicles to travel on I-405. Speeds in the ETLs proposed with the Build Alternative would be more reliable than the HOV lanes with No Build. This would give more users, including transit and carpools, a faster and more reliable trip. The ETL and GP lanes would be separated by a buffer, and ETL access to and from the GP lanes would be provided at several locations. We expect vehicle speeds to be slower in these access sections than where ETL access is not provided because of vehicle lane changes.

Local Intersection Operations

Higher traffic demands are expected at most study intersections with the Build Alternative compared to the No Build. The Build Alternative would increase freeway volumes and, in turn, more vehicles would use local streets to enter and exit the freeway. As a result, intersection performance at some intersections may degrade compared to No Build, but in most cases, they would remain above a level of service D. In addition, proposed modifications at some interchange areas with the Build Alternative would improve local intersection operations compared to No Build. In both the morning and afternoon peak periods, the Build Alternative would have fewer intersections than No Build operating worse than level of service D. In addition, with the Build Alternative we do not expect queues to spill back from the off-ramps to the I-405 mainline between I-5 and I-90.

Safety Performance

Under existing conditions, approximately 91 percent of crashes in the study area are rear-end and sideswipe crashes. These crash types are typically associated with congested

What is level of service?

For intersection operations, level of service refers to the degree of congestion measured in average delay per vehicle. Level of service A is the best operating condition, with motorists experiencing minimal delay. Level of service F is the worst condition, with motorists experiencing delays at traffic signals of more than 1 minute.

conditions. The Build Alternative would add capacity to I-405, which would improve freeway operations and reduce congestion. This would, in turn, be expected to improve safety performance in the study area when compared to the No Build. Safety performance during off-peak periods is expected to be similar between the Build and No Build Alternatives.

With the Build Alternative, lane and shoulder widths in some sections of I-405 would be increased compared to No Build and widths in other sections would decrease based on physical limitations in the corridor. Based on research, areas with reduced widths would be expected to see a decrease in safety performance, while areas with added width would see improved safety performance. The Build Alternative would introduce tolling, but we do not expect tolling to influence safety performance.

How would the Project affect transit operations?

Completing the 40-mile-long toll system between Auburn and Lynnwood would provide opportunities for transit improvements. With No Build, traffic congestion would increase in both the GP and HOV lanes compared to existing conditions, further compromising transit reliability.

ETLs provide more reliable travel times for transit vehicles compared to HOV or GP lanes. The ETLs proposed with the Build Alternative would limit the number of paying vehicles allowed in the lanes, and vehicles would only be allowed to enter the ETLs at designated locations. We expect the ETLs would maintain an average travel speed of at least 45 miles per hour in 2025 and 2045, even when the GP lanes become congested, which would be an improvement over existing conditions or No Build.

Some transit routes would continue to operate in the GP lanes for some or all of their trip along I-405. The Build Alternative would reduce congestion in the GP lanes and increase travel speeds, which would benefit all traffic, including transit traveling in these lanes.

Several Sound Transit improvements are now funded in the study area due to the transit expansion projects approved and funded in the Sound Transit 3 (ST3) Plan. ST3 includes funding for bus rapid transit and additional park-and-ride

facilities along I-405 between south Renton and Lynnwood. ST3 provides funding for freeway stations that would allow buses to stop within the freeway right of way to pick up and drop off riders.

Direct access ramps and inline transit stations would be built at the NE 44th Street interchange and the 112th Avenue SE interchange as part of this Project. While specific routing of Sound Transit bus rapid transit has not been determined, the ETL system proposed with the Build Alternative would provide the infrastructure needed to facilitate a fast, reliable bus rapid transit system that increases person throughput while providing travel time and reliability benefits for existing and future transit riders.

How would the Project affect freight operations?

The Project would not adversely affect freight travel. The Build Alternative would decrease congestion in the GP lanes, thus, improving operations for freight. The ETLs would continue to have the same vehicle weight limits as all HOV lanes, meaning that vehicles over 10,000 pounds would continue to not be allowed. With the No Build, freight would continue to be affected by increased congestion compared to the Build Alternative.

How would the Project affect pedestrian and bicycle facilities?

With the Build Alternative, pedestrian and bicycle travel would continue to be prohibited on I-405 as they are now. The following would also occur as part of the Project:

- The Eastside Rail Corridor Regional Trail would be extended between Ripley Lane in Renton and Coal Creek Parkway in Bellevue.
- For crossings at Cedar and Renton Avenues existing sidewalks located on the north side of these roadways would be replaced.
- At NE 44th Street, sidewalks would be improved by providing a contiguous sidewalk on both sides of the street. Currently, sidewalks are provided on the north side of the roadway and they are not contiguous.

Sidewalks would be provided between the park-and-ride and inline transit stations.

- At 112th Avenue SE, bicycle lanes would be provided on both sides of the street and a sidewalk would be provided on the north side, which would be an improvement over existing conditions where no bike lanes or sidewalks are currently provided. Sidewalks would be provided between the park-and-ride and inline transit stations.
- At Coal Creek Parkway, sidewalks would be provided on both sides of the street, which would be an improvement over existing conditions since sidewalks are only provided on the south side.

What are the expected short-term impacts on traffic if WSDOT builds the Project?

The Project would realign or widen I-405 and rebuild overpasses over I-405. Construction would take place over a 5-year period between 2019 and 2024, but construction activities in some areas would not take place throughout the entire period. A contractor may use multiple work crews and zones to reduce the overall construction period.

WSDOT will maintain existing roadway capacity during construction activities to the extent possible. Lane or local roadway closures will be minimized and scheduled to occur when there will be the least effect on traffic, such as during night and weekend periods. Full freeway closures may be required at limited times. Most of these full closures would be accomplished with a rolling slowdown and would be restricted to nights and weekends.

Construction vehicles would carry dirt and materials to and from construction sites. Construction vehicles would increase traffic delay and traffic volumes in the area during construction. These delays would occur on freeways and arterials identified as haul routes. The exact haul routes and number of construction vehicles would not be known until a construction contract is signed, but we anticipate most construction vehicles would use I-405, SR 167, and I-90 to bring materials to and from construction sites.

Construction activities may limit pedestrian and bicyclist movements on local roadways. Safe routes for non-motorized

What is a rolling slowdown?

A rolling slowdown is a safe way to accomplish road closures with little disruption to traffic. Traffic is slowed down to a low speed (typically 20 miles per hour or slower) well in advance of the construction area to create a gap in traffic so construction can occur without active traffic in the immediate construction zone.

While motorists are traveling slowly, construction crews are completing the required work without anyone driving through the work zone. These slowdowns generally last a few minutes but could be longer if the work zone activity requires it.

users would be maintained to the extent possible, with specified detour routes when needed.

Would the Project have other effects on transportation that may be delayed or distant?

Effects that could occur later in time or farther removed in distance are referred to as indirect effects. Capacity improvements proposed with the Build Alternative would reduce congestion that normally occurs at several locations in the study area; however, areas adjacent to the study area could see changes in traffic volume and congestion due to these improvements as described here.

Increased PM Period Southbound SR 167 Congestion

There would be congestion on southbound SR 167 with either the No Build or the Build Alternative at the S 277th Street interchange. With No Build, there would be congestion on southbound SR 167 through several bottleneck locations near the S 277th Street interchange and the end of the high-occupancy toll (HOT) system south of SR 18. These congested locations would affect traffic operations in both the GP and HOT lanes. With the Build Alternative, less congestion on southbound I-405 between Renton and Bellevue would allow higher traffic volumes to access SR 167, which would increase congestion at S 277th Street. With No Build, some of these vehicles would be stuck in traffic on southbound I-405.

While the Build Alternative would increase the number of vehicles accessing southbound SR 167, reduced congestion on northbound I-405 would decrease congestion spillback to northbound SR 167 in both the morning and evening peak periods.

WSDOT has identified that adding an auxiliary lane to southbound SR 167 between the SR 516 interchange southbound on-ramp and the S 277th Street interchange southbound off-ramp could help reduce congestion at the S 277th Street bottleneck. However, this improvement is currently unfunded.

Changes in Trip Patterns in South Bellevue

Due to heavy congestion in both the morning and evening peak periods near the I-405/I-90 interchange, many drivers currently choose alternative routes. These routes include local

What are indirect effects?

An indirect effect is caused by the proposed action that is later in time or farther removed in distance, but still reasonably foreseeable. Indirect effects may include effects related to changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.

roadways through downtown Bellevue, the Eastgate area, and south Bellevue. During both the morning and afternoon peak periods, travel patterns could change on local roadways and I-90 as trips shift to I-405 with the Build Alternative. This may result in higher use at some ramp terminals in south Bellevue and lower use at others.

4.2 Noise

This section provides a summary of Attachment C, *Noise Discipline Report*, which evaluated noise effects of the Build and No Build Alternatives. Additional details for the noise analysis are contained in Attachment C.

How did WSDOT evaluate noise?

The study area for the noise analysis extends 400 feet from the edge of the pavement on both sides of I-405 within the project limits. WSDOT used the FHWA Traffic Noise Model (TNM) Version 2.5 (FHWA 2004) to predict future noise levels to determine if there would be future noise effects with the Project to sensitive land uses such as residential properties, parks, and trails.

WSDOT measured existing sound levels in the study area at 71 sites to understand the existing noise environment, validate the noise model, and estimate future sound levels with and without the Project. The measured sites represent approximately 407 receivers, representing 1,198 residences, 1 hospital, 1 school, 1 daycare, 7 parks, 5 hotels, 3 commercial sites, 3 churches, 9 trails, and 3 swimming pools. WSDOT then used existing and future traffic volumes to determine possible noise effects with and without the Project.

Traffic noise effects occur when predicted noise levels approach or exceed WSDOT Noise Abatement Criteria (NAC). WSDOT considers a noise impact to occur if predicted noise levels approach within 1 A-weighted decibel (dBA) of the NAC. WSDOT also considers an increase of 10 dBA or more to be a substantial increase that constitutes a traffic noise effect. In areas where traffic noise with the Project was expected to approach or exceed the NAC, WSDOT evaluated possible noise abatement (mitigation).

What is sound and how is it measured?

Sound is created when objects vibrate, resulting in a minute variation in surrounding atmospheric pressure, called sound pressure. The human response to sound depends on the magnitude of a sound as a function of its frequency and time pattern (EPA 1974). Magnitude is a measure of the physical sound energy in the air. The range of magnitude the ear can hear, from the faintest to the loudest sound, is so large that sound pressure is expressed on a logarithmic scale in units called *decibels (dB)*. Loudness refers to how people subjectively judge a sound and how it varies between people.

Sound is measured using the logarithmic decibel scale, so that doubling the number of noise sources, such as the number of cars on a roadway, increases the sound level by *3 A-weighted decibels (dBA)*. Therefore, when you combine two sources emitting 60 dBA, the combined sound level is 63 dBA, not 120 dBA. The human ear can barely perceive a 3-dBA increase, while a 5-dBA increase is about 1.5 times as loud and readily noticed. A 10-dBA increase appears to be a doubling in noise level to most listeners. A tenfold increase in the number of noise sources will add 10 dBA.

What are noise levels like today?

Land use in the study area is primarily single-family residential with pockets of multi-family residential and commercial developments. Existing (2016) noise levels within the study area range between 50 and 78 dBA. Under existing conditions, 168 receivers, representing 365 residences, 5 parks, 7 trails, and 2 churches currently approach or exceed the NAC.

What would happen to noise levels if WSDOT does not build this Project?

Without the Project there would be no capacity improvements made and this section of I-405 would not have ETLs. Traffic noise levels would continue to increase over time as traffic volumes increase in the study area. Noise barriers, such as noise walls, would not be built, so the number of affected receivers would increase. With the No Build, noise levels in the study area are expected to range between 51 and 79 dBA in 2045, which is a negligible increase compared to existing conditions. By 2045, the number of receivers approaching or exceeding the NAC would grow from 168, under existing conditions to 203. The 203 receivers represent 444 residences, 1 hospital, 5 parks, 7 trails, and 3 churches.

What are the long-term effects on noise levels with the Project?

With the Project, noise levels are predicted to range from 50 to 79 dBA, which is similar to conditions in the No Build. By 2045 with the Project, the number of receivers approaching or exceeding the NAC is expected to be 193, which is less than the No Build Alternative that would affect 203 receivers. The 193 receivers affected by the Project represent 425 residences, 5 parks, 7 trails, and 3 churches. With the proposed noise walls discussed below, 22 receivers representing 121 residences would drop below the NAC. This means that with the Project 171 receivers representing 304 residences, 5 parks, 7 trails, and 3 churches would be affected, which is less than the No Build.

WSDOT evaluated the feasibility and reasonableness of noise barriers at every location where noise impacts are expected to approach or exceed the NAC with the Build Alternative in 2045. Attachment C, *Noise Discipline Report* provides a detailed explanation of the criteria used to assess feasibility and reasonableness of noise walls as well as the results of the

How does WSDOT determine if a noise wall is feasible and/or reasonable?

Attachment C, *Noise Discipline Report* provides a detailed explanation of the criteria WSDOT uses to assess the feasibility and reasonableness of noise walls as well as the results of the noise analysis for this Project. In general, feasibility is assessed by determining if the noise wall is physically constructible and if it would achieve a meaningful reduction in noise levels for affected receivers. If wall is feasible, WSDOT then assesses the reasonableness of the noise wall, which considers factors such as cost-effectiveness and the expected noise reduction for receivers.

analysis. WSDOT evaluated 39 possible noise walls and determined that 5 of the 39 noise walls were both feasible and reasonable. Because of this, WSDOT recommended that all 5 noise walls be constructed as part of the Project. However, property owners and tenants near the proposed Wall East 3 expressed their desire not to have a new noise wall constructed. Because of this, WSDOT worked with the property owners and tenants and organized an official poll. As documented in Appendix D, of the *Noise Discipline Report*, approximately 96 percent of the residents who participated in the poll indicated they were against constructing the wall. As a result, WSDOT is no longer proposing to build Wall East 3.

Exhibit 4.2-1 identifies the 4 walls that are proposed for construction, provides a brief description of the proposed walls, and identifies the expected benefits of providing a noise wall at these locations.

Exhibit 4.2-1. Noise Effects and Noise Abatement Considered

Proposed Wall Name	Description	Benefits of the Proposed Noise Wall in 2045
Wall East 10A	This wall would be located in the City of Newcastle and is shown on Exhibit 3-2, sheet 6 of 8. A two-wall concept was evaluated with a front wall of approximately 537 feet long and a back wall of approximately 380 feet long with approximately 70 feet of overlap between the two walls. The two-wall concept was evaluated to avoid conflicts with existing utilities and to allow space for utility maintenance. The walls would be 6 to 14 feet tall. Right of way would be required in this area, but the acquisitions are needed for other proposed improvements and are not specifically needed to construct the wall.	The noise walls would reduce noise for several receivers, but most receivers would continue to experience noise levels that would be above the NAC. Wall East 10A would reduce noise levels by 1 to 11 dBA as compared to the No Build in 2045.
Wall West 5, ERC1 Trail Wall	This wall would be built in portions of Renton, Bellevue, and unincorporated King County along the eastern side of the Eastside Rail Corridor Regional Trail. The wall would be about 6,000 feet long and 12 to 14-feet tall beginning near the NE 44 th Street interchange, extending north near the junction of Hazelwood Lane SE and 106 th Avenue SE as shown in Exhibit 3-2, sheets 6 and 7 of 8. The wall would be constructed in existing WSDOT right of way.	The wall would reduce noise levels to below the NAC for 11 of the 22 receivers, representing 100 residences.
Wall East 11	This wall would be located in the City of Bellevue, south of the 112th Avenue SE interchange as shown in Exhibit 3-2, sheet 7 of 8. The proposed wall would be about 1,550 feet long and 10 to 16 feet tall and would be built on top of a proposed retaining wall. Right of way would be required in this area, but the acquisitions are needed for other proposed improvements and are not specifically needed to construct the wall.	The noise wall is expected to reduce noise levels to below the NAC at 3 of 11 receivers, representing 6 residences.
Wall West 6 Extension	This wall would be located in the City of Bellevue between the Coal Creek Parkway and I-90 interchange as shown in Exhibit 3-2, sheets 7 and 8. The proposed wall would extend about 934 feet and be 8 to 12 feet tall. The wall would be built within WSDOT's existing right of way.	The wall would reduce noise to below the NAC for 8 of the 16 receivers representing 15 residences.
TOTAL NOISE WALL BENEFITS		Proposed noise walls would reduce noise levels to below the NAC for 22 receiver locations representing 121 residences and a trail. Additional reductions in noise are expected from these walls.

Existing Walls

In addition to the new walls proposed for construction, WSDOT plans to relocate two existing walls: Wall East 3 and Wall West 4. Wall East 3 is shown on Exhibit 3-2 sheet 4 and Wall West 4 is shown on Exhibit 3-2, sheet 6 and additional information is provided below:

- Wall East 3 - Approximately 660 feet of the existing wall located near Sunset Boulevard would be moved 9 feet to the east within WSDOT's existing right of way. Once it is relocated, the four receivers representing 18 homes located behind the existing wall representing would experience noise levels above the NAC. WSDOT evaluated raising the wall height; however, the evaluation revealed that raising the wall height would not reduce the noise level of the affected receivers to below the NAC. Therefore, the wall will be relocated, and the height of this wall will remain unchanged.
- Wall West 4 - WSDOT will shift the northern end of Wall West 4 approximately 400 feet to the west, to the new right of way line. WSDOT would acquire right of way in this area for the proposed Project; however, the right of way is needed for the roadway improvements and not for relocating the noise wall. All eight receivers (representing 54 dwelling units) are expected to maintain noise levels below the NAC.

In addition, WSDOT would build concrete protective fence and roadside barrier in some locations. The concrete protective fence would be built on the top of retaining walls adjacent to homes, and the roadside barrier would be built at the edge of pavement when required by safety standards to protect vehicles from steep slopes or other roadside hazards. Although these design elements are not considered noise abatement, modeling has shown that they may provide up to 3 dBA of noise reduction for adjacent residences.

What are the short-term effects on noise levels with the Project?

Construction creates temporary noise, that varies depending on the type of construction activity, location of the activity, and type of equipment used. The most constant noise source at construction sites is usually engine noise. Mobile equipment generally operates intermittently or in cycles of operation, while stationary equipment, such as generators and compressors, generally operates at fairly constant sound levels. Trucks are present during most phases of construction and are not confined to the specific construction site, so noise from trucks may affect more receivers than other construction noise. The maximum noise levels of construction equipment

typically range from 69 to 106 dBA at 50 feet. The various pieces of equipment are almost never operating simultaneously at full-power, and some will be turned off, idling, or operating at less than full-power at any time. Construction noise is exempt from state and local property line regulations during daytime hours. If nighttime construction is required for the Project, WSDOT will apply for variances or exemptions from local noise ordinances for the night work. Such noise variances or exemptions require construction noise abatement measures that vary by jurisdiction.

Would the Project have other noise effects that may be delayed or distant?

The Project is not expected to cause any effects on noise that would be delayed or distant.

4.3 Land Use, Socioeconomics, and Environmental Justice

This section describes existing conditions and Project effects during construction and operation for land use and socioeconomics. It also summarizes Attachment D, *Environmental Justice Discipline Report*, which evaluated the potential effects of the Build and No Build Alternatives on environmental justice populations during construction and operation.

How did WSDOT evaluate land use, socioeconomics, and environmental justice?

Existing planning documents and social and economic characteristics of the study area were reviewed to provide an understanding of the general community context, employment opportunities, and demographic characteristics. That information was used as a baseline to assess Project effects related to land use and socioeconomics.

We used demographic data to determine if minority, low-income, or persons with limited English proficiency live in the study area or use I-405. Potential effects of the Project, including effects on community character and livability, were evaluated. The transportation analysis provided key information to identify potential effects related to traffic, access, and mobility for people living and working in the

study area, including environmental justice populations. We used the demographic analyses to determine if any of the Project adverse effects would disproportionately affect environmental justice populations. We applied mitigation, as appropriate, and identified benefits which may help to offset any disproportionately high and adverse effects. Section 3 of Attachment D, *Environmental Justice Discipline Report*, provides a more detailed discussion of the methods used to evaluate effects on environmental justice populations.

What are conditions today for land use, socioeconomics, and environmental justice populations?

Land Use

The following regional and local planning documents establish frameworks for land use in the study area. These planning documents include:

- Puget Sound Regional Council's (PSRC) *VISION 2040* (PSRC 2009) and *Transportation 2040* (PSRC 2010).
- *2012 King County Countywide Planning Policies* (King County 2012).
- *King County Comprehensive Plan* (King County 2016).
- *City of Tukwila Comprehensive Plan* (City of Tukwila 2015).
- *City of Renton Comprehensive Plan* (City of Renton 2015).
- *City of Newcastle 2035 Comprehensive Plan* (City of Newcastle 2016).
- *Bellevue Comprehensive Plan* (City of Bellevue 2016).

The policies established in the early 2000's promote, implement, and advance an overall vision for land use and transportation development in the I-405 corridor between Tukwila and Bellevue that focuses on concentrating population growth in urban centers, such as downtown Bellevue and downtown Renton, and connecting those urban centers with an efficient, transit-oriented, multimodal transportation system. Long-range plans continue to prioritize regional transportation investments to serve these urban centers. It should be noted that not all of the planning documents listed above consider the effects of long-range planning on environmental justice populations.

What is a disproportionately high and adverse effect?

According to the 2012 U.S. Department of Transportation (USDOT) updated environmental justice order 5610.2(a), a disproportionately high and adverse effect on minority and/or low-income populations means an adverse effect that: (1) is predominantly borne by a minority population and/or a low-income population, or (2) will be suffered by the minority population and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-minority population and/or non-low-income population (USDOT 2012).

Population, Housing, and Neighborhoods

For residents and businesses on the Eastside, I-405 is the primary north-south transportation thoroughfare. Neighborhoods, services, and community facilities have adjusted and formed around I-405. Population and housing have substantially grown since 2000 as shown in Exhibit 4.3-1.

Exhibit 4.3-1. Population and Housing in the Study Area

Jurisdiction	Population			Housing		
	2000	2010	2015	2000	2010	2015
Tukwila	17,181	19,107	19,757	7,725	7,755	7,741
Renton	50,052	90,927 ^a	97,234 ^a	22,676	38,930 ^a	40,058 ^a
Newcastle	7,737	10,380	10,994	3,117	4,227	4,288
Bellevue	109,569	122,363	134,630	48,396	55,551	58,215

Source: U.S. Census Bureau, Census 2000, 2010, and 2011–2015 American Community Survey 5-Year estimates

^a Some of the population and housing growth between 2000 and 2010 is due to annexation as part of the Benson Hill Communities annexation that occurred in 2008 (City of Renton 2017).

Tukwila has a large proportion of commercial and industrial activity compared to residential use. Large industrial and commercial developments, together with associated parking, tend to dominate the City’s landscape when seen from freeways and major arterials. The City’s population from 2000 to 2015 has increased about 15 percent, while housing has hardly grown, with an approximate increase of 0.2 percent in 15 years.

Renton is the fourth-most populated city in King County, and the eighth-most populated city in the state (Office of Financial Management 2016). Renton has growing residential neighborhoods, a strong industrial base, and a growing commercial/office sector. Residential development in Renton has grown approximately 77 percent from 2000 to 2015. In that same time period, Renton’s population grew by 94 percent, nearly doubling. Some of the population and housing growth between 2000 and 2010 in Renton is due to annexing portions of unincorporated King County. The 2008 Benson Hill Communities annexation that occurred in 2008 added about 16,000 people to the City of Renton’s population (City of Renton 2017). Vacant or underutilized properties located in Renton along Lake Washington have been redeveloped, bringing new mixed-use development to the area.

Developments such as The Landing on South Lake Washington near the NE Park Drive interchange, and the Virginia Mason Athletic Center and Barbee Mill waterfront residential development near the NE 44th Street interchange have added substantial housing, commercial, and retail uses.

The City of Newcastle is situated between Renton and Bellevue, with I-405 at the western edge of the city. Dominant land use in Newcastle is single-family housing. From 2000 to 2015, the population of Newcastle grew about 42 percent and housing grew by about 38 percent.

Bellevue is the fifth-most populated city in Washington (Office of Financial Management 2016), with an active downtown, single and multifamily neighborhoods, and auto-oriented commercial centers. From 2000 to 2015, housing in Bellevue grew 20 percent and the population grew about 23 percent.

Between 2000 and 2015, the population in the study area has become more diverse and the percentage of low-income individuals has increased. Exhibit 4.3-2 shows how diversity within the study area has changed between 2000 and 2015, while Exhibit 4.3-3 shows changes in the low-income population between 2000 and 2016. The number of low-income individuals has increased in all cities located in the study area. The largest increase in the low-income population has occurred in Tukwila, where the low-income population has increased by about 11 percent from 2000 to 2015. Additional demographic information by census block is presented in Exhibit 4.3-6.

Exhibit 4.3-2. Population by Race or Ethnicity in the Study Area

Race	2000				2010				2015			
	Tukwila	Renton	Newcastle	Bellevue	Tukwila	Renton	Newcastle	Bellevue	Tukwila	Renton	Newcastle	Bellevue
White	58.6%	65.4%	73.7%	71.8%	43.9%	54.6%	65.4%	62.6%	40.3%	47.4%	60.3%	54.7%
Black	12.8%	10.0%	2.0%	2.6%	17.9%	10.6%	2.6%	2.3%	20.1%	10.5%	2.3%	2.2%
American Indian	1.3%	1.8%	1.0%	0.8%	1.1%	0.7%	0.4%	0.4%	1.2%	0.4%	0.0%	0.3%
Asian	10.9%	15.0%	20.2%	19.0%	19%	21.2%	24.7%	27.6%	22.3%	22.1%	29.0%	31.2%
Pacific Islander	1.8%	0.9%	0.6%	0.5%	2.8%	0.8%	0.3%	0.2%	2.2%	1.1%	0.0%	0.2%
Hispanic	12.7%	7.6%	2.9%	5.3%	17.5%	13.1%	4.2%	7.0%	14.2%	12.3%	3.2%	7.1%

Source: U.S. Census Bureau, Census 2000, Census 2010, and 2011–2015 American Community Survey 5-Year estimates.

Note: The totals do not add up to 100 percent because this table does not include people who identify as two or more races, and because individuals can identify as both Hispanic and White, Black, American Indian, Asian, or Pacific Islander.

Exhibit 4.3-3. Low-Income Populations in the Study Area

Jurisdiction	2000		2010			2015		
	Total Population	% Below Poverty Level	Total Population for Whom Poverty Status is Determined	% Below Poverty Level	Margin of Error	Total Population for Whom Poverty Status is Determined	% Below Poverty Level	Margin of Error
Tukwila	17,181	12.7	18,463	23.8	+/- 4.9	19,608	23.7	+/- 4.2
Renton	50,052	9.7	85,534	10.4	+/- 1.5	96,721	12.2	+/- 1.3
Newcastle	7,737	2.0	9,837	4.4	+/- 2.0	10,980	4.8	+/- 2.6
Bellevue	109,569	5.7	119,160	6.4	+/- 0.7	134,186	7.9	+/- 0.9

Source: U.S. Census Bureau, Census 2000, 2010, and 2011–2015 American Community Survey 5-year estimates.

Note: The Census estimates data for the 2010 and 2015 American Community Survey, so there is a margin of error. 2000 Census data are actual with no margin of error.

Business and Employment

Tukwila has about 47,000 jobs, as shown in Exhibit 4.3-4.

Employment numbers for the city have shown a rebound since 2010, when Tukwila had 2.27 more jobs than residents.

Employment in Tukwila is distributed among a number of sectors, with the services sector making up the largest percentage (32 percent), followed by the manufacturing sector (25 percent).

Exhibit 4.3-4. Employment (Jobs) in the Study Area

Jurisdiction	2000	2010	2015
Tukwila	48,616	43,122	46,961
Renton	55,519	54,050	62,732
Newcastle	1,044	1,660	2,254
Bellevue	118,405	120,015	140,545

Source: PSRC 2015

PSRC 2015 data indicate that there are nearly 63,000 jobs in Renton. Renton’s largest employer is Boeing, although it continues to diversify its employer base. The number of jobs in Renton is expected to grow as developments such as the Southport mixed use area are built out on South Lake Washington near the NE Park Drive interchange. Currently three, 9-story office towers are under construction in this area and are expected to be completed in 2018.

Newcastle has remained a primarily residential community with growing employment and business opportunities. PSRC 2015 employment estimates indicate 2,254 jobs in Newcastle, with nearly half of them in the services sector.

Bellevue continues to be the financial, retail, and office center of the Eastside. PSRC 2015 data indicate that there are about 140,000 jobs in Bellevue, as shown in Exhibit 4.3-4. Major sectors continue to be services, retail, finance, insurance, and real estate.

Environmental Justice Populations

Exhibits 4.3-2 and 4.3-3, Exhibit 4.3-5, sheets 1 through 3 and Exhibit 4.3-6 contain study area demographics that confirm the presence of environmental justice populations in the study area. Study area demographics also confirm the presence of linguistically-isolated households.

What are environmental justice populations?

Federal orders, regulations, and guidance require agencies to identify and address potential adverse effects on low-income and/or minority populations. Additionally, Executive Order 13166 ensures persons with limited-English proficiency have fair and equal access to the decision-making processes for publicly funded projects, as well as the benefits of these projects.

Exhibit 4.3-5. Census Block Groups in the Study Area, Sheet 1 of 3

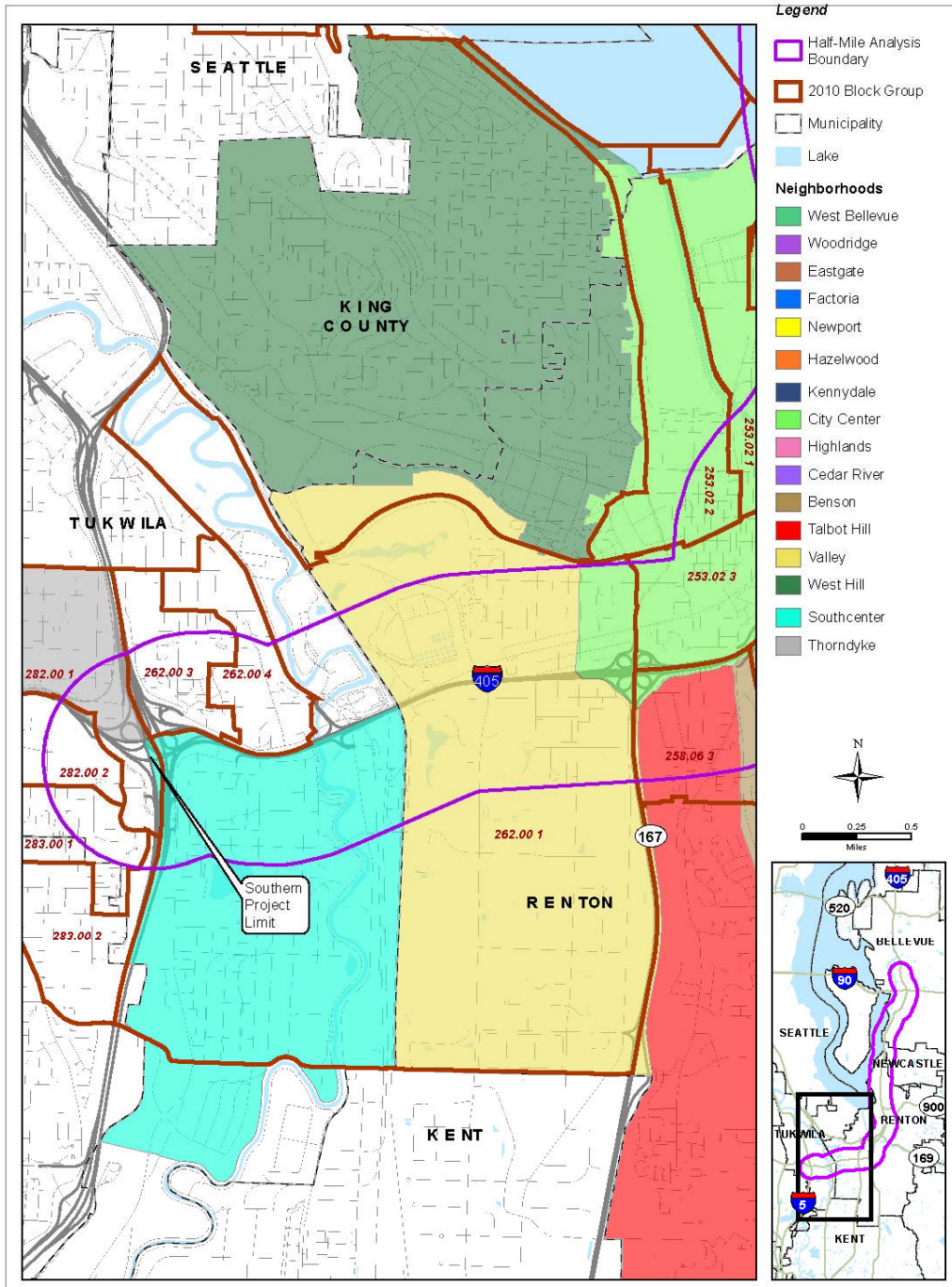


Exhibit 4.3-5. Census Block Groups in the Study Area, Sheet 2 of 3

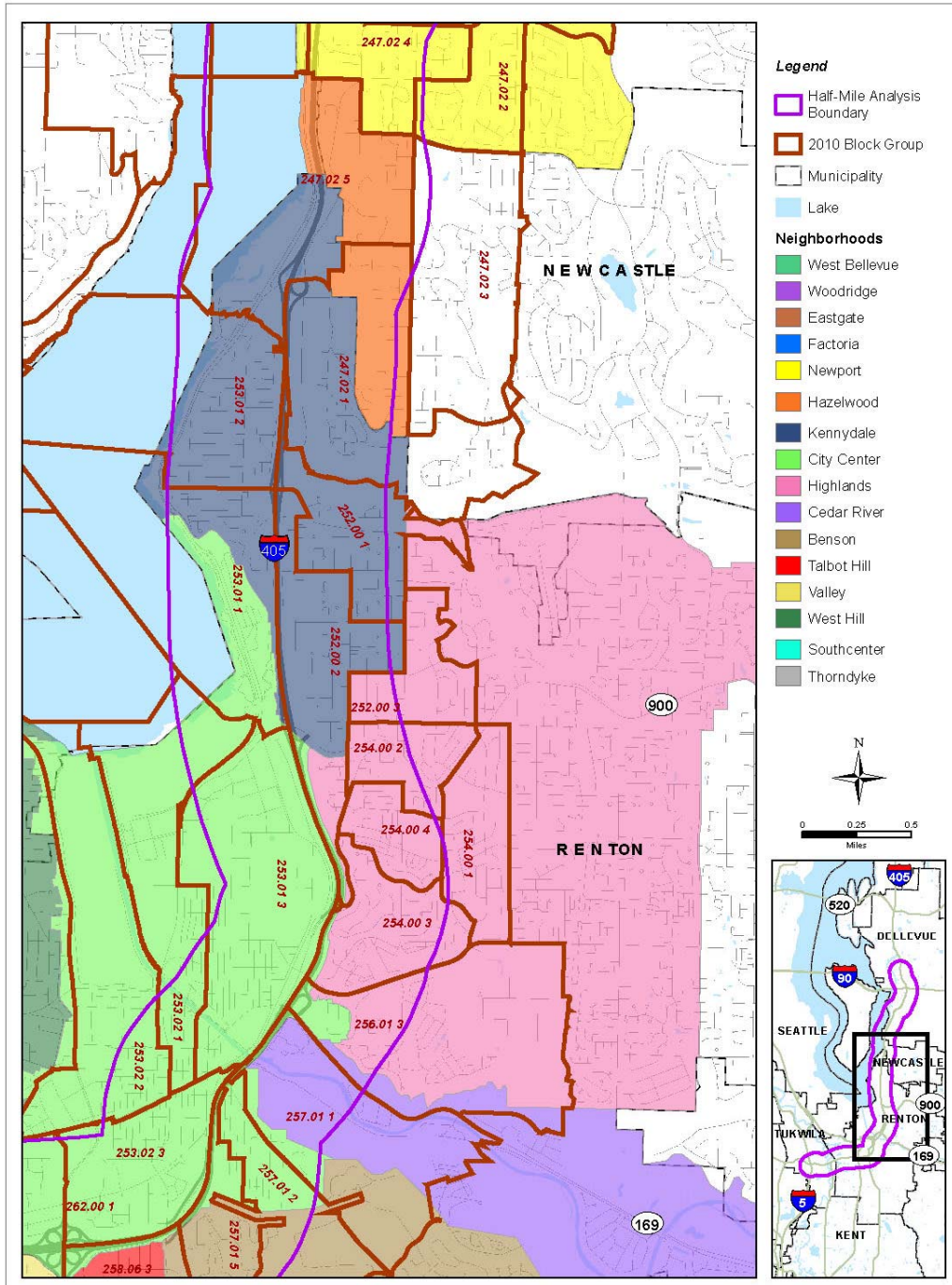


Exhibit 4.3-5. Census Block Groups in the Study Area, Sheet 3 of 3

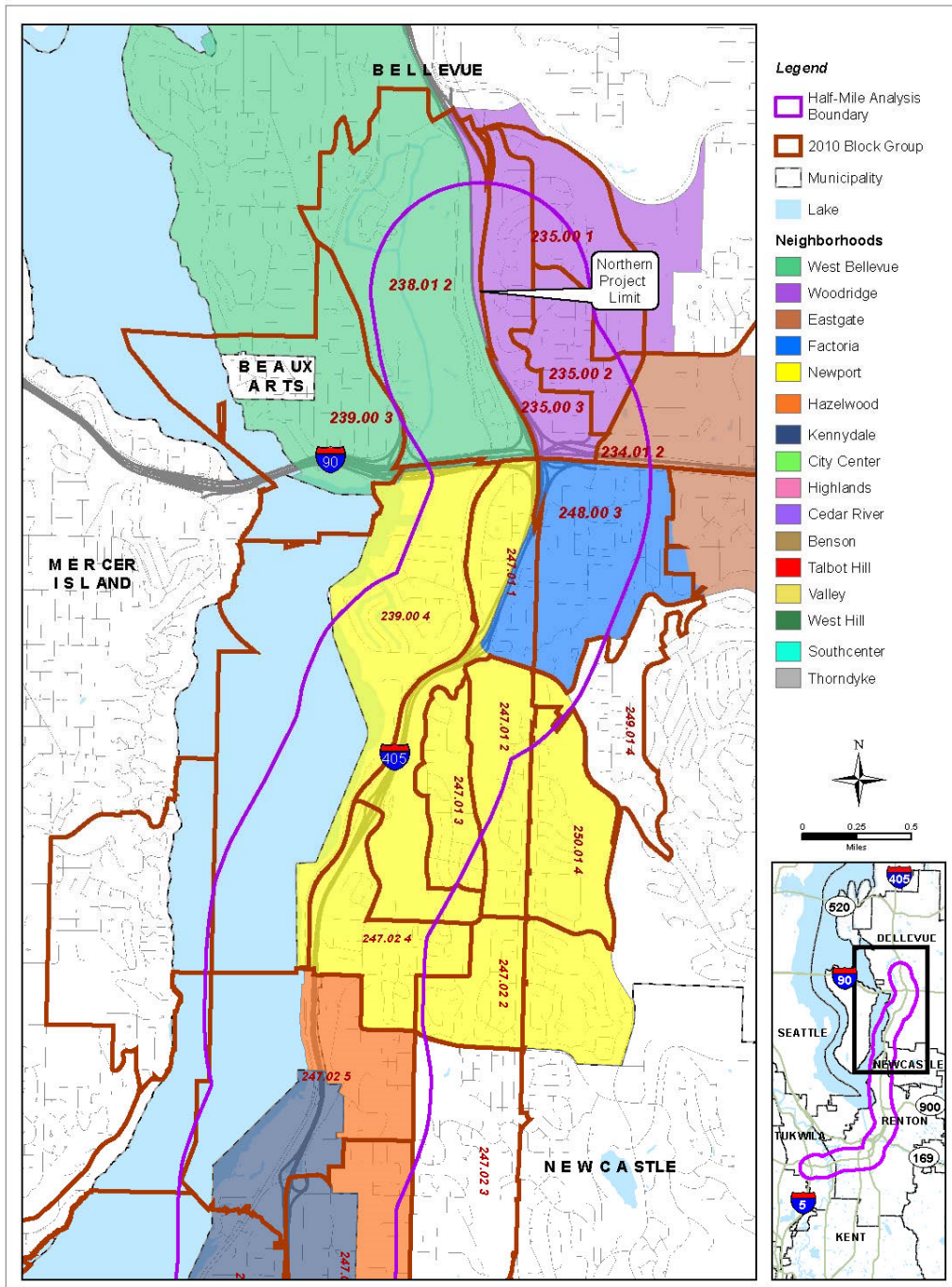


Exhibit 4.3-6. Minority and/or Low-Income Populations in the Study Area

Census Block Group	Percent Identifying as Minority	Percent Population at or below Federal Poverty Level
235002	37	4
235003	42	12
238012	37	8
239004	22	6
247011	41	10
247012	51	6
247013	25	3
247021	24	12
247024	32	2
247025	39	6
248003	65	9
252002	36	12
253011	19	8
253012	13	2
253013	49	10
253023	58	20
254002	64	17
254003	51	10
254004	36	21
257011	41	2
257012	34	9
257015	35	6
258063	57	7
262001	64	53
262003	67	19
262004	53	17
283001	54	5
Area Average	44	10

Source: U.S. Census Bureau, 2011–2015 American Community Survey 5-Year estimates

We found six census block groups in Renton at the southern end of the study area where 5 percent or more of the population lives in a linguistically isolated household and speaks Spanish. Based on this demographic analysis, WSDOT will continue to translate Project information deemed critical into Spanish.

As part of our analysis, we identified dozens of community-based and social service providers who serve minority and/or low-income populations and persons with limited English proficiency. We also identified several places of worship that are of importance to minority and/or low-income persons and/or persons with limited English proficiency. These community resources are listed in Attachment D, *Environmental Justice Discipline Report*.

Based on our demographic analysis, we can infer that minority populations, low-income populations, and persons with limited-English proficiency use transit on I-405 in the study area. Attachment D, *Environmental Justice Discipline Report*, also indicates there are minority populations, low-income populations, and persons with limited English proficiency living in the I-405 travelshed. Most I-405 users in the study area come from the census tracts in Renton and south Bellevue, where there are substantial minority and/or low-income populations as well as some residents with limited English proficiency. Similarly, information in Attachment D indicates that environmental justice populations in the study area use transit. According to the 2015 King County Metro Transit Rider/Non-Rider Survey (King County Metro Transit 2016), approximately 30 percent of transit riders identified as belonging to a minority group. There are also low-income transit riders; of those transit riders who live in East King County, 12 percent have annual household incomes below \$35,000. Regular transit riders in King County are more likely than non-riders to have annual household incomes below \$35,000. They—along with all other I-405 motorists and transit riders—deal with daily traffic congestion on I-405.

How has WSDOT engaged environmental justice populations?

WSDOT has engaged environmental justice populations throughout the life of the Project. Specific outreach conducted to engage environmental justice populations was discussed

Where can I find information about how WSDOT has engaged environmental justice populations?

This information is provided in Chapter 2 under the questions “How has the public been involved?” and “How have tribes been involved?”.

previously in Chapter 2 under the questions “How has the public been involved?” and “How have tribes been involved?”

What would happen to land use, socioeconomics and environmental justice populations if WSDOT does not build the Project?

Without the Project, there would be no capacity improvements and there would be no ETLs on this section of I-405. Residents and employees in the communities along I-405 through the study area would experience continued delay and time spent in traffic. These conditions would continue to make travel times unpredictable, thus affecting the quality of life for people that live and work in the area.

Worsening traffic congestion and decreased travel speeds on I-405 in the GP and HOV lanes would also cause delays and reduce the reliability of transit service and carpools through the study area. Reduced transit reliability would result in increased costs for transit agencies and compromised service for transit users. If the Project is not built, transit service would continue to operate primarily in the existing I-405 HOV lanes between Renton and Bellevue. Due to congestion in the HOV lanes, Sound Transit would likely not be able to meet travel times and reliability standards for planned bus rapid transit service, and Sound Transit would need to evaluate this impact on planned bus rapid transit service.

What are the expected long-term effects on land use and socioeconomics with the Project?

Land Use

This Project is consistent with local and regional land use policies. The addition of a new ETL in each direction and the conversion of the existing HOV lanes to ETLs is consistent with the long-term vision for the I-405 corridor in PSRC’s *VISION 2040* and *Transportation 2040*, and *2012 King County Countywide Planning Policies*. These documents and local plans and policies support a regional growth strategy that focuses on connecting centers with a highly efficient multimodal transportation network.

Within Tukwila, Renton, Newcastle, and Bellevue, I-405 provides regional mobility and serves as the backbone of the transportation system, including the transit system and freight network. The Project would reduce traffic congestion on I-405, manage demand to improve speed and reliability, and improve operations on I-405. The Project supports King County's policies for implementing congestion pricing strategies and supports local policies that call for effectively using existing and planned transportation capacity. PSRC's *Transportation 2040* identifies improvements in the I-405 corridor as a necessary component to support development of the urban centers identified in *VISION 2040*, and it also supports relying directly on users of the new highway capacity to pay for improvements through system-wide tolling. Similarly, King County's long-range plans establish an urban growth area in the western one-third of King County, where most growth and development is projected to occur. King County's policies that support the urban growth area call for congestion pricing strategies such as HOT lanes, ETLs, corridor tolling, system-wide tolling, and charges for vehicle miles traveled.

Local plan updates in Tukwila, Renton, Newcastle, and Bellevue support the broader regional land use and transportation goals identified in PSRC's planning documents and recognize I-405 as an integral transportation element that serves a critical role in supporting efficient transportation to and from these population centers. Local plans support transportation demand strategies to reduce trips, disperse travel demand throughout the day, and increase transit use and ridesharing.

Neighborhoods and Businesses

The Project would require 5.6 acres of land for right of way. As shown in Exhibit 4.3-7, a total of 54 parcels would be affected by permanent or partial property acquisitions or easements, and 5 permanent displacements would be required. There would also be a total of 22 temporary construction easements required to build the Project.

A lot of the roadway widening for the Project would be achieved through restriping instead of physical roadway expansion, although there are a couple of areas, particularly near the NE 44th Street and 112th Avenue SE interchanges, where full or partial property acquisitions would be required.

Exhibit 4.3-7. Property Acquisitions and Easements

Property Type	Parcels	Full Acquisitions	Partial Acquisitions	Permanent Easements	Temporary Construction Easements
Residential	34	3	16	33	10
Commercial	15	2	4	10	10
Public	5	0	1	6	2
TOTAL	54	5	21	49	22

Note: A total of 54 properties would be affected by property acquisitions or easements. Some of these properties would require more than one type of easement, such as a utility easement and a subterranean (underground) easement.

The Project would provide an overall benefit to the communities that I-405 serves. The added ETLs would improve speed and reliability and increase throughput on I-405 compared to the existing lane configuration. Periods of congestion would be shortened in the study area, and the interchange reconfigurations would make them operate more efficiently. WSDOT would incorporate context sensitive solutions (CSS) to help make the Project fit aesthetically with the surrounding community.

Full Property Acquisitions

A total of 5 full property acquisitions are required: 3 residential properties and 2 commercial properties. The 3 residential properties and 1 of the commercial properties are owned by persons identifying as minorities. Effects on properties owned by environmental justice populations are discussed in Exhibit 4.3-8. The other commercial property is not owned or occupied by a member of an environmental justice population. This commercial property is owned by a Canadian company and has 5 warehouses that are used to store building materials. The needed property acquisitions are not expected to affect the appearance, character, and livability of adjacent neighborhoods.

Partial Property Acquisitions

Residential Partial Property Acquisitions

The Project would require 16 partial property acquisitions on residential properties. Of the 16 partial property acquisitions: three are vacant and the partial property takes would not affect the ability to construct buildings or improvements in the

What are context sensitive solutions?

Context sensitive solutions (CSS) are a model for transportation project development that has received much discussion and broad acceptance. Its essence is that a proposed transportation project must be planned not only for its physical aspects as a road serving specific transportation objectives, but also for its effects on the aesthetic, social, economic, and environmental values, needs, constraints, and opportunities in a larger community setting.

future. The remaining 13 properties all have residences located on the property:

- Nine of these properties would be affected by acquisitions that would bring the freeway between 40 and 120 feet closer to the homes, but the freeway would remain more than 35 feet away from the home. With the Project, noise walls would be built at 4 of these 9 properties and noise levels would be similar to existing conditions at all 9 properties once the Project is built.
- Four of the properties would require a larger portion of the yards and would bring the freeway between 75 and 105 feet closer to the home, and the freeway would be within 35 feet of home. WSDOT discussed the impacts of the properties with the owners and they indicated a desire for a partial acquisition instead of a full acquisition. With the noise wall that WSDOT would construct in front of these four homes, noise levels would remain the same or up to 1 dBA higher than current noise levels. Compared to the No Build in 2045, noise levels with the Project would be the same or up to 4 dBA lower.

Some of the properties that would be partially acquired are owned by persons identifying as minorities. Effects on properties owned by environmental justice populations are discussed in Exhibit 4.3-8.

Commercial Partial Property Acquisitions

The Project would require 4 partial acquisitions on commercial properties. As with the residential properties, most of these partial acquisitions would have little to no impact on the owners' or tenants' use of the property. One retail business would need to relocate a small portion of their display as a result of the partial acquisition of their property. Along NE 44th Street, the existing commercial driveways would need to be rebuilt to tie into the upgraded street. This would create a temporary and minor effect, although access to these businesses would be maintained during construction. For the commercial properties, noise levels with the Project are expected to be similar to the 2045 No Build.

Some of the affected properties are owned by persons identifying as minorities. Effects on properties owned by

environmental justice populations are discussed in Exhibit 4.3-8.

Publicly Owned Partial Property Acquisitions

A partial property acquisition is required on a vacant property owned by the City of Newcastle. Noise levels are expected to increase by 1 dBA when compared to the 2045 No Build.

Permanent Easements

The project would require a total of 49 permanent easements. Many of these easements are subterranean or utility easements. These easements would not impact the use of the property, access to the property, or utilities. Some of the properties that would require permanent easements are owned by persons identifying as minorities. Effects on properties owned by environmental justice populations are discussed in Exhibit 4.3-8.

WSDOT conducts all property acquisitions in accordance with the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended and implemented by FHWA under 49 Code of Federal Regulations (CFR) Part 24, and according to Chapter 468-100 Washington Administrative Code (WAC) Uniform Relocation and Assistance and Real Property Acquisition. At the time of publishing, WSDOT has obtained all 3 of the full residential acquisitions, 5 of the partial residential acquisitions, 2 of the residential easements, 1 commercial easement, and the 1 public partial acquisition. These properties were acquired based on the NEPA process for the previously approved Renton to Bellevue Project in 2008. WSDOT has other offers that are in progress. If the Project were not constructed, WSDOT would most likely retain the acquired properties and easements, unless WSDOT determined the properties would not be needed. In that instance, WSDOT would sell or repurpose the acquired properties. Additional information about mitigation for property acquisitions is provided in Chapter 6, Measures to Avoid or Minimize Effects.

What are the expected long-term effects on environmental justice populations?

The following text and Exhibit 4.3-8 is a summary of the effects on environmental justice populations that is contained in Attachment D, *Environmental Justice Discipline Report*.

Exhibit 4.3-8. Operational Project Effects on Environmental Justice Populations

Evaluation Element	Project	No Build
Historic and cultural resources of significance to tribes	The Project would have no effect on any historic, cultural, or archaeological resources.	There would be no effect on any historic, cultural, or archaeological resources.
Fishing and aquatic resources of significance to tribes	The Project would replace five fish barriers with fish passable structures. In addition, WSDOT would make habitat improvements to May Creek.	In accordance with the terms of the existing injunction, existing fish barriers would be replaced under a future project.
Noise in neighborhoods	<p>With the Project and proposed noise wall mitigation, noise levels are expected to exceed WSDOT NAC at 171 receivers representing 304 residences, 5 parks, 7 trails, and 3 churches, which is less than expected noise impacts with the 2045 No Build.</p> <p>The Project includes constructing 4 new noise walls and relocating 2 existing noise walls.</p> <p>The Project would build Wall East 10A in the City of Newcastle. Wall East 10A would reduce noise levels by 1 to 11 dBA as compared to the 2045 No Build. While Wall East 10A would reduce noise levels for several receivers, most receivers would continue to experience noise levels above the NAC. The neighborhood adjacent to the East 10a wall has a population that is 32% minority, 2% low-income, and 6% have limited English proficiency.</p> <p>The Project would build Wall West 5 along the eastern side of the Eastside Rail Corridor Regional Trail, in portions of Renton, Bellevue, and unincorporated King County. The wall would reduce noise levels to below the NAC for 11 of the 22 receivers representing 100 residences. The neighborhood adjacent to Wall West 5 has a population that is 36% minority, 5% low-income, and 1% have limited English proficiency.</p> <p>The Project would build Wall East 11 in the City of Bellevue. This noise wall is expected to reduce noise levels to below the NAC at 3 of 11 receivers, representing 6 residences. The neighborhood adjacent to the East 11 wall has a population that is 38% minority, 4% low-income, and there is no known population with limited English proficiency.</p> <p>The Project would extend existing Wall West 6 in Bellevue. The wall would reduce noise to below the NAC for 8 of the 16 receivers representing 15 residences. The neighborhood adjacent to West 6 has a population that is 41% minority, just under 14% low-income, and just under 5% have limited English proficiency.</p> <p>The Project would replace and relocate approximately 400 feet of Wall West 4. All eight receivers representing 54 dwelling units are expected to maintain noise levels below the NAC. The neighborhood adjacent to Wall West 4 has a population that is 13% minority, 4% low-income, and there is no known population with limited English proficiency.</p> <p>The Project would relocate Wall East 3—an existing noise wall on the bridge over Sunset Boulevard—9 feet to the east within existing WSDOT right of way. Once it is relocated, the four</p>	<p>With No Build, noise levels would exceed WSDOT noise abatement criteria at 203 receivers representing 444 residences, 1 hospital, 5 parks, 7 trails, and 3 churches. With No Build, 140 more residences would experience noise impacts than with the Project and the proposed mitigation.</p>

Exhibit 4.3-8. Operational Project Effects on Environmental Justice Populations

Evaluation Element	Project	No Build
	<p>receivers representing 18 homes behind the existing wall would experience noise levels above the NAC. The neighborhood adjacent to Wall East 3 has a population that is 53% minority, 14% low-income, and 5% has limited English proficiency.</p> <p>Attachment C, <i>Noise Discipline Report</i>, contains additional information about the noise analysis done for the Project. Based on the demographic analysis, the population affected by noise would not be predominately minority or low-income. We describe noise impacts on property owners affected by partial property acquisitions later in this table.</p>	
<p>Air quality, water quality, public services, utilities, and visual effects in neighborhoods</p>	<p>The Project would result in improvements over current conditions for water quality, public services, and utilities. Air emissions for the Build or No Build Alternatives would be reduced compared to existing conditions because of improved vehicle technology. The project would result in minor changes to visual quality experienced by I-405 users and neighbors. According to Attachment F, <i>Visual Impact Assessment Discipline Report</i>, for neighbors adjacent to the highway, the Project would have few impacts. The Project proposes minimal clearing of vegetation between the highway and the WSDOT right of way line. In locations where vegetation would be cleared and not replanted, neighbors are generally screened from the highway through topography, noise walls, and remaining vegetation. Just north of NE 44th Street, where Wall 10 East would be constructed, the Project would clear the last remaining vegetation that shields neighbors from the highway. The neighborhood adjacent to the East 10a wall has a population that is 32% minority, 2% low-income, and 6% have limited English proficiency. Based on the demographic analysis, the population affected by visual impacts would not be predominately minority or low-income.</p>	<p>No improvements to water quality, public services, and utilities. Air emissions would be reduced compared to existing conditions because of improved vehicle technology.</p>

Exhibit 4.3-8. Operational Project Effects on Environmental Justice Populations

Evaluation Element	Project	No Build
Bicycle and pedestrian facilities	<p>The Project would include improvements to bicycle and pedestrian facilities in the corridor. The Project would align the Lake Washington Trail to the Eastside Rail Corridor right of way between north of the Ripley trestle in Renton (MP 7.7) and Coal Creek Parkway interchange in Bellevue (MP 10.2). This would improve connectivity for bicyclists and pedestrians in the corridor. The realigned trail would be built to current ADA standards. These improvements would benefit the surrounding neighborhoods. A demographic analysis of neighborhoods within ½ mile of this improvement indicates there are populations who identify as minority (up to 40 percent of the census block group) and households with low incomes (up to 15 percent of the census block group). This suggests environmental justice populations would benefit from these improvements.</p> <p>In addition, at NE 44th Street, sidewalks would be improved by providing contiguous sidewalk on both sides of the street. Currently sidewalks are provided on the north side of the roadway and they are not contiguous. Sidewalks would also be provided between the park-and-ride and inline transit stations.</p> <p>At 112th Avenue SE, bicycle lanes would be provided on both sides of the street and a sidewalk would be provided on the north side, which would be an improvement over existing conditions where no bike lanes or sidewalks are currently provided. Sidewalks would also be provided between the park-and-ride and inline transit stations.</p> <p>At Coal Creek Parkway, sidewalks would be provided on both sides of the street, which would be an improvement over existing conditions since sidewalks are only provided on the south side.</p>	<p>The Lake Washington Trail realignment would not take place. Improvements to bike lanes and sidewalks at NE 44th Street, 112th Avenue SE, and Coal Creek Parkway would not be built.</p>

Exhibit 4.3-8. Operational Project Effects on Environmental Justice Populations

Evaluation Element	Project	No Build
Effects on residential property owners and tenants	<p>Full residential property acquisitions: The Project would require full acquisitions of three residential properties. WSDOT has already acquired these three properties, which were owner-occupied and owned by persons who identify as minority. One of these owners has limited English proficiency. WSDOT mitigated for these effects as described in Exhibit 4.3-10 and Chapter 6, Measures to Avoid or Minimize Effects. These acquisitions took place based on the completed NEPA process for the previously approved Renton to Bellevue Project in 2008; however, this EA must consider the effects of these acquisitions.</p> <p>Partial residential property acquisitions: The Project would require 33 permanent easements on residential properties. Many of the permanent easements are subterranean and would not impact of the property or utilities.</p> <p>The Project would require 16 partial property acquisitions on residential properties. Three of these residential properties do not have homes on the property. Nine of the affected residential properties would lose a small portion of their yards and the Project would bring the highway between 40 and 120 feet closer to homes than it is now. Even with the widening, however, the highway would be more than 35 feet away from homes. With the Project, noise walls would be built at 4 of these 9 properties and noise levels would be similar to existing conditions at all 9 properties once the Project is built.</p> <p>Four residential property owners—including one property owner who identifies as minority—would permanently lose a larger portion of their yards and the Project would bring the highway 75 to 105 feet closer to their houses. The partial property acquisitions would not affect the house structures or access to the homes for the four affected property owners. With the noise wall that WSDOT would construct in front of these four homes, noise levels would remain the same or up to 1 dBA higher than current noise levels.</p> <p>The project team reached out to residential property owners and tenants affected by the partial property acquisitions and permanent easements and confirmed that some of the persons affected identify as minority, and a few have limited English proficiency. WSDOT would mitigate for the adverse effects on affected property owners and tenants as described in Exhibit 4.3-10 and Chapter 6, Measures to Avoid or Minimize Effects.</p>	<p>Full residential property acquisitions: Since WSDOT has purchased all three residential properties required for the Project and relocated the residents, the effects of the No Build would be similar to the effects of the Project. The only difference would be that WSDOT would sell or repurpose the acquired properties if at a later date they determined the properties were not needed.</p> <p>Partial residential property acquisitions: As of the date of publication of this document, WSDOT had closed on 7 partial residential acquisitions or easements and has several offers in progress. Under the No Build, WSDOT would most likely retain the partial acquisitions and easements. Without the Project, the highway would not be closer to houses. However, noise levels for the 13 residential property owners described in the previous column would be up to 6 dBA higher than today.</p>

Exhibit 4.3-8. Operational Project Effects on Environmental Justice Populations

Evaluation Element	Project	No Build
<p>Effects on businesses, community gathering places, and faith-based organizations of particular importance to environmental justice populations</p>	<p>The Project would displace two businesses and cause minor impacts on access for a few other businesses during construction. One commercial displacement would affect a chain restaurant owned by a person who identifies as minority. At the time of publication of this document, the affected restaurant owner made the decision to relocate the restaurant about 40 miles from its current location. Many of the 26 current employees of the restaurant are unlikely to relocate with the restaurant, which means they would lose their jobs. At least a few of the employees of that restaurant identify as minority and some may be low income. The Uniform Relocation Act does not cover employees of a business. The second commercial property affected by a full acquisition is not owned or operated by a member of an environmental justice population. This is a property with five warehouses that are used to store building materials. This business is owned by a Canadian company.</p> <p>The Project would also require four partial acquisitions and 10 permanent easements on commercial properties. A few of the affected commercial property owners identify as minority. As with the residential properties, most of these partial acquisitions and easements would have little to no impact on the owners' or tenants' use of the property. One retail business would need to relocate a small portion of their display as a result of the partial acquisition of their property. Along NE 44th Street, the existing commercial driveways would need to be rebuilt to tie into the rebuilt street. This would create a temporary and minor effect, although access to these businesses would be maintained during construction.</p> <p>The Project would not cause any other substantial effects on businesses, community gathering places, or faith-based organizations of importance to environmental justice populations.</p>	<p>No effects on businesses, community gathering places, or faith-based organizations of particular importance to environmental justice populations.</p> <p>As of the date of publication of this document, WSDOT had closed on one commercial easement. Under the No Build, WSDOT would most likely retain the partial acquisitions and easements.</p>

Exhibit 4.3-8. Operational Project Effects on Environmental Justice Populations

Evaluation Element	Project	No Build
Community cohesion	<p>A total of 54 properties totaling 5.6 acres would be affected by property acquisitions and easements. This includes 3 residential properties and 2 commercial properties that would be permanently displaced. The total area that would be directly affected by these acquisitions is small compared to the number of residences and businesses located in the study area. Because of this, effects on community cohesion are expected to be minimal. In addition, WSDOT will incorporate context sensitive solutions and will adhere to the <i>I-405 Urban Design Criteria</i> (WSDOT 2016a) to help make the Project fit aesthetically with the surrounding community. The Project would result in mostly positive effects on community cohesion. New and improved sidewalks, inline transit access improvements at NE 44th Street and 112th Avenue SE, and reduced traffic congestion on I-405 and arterials would promote community cohesion for the neighborhoods in the study area.</p> <p>The Build Alternative would require a permanent acquisition of land at the Fawcett property and a temporary easement from the Meadow property that comprise the May Creek Greenway, a Section 4(f) resource. These properties are owned by the City of Renton, which has concurred that with mitigation, the use of the Fawcett property would have a <i>de minimis</i> impact and the Meadow property would qualify as temporary occupancy under Section 4(f). During construction, temporary access delays may affect people accessing Cedar River Park, Gene Coulon Memorial Beach Park, Newcastle Beach Park. In addition, temporary detours or delays and a trail realignment would be required within the WSDOT right of way at the Cedar River Trail. Additional information about effects on recreational resources are provided in Section 4.4 of this EA.</p>	<p>Greater traffic congestion on I-405 and some intersections at local roads in the study area could have an effect on community cohesion in neighborhoods adjacent to or bisected by I-405.</p>

MP = milepost; ADA = Americans with Disabilities Act; EA = environmental assessment; dBA = A-weighted decibels; WSDOT = Washington State Department of Transportation; NAC = noise abatement criteria

Effects Associated with the ETLs

This section summarizes the effects of the ETLs on environmental justice populations. Environmental justice populations could be affected by the proposed ETLs in the following ways:

1. The cost of the toll to use ETLs would disproportionately affect low-income populations.

Any toll that charges all users the same amount, regardless of income, disproportionately affects low-income users. This is because, compared to users with moderate and high incomes, the toll represents a higher proportion of annual income.

To understand the extent to which tolls may disproportionately affect low-income users, we estimated the annual cost for a typical user. The sidebar explains how we developed this estimate and additional details regarding the analysis done is provided in Attachment D, *Environmental Justice Discipline Report*.

We estimated the annual cost for the average ETL user to be \$106.56 for users with a *Good To Go!* pass and \$178.56 for users who pay by mail.¹ Exhibit 4.3-9 shows the percentage of annual household income the toll represents for low-, middle-, and high-income users. While Exhibit 4.3-9 demonstrates that tolls would represent a higher proportion of household income for low-income users, these estimates do not suggest the tolls are unaffordable for these users.

How did we estimate the annual cost to a typical user of ETLs?

Estimating the annual cost for a typical user proved to be challenging, for two reasons. First, toll rates to use the lanes would vary, depending on the amount of traffic congestion in the lanes. During relatively quiet periods, toll rates in the I-405 Bellevue to Lynnwood ETLs can be as low as \$0.75. During peak periods, toll rates in the Bellevue to Lynnwood ETLs can go as high as \$10. Second, toll rates for these projects have not yet been set.

Given these uncertainties, we based our estimate on what has been happening with the Bellevue to Lynnwood ETLs over the past 21 months. According to the WSDOT I-405 Express Toll Lanes 21-Month Update (WSDOT 2017b), the average toll during the peak period in the peak direction was \$2.96. The average user makes between two to five trips per month, so we assumed three trips per month for our estimate.

Exhibit 4.3-9. Comparison of Percentage of Household Income for Different User Types

User Type	Low-Income User	Middle-Income User	High-Income User
Description of user type	\$28,780/year or less (HHS federal poverty level of household of 5 people)	Median household income for King County: \$82,000/year	1.5 times median household income for King County (\$123,000/year or more)
Percent of annual income for <i>Good To Go!</i> passholders	0.4%	0.1%	0.1%
Percent of annual income for pay by mail users	0.6%	0.2%	0.2%

HHS = U.S. Department of Health and Human Services
Source: U.S. Department of Health and Human Services 2017

¹ To calculate these average annual costs, we assumed an average toll of \$2.96 x three times per month x 12 months per year. For pay by mail users, we added a \$2-per-trip surcharge.

Multiple studies on ETL use indicate users of all incomes value the faster trip and use the lanes when they absolutely need to be somewhere on time. Given the relative infrequency with which the average I-405 motorist chooses to pay the toll and use the ETLs, the annual cost of making this choice tends to be relatively small for most users. As stated previously, the Washington State Transportation Commission (WSTC) will set operating parameters for the ETL system. However, WSDOT's current assumption is that the ETLs would be free for all users at night and on weekends. This means the tolls would only affect low-income and other ETL users during the daytime on weekdays. As such, while we believe the toll to use ETLs would disproportionately affect low-income users, we do not believe that the adverse effect would be high. Furthermore, this adverse effect would be offset by increased travel speeds for most motorists traveling toll-free in the GP lanes during most times of day.

2. Use of the electronic toll collection system could disproportionately affect persons with limited English proficiency.

Use of the electronic toll collection system could disproportionately affect persons with limited-English proficiency. The electronic toll collection system could be a barrier for I-405 travelers who do not understand the system or how to acquire a *Good To Go!* pass, particularly persons with limited English proficiency. People who do not understand how the system works may be less likely to use it or could incur additional costs in pay by mail surcharges. In addition, to use the electronic toll collection system, individuals who do not have a credit or debit card must travel to a customer service center in Seattle, Bellevue, or Gig Harbor to open an electronic toll account and preload or replenish it using cash. This may discourage individuals from using the ETLs, or they may incur additional costs in pay by mail surcharges. Most individuals without credit or debit cards are immigrants or have low incomes.

3. Use of the electronic toll collection system could disproportionately affect low-income populations.

As described above, the electronic toll collection system could be a barrier for low-income I-405 travelers who do not have a credit or debit card.

We conclude the ETLs would not result in disproportionately high and adverse effects on environmental justice populations, for the following reasons:

- All users—including low-income and limited English proficient users—would continue to have an accessible, convenient, and free travel option: the GP lanes on I-405.
- All travel lanes on I-405 would experience improved travel times with the Project as compared to No Build. We recognize that individual trip travel times could vary. Northbound trips during the morning peak period would see the greatest benefit with the Project. In 2025 trips for northbound travelers on I-405 during the morning peak period using the GP lanes would take about 16 minutes with the Project, compared to about 34 minutes with the No Build. In 2045, this same trip is expected to take nearly 23 minutes with the Project, compared to nearly 36 minutes with the No Build.
- Most motorists—including individuals who have low incomes or have limited English proficiency—would not lose a travel option because of the Project. The only exception would be two-person carpools, who would have to pay a toll to use the ETLs during weekday peak periods. These carpools are able to use the HOV lanes for free today. However, because travel times in the GP lanes are expected to improve with the Project, two-person carpools who do not want to pay tolls would still have the same or faster travel times with the Project than without for trips in 2025. By 2045, two-person carpools who do not want to pay tolls would have slightly slower trips with the Project than without, but the time difference would be one minute to five minutes. As such, even two-person carpools would benefit from the Project compared to the No Build for most trips during most times of the day.
- The additional capacity and ETL system would improve travel times for the GP lanes and ETLs compared to the No Build Alternative. The improvements would result in an increase in person throughput. For example, in 2025 during the morning commute period, I-405 near the interchange with NE

44th Street in Renton would carry approximately 5,400 more people with the Project than with the No Build Alternative.

- Low-income individuals who are eligible for public benefits may use their Electronic Benefit Transfer cards to open and maintain their *Good To Go!* accounts. The use of Electronic Benefit Transfer cards allows users who do not have bank accounts to obtain a *Good To Go!* pass and avoid extra charges for the pay by mail option. In addition, WSDOT is currently working to expand the network of retail locations where people can buy *Good To Go!* passes with cash, which would make it easier for people to purchase a pass if they do not have a bank account, debit, or credit card.
- Sound Transit's expansion of the regional mass transit system includes multiple future improvements in the study area. Sound Transit will implement bus rapid transit on the SR 518 and I-405 corridors between Burien and Lynnwood. New inline freeway stations will allow buses to pick up and drop off riders without having to exit and re-enter I-405. The two-lane ETL system would provide the infrastructure needed to facilitate a fast, reliable bus rapid transit system and result in benefits to transit riders, including transit riders who identify as minority, have low incomes, or have limited English proficiency. Bus rapid transit service on I-405 is expected by the end of 2024, when this Project opens.

Although there is no need for mitigation, WSDOT will continue conduct targeted outreach to engage minority populations, low-income populations, and persons with limited English proficiency in the study area and I-405 travelshed. Ongoing public involvement activities are identified in Chapter 6, Measures to Minimize and Mitigate Effects.

What are the expected short-term effects on land use, socioeconomic, and environmental justice populations with the Project?

Project construction would have the following benefits and adverse effects:

- Construction would require temporary construction easements for 10 residential properties, 10 commercial properties, and 2 publicly owned properties. As with all real estate acquisitions, WSDOT will conduct property acquisition in accordance with the Uniform Relocation Assistance and Real Property Acquisitions Policies Act of 1970, as amended and implemented by FHWA under 49 CFR 24, and according to WAC 468-100 (Uniform Relocation and Assistance and Real Property Acquisition). At least one of the affected residential property owners identifies as minority. Temporary construction easements would not have a long-term effect on the owners' or tenants' use of the property, so we do not believe these temporary construction easements would have a disproportionately high and adverse effect on environmental justice populations.
- Two property owners, including one property owner who identifies as a minority, would experience temporary loss of sewer use while WSDOT relocates their sewer lines. The disruption could occur for up to 30 days.
- At the time of publication of this document, there were no known homeless encampments along this stretch of I-405. However, it is possible that homeless encampments could be located in construction areas when construction begins. WSDOT works with law enforcement to ensure WSDOT-owned property is used as it is intended. If there is a homeless encampment that requires clearing, WSDOT and/or its construction contractors post signage in English and Spanish at least 72 hours prior to construction activities, conduct a visual assessment of the area to determine the specific needs for clearing an encampment, and contact advocacy groups to enlist

their help in notifying and relocating homeless populations.

- Construction jobs would be generated that could benefit all populations, including environmental justice populations.
- Construction vehicles would increase traffic delay on the I-405 mainline, ramps to and from I-405, and local arterials in the study area during the construction period. This would affect all I-405 users and motorists on local streets, including persons who are minorities, have low incomes, or have limited English proficiency.
- Transit riders—including minority, low-income, and persons with limited English proficiency—could face revised routes and closed transit stops during construction.

Additional temporary construction-related effects on neighborhoods within the study area could also include increased noise, dust, visual effects, and temporary delays or access changes to parks and recreational facilities.

Construction-related effects on these resources are discussed in this EA in Section 4.2, Noise; Section 4.5, Visual Quality; Section 4.4, Recreational, Section 4(f), and Section 6(f) Resources, and the Air Quality subsection at the beginning of Section 4. During construction, WSDOT will implement mitigation measures identified in Chapter 6, Measures to Minimize and Mitigate Effects. These measures include conducting outreach during construction to minority populations, low-income populations, and persons with limited English proficiency. These measures also include translating project materials about construction effects into Spanish. None of the temporary construction effects discussed above would have a disproportionately high and adverse effect on environmental justice populations.

Would the Project have other effects that may be delayed or distant?

To determine if the Project would contribute indirect effects, we examined local and regional comprehensive plans for the study area to determine whether the Project would affect changes in the type, rate, or timing of planned growth. As discussed previously, the Project is consistent with PSRC's

long-term vision for the I-405 corridor as documented in *VISION 2040* and *Transportation 2040*, as well as *King County's Countywide Planning Policies* and local policies for the cities of Tukwila, Renton, Newcastle, and Bellevue.

We also looked at future impacts on environmental justice populations that are reasonable and foreseeable. As described earlier, the ETLs for the Project would—in combination with the other I-405 projects and the SR 167 HOT lanes—create a 40-mile-long ETL system from Auburn on SR 167 to Lynnwood on I-405. The WSTC has not yet set toll policy and toll rates for the entire SR 167/I-405 ETL system, so we do not know how much it would cost a motorist to travel from Auburn to Lynnwood in the ETLs. For more information on current rates of the existing system please see <http://www.wsdot.wa.gov/Tolling/TollRates.htm>. Regardless of the toll policy, the cost to use the entire SR 167/I-405 ETL system would disproportionately affect low-income users, for whom the total cost would represent a higher proportion of annual household income.

This disproportionate adverse effect would be offset by improved travel time, reliability, and travel conditions in both the GP lanes and the ETLs. All lanes of I-405 would have improved travel times with the Project. Most users of I-405 would benefit from these improved travel times. The one exception is that two-person carpools who choose not to pay a toll would see increased travel times in 2045. We recognize that individual trip travel times could vary.

Note that, as of 2009, low-income individuals who are eligible for public benefits have been able to use their Electronic Benefit Transfer cards to open and maintain their *Good To Go!* accounts. The use of Electronic Benefit Transfer cards allows users who do not have bank accounts to obtain a *Good To Go!* pass and avoid extra charges for the pay by mail option. This option could offset some of the disproportionate adverse effect. In addition, WSDOT is currently working to expand the network of retail location where people can buy *Good To Go!* passes with cash, making it easier for people to purchase a pass without a bank account. As concluded in the analysis of ETLs on these and other segments of I-405, we do not anticipate the SR 167/I-405 corridor ETL system would result in disproportionately high and adverse indirect effects on environmental justice populations.

By eliminating or reducing several areas of congestion on southbound I-405, the ETLs would create bottlenecks “downstream” on SR 167. WSDOT anticipates the higher volumes on I-405 southbound during peak periods to create more congestion on southbound SR 167, which would increase travel times in the southbound SR 167 GP lanes. Motorists traveling in the opposite direction in the northbound SR 167 GP lanes would benefit from faster travel speeds because of improved operations on northbound I-405.

The SR 167 travelshed has substantial proportions of low-income populations, minority populations, and persons with limited English proficiency, so we conclude the effects of the Project on traffic operations on SR 167 would disproportionately affect environmental justice populations. While we believe this congestion would cause some additional inconvenience for motorists, we do not believe this would be disproportionately high and adverse effect. WSDOT has identified projects in the SR 167 corridor that would address this congestion. An auxiliary lane to southbound SR 167 between the SR 516 interchange southbound on-ramp and the S 277th Street interchange southbound off-ramp could help reduce congestion on SR 167; however, this project is currently unfunded.

Conclusion: Would the Project result in disproportionately high and adverse effects on environmental justice populations?

Exhibit 4.3-10 summarizes the effects of the Project on environmental justice populations, mitigation, and/or offsetting benefits.

Exhibit 4.3-10. Project Effects on Environmental Justice Populations, Mitigation, and/or Offsetting Benefits

Project Effect	Mitigation and/or Offsetting Benefits
Effects of the ETLs	
The cost of the toll to use ETLs would disproportionately affect low-income populations.	<ul style="list-style-type: none"> – These effects would be offset by faster travel times for most users—including environmental justice populations—with the Project. – WSDOT would continue to conduct targeted outreach to engage environmental justice populations in the study area and the I-405 travelshed.
Use of the electronic toll collection system could disproportionately affect persons with limited English proficiency and/or low-income populations.	<ul style="list-style-type: none"> – WSDOT would continue to offer the option for low-income persons who are eligible for public benefits to use their Electronic Benefit Transfer cards to open and maintain their <i>Good To Go!</i> accounts. The use of Electronic Benefit Transfer cards allows users who do not have bank accounts to obtain a <i>Good To Go!</i> pass and avoid extra charges for the pay by mail option. – WSDOT is working to expand the network of retail locations where people can buy <i>Good To Go!</i> passes with cash, making it easier for people to purchase a pass without a bank account.
The cost to use the entire length of the ETL system would disproportionately affect low-income users, for whom the total cost would represent a higher proportion of annual household income.	<ul style="list-style-type: none"> – This effect would be minor and improved travel times for almost all users—including environmental justice populations—would offset this effect.
Effects of Property Acquisitions	
Three households who identify as minority have been displaced. ²	<ul style="list-style-type: none"> – WSDOT collected information to identify specific needs of the residents, made relocation resources available, ensured at least one comparable property was available to relocate, and reimbursed displaced families for certain relocation costs.
Thirteen residential property owners—including one minority property owner—would experience loss of use of a portion of their yards, closer proximity of their dwellings to the highway, and two would experience a temporary disruption in sewer service.	<ul style="list-style-type: none"> – WSDOT is conducting property acquisition in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, to ensure just compensation for all properties and a minimal adverse effect on the current owners and tenants. – Areas that qualified for a noise wall, would maintain noise levels close to current conditions. – WSDOT discussed the impacts of the properties with the owners and they indicated a desire for a partial acquisition instead of a full acquisition. – WSDOT would provide temporary relocation to the two property owners who would experience short-term disruption in their sewer service.

² All three full residential property acquisitions and some of the partial residential and commercial property acquisitions have already taken place under the completed NEPA process for the previously approved Renton to Bellevue in 2008; however, this EA must consider the effects of these acquisitions in making an environmental justice determination.

Exhibit 4.3-10. Project Effects on Environmental Justice Populations, Mitigation, and/or Offsetting Benefits

Project Effect	Mitigation and/or Offsetting Benefits
One commercial property owner who identifies as minority must sell his property to WSDOT.	– WSDOT is conducting property acquisition in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, to ensure just compensation for the adverse effect on the current owner and tenants.
One commercial business owned by an individual who identifies as minority is being displaced.	– WSDOT prepared a relocation plan, collected information to identify the specific needs of the affected business, paid for the costs of relocating or replacing all property, provided up to \$2,500 to pay for time invested in finding a replacement site, and provided limited funds to pay for costs associated with relocating and reestablishing.
For the displaced, minority-owned business, 26 restaurant employees—including some employees who are environmental justice populations—will lose their jobs.	– Per the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 employees are not eligible for benefits
Indirect Effects, Transportation	
With the Project, increased capacity on southbound I-405 would allow higher traffic volumes to access southbound SR 167, which would worsen congestion at the SR 167/S 277th Street interchange during afternoon peak periods.	– Although there are no funded projects to mitigate for this congestion, WSDOT has identified a project in the SR 167 corridor that would address this congestion.

After analyzing the totality of the impacts and associated mitigation, we have determined that the Project would not have a disproportionately high and adverse effect on the study area’s environmental justice populations.

4.4 Recreational, Section 4(f), and Section 6(f) Resources

This section provides a summary of Attachment I, *Recreational, Section 4(f), and Section 6(f) Resources Technical Memorandum*, which evaluated effects of the Build and No Build Alternatives during construction and operation.

How did WSDOT evaluate recreational, Section 4(f) and Section 6(f) resources?

Recreational resources, including those that qualify as a Section 4(f) resource or a Section 6(f) property, were identified within one-quarter mile of the proposed Project improvements. Potential effects on these resources were evaluated by reviewing preliminary design drawings and reviewing conclusions from other environmental

What is Section 6(f)?

Section 6(f) of the 1965 Land and Water Conservation Fund Act provides funding for acquiring property and developing public recreational facilities, and protects against the loss of that property to other uses. This section of the act states, “No property acquired or developed with assistance under this section shall, without the approval of the Secretary, be converted to other than public outdoor recreation uses.” Section 6(f) applies when the project acquires property where Land and Water Conservation Grant Funds have been used to either acquire or develop the property.

investigations, including property acquisitions, transportation, noise, and visual and aesthetic resources. Site-specific information about the type and function of each potentially affected recreational resource was collected from local websites. We also searched the Washington State Recreation and Conservation Office online database for study area recreation projects with Land and Water Conservation Fund (LWCF) grants and Section 6(f) long-term obligations for maintenance and public access.

What are conditions like today for recreational, Section 4(f) and Section 6(f) resources?

Exhibit 4.4-1 lists the recreational resources identified within the study area and compares each resource with Section 4(f) regulations. A total of 28 recreational resources were identified. The location of these resources relative to I-405 are shown on Exhibit 4.4-2, sheets 1 and 2. All but two of the resources are considered Section 4(f) resources. Five of the resources meet the criteria for a Section 6(f) resource. Two of the resources qualify for listing under the NRHP. Attachment I, *Recreational, Section 4(f), and Section 6(f) Resources Technical Memorandum*, contains a description of each of the resources listed in Exhibit 4.4-1.

What is Section 4(f)?

Section 4(f) of the U.S. Department of Transportation Act of 1966 declares that special efforts be made to preserve public park and recreation lands, wildlife and waterfowl refuges, and historic sites of national, state, or local significance. Historic sites are afforded protection under Section 4(f) if listed or determined eligible for the NRHP. Section 4(f) permits the Secretary of Transportation to approve a project that requires the use of land from a significant publicly owned park, recreation area, or wildlife and waterfowl refuge, or any land from a historic site of national, state, or local significance only if the lead federal agency(s) makes the following determinations:

- There is no feasible and prudent alternative to the use of such land; and
 - All possible planning has been undertaken to minimize harm to the Section 4(f) lands resulting from such use.
-

Exhibit 4.4-1. Study Area Parks and Recreation Areas and Historic Sites

Resource		Criteria for Section 4(f) Resources				Protected Resource	
		Publicly Owned	Open to the Public	Major Purpose is Park or Recreational Activities	Significant as a Park or Recreation Area	Section 4(f)	Section 6(f)
Recreational Resources							
1	Burnett Linear Park	Yes	Yes	Yes	Yes	Yes	No
2	Tonkins Park	Yes	Yes	Yes	Yes	Yes	No
3	Narco Site ^a and Cedar River Natural Area	Yes	Yes	Yes	Yes	Yes	No
4	Cedar River Park	Yes	Yes	Yes	Yes	Yes	No
5	Ron Regis Park	Yes	Yes	Yes	Yes	Yes	Yes
6	Gateway Park	Yes	Yes	Yes	Yes	Yes	No
7	Piazza Park	Yes	Yes	Yes	Yes	Yes	No
8	Veterans Memorial Park	Yes	Yes	Yes	Yes	Yes	No
9	Jones Park	Yes	Yes	Yes	Yes	Yes	No
10	Liberty Park	Yes	Yes	Yes	Yes	Yes	No
11	Windsor Hills Park	Yes	Yes	Yes	Yes	Yes	No
12	Gene Coulon Memorial Beach Park	Yes	Yes	Yes	Yes	Yes	Yes
13	Kennydale Elementary School Playground	Yes	Yes	Yes	Yes	Yes	No
14	May Creek Greenway	Yes	Yes	Yes	Yes	Yes	No
15	Little Rhody Park	Yes	Yes	Yes	Yes	Yes	No
16	Newcastle Beach Trail and Park	Yes	Yes	Yes	Yes	Yes	Yes
17	Coal Creek Natural Area	Yes	Yes	Yes	Yes	Yes	No
18	Mercer Slough Nature Park ^b	Yes	Yes	Yes	Yes	Yes	Yes ^b
Trails							
1	Duwamish Green River Trail	Yes	Yes	Yes	Yes	Yes	No
2	Interurban Trail	Yes	Yes	Yes	Yes	Yes	No
3	Springbrook Trail	Yes	Yes	Yes	Yes	Yes	No
4	Cedar River Trail	Yes	Yes	Yes	Yes	Yes	Yes ^c
5	Eastside Rail Corridor Regional Trail	Yes	Yes	Yes	Yes	Yes	No
6	May Creek Trail	Yes	Yes	Yes	Yes	Yes	No
7	Lake Washington Trail ^e	Yes	Yes	No	No	No	No

I-405, TUKWILA TO I-90 VICINITY EXPRESS TOLL LANES PROJECT (MP 0.0 TO 11.9)
ENVIRONMENTAL ASSESSMENT

Resource		Criteria for Section 4(f) Resources				Protected Resource	
		Publicly Owned	Open to the Public	Major Purpose is Park or Recreational Activities	Significant as a Park or Recreation Area	Section 4(f)	Section 6(f)
8	Mountain to Sound Greenway (I-90 Trail) ^e	Yes	Yes	No	No	No	No
Historic Resources							
1	Eastside Rail Corridor ^d	Resource eligible for listing in the National Register of Historic Places				Yes	No
2	Paukstis House, 11620 SE 45th Place	Residence eligible for listing in the National Register of Historic Places				Yes	No

^a While the Narco property has not been developed, the City of Renton has completed long-range master planning that integrates the property and future recreation facilities with Cedar River Park, Liberty Park, and the Cedar River Trail.

^b Section 6(f) applies to a portion of the Mercer Slough Nature Park. The City of Bellevue used the Mercer Slough Phase 1 LWCF grant in 1975 to acquire approximately 60 acres for a nature park. This park is now called Mercer Slough Nature Park. The Project would not affect the portion of the park purchased with Section 6(f) funds.

^c Section 6 (f) applies to a small segment of the Cedar River Trail, which is located beyond the study area.

^d A portion of the Eastside Rail Corridor Regional Trail would be constructed in the Eastside Rail Corridor railbed.

^e The Lake Washington Trail and the Mountain to Sound Greenway (I-90 trail) are pedestrian and bicycle paths that parallel the freeway. FHWA has determined them to be transportation facilities rather than recreational resources. Therefore, they are not Section 4(f) resources.

Exhibit 4.4-2. Parks, Recreational, and Historic Resources (Sheet 1 of 2)

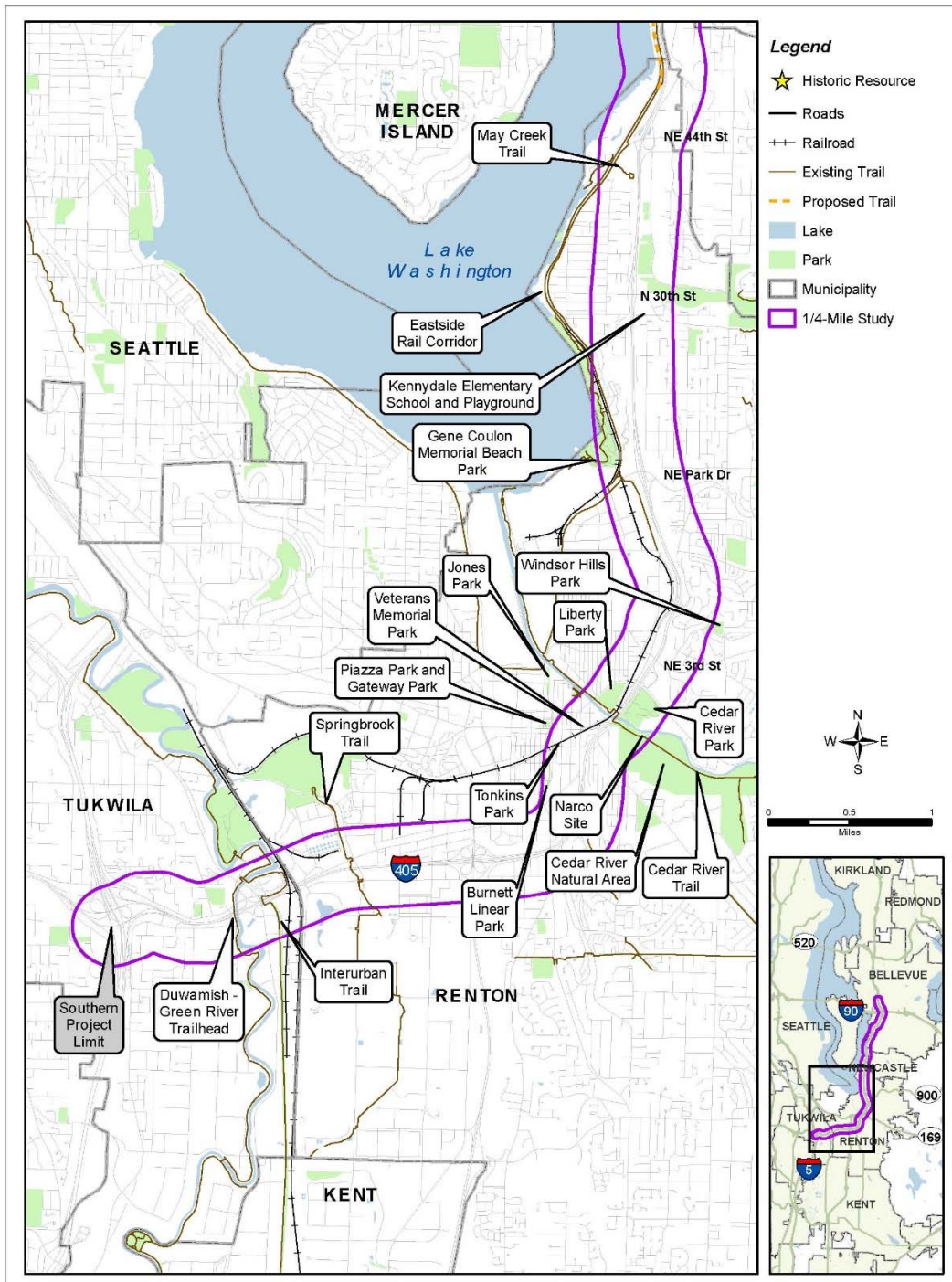
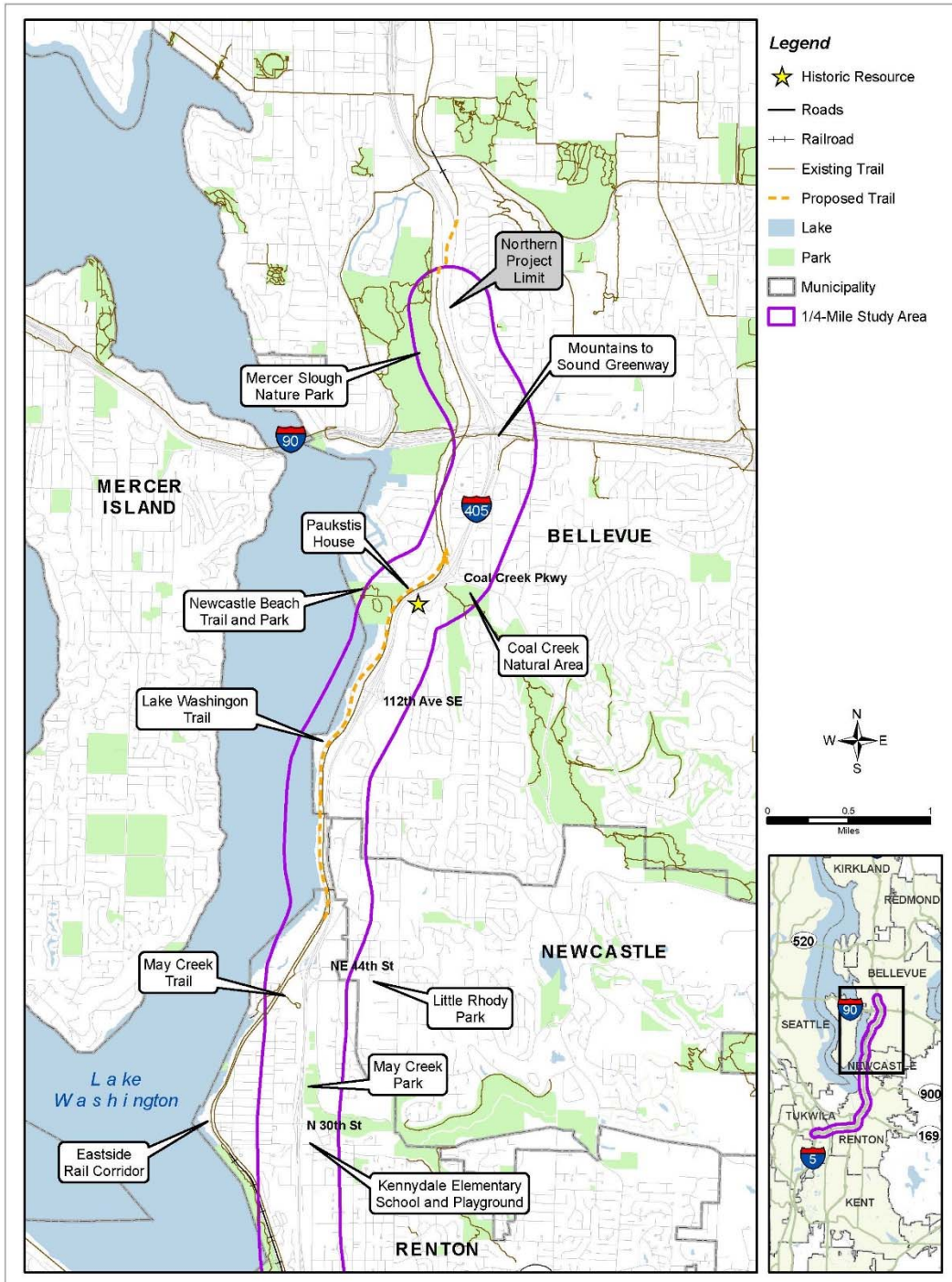


Exhibit 4.4-2. Parks, Recreational, and Historic Resources (Sheet 2 of 2)



What would happen if WSDOT does not build this Project?

Without the Project there would be no capacity improvements made and this section of I-405 would not have ETLs. Routine maintenance of I-405 in the study area would continue.

Ongoing maintenance activities include short-term minor construction necessary for continued operation of the existing I-405 facility and minor safety improvements, as required within the project limits. As a result, there would be no direct, proximity, and/or constructive uses at any of the recreational, Section 4(f) or Section 6(f) resources.

What are the expected long-term and short-term effects on recreational resources with the Project?

The summary text below describes the construction and operational effects on recreational resources if the Project were built and provides an assessment of the Project's use as defined in 23 CFR 774.17 on Section 4(f) resources, and determines whether a conversion would occur on any Section 6(f) properties. The assessment determined that two properties (May Creek Greenway and the Eastside Rail Corridor) would experience effects that meet the definition of use. However, it was determined that the use would not result in substantial impairment to the resources' activities, features, or attributes and would, therefore, be considered *de minimis* (not significant enough to merit further consideration). In addition, the Project would not result in the conversion of any Section 6(f) properties. The discussion below further supports these findings. Additional details about each resource is provided Attachment I, *Recreational, Section 4(f), and Section 6(f) Resources Technical Memorandum*.

As summarized in Exhibit 4.4-3, most of the parks are located at the edge of the study area and at a distance far enough from the I-405 corridor that the activities, features, or attributes of the recreational resources would not be affected by construction activities or operational effects of the Project. Those resources listed in Exhibit 4.4-3 that are adjacent to or within WSDOT right of way, however, would experience some minor effects. These effects are discussed in more detail below.

Exhibit 4.4-3. Effects on Recreational Resources and Section 4(f) Determinations

Recreational Resource		Distance from Project Footprint	Permanent Acquisition	Effects and Section 4(f) Determinations ^a
1	Burnett Linear Park	About 0.25 mile	None	None, no Section 4(f) use
2	Tonkins Park	About 0.25 mile	None	None, no Section 4(f) use
3	Narco Site and Cedar River Natural Area	Adjacent to WSDOT right of way	None	None, no Section 4(f) use
4	Cedar River Park	Adjacent to WSDOT right of way	None	Temporary traffic delays during construction to traffic using the secondary park entrance, no Section 4(f) constructive use
5	Ron Regis Park	2.5 mile	None	Stream buffer enhancements, meets the Section 4(f) exception specified in 23 CFR 774.13 (g)
6	Gateway Park	About 0.25 mile	None	None, no Section 4(f) use
7	Piazza Park	About 0.25 mile	None	None, no Section 4(f) use
8	Veterans Memorial Park	About 0.25 mile	None	None, no Section 4(f) use
9	Jones Park	About 0.25 mile	None	None, no Section 4(f) use
10	Liberty Park	Adjacent to WSDOT right of way	None	None, no Section 4(f) use
11	Windsor Hills Park	About 0.25 mile	None	None, no Section 4(f) use
12	Gene Coulon Memorial Beach Park	500 feet	None	Temporary traffic delays during construction to traffic entering the park, no Section 4(f) constructive use
13	Kennydale Elementary School Playground	Adjacent to WSDOT right of way	None	None
14	May Creek Greenway – Fawcett property	Adjacent to WSDOT right of way	1.03 acre	1.03-acre permanent acquisition – <i>de minimis</i> finding
	May Creek Greenway - Meadow property	Adjacent to WSDOT right of way	None	Temporary construction easement, Section 4(f) temporary occupancy
15	Little Rhody Park	1,000 feet	None	None, no Section 4(f) use
16	Newcastle Beach Trail and Park	Adjacent to WSDOT right of way	None	Temporary traffic delays during construction to traffic entering the park, no Section 4(f) constructive use
17	Coal Creek Natural Area	Adjacent to WSDOT right of way	None	None, no Section 4(f) use
18	Mercer Slough Nature Park	300 to 500 feet	None	Stormwater feature proposed in WSDOT right of way near the park, no Section 4(f) constructive use

Trails		Distance from Project Footprint	Permanent Acquisition	Effects
1	Duwamish Green River Trail	Crosses under I-405, is within WSDOT right of way	None	None, no Section 4(f) use
2	Interurban Trail	Crosses under I-405, is within WSDOT right of way	None	None, no Section 4(f) use
3	Springbrook Trail	Crosses under I-405, is within WSDOT right of way	None	None, no Section 4(f) use
4	Cedar River Trail	Crosses under I-405, is within WSDOT right of way	None	Temporary detours or delays and trail realignment within WSDOT right of way, meets the Section 4(f) exception specified in 23 CFR 774.13 (f)(3)
5	Eastside Rail Corridor Regional Trail/Eastside Rail Corridor	Adjacent to WSDOT right of way	None	Project improvements proposed, no Section 4(f) constructive use
6	May Creek Trail	Adjacent to and within WSDOT right of way	None	Construction would occur near the trail, but would not restrict trail use, no Section 4(f) constructive use
7	Lake Washington Trail	Within WSDOT right of way	None	Trail sections relocated to the Eastside Rail Corridor Regional Trail, this is not considered a Section 4(f) resource
8	Mountain to Sound Greenway (I-90 Trail)	Within WSDOT right of way	None	None, this is not considered a Section 4(f) resource
Historic Resource		Distance from Project Footprint	Permanent Acquisition	Effects
1	Eastside Rail Corridor	Adjacent to WSDOT right of way	None	Section 4(f) <i>de minimis</i> finding due to NHRP eligibility and finding of "no adverse effect" under Section 106
2	Paukstis House, 11620 SE 45th Place	Adjacent to WSDOT right of way	None	None, no Section 4(f) use

^a A constructive use occurs when the transportation project does not incorporate land from a Section 4(f) property, but the project's proximity in activities, features, or attributes that qualify the property for protection under Section 4(f) are substantially impaired.

As shown in Exhibit 4.4-3, the following park and recreational resources would be affected, a discussion for each of these resources is provided in the text that follows:

- Cedar River Park
- Ron Regis Park
- Gene Coulon Memorial Beach Park
- May Creek Greenway
- Newcastle Beach and Trail Park

- Mercer Slough Nature Park
- Cedar River Trail
- Eastside Rail Corridor Regional Trail/Eastside Rail Corridor
- May Creek Trail
- Lake Washington Trail

Cedar River Park

As shown in Exhibit 4.4-4, Cedar River Park has two entrances: a main entrance off of SR 169 and a secondary entrance off of Houser Way North.

Exhibit 4.4-4. Cedar River Park Entrances



Construction would occur in the vicinity of Cedar River Park's secondary entrance off of Houser Way North. Construction in this area would include widening the southbound I-405 structure over Cedar River Park Drive, which would involve constructing new piers and placing girders over the existing roadway both on the west and east sides of the Cedar River. Construction activities could result in interruptions or delays to traffic entering the park at this secondary entrance. The secondary park entrance would remain open and access would be managed by flaggers that would direct traffic

through the construction site. In addition, the main entrance off of SR 169 would remain open throughout construction. Temporary traffic delays during construction to traffic using the secondary park entrance would be minor and would not cause substantial impairment to the resource's activities, features, or attributes that qualify the property for protection under Section 4(f). Therefore, there would be no constructive use under Section 4(f).

Ron Regis Park

The Project would affect stream buffers, and WSDOT has identified an approximately 6,000 square foot area located within the Ron Regis Park where stream buffer mitigation is proposed (Exhibit 4.4-5).

Exhibit 4.4-5. Stream Buffer Enhancements at Ron Regis Park



WSDOT would not acquire any land from the Ron Regis Park nor would the Project convert the property to another use for the buffer enhancements. The proposed enhancements involve planting native vegetation along the Cedar River. These plantings would be consistent with the natural features of the Cedar River and this area of Ron Regis Park and would not be subject to the Section 6(f) conversion process. Because the enhancements are consistent with the use in this section of Ron Regis Park, they qualify as Section 4(f) exception under 23 CFR 774.13 (g).

The exception applies to transportation enhancement projects and mitigation activities where:

1. The use of the Section 4(f) property is solely for the purpose of preserving or enhancing an activity, feature, or attribute that qualifies the property for Section 4(f) protection, and
2. The official(s) with jurisdiction over the Section 4(f) resource agrees in writing to item 1 listed above.

WSDOT is coordinating the stream buffer enhancements with the City of Renton and will continue to work with the City to obtain approval for the enhancements in writing.

Gene Coulon Memorial Beach Park

The Project includes constructing an outfall to direct treated I-405 stormwater into Johns Creek. This conveyance pipe would not be located on park property but would require construction across Lake Washington Boulevard N near the park's access road. The construction method to cross the road would be determined in final design, but would not involve an open cut. The park entrance would remain open, and flaggers would direct traffic through the construction site. Traffic control hours on city streets will be coordinated with the City of Renton. Temporary traffic delays during construction to traffic entering the park would be minor and would not substantially impair protected activities, features, or attributes that qualify the park for protection under Section 4(f). Therefore, there would be no constructive use under Section 4(f).

May Creek Greenway

The Project would require a permanent acquisition from the Fawcett property and a temporary easement from the Meadow property, which are both part of the May Creek Greenway, a Section 4(f) resource.

Fawcett Property

WSDOT would acquire approximately 1.03 acres from the Fawcett property located along the eastside of I-405 near the NE 44th Street interchange to make room for the realignment of the northbound off-ramp. Located on the east side of I-405 at the southeast quadrant of the NE 44th Street interchange, the Fawcett property is one of many properties that make up the nearly 60-acre May Creek Greenway. The acquisition and

permanent incorporation of land from this property into a transportation facility would result in a Section 4(f) use. This effect is considered generally minor in nature and meets the criteria for a *de minimis* effect under Section 4(f).

A determination of a *de minimis* under Section 4(f) may be made when all three of the following criteria are satisfied:

- The transportation use of the Section 4(f) resource, together with any effect avoidance, minimization, and mitigation or enhancement measures incorporated into the project, does not adversely affect the activities, features, and attributes that qualify the resource for protection under Section 4(f).
- The public has been afforded an opportunity to review and comment on the effects of the project on the protected activities, features, and attributes of the Section 4(f) resource.
- The official(s) with jurisdiction over the property are informed of the U.S. Department of Transportation's intent to make the *de minimis* effect determination based on their written concurrence that the project would not adversely affect the activities, features, and attributes that qualify the property for protection under Section 4(f).

WSDOT and the City of Renton have concurred that with proposed mitigation, use of the Fawcett property would have a *de minimis* effect on this Section 4(f) resource. The City's concurrence as well as the interlocal agreement and letter of intent outlining mitigation are contained in Attachment I, Appendix B, and Attachment M, Agency and Tribal Correspondence. Mitigation is summarized in Chapter 6, Measures to Avoid or Minimize Effects. The public will be provided an opportunity to comment on this *de minimis* finding as part of the 30-day public review and comment period for this EA.

Meadow Property

The Project would also require a temporary easement on the Meadow property, located on the west side of I-405 at the May Creek Bridge. A 1,000-square-foot temporary construction easement would be needed to build temporary access to construct the southwest side of the new May Creek Bridge. This temporary construction easement would meet the Section

4(f) temporary occupancy exemption listed in 23 CFR 774.13(d) because the following conditions would be satisfied:

- The duration is temporary, i.e., less than the time needed for construction of the project, and there should be no change in ownership of the land.
- The scope of the work is minor, i.e., both the nature and the magnitude of the changes to the Section 4(f) property are minimal.
- There are no anticipated permanent adverse physical effects, nor would there be interference with the protected activities, features, or attributes of the property, on either a temporary or permanent basis.
- The land being used would be fully restored, i.e., the property must be returned to a condition which is at least as good as that which existed prior to the Project.
- There would be documented agreement of the official(s) with jurisdiction over the Section 4(f) resource regarding the above conditions.

WSDOT and the City of Renton have concurred that with proposed mitigation, the temporary construction easement needed on the Meadow property would meet the conditions listed above for temporary occupancy. The City's concurrence, as well as the interlocal agreement and letter of intent outlining mitigation, are contained in Attachment I, Appendix B, and Attachment M. Mitigation is summarized in Chapter 6, Measures to Avoid or Minimize Effects.

Newcastle Beach Trail and Park

Construction of the Eastside Rail Corridor Regional Trail would occur adjacent to Newcastle Beach Park property. Construction would occur approximately 600 feet from the nearest active use area within the park and about 1,000 feet from the Lake Washington beach. Vehicles access the park from the south via Lake Washington Boulevard SE.

Construction in the I-405/112th Avenue SE interchange area may cause temporary traffic delays during construction to traffic entering the park. Flaggers would maintain vehicle and non-motorized access through the work zones when lane closures are necessary on Lake Washington Boulevard SE between the 112th Avenue SE interchange and the park entrance. Temporary traffic delays during construction would

be minor and would not cause substantial impairment to the resource's activities, features, or attributes that qualify the property for protection under Section 4(f). Therefore, there would be no constructive use under Section 4(f).

Mercer Slough Nature Park

The Project would not permanently or temporarily require land from Mercer Slough Nature Park. However, a stormwater feature would be placed within WSDOT right of way adjacent to the northwest side of the I-90/I-405 interchange near the park. This area of right of way was once used as a maintenance facility but now is vacant and exists as a parking lot. Stormwater from this discharge would disperse south under I-90 on WSDOT property and then eventually into Mercer Slough, which is part of the Mercer Slough Nature Park.

The stormwater would be treated using enhanced treatment BMPs. All work near Mercer Slough Nature Park would be constructed in existing WSDOT and City of Bellevue right of way. Construction on I-405 would not affect Mercer Slough Nature Park.

Because the stormwater would be treated prior to discharge, the nature of the area and its function as a slough and wetland area would not change, nor would there be substantial impairment to the resource's activities, features, or attributes that qualify the property for protection under Section 4(f). Therefore, there would be no constructive use under Section 4(f).

Cedar River Trail

Construction would affect a portion of the Cedar River Trail within WSDOT right of way. Bridge construction would be isolated to the west side of I-405 and would include widening the southbound I-405 structure over the Cedar River and the Cedar River Trail. This widening would involve constructing new piers, widening both the north and south abutments, and placing new girders to support the new southbound lane on I-405 on the west side of existing southbound bridge carrying I-405 over the Cedar River.

Trail use would be provided during construction. At times, trail users may be detoured to a temporary trail that would be located near the existing trail within WSDOT's right of way or flaggers may manage trail traffic and trail users may

experience minor delays. In addition, approximately 150 to 200 feet of the Cedar River Trail on the south side of the Cedar River would be permanently realigned within WSDOT's right of way to make room for a new bridge pier. This realignment would only be in the proximity of the pier and would not affect the rest of the trail alignment. The existing trail is about 9 feet wide and that width would be maintained in the realigned trail. The affected areas are all located within WSDOT right of way and would be fully restored following construction.

The effects on the Cedar River Trail would meet the Section 4(f) exception found in 23 CFR 224.13 (f)(3) because construction would affect only a portion of the Cedar River Trail contained within WSDOT right of way and the continuity of the trail would be maintained.

Eastside Rail Corridor Regional Trail/Eastside Rail Corridor

The Eastside Rail Corridor that parallels I-405 is eligible for listing in the NRHP and is considered a Section 4(f) resource. WSDOT as part of the Project would construct for King County a section of the trail between the Ripley Lane N trestle (north of NE 44th Street) in Renton north to Coal Creek Parkway in Bellevue on the King County-owned Eastside Rail Corridor. This section of trail would be constructed to replace the existing sections of the Lake Washington Trail that would be relocated due to the Project. This document includes analysis of the portion of this trail being constructed by WSDOT. King County's preferred alignment of the trail was analyzed within the *Eastside Rail Corridor Regional Trail Final Master Plan and Environmental Impact Statement* (King County 2016b). King County completed its environmental analysis and documentation on the Eastside Rail Corridor Trail Project in July 2016.

A new drainage easement would be required for a stormwater pipe that would cross underneath the trail. Since the stormwater pipe would be located under the trail, it would not cause substantial impairment to the resource's activities, features, or attributes that qualify the property for protection under Section 4(f).

Construction of this trail segment would be completed and open for use before the segments of the Lake Washington Trail in WSDOT right of way are closed.

The Project would not permanently or temporarily require land from the Eastside Rail Corridor, nor would the proximity effects result in substantial impairment to the resource's activities, features, or attributes that qualify the property for protection under Section 4(f). However, the Eastside Rail Corridor that parallels I-405 is eligible for listing on the NRHP and, therefore, is considered a Section 4(f) resource. Per FHWA guidance, a Section 4(f) *de minimis* finding was made because the SHPO concurred that there was no adverse effect on historic resources. The Section 4(f) *de minimis* impact determination is contained in Attachment I, Appendix C and Attachment M, Agency and Tribal Correspondence. SHPO concurrence is contained in Attachment M.

May Creek Trail

The May Creek Trail is located on the west side of I-405 near the NE 44th Street southbound on-ramp and the new May Creek bridge. When completed, the on-ramp would be about 30 feet closer to the trail but would remain screened by vegetation. There would be no change to trail access. The above-described proximity impacts would not substantially impair the protected activities, features, or attributes that qualify the property for protection under Section 4(f); therefore, there would be no constructive use under Section 4(f).

Lake Washington Trail

The Lake Washington Trail segments within WSDOT right of way in the study area are primarily for transportation use and are not Section 4(f) resources (WSDOT and FHWA 2006). The trail is a component of a regional multi-use trail system that is presently only partially developed. The segments of the trail that would be affected by the Project are fully contained within the WSDOT right of way. According to 23 CFR 774.13 (f)(4), if a publicly owned facility is primarily used for transportation and it is an integral part of the local transportation system, then the requirements of Section 4(f) do not apply.

How would the Project affect Section 4(f) resources?

Exhibit 4.4-6 provides a summary of effects on Section 4(f) resources from the Project. Section 6, Measures to Avoid or Minimize Effects, identifies mitigation for effects on the May Creek Greenway and Cedar River Trail.

Exhibit 4.4-6. Effects on Section 4(f) Resources

Recreational Resource/Trails	Distance from Project Footprint	Section 4(f) Use
May Creek Greenway	Adjacent to WSDOT right of way	1.03-acre permanent acquisition at the Fawcett property - <i>de minimis</i> finding under Section 4(f) Temporary construction easement at the Meadow Property - temporary occupancy under Section 4(f)
Eastside Rail Corridor	Adjacent to WSDOT right of way	Construct a portion of the Eastside Rail Corridor Regional Trail within the NRHP eligible Eastside Rail Corridor Alignment - <i>de minimis</i> finding

How would the Project affect Section 6(f) resources?

The Project would not result in the conversion of any Section 6(f) properties; therefore, there would be no effects on Section 6(f) resources.

Would the Project have other effects on recreational resources that may be delayed or distant?

The Project is not expected to cause any effects on recreational, Section 4(f), or Section 6(f) resources that would be delayed or distant.

4.5 Visual Quality

This section provides a summary of Attachment F, *Visual Impact Assessment Discipline Report*, which evaluated effects of the Build and No Build Alternatives during construction and operation.

How did WSDOT evaluate visual quality?

WSDOT evaluated the Project’s effects on visual quality during construction and operation, using the methodology

described in FHWA's publication, *Guidelines for Visual Impact Assessment of Highway Projects* (FHWA 2015). This publication provides guidance that WSDOT follows to ensure that its projects comply with local, state, and federal laws and regulations pertaining to visual quality.

The study area for this analysis encompasses areas that can be seen from I-405 as well as areas from which I-405 can be seen. The study area also includes views to and from the Lake Washington Trail in areas where the existing trail would shift to the Eastside Rail Corridor. Viewer groups for this assessment include travelers on I-405 and viewers on properties adjacent to the highway, and trail users on the May Creek, Cedar River, and Lake Washington Loop trails. Ten viewpoints were evaluated and these viewpoints are discussed under the question "What are the expected long-term effects on visual quality with the Project?"

What are visual conditions like today?

WSDOT identified 15 landscape units in the study area. Each landscape unit is described in Attachment F, *Visual Impact Assessment Discipline Report*. This section provides an overview of the existing visual conditions in the study area.

The study area begins in a highly developed area just east of I-5. The sprawling commercial development of the Southcenter area lies south of I-405, while apartments and condominiums dot a wooded hillside to the north. East of SR 181, views from the highway become more open. Travelers have broad views of the sky and the industrial valley of the Green River through Renton. In this section of the study area, built elements prevail, though corridors of green remain where the Green River and the Cedar River weave through Renton and there are more distant views of the wooded hillsides around Lake Washington.

At SR 167, I-405 curves north to follow the east shore of Lake Washington at the base of a hill dotted with residential development. Views of the commercial and industrial development persist in the lower-lying areas to the east, while views to the west are blocked by noise walls, topography changes, and vegetation.

From SR 169 to the I-90/I-405 interchange, the I-405 runs north-south and is carved into the west-facing hillside of Lake

Washington. Views of I-405 from surrounding neighborhoods are limited by topography and most houses near I-405 do not have direct views of it. Where streams cross under I-405, the ravines are lushly vegetated and their treetops are visible from I-405 above.

Near the I-90 interchange, the topography flattens and the hillside east of the highway descends. High-voltage power lines cross I-405, and travelers have views of the Factoria Mall to the east and single-family homes to the west. The I-90 and I-405 interchange has a very open and visually cluttered character due to highway signage, lights, and several on- and off-ramps.

What would happen to visual quality if WSDOT does not build this Project?

Without the Project there would be no capacity improvements made and this section of I-405 would not have ETLs. The No Build Alternative would include short-term minor construction necessary for continued operation of existing I-405 facility and minor safety improvements. With the No Build Alternative, existing vegetation, views, and the pavement width on I-405 would remain unchanged.

What are the expected long-term effects on visual quality with the Project?

WSDOT evaluated ten viewpoints as part of the visual quality analysis as shown in Exhibit 4.5-1.

As part of the analysis, WSDOT considered possible effects on viewers with higher and lower sensitivity. Within the study area, viewers with higher sensitivity likely to view I-405 include:

- Persons using parks and trails
- Residents of single- and multi-family areas
- Teachers, children, and parents at schools and their associated playfields

Viewers likely to exhibit lower sensitivity include:

- Travelers along arterial streets and highways that traverse the Project area.

- Employees and visitors in office and hotel centers in the urban cores of each city.
- Employees and visitors in commercial, distribution, transportation, and industrial businesses.

Exhibit 4.5-1. Viewpoints Analyzed for I-405, Tukwila to I-90 Vicinity Express Toll Lanes Project



The Project would result in long-term visual impacts with varying levels of impact, based on the sensitivity of different viewer groups.

For pedestrians and cyclists on the Lake Washington Loop Trail, the Project would have a beneficial impact on visual quality by relocating the trail to the Eastside Rail Corridor, thus, limiting exposure to and awareness of highway traffic, lights, and glare on I-405. In addition, the Project would construct a new trail under I-405 and restore May Creek to a meandering channel with native vegetation on either side of the new I-405 bridge overhead. Visual quality changes for trail users are discussed further in the representative viewpoint analysis section below.

For neighbors adjacent to the highway, the Project would have few impacts. The Project proposes minimal clearing of vegetation between the highway and the right of way line. In locations where vegetation would be cleared and not replanted, neighbors are generally screened from the highway through a combination of topography, noise walls, and remaining vegetation; therefore, these changes would not be visible. In a few locations, such as north of NE 44th Street where Wall East 10A would be constructed, the Project would clear the last remaining vegetation that shields neighbors from the freeway. To mitigate for the loss of screening, the Project would construct a concrete panel wall to restore privacy and screen homes from the light and glare of highway traffic.

For the most part, the Project would result in little to no visual effect for travelers. At several interchange areas along I-405, the Project would create adverse impacts on visual quality by eroding the natural character of the corridor and shifting it to a more urban condition. Vegetation would be cleared for construction. Tolling gantries, new light poles, and signs would add complexity, light, and glare to the corridor. The Project would construct retaining walls, ramps, and inline transit stations and widen pavement to accommodate the additional lanes.

The Project would replace bridges at Cedar Avenue and Renton Avenue with longer span structures and widen the southbound bridge at Cedar River. The bridge at May Creek would also be widened and changed to a single-span structure. New bridges will follow the *I-405 Urban Design*

What is the purpose of the *I-405 Urban Design criteria*?

The *I-405 Urban Design Criteria* (WSDOT 2016a) serve as the primary standard design guidelines necessary to produce an attractive and unified highway system that will enhance corridor continuity and help guide traffic safely through the I-405 corridor. The document provides specific technical guidelines and criteria, as well as standard solutions for typical situations as derived from the CSS process. The design criteria are necessary to produce an intended aesthetic form, function, and appearance of the corridor for each highway feature and element to provide predictability and coherence in the visual environment throughout the I-405 corridor project.

Criteria (WSDOT 2016a), which will have a beneficial impact on project coherence. Where bridge spans are lengthened, vegetation clearing will be minimal and changes less noticeable to the public. Where bridges are widened, vegetation clearing will be more extensive and shading would increase, both of which would have an adverse visual impact in areas where natural harmony is high.

For viewpoints where the visual effects of the Project are greater, we developed sketches that simulate the views after construction. It is important to note that the simulations in the viewpoint analysis section below are based on current designs, which may change during construction. As discussed in Section 2, this project is being constructed using a Design-Build approach in which contractors have the flexibility to propose alternatives that may result in changes to the visual effects described in this report. If the contractor proposes modifications not covered by this report, additional review of visual impacts would be conducted as needed. A discussion of view impacts at the ten different viewpoints is provided below.

View A – I-405 bridges over Cedar and Renton Avenues (from I-405)

View A is shown in Exhibits 4.5-2 and 4.5-3. The Project would rebuild the bridges over Cedar and Renton Avenues and lengthen their spans by about 20 feet to the west to make room for two additional lanes (one in each direction) on I-405. The rebuilt bridges would include the aesthetic treatments in the *I-405 Urban Design Criteria*. The new bridges would include sidewalks and pedestrian lights on the north sides. These changes would increase the level of project coherence and cultural order for this viewpoint, resulting in an overall beneficial impact on visual quality.

Exhibit 4.5-2. View A, South of Cedar and Renton Avenue Bridges over I-405, Existing Conditions



View looking north from the northbound lanes of I-405 just south of the Cedar and Renton Avenue bridges that cross over I-405

Exhibit 4.5-3. View A, Cedar and Renton Avenue Bridges over I-405 with the Project



View looking north from the northbound lanes of I-405 just south of the Cedar and Renton Avenue bridges that cross over I-405

View B – Southbound I-405 bridge over Cedar River (from Cedar River Trail)

View B is shown in Exhibits 4.5-4 and 4.5-5. With the Project, the southbound bridge would be widened by about 15 feet to accommodate new lanes. The wider bridge carrying southbound I-405 would bring the highway about 15 feet closer to the viewer and increase the shadowing and size of the structure over the trail and roadway below. The new bridge would include the aesthetic treatments shown in the *I-405 Urban Design Criteria*. The aesthetic treatments on the bridge would have a beneficial impact on coherence that would offset the adverse impacts of increased shading due to bridge widening. Similar to existing conditions, the trail and roadway under the bridge would be illuminated at night with underdeck lighting.

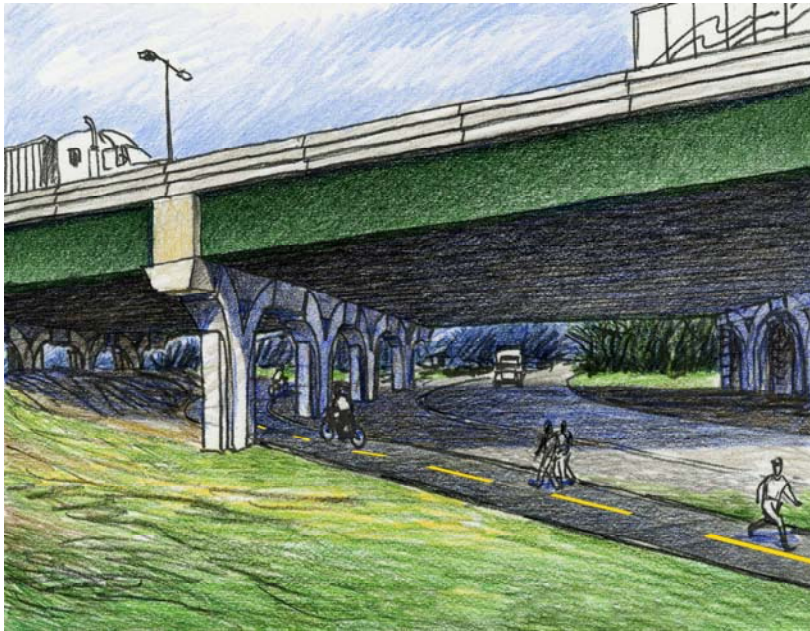
While recreational users typically have higher sensitivity to visual changes, trail users in this location are already exposed to views of I-405 and commercial development to the west. These viewers are presumed to have relatively moderate to low sensitivity to the changes proposed by the Project. Overall, the Project would have a neutral impact on visual quality at this viewpoint.

Exhibit 4.5-4. View B, I-405 Bridge at Cedar River Existing Conditions



View looking east toward I-405 from the Cedar River Park where the Cedar River Trail and S 3rd Street pass under I-405

Exhibit 4.5-5. View B, I-405 Bridge Widening at Cedar River with the Project



View looking east toward I-405 from the Cedar River Park where the Cedar River Trail and S 3rd Street pass under I-405

View C – Southbound I-405 Bridge over May Creek (from May Creek Trail)

View C is shown in Exhibits 4.5-6 and 4.5-7. The Project would construct both a longer and wider bridge to make room for the two additional ETLs on I-405. The existing bridge columns would be removed, and the bridge would be replaced with a single-span structure. While the wider bridge would increase shading over the trail and creek, the increased span of the bridge and the single-span design would allow for more expansive views under the bridge of the natural vegetation on either side of I-405. The Project would restore the stream channel giving it a more natural, meandering alignment, replacing existing rip rap with rounded rock, and restoring the stream bank with native vegetation at the edges of the bridge. The informal footpath under I-405 would be replaced with a recreational trail. The bridge would include the aesthetic treatments shown in the *I-405 Urban Design Criteria*.

The changes would increase natural harmony, cultural order, and coherence at this viewpoint. The changes would result in a more vivid landscape composition and have a beneficial impact on visual quality at View C.

Exhibit 4.5-6. View C, I-405 Bridge at May Creek Existing Conditions



View looking east underneath I-405 from the existing May Creek Trail

Exhibit 4.5-7. View C, I-405 Bridge Widening at May Creek with the Project



View looking east underneath I-405 from the existing May Creek Trail

View D – Sound Transit Park-n-Ride (from May Creek Trail)

View D is shown in Exhibits 4.5-8 and 4.5-9. The Project would demolish the existing industrial structures at this location and would grade the industrial site to prepare it for construction of a 200-stall park-and-ride lot shown. The existing vegetation would remain intact between the May Creek Trail and the chain-link fence around the industrial property. The Project would install a compost-amended biofiltration swale (maintained as a mowed lawn) at the south end of the parking lot, just beyond the chain-link fence, to treat stormwater running off the graded site. The actual design of the parking lot would be determined by others and would likely include landscape buffers and sidewalks to supplement the parking lot shown in the Exhibit 4.5-9.

The proposed park-and-ride would not substantially alter the natural harmony of this view, and it would be more compatible with surrounding suburban land uses, having a beneficial impact on cultural order. In the future, the Project could have a beneficial impact on visual quality, depending upon how the parking lot is designed. In the short term, demolishing the industrial buildings would have a neutral effect on visual quality.

Exhibit 4.5-8. View D, At-Grade Park-and-Ride Existing Conditions



View looking north from the May Creek Trail

Exhibit 4.5-9. View D, At-Grade Park-and-Ride with the Project



View looking north from the May Creek Trail

View E – NE 44th Street interchange (from and toward I-405)

View E is shown in Exhibits 4.5-10 and 4.5-11. The Project would reconstruct the NE 44th Street interchange by widening I-405 by two lanes and adding direct-access ramps and inline transit stations (one in each direction) in the median. The Project would replace the NE 44th Street bridge with a longer, wider bridge, relocate Lake Washington Boulevard along the east side of I-405, reconstruct the on- and off-ramps, and relocate the northbound off-ramp. The Project would clear trees east of I-405 to make way for the reconstructed off-ramp to Lake Washington Boulevard. For highway elements being built by WSDOT, the Project would incorporate the aesthetic treatments described in the *I-405 Urban Design Criteria*. For Project elements associated with the inline transit stations that WSDOT is developing jointly with Sound Transit, Sound Transit and WSDOT will work together to meet the intent of the *I-405 Urban Design Criteria*. In addition, fixtures with hoods would be used for station lighting to minimize light pollution.

While trees and native vegetation would be installed in between the mainline and the off-ramp, the overall effect of

the Project would increase the expansiveness of the built structures and this area would have a more urban character.

The addition of two lanes to the mainline and direct-access ramps proposed as part of this Project as well as inline transit stations described in Exhibit 3-1 would add visual complexity for travelers and new sources of light and glare. While the use of the aesthetic treatments described in the *I-405 Urban Design Criteria* would have a beneficial impact on project coherence, the overall shift in character from natural to more urban would be incompatible with the surrounding visual character. For this reason, the Project would have an adverse impact on visual quality at this viewpoint.

Exhibit 4.5-10. View E, NE 44th Street Interchange Existing Conditions



View looking north from northbound I-405 toward the NE 44th Street interchange

Exhibit 4.5-11. View E, NE 44th Street Interchange with the Project



View looking north from northbound I-405 toward the NE 44th Street interchange

View F – Lake Washington Trail north of Ripley Lane

Exhibit 4.5-12 shows View F, the Lake Washington Trail and Exhibits 4.5-13 and 4.5-14 show the Eastside Rail Corridor. The Project includes relocating a portion of the existing Lake Washington Trail to an abandoned railway corridor (the Eastside Rail Corridor) west of I-405. The new trail would be 12 feet wide, with a 2-foot-wide gravel shoulder on the west side and a 6-foot-wide gravel shoulder on the east side.

The new trail would be flanked by the natural vegetation alongside the Eastside Rail Corridor and offer occasional views through the trees of Lake Washington and the homes along the lakeshore, thus increasing the degree of natural harmony and sense of cultural order for viewers at this viewpoint. In addition, the relocated trail would be approximately 20 feet lower in elevation than the highway, so the light and glare trail users experience today would be blocked by both the change in elevation and the vegetation between the old railroad bed and I-405. The simplicity and consistency of the trail section, especially when compared to the existing trail conditions, would offer an improved project coherence for trail users. For bicyclists and pedestrians, the visual experience of traveling on the relocated trail would be improved and would benefit trail users.

Exhibit 4.5-12. Lake Washington Trail Existing Conditions



View of the Lake Washington Trail looking north near Ripley Lane

Exhibit 4.5-13. Eastside Rail Corridor Existing Conditions



View of the Eastside Rail Corridor looking north near Ripley Lane

Exhibit 4.5-14. Eastside Rail Corridor with the Project



View of the Eastside Rail Corridor looking north near Ripley Lane

Views G and H – 112th Avenue SE interchange

View G is shown in Exhibits 4.5-15 and 4.5-16 and View H is shown in Exhibits 4.5-17 and 4.5-18. At 112th Avenue SE, the Project would reconfigure and lengthen the footprint of the existing Newport Hills Park-and-Ride and widen the 112th Avenue SE overpass to make room for two additional ETLs on I-405. The Project would also add direct-access ramps and inline transit stations as described in Exhibit 3-1 to support bus rapid transit in the I-405 median.

As shown in Exhibit 4.5-16, at View G, the Project would shift the southbound lanes to the east, where the grass median is today. While the grass slope would remain between the mainline and the southbound on-ramp (as shown on the right side of Exhibit 4.5-16), the grassed median would be replaced by the additional southbound lane and direct-access ramps with inline transit stations. The retaining walls supporting the direct-access ramps and the northbound off-ramp would be visible from View G, while the northbound mainline would be hidden from view behind the direct-access ramps. The inline transit stations are not visible in this view; however, they would be similar to the transit station shown at NE 44th Street in Exhibit 4.5-11. The inline transit stations would add new sources of light and glare, though impacts would be minimized by using fixtures with hoods.

The retaining walls, ramps, and bridge will use the aesthetic treatments described in the *I-405 Urban Design Criteria*. For the transit stations, WSDOT and Sound Transit will work together to meet the intent of the *I-405 Urban Design Criteria*.

Overall, the changes at viewpoint G would have an adverse impact on natural harmony, and a neutral impact on coherence.

Exhibit 4.5-15. View G, 112th Avenue SE Interchange Existing Conditions



View looking south at 112th Avenue SE

Exhibit 4.5-16. View G, 112th Avenue SE Interchange with the Project



View of the Eastside Rail Corridor looking south at 112th Avenue SE

As shown in Exhibits 4.5-17 and 4.5-18, the impacts of the Project on visual quality at View H would be similar to the impacts described for View G. The southbound lanes would shift east and be farther away from the viewer, while the retaining walls that support the direct-access ramps would block views of the northbound lanes. The park-and-ride lot would be more noticeable, especially on the left side of the view where trees would be cleared to make way for the longer park-and-ride footprint. These changes would have an adverse impact on natural harmony and a neutral impact on project

coherence.

Exhibit 4.5-17. View H, 112th Avenue SE Interchange Existing Conditions



View looking northeast across I-405 near the Newport Hills Park-and-Ride lot at 112th Avenue SE

Exhibit 4.5-18. View H, 112th Avenue SE Interchange with the Project



View of the Eastside Rail Corridor looking northeast across I-405 near the Newport Hills Park-and-Ride lot at 112th Avenue SE

Views I and J – Coal Creek Parkway

View I is shown in Exhibits 4.5-19 to 4.5-20, and View J is shown in Exhibits 4.5-21 and 4.5-22. The Project would build a new bridge carrying I-405 southbound lanes over Coal Creek Parkway. The Lake Washington Trail, which is currently adjacent to the highway, would be relocated to the west onto the Eastside Rail Corridor. In addition, the Project would replace existing signalized intersections on Coal Creek Parkway with four roundabouts.

At View I, the Project would clear mature trees, construct a wider bridge over Coal Creek Parkway, and clear vegetation to construct a mowed grass bioswale in the southwest quadrant of the intersection as shown in Exhibit 4.5-20. The new bridge carrying the southbound lanes would be approximately 70 feet wide and include the aesthetic treatments shown in the *I-405 Urban Design Criteria*. The new bridge would bring the highway much closer to the viewer than it is today.

Exhibit 4.5-19. View I, Coal Creek Parkway Existing Conditions



View looking east toward I-405 from Coal Creek Parkway

Exhibit 4.5-20. View I, Coal Creek Parkway with the Project



View looking east toward I-405 from Coal Creek Parkway

At View J, the existing northbound I-405 bridge would remain and the Project would construct roundabouts, retaining walls, and a transit island between the northbound on-ramp to I-405 and the westbound through-lanes on Coal Creek Parkway.

Exhibit 4.5-21. View J, Coal Creek Parkway Existing Conditions.



View looking west toward I-405 from Coal Creek Parkway

Exhibit 4.5-22. View J, Coal Creek Parkway with the Project



View looking west toward I-405 from Coal Creek Parkway

For both views, the Project would clear much of the vegetation that exists today and realign the ramps and roadways to fit into the new roundabout configuration. The new roundabouts

would increase the expansiveness of pavement at both viewpoints.

The Project would have an adverse impact on natural harmony at Views I and J. The expansiveness of the pavement and clearing of vegetation are incompatible with the existing greenbelt character seen at these viewpoints and would permanently shift the visual character from natural to semi-urban, especially if areas where low vegetation is possible are paved in stamped, colored concrete rather than planted.

WSDOT will mitigate for these adverse impacts by including the landscaped terraces and other aesthetic treatments described in the *I-405 Urban Design Criteria*. At View I, landscape terraces would be installed only on the south side of Coal Creek Parkway, since there is not enough room between the highway and the southbound off-ramp to install landscape terraces on the north side of Coal Creek Parkway. This area north of Coal Creek Parkway would include only vines and shrubs.

Where possible, the Project would install plants in the roundabout islands. The plant selection would allow for unobstructed sight lines and be compatible with the plant palette described for community enhancement planting in the *I-405 Urban Design Criteria*. Mowed grass or low-growing plants may be used in areas where only low vegetation is possible, provided there is a maintenance agreement with the City of Bellevue or a local community to keep it maintained. If such an agreement is not reached, the Project would install landscape rock with mortar-set river cobble instead.

The Project would remove the traffic poles and signals currently cluttering the intersections at both viewpoints. Pedestrian lights would be added along all new sidewalks, and the existing street lights would be replaced with lights shown in the *I-405 Urban Design Criteria*. The sidewalks themselves would have the paving pattern shown in the *I-405 Urban Design Criteria*. These changes would have a beneficial impact on project coherence and cultural order at both viewpoints.

The roundabouts would have an adverse impact on natural harmony at these two viewpoints, and a beneficial impact on project coherence. The changes proposed are compatible with the suburban neighborhoods nearby, which would have a

beneficial impact on cultural order. Overall, the Project would have an adverse impact on visual quality at Views I and J due to the permanent loss of vegetation, expansiveness of pavement, and change in visual character from natural to semi-urban.

WSDOT would mitigate for these impacts by adhering to the *I-405 Urban Design Criteria* for walls, lighting, and landscaping and by developing aesthetic criteria for roundabouts that are compatible with these community enhancement treatments. WSDOT may also mitigate for these impacts by pursuing a maintenance agreement that will allow planting in the splitter islands and “teardrop” center islands.

What are the expected short-term effects on visual quality with the Project?

The visual effects of construction are not anticipated to change most views for neighbors, since the majority of screening vegetation along the right of way would be preserved. However, during construction, highway views would become cluttered by construction activities, construction equipment, stored materials, and general disruption of normal landscapes with fencing, equipment, vehicles, additional lighting, signage, and activity. These temporary effects would persist in some locations for up to 3 years.

Although WSDOT would clear vegetation in select locations for construction access, visual impacts would be minimal. In most cases, except where vegetation is cleared to add new ETLs or structures, WSDOT would restore areas cleared for access with native vegetation to minimize visual impact. Temporary lighting could be employed for nighttime construction of some project elements.

Generally, residential areas east of I-405 are screened from I-405 by a combination of topography and vegetation. However, removal of vegetation for the Project could expose businesses and homes along the right of way to views of or from the facility. Viewers in homes closest to the right of way are more likely to be exposed or to notice visual changes than are viewers in homes set farther back from the right of way. Many residential areas east of I-405 are only partially screened by vegetation and topography; therefore, removal of vegetation west of the facility could expose many of these

viewers to the highway or reveal views of Lake Washington and Mercer Island to the west.

Would the Project have other effects on visual quality that may be delayed or distant?

With the expansion of the May Creek Trail under I-405 and the relocation of the Lake Washington Loop Trail to the Eastside Rail Corridor, people would be more likely to travel on foot or by bike within their neighborhoods or to commute to urban centers for work, shopping, or recreation. Viewers in homes near these trails are likely to see the movement of these travelers on a more frequent basis as these modes of travel increase.

4.6 Water Resources

This section provides a summary of Attachment G, *Water Resources Discipline Report*, which evaluated effects of the Build and No Build Alternatives during construction and operation.

How did WSDOT evaluate water resources?

The construction footprint for the Project was used to determine the study area for water resources, which is defined as the area affected by proposed improvements to I-405 from I-5 in Tukwila to about a mile north of I-90 in Bellevue. The study area includes existing and proposed new WSDOT right of way. Along streams and rivers, the study area extends 300 feet upstream and 1,320 feet (one-quarter mile) downstream to assess effects on those waterbodies.

The methods described in the WSDOT *Environmental Manual* (WSDOT 2017c) were used to evaluate the Project's effects on surface water flows and water quality, floodplains, and groundwater during construction and operation as discussed below.

Surface Water

WSDOT evaluated surface water resources within the study area by comparing the proposed Project drainage designs to existing conditions to determine the change in impervious area. The increase in impervious area was used to determine new runoff volumes as directed by the WSDOT *Highway Runoff Manual* (WSDOT 2016b). We used the runoff volumes to

verify the number and size of stormwater treatment facilities needed to protect receiving waters.

We followed guidelines within the WSDOT *Temporary Erosion and Sediment Control Manual* (WSDOT 2014) to select appropriate BMPs to treat stormwater runoff from the Project. We calculated annual pollutant loads using the Highway Runoff Dilution and Loading (HiRUN) model to assess the probability of effects on receiving waterbodies from pollutant loading concentrations in accordance with WSDOT's *Environmental Manual*.

Floodplains

We compared existing conditions to the Project footprint to determine if construction activities would affect floodplain areas. We used floodplain elevation maps to identify the volumes of cut or fill proposed in floodplain areas. If, for a floodplain area, more material would be removed than placed as fill, then WSDOT determined that the Project would not negatively affect floodplain storage capacities.

Groundwater and Aquifers

We reviewed the Project design and likely construction methods to evaluate the Project's potential effects on groundwater and the aquifer protection areas (APAs) located within the Project footprint.

What are conditions like for water resources today?

Surface Water

The study area includes water resources from Water Resource Inventory Areas (WRIA) 8 – Lake Washington/Cedar/Sammamish Watershed, and WRIA 9 – Green/Duwamish and Central Puget Sound Watershed. Surface waterbodies in the study area that would be affected by this Project include Gilliam Creek, the Cedar River, Johns Creek, three unnamed tributaries (UNT) to Lake Washington near the NE 44th Street interchange, Coal Creek, Mercer Slough, Richards Creek, and Lake Washington. Other waterbodies from these WRIs within the project limits would not be affected by the Project and, therefore, are not discussed. Attachment P, *Wetland and Water Resources Maps*, shows the location of various streams and waterbodies in the study area.

What are best management practices?

Best management practices (BMPs) are generally accepted techniques that, when used alone or in combination, prevent or reduce adverse effects of a project. Examples include erosion control measures and construction management to minimize traffic disruption.

According to the Water Quality Atlas (Ecology 2018), an online interactive map, the following waterbodies in the study area that would be affected by the Project do not meet state water quality standards:

- Cedar River – dissolved oxygen, pH, temperature
- Johns Creek – dissolved oxygen, fecal coliform, temperature
- May Creek – fecal coliform, temperature
- Coal Creek – dissolved oxygen
- Mercer Slough – fecal coliform, temperature

Floodplains, Groundwater, and Aquifers

Existing floodplains in the study area that would be affected by this Project are associated with the Cedar River, May Creek, Coal Creek, and the Mercer Slough.

The most important aquifer in the study area exists along the Cedar River and is known as the Cedar Valley Aquifer. This aquifer is a designated sole source aquifer by the EPA and supplies 80 percent of the drinking water used in its service area (EPA 1988). Attachment G, *Water Resources Discipline Report*, provides additional information about existing conditions in the study area.

What would happen to water resources if WSDOT does not build this Project?

Without the Project there would be no capacity improvements made and this section of I-405 would not have ETLs. With the No Build Alternative, conditions would not change from the status quo. The stormwater improvements proposed as a part of the Project would not be implemented, and those benefits would not be realized. Untreated stormwater runoff from I-405 would continue to discharge to receiving surface waters.

What are the expected long-term effects on water resources with the Project?

Surface Water

The Build Alternative would provide flow control and water quality treatment for new impervious areas that would be added. The Project would also retrofit existing

What are threshold discharge areas?

A *threshold discharge area (TDA)* is an area that drains to a natural or constructed discharge location(s) that combine within one-quarter mile downstream—as determined by the shortest flow path. A TDA delineation begins at the first discharge location that exits WSDOT right of way and is based on pre-project conditions.

The limits of a TDA would generally encompass the project footprint, including existing and proposed right of way. The limits of a TDA should be large enough to include all development by the Project.

untreated impervious surface areas with treatment, which would be an improvement over existing conditions or No Build. The Build Alternative is not expected to negatively affect water quality in the waterbodies where state water quality standards are not being met.

Exhibit 4.6-1 compares existing stormwater treatment to the proposed stormwater treatment with the Build Alternative. As shown in Exhibit 4.6-1, the Project would add 46.92 acres to the existing 218.74 acres of pollutant generating impervious surfaces (PGIS) in the study area. Currently about 9.8 percent (21.27 acres) of stormwater runoff is treated in the study area. With the Build Alternative, this would increase to 67.4 percent (179.69 acres). The Build Alternative would treat an additional 51 percent (111.50 acres) of the existing PGIS that is not currently being treated. Peak flow rates of stormwater discharged to streams and rivers would be reduced from present-day conditions because of this retrofit.

Exhibit 4.6-1. Stormwater Design with the Project

Subwatershed	Receiving Waterbody	TDA	Existing I-405 PGIS in TDA (acres)	Existing I-405 Treatment (acres)	Build Alternative Proposed PGIS in TDA (acres)	Build Alternative Proposed Treated PGIS (acres)
Lower Green River – West	Gilliam Creek	G1	17.78	1.11	17.80	1.19
Cedar River	Cedar River	C1	20.38	2.29	21.66	12.08
		C2	9.96	0.00	10.27	9.50
East Lake Washington – Renton	Johns Creek	J0	0.85	0.00	0.87	0.00
		J1	4.84	0.00	1.90 ^a	0.00
		J2	5.44	0.00	31.90	31.90
		J3	5.73	0.00	0.00 ^a	0.00
		J4	10.81	0.00	0.00 ^a	0.00
		W1-1 Private Drain to Lake Washington	3.07	0.00	0.48 ^a	0.00
East Lake Washington – Bellevue South	UNT 08.LW.0283	CL1 Clover Creek	2.84	0.00	0.00 ^b	0.00
		M1 May Creek at I-405	12.79	0.00	0.00 ^b	0.00
		M2 May Creek at Lake Washington Blvd	8.70	3.41	6.58	5.60
		W1-2 UNT 08.LW.0283	11.34	0.00	60.37	58.50
		W1-3 Private Drain to Lake Washington	1.62	0.00	0.00 ^c	0.00
		W1-4 Private Drain to Lake Washington	1.71	0.00	0.00 ^c	0.00
		W1-5 Private Drain to Lake Washington	2.86	0.00	0.00 ^c	0.00
		W1-6 Private Drain to Lake Washington	1.48	0.00	0.00 ^c	0.00

Exhibit 4.6-1. Stormwater Design with the Project

Subwatershed	Receiving Waterbody	TDA	Existing I-405 PGIS in TDA (acres)	Existing I-405 Treatment (acres)	Build Alternative Proposed PGIS in TDA (acres)	Build Alternative Proposed Treated PGIS (acres)
	Lake Washington	W2-1 – Pleasure Point	4.66	0.00	4.15 ^d	4.15
		W2-2 – Lakehurst Creek	9.57	1.22	8.60 ^d	8.60
		W2-3 – Bagley Lane	1.91	0.00	10.27	10.27
Coal Creek	Coal Creek	W3-1 Newcastle Beach Park	2.15	0.00	1.61 ^e	1.61
		W3-2 – Coal Creek Parkway	16.99	3.34	8.20 ^e	4.75
Mercer Slough	Mercer Slough Wetlands	W4 – I-90 Vicinity	37.67	5.43	56.66	24.54
		W5	8.80	4.47	9.51	7.00
	Richards Creek	R1	1.08	0.00	1.08	0.00
		R2	13.72	0.00	13.72 ^f	0.00
Total Acreage			218.75	21.27	265.66	179.69

PGIS = pollutant discharge area; TDA = threshold discharge area; UNT = unnamed tributary

^a WSDOT highway runoff would be diverted to J2 for runoff treatment.

^b All highway runoff flows would be diverted from Clover Creek and May Creek TDAs into TDA W1-2.

^c WSDOT highway runoff would be diverted to W1-2 for runoff treatment.

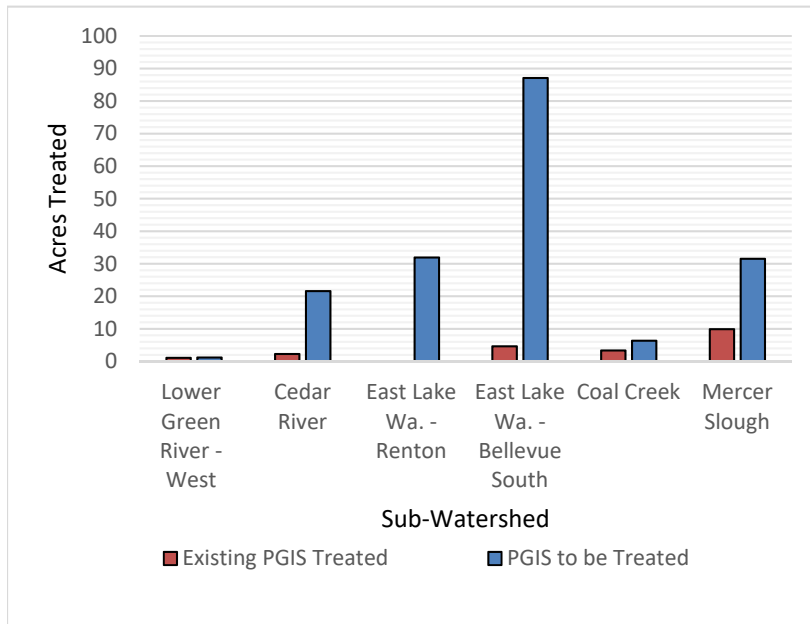
^d Area equal to new PGIS diverted from Pleasure Point and Lakehurst Creek TDAs (W2-1 and W2-2) into the TDA W2-3 (Bagley Lane direct discharge to Lake Washington).

^e Area greater than new PGIS diverted from Newcastle Beach Park and Coal Creek TDAs into the TDA W4 (I-90 vicinity discharges).

^f Area equal to new PGIS diverted from Richards Creek TDA (R) into the TDA W4. No new discharge to Richards Creek.

Highway runoff contains several pollutants of concern: nutrients such as nitrogen and phosphorous, which generally bond to dirt particles; heavy metals such as copper and zinc; and petroleum hydrocarbons. These contaminants accumulate on the road surface and are eventually washed away by rainfall. Exhibit 4.6-2 summarizes the change in treatment that would occur in various watersheds with the Project.

Exhibit 4.6-2. Comparison of Runoff Treatment



Our analysis shows that the Build Alternative would reduce stormwater pollutant loading for most pollutants compared to existing conditions. There would be a minor (4 percent) increase in dissolved copper, but total copper would decrease by 36 percent. The reason for the increase in dissolved copper may be because not all of I-405 would be retrofitted with stormwater treatment as part of the Build Alternative. Exhibits 4.6-3 and 4.6-4 show the change in total pollutant loading with the proposed Build Alternative as compared to the No Build for the five key pollutants assessed.

Exhibit 4.6-3. Total Suspended Solids

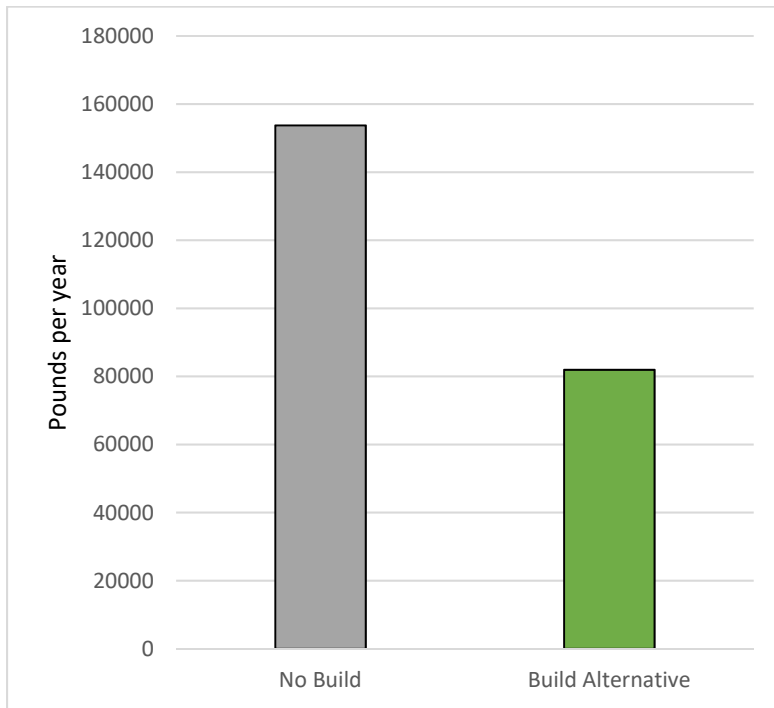
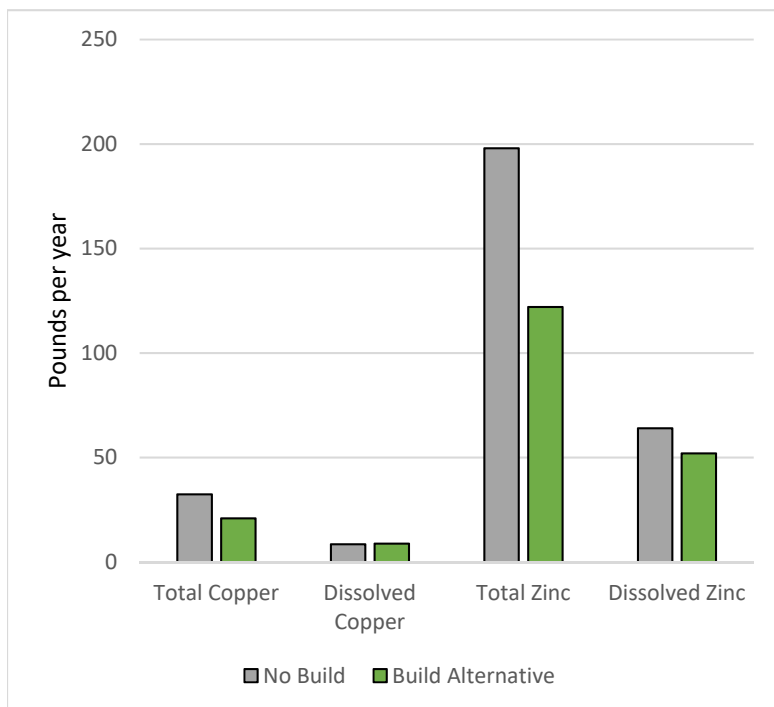


Exhibit 4.6-4. Total Copper and Zinc, and Dissolved Copper and Zinc



The assessment method used assumed average removal for all BMPs. However, the Project proposes to implement only enhanced treatment BMPs, which would increase contaminant removal compared with traditional BMPs. The use of enhanced treatment BMPs would likely address the increase of dissolved copper discharges. The use of only enhanced treatment BMPs is a deviation from WSDOT standards but is being implemented due to environmental commitments made during ESA consultation.

Dissolved copper is associated with concerns about direct effects on fish. Increases in dissolved copper discharges are expected at four locations. Two of those locations, the Bagley Lake deep water discharge and the Mercer Slough wetland complex, are locations where fish are not present. An increase in dissolved copper discharges is expected at Johns Creek, a fish bearing stream and UNT 08.LW.0283. UNT 08.LW.0283 is not currently a fish-bearing stream; however, it may become a fish-bearing stream after fish passage improvements are made as part of the Build Alternative. For both locations, the dilution assessment demonstrated that dissolved copper levels will be below effects thresholds on fish within 1 foot of outfalls in areas where fish may be present. The dilution analysis was completed using the HI-RUN model in accordance with the 2009 Memorandum of Agreement between FHWA, National Marine Fisheries Service (NMFS), U.S. Fish and Wildlife Service (USFWS), and WSDOT for analyzing the effects of stormwater on ESA. HI-RUN user guidelines state that dilution values less than 1 foot suggest near instantaneous dilution to below the biological effects threshold.

As a part of the Build Alternative, several new treatment facilities would be constructed to treat increased stormwater flows. These treatment facilities would discharge to streams and tributaries that are flow control exempt with the exception of discharges to the Mercer Slough wetland complex. The increased flow to the Mercer Slough wetland complex has been modeled and meets the requirements for wetland protection as set forth by Ecology.

In addition, the Project would also modify some existing stormwater facilities to meet treatment requirements. The amount of treatment proposed typically exceeds the number of acres that would be required according to the *Highway Runoff Manual*. This additional treatment is consistent with the

permit requirements and ESA consultation commitments.

Exhibit 4.6-5 presents the new and modified treatment facilities proposed for the Build Alternative (these treatment facilities are also shown in Exhibit 3-2, sheets 1 through 8).

Exhibit 4.6-5. Proposed New or Modified Treatment Facilities

TDA	Milepost	Type of Facility	Area Treated
G1	0.20 (M)	Reconstruct Media Filter Drain Type 3 for widening	1.28
C1	3.60 (LT)	Spill containment - reconstruct existing lined pond to accommodate runoff treatment	10.50
C1	3.60 (LT)	New compost-amended biofiltration swale	10.50
C2	4.05 (RT)	New compost-amended biofiltration swale	9.50
C2	4.10 (RT)	New detention to match peaks in downstream conveyance to the Cedar River	9.50
J2	5.18 (LT)	New compost-amended biofiltration swale	10.86
J2	5.25 (LT)	New compost-amended biofiltration swale	4.3
J2	5.30 (LT)	New compost-amended biofiltration swale	1.68
J2	5.41 (LT)	New compost-amended biofiltration swale	15.06
M2	7.30 (LT)	New compost-amended biofiltration swale	2.19
W1-2	7.37 (RT)	New compost-amended biofiltration swale	29.69
W1-2	7.46 (LT/RT)	New compost-amended biofiltration swale	28.81
W1-2	Lake Washington Boulevard NE to Northbound On-ramp	New compost-amended biofiltration swale	0.55
W2-1	8.95 (LT)	New compost-amended biofiltration swale	4.28
W2-2	9.27 (LT)	New compost-amended biofiltration swale	8.60
W2-3	9.41 (LT)	New compost-amended biofiltration swale	10.27
W3-1	9.87 (LT)	New compost-amended biofiltration swale	1.61
W3-2	10.00 (RT)	New compost-amended biofiltration swale	4.13
W3-2	10.17 (LT)	New compost-amended biofiltration swale	8.25
W3-2	10.26 (LT)	New compost-amended biofiltration swale	6.25
W3-2 to W4	10.26 (LT) to 11.12 (LT)	New flow diversion with vortex separator pre-treatment. Connect conveyance to flow dispersion on the north side of I-90	14.5
W4	I-90 median	New compost-amended biofiltration swale	1.5
W4	Eastbound I-90 to Southbound I-405 ramp	New Media Filter Drain Type 3	1.04

Exhibit 4.6-5. Proposed New or Modified Treatment Facilities

TDA	Milepost	Type of Facility	Area Treated
W4	Eastbound I-90 to Northbound I-405 ramp	New Media Filter Drain Type 3	0.32
W4	Eastbound I-90 median	New Media Filter Drain Type 3	0.77
W4	Westbound I-90 median	New Media Filter Drain Type 3	1.72
W4	Southbound I-405 to Eastbound I-90 ramp	New Media Filter Drain Type 3	0.36
W5	11.75 (LT)	Modify combined stormwater treatment wetland/detention pond to comply with current sizing for post-project condition	7.00

M=median, LT=left, RT=right

Floodplains

The Project will be designed and constructed to meet all current federal, state, and local standards for floodplain management. No floodplains or floodways designated as Special Flood Hazard Areas would be affected.

Channel and floodplain enhancements would occur within the East Lake Washington – Bellevue South subbasin. Three unnamed tributaries; UNT 08.LW.0283, UNT 08.LW.7.7A, and UNT 08.LW.7.8, would have their existing culverts replaced with fish passage structures. Additionally, on UNT 08.LW.0283, two open channel and floodplain areas would be constructed between I-405 and NE 43rd Street for fish passage and improved habitat.

Removal of existing bridge piers out of the floodplain and habitat improvements have been added to improvements proposed at May Creek, but no in-water work would be required. Removing the bridge piers would meet the City of Renton zero-rise floodplain requirement.

Groundwater and Aquifers

The increase in impervious surfaces would not substantially affect the total amount of water reaching the shallow alluvial aquifers in the study area, as most of the water that goes to these aquifers is derived from much larger, upgradient drainage areas outside the I-405 corridor. The increase in impervious areas caps a greater portion of the soils that are covering these shallow aquifers, but this change is so small in the context of the overall basin that the impact would be

insignificant. Storm runoff from the impervious areas would also be captured and treated prior to being allowed to infiltrate, thus reducing the chances of introducing contaminants into the aquifer system.

Retaining and noise walls built for the Project would be constructed with underdrain systems. These systems would likely intercept a portion of groundwater flow and temporarily affect groundwater until the groundwater levels reach equilibrium at some point downstream of the highway.

What are the expected short-term effects on water resources with the Project?

Without proper controls and/or measures to minimize effects, facility construction can have adverse effects on water quantity and quality in receiving waterways. Such effects would result from site clearing and subsequent earth-moving and excavation activities in which vegetation and other naturally occurring, soil-stabilizing materials are removed from the construction site. The exposed surface areas, slopes, and stockpiles of soil created by freeway construction would be subject to erosion until the earthwork is completed and a protective vegetative cover is restored or the surface is artificially stabilized (Barrett et al. 1995).

As part of the proposed stormwater system, a stormwater runoff diversion pipe that would be about 5,000 linear feet long would be constructed under local road and easements using trenchless technology. The pipe would be located between Coal Creek Parkway and Mercer Slough, west of I-405. The benefit of this construction method is that it typically has fewer impacts, since most of the work is done underground. Two pits would be built where pipe construction begins and ends. The working pits are typically a 10 to 15 feet square. Construction equipment would be staged at the pipe entry and exit locations. There is typically construction noise associated with the drilling operation and trucks enter and exit the site to haul excavated soils.

Although freeway construction could create adverse, short-term effects in surface waters, such effects would be minimized through implementation of the erosion controls and sedimentation BMPs that will be implemented.

Surface Water

Peak and base flow rates to streams and rivers would not be negatively altered during construction because detention ponds will be constructed prior to the highway widening. These ponds may be used for temporary erosion and sedimentation control.

The Project will be constructed in accordance with federal and state technical guidance, permit requirements, and WSDOT project requirements that require the use of BMPs to control construction runoff. Prior to construction, WSDOT will prepare a TESC Plan in accordance with WSDOT requirements and permit conditions. The TESC plan will address clearing limits, construction access, flow control, sediment control, soil stabilization, slope protection, drainage inlet protection, channel and outlet stabilization, and pollutant control. Any increases in runoff quantity would not have any appreciable effect on local waterways.

The existing highway (baseline conditions) have some permanent flow control and runoff treatment BMPs already in place. These BMPs include ponds, biofiltration swales, ecology embankments, filter strips, and a combined stormwater quality wetland and detention facility. During construction of the new roadway and new BMPs, some existing BMPs would be removed so that they can be replaced. WSDOT will use construction BMPs to maintain water quality during construction periods when permanent BMPs may not be functional.

Construction could also create the potential for unexpected spills of hazardous materials used during construction. Construction work typically requires use of hazardous or toxic materials such as fuel, oil, concrete, paint, etc., which may be temporarily stored on site. These materials present the greatest risk near open waterbodies where streams and rivers pass under I-405. To prevent unexpected spills to waterbodies, a Spill Prevention, Control, and Countermeasures (SPCC) Plan will be prepared before construction starts. Along with the Temporary Erosion and Sediment Control Plan, the measures provided would prevent substantial effects on water quality during construction. Chapter 6, Measures to Avoid and Minimize Effects, contains a listing of mitigation measures to protect surface waters that will be implemented with the Project.

Floodplains

Work done to remove existing bridge piers and provide habitat elements in May Creek would improve floodplain function as compared to existing conditions.

The Green River, Cedar River, May Creek, Coal Creek, Mercer Slough complex, and other smaller receiving waters and drainage systems that convey water to Lake Washington would each receive only a small percentage of total flow from construction areas. Each receiving waterbody is anticipated to have sufficient capacity to convey the flow to Lake Washington without increasing the existing flood risk. Detention provided during construction would help prevent downstream flooding, erosion, and sedimentation.

New cross-culverts would typically be constructed in the dry, although there could be in-water work associated with some culvert replacements. Existing streams and watercourses would be conveyed under I-405 via existing cross-culverts until the new cross-culverts and associated channel modifications are completed. This approach would maintain existing conveyance across I-405 during construction.

Chapter 6, Measures to Avoid and Minimize Effects, contains a listing of mitigation measures to protect floodplains that would be implemented with the Project.

Groundwater and Aquifers

The study area contains wellhead protection areas and a sole source aquifer. Potential groundwater effects, including contamination and/or reduced well capacity, would be addressed by strict limits on certain activities and material handling during construction. A Memorandum of Understanding (MOU) between FHWA, EPA, and WSDOT was completed in 2014 to develop an understanding between these agencies concerning projects that may affect sole source aquifers. This MOU states that all projects will be constructed in a manner that will prevent the introduction of contaminants into an aquifer and not cause an exceedance of the maximum contaminant levels promulgated by the Washington State Department of Health in Washington Administrative Code (WAC) 246-290-310. The MOU also provides steps to determine if a project is exempt from and EPA sole source aquifer review. This Project is not exempt. All construction within or over the City of Renton APA Zones 1 and 2 will meet

the intent of the Washington State Wellhead Protection Requirements outlined in WAC 246-290-135(4) and Renton Municipal Codes 4-3-050C, 4-4-030, and 4-9-015. Specific measures to protect groundwater and aquifers are provided in Chapter 6, Measures to Avoid and Minimize Effects.

Would the Project have other effects on water resources that may be delayed or distant?

The Project is not expected to cause any effects on water resources that are delayed or distant.

4.7 Ecosystems

This section provides a summary of the wetlands, aquatic resources, upland vegetation, and wildlife habitat found in the study area and explains how the proposed project may affect them. Attachment P, Wetland and Water Resources Maps, located at the back of this EA provides an overview of wetlands and streams in the study area.

How did WSDOT evaluate ecosystems?

The area examined for wetland, streams and associated buffers, and wildlife habitat is referred to the study area. This area is shown in Attachment P, *Wetland and Water Resources Maps*. The portion of the study area examined specifically to address wetlands and aquatic resources extends 300 feet from the Project footprint, which is defined as the current WSDOT right of way and proposed new I-405 right of way between MP 0.0 and 11.9.

The portion of the study area examined to address terrestrial resources and wildlife habitats is the area included within a 0.5-mile buffer surrounding the same Project footprint, as defined in the biological assessments (BAs) prepared for the Project. For this reason, we also included a small area on SR 167 between MP 24.8 and its intersection with I-405 that is comprised primarily of wetlands. Similarly, we included a small area on the Eastside Rail Corridor Regional Trail and Lake Washington Trail.

The Ecosystems and Wetlands Discipline Reports developed in support of the *2008 Tukwila to Renton Improvement Project (TRIP) EA* (WSDOT and FHWA 2008a), and the *2006 Renton to Bellevue Project EA* (WSDOT and FHWA 2006) were revisited

to characterize and evaluate ecosystems and natural resources for the Project. Biologists also gathered existing information for the study area through literature and internet research; interviews with local, state, and federal agency personnel; and previously prepared WSDOT reports. In addition, biologists conducted wetland delineations, stream surveys, and field verified wildlife habitat data. The collected information was then compared to the project footprint, including all roadway and drainage improvements, to assess potential effects.

What ecosystems are located in the study area?

The wetland, aquatic, and terrestrial resources in the study area are described below. In addition, the threatened and endangered species potentially occurring in the study area are also discussed.

Wetlands

Baseline ecosystem conditions in the study area are typically degraded. The baseline conditions are described in detail in the *I-405, Tukwila to Renton Improvement Project (I-5 to SR 169-Phase 2) Ecosystems Discipline Report* (WSDOT 2007) and the *I-405 Renton to Bellevue Corridor Milepost 4.0-13.7 Wetland and Stream Assessment Report* (WSDOT 2018). Wetlands identified in the study area are generally associated with streams, hillside seeps, or drainage ditches that receive road runoff and convey stormwater. All of the wetlands in the study area have been affected by human influence to some extent. Wetland buffer sizes are limited by their proximity to elements of the built environment and typically consist of immature trees, shrubs, or grasses intermixed with nonnative invasive plant species.

There is a wide variety of wetland types of various quality found within the study area. Many are small roadside ditches with little species diversity beyond erosion-control grasses and invasive plants. Most of the wetlands in the study area receive runoff from developed areas through ditches and drainage pipes, as well as natural sources including groundwater, seeps, and springs. The most diverse and highest quality wetlands are found around Coal Creek, the larger wetlands around UNT 08.LW.0283 (formerly known as Gypsy Creek located near NE 44th Street), and the Mercer Slough wetland adjacent to I-90.

Fieldwork was conducted from 2015 to 2017 to verify wetlands in the study area and included observation of soils, hydrology, and vegetation, as well as landscape position and general site conditions. Exhibit 4.7-1 and Attachment P, Wetland and Water Resources Maps, identify the 62 wetlands totaling just over 131 acres that WSDOT delineated within the study area. However, only a subset of these wetlands and/or their associated buffers would be affected by the Project.

Wetlands in Exhibit 4.7-1 are described by location in sequence from south to north. Each wetland in the study area was assigned a unique name based on its location relative to the nearest I-405 or SR 167 MP, starting with I-405 MP 0.0 at the I-405 and I-5 interchange at the southern end of the study area and extending north to MP 11.9 north of the I-90 and I-405 interchange. The portion of SR 167 within the study area is limited to the SR 167/I-405 Interchange.

The Direct Connector Project on SR 167, which extends from MP 24.4 to MP 26.3 at this interchange, is currently in construction and considered part of the baseline conditions for this analysis. The Project would have no impacts to wetlands and aquatic habitats in this area. The wetland number includes "L" if the wetland is located on the outside of southbound lanes of I-405; "R" if it is located on the outside of northbound lanes of I-405; and "M" if the wetland is located within the I-405 median. For example, a wetland found at the midpoint between MP 2.0 and MP 3.0 on the left side of I-405 would be Wetland 2.5L. A summary of the study area wetlands, their associated local and state ratings, and their buffers is presented in Exhibit 4.7-1.

Exhibit 4.7-1. Delineated Wetlands in the Study Area

	Wetland Name	Size (acres)	HGM Class	Cowardin Class	Wetland Rating	Local Jurisdiction
1	0.1R	0.05	depressional	PEM	IV	Tukwila
2	0.15R	0.52	depressional	PEM	III	Tukwila
3	0.25M	0.07	depressional	PEM	IV	Tukwila
4	0.3R	1.29	depressional	PFO	III	Tukwila
5	0.4L	0.03	depressional	PEM	IV	Tukwila
6	0.6L	0.17	depressional	PSS	IV	Tukwila
7	0.9R	1.01	depressional	PSS & PAB	III	Tukwila
8	2.2R-A	0.03	depressional	PSS	IV	Renton
9	2.6R	0.1	riverine	PSS & PEM	III	Renton
10	24.7R-A	44.04	depressional	PFO,PSS & PEM	II	Renton
11	24.7R-B	8.83	depressional	PFO,PSS & PEM	II	Renton
12	24.7R-C ^a	5.95	depressional	PFO,PSS, PEM, PAB	II	Renton
13	25.0L	4.14	depressional	PFO	III	Renton
14	25.7L	0.29	depressional	PSS	III	Renton
15	25.8L	11.51	depressional	PSS & PEM	III	Renton
16	25.9L	0.10	depressional	PEM	III	Renton
17	4.1 R-NJ	0.005	slope	PEM	IV	Renton
18	4.53 R	0.064	depressional	PSS	IV	Renton
19	4.9 R	0.01	slope	PEM	IV	Renton
20	5.0 R	0.02	slope	PEM	IV	Renton
21	5.1 R	0.05	depressional	PFO	IV	Renton
22	5.37 L	0.12	slope	PEM/PSS	IV	Renton
23	5.38 L	0.26	depressional	PEM/PFO	IV	Renton
24	5.39 L	0.06	depressional	PEM	IV	Renton
25	5.4 L	0.02	slope	PSS	III	Renton
26	7.2 R	5.13	depressional	PFO	III	Renton
27	7.3 R	0.48	depressional	PFO	IV	Renton
28	7.35 R	0.28	depressional	PEM	IV	Renton
29	7.42 R	0.17	depressional	PEM	III	Renton
30	7.44 L	0.07	depressional	PSS	IV	Renton

Exhibit 4.7-1. Delineated Wetlands in the Study Area

	Wetland Name	Size (acres)	HGM Class	Cowardin Class	Wetland Rating	Local Jurisdiction
31	7.5 L	0.28	depressional	PSS	III	Renton
32	7.66 R	0.50	riverine	PEM/PSS	III	Renton
33	7.78 L	0.7	depressional	PEM/PSS/PFO	III	Renton
34	7.79 L	0.10	depressional	PSS/PEM	IV	Renton
35	7.82 R	0.37	slope	PSS/PFO	IV	Renton
36	7.84 R	0.67	slope	PEM/PFO	IV	Renton
37	8.05 R	0.05	slope	PEM	IV	King County /Newcastle
38	8.2 L	0.01	depressional	PEM	IV	King County
39	8.2 R	0.03	slope	PEM	IV	King County
40	8.4 L	0.02	depressional	PEM	IV	King County
41	8.44 L	0.11	slope	PEM	IV	Bellevue
42	8.5 L	0.01	slope	PEM	IV	Bellevue
43	8.75 L	0.05	depressional	PEM	IV	Bellevue
44	8.8 L	0.07	depressional	PEM	IV	Bellevue
45	9.3 R	0.25	depressional	PFO	IV	Bellevue
46	9.32 R	0.04	depressional	PFO	IV	Bellevue
47	9.5 L	0.02	depressional	PEM	IV	Bellevue
48	9.68 L	0.10	depressional	PEM	III	Bellevue
49	9.82 L	0.09	depressional	PEM	III	Bellevue
50	9.83 L	0.17	depressional	PEM/PSS	III	Bellevue
51	10.0 L	0.34	depressional	PEM/PFO	III	Bellevue
52	10.01 R	0.08	depressional	PSS	III	Bellevue
53	10.12	0.68	slope	PSS/PFO	III	Bellevue
54	10.16 L	0.14	depressional	PSS	III	Bellevue
55	10.25 L-A	0.02	slope	PEM	IV	Bellevue
56	10.25 L-B	0.20	slope	PEM/PFO	IV	Bellevue
57	10.8 L	41.09	riverine/lake-fringe/depressional	PEM/PSS/PFO	II	Bellevue
58	10.9 L	0.07	depressional	PSS	IV	Bellevue
59	118-1	0.07	depressional	PEM	III	Bellevue
60	118-2	0.03	depressional	PEM	III	Bellevue
61	118-3	0.05	depressional	PEM	IV	Bellevue
62	118-4	0.15	depressional	PFO/PSS	III	Bellevue

Exhibit 4.7-1. Delineated Wetlands in the Study Area

	Wetland Name	Size (acres)	HGM Class	Cowardin Class	Wetland Rating	Local Jurisdiction
TOTAL		131.4 acres				

L=Left, R=Right, PEM=Emergent; PSS=Scrub-shrub; PFO = Forested, PAB = Aquatic Bed

^a Acreages for these wetlands (26.R, 2.7R, 2.82R, 2.9L, 24.7R-A, 24.7R-B, 24.7R-C) have been altered from wetland reports to reflect the losses and impacts associated with the Direct Connector Project

State and local resource agencies rate or categorize wetlands according to their relative rarity, sensitivity to disturbance, and the functions they provide. WSDOT biologists collected field data on the wetlands in the study area and categorized them according to the *Washington State Wetland Rating System for Western Washington 2014 Update* (Ecology 2014) and wetland rating systems from applicable local jurisdictions. Under Ecology’s rating system, three major wetland functions are analyzed: water quality improvement, flood and erosion control, and wildlife habitat. The wetlands found in the study area were assigned to Category II, III and IV, based on the following criteria:

- Category II wetlands are those that: 1) provide habitat for very sensitive or important wildlife and plants; 2) are either difficult to replace; or 3) provide very high functions, particularly for wildlife habitat.
- Category III wetlands have a moderate level of function, can often be adequately replaced with a well-planned mitigation project, or are interdunal wetlands up to an acre in size. They have been disturbed in some way and are often less diverse or more isolated from other natural resources in the landscape than higher category wetlands.
- Category IV wetlands have the lowest levels of function and are often heavily disturbed, though some may still provide important functions. These wetlands should be able to be replaced, and in some cases, improved.

Aquatic Resources

The southern portion of the study area is located in the lower Green River subwatershed of the Green-Duwamish River watershed (WRIA 9) and the northernmost extent of the Project extends into the Lake Washington Watershed

(WRIA 8). Attachment P, Wetland and Water Resource Maps provides maps showing streams in the study area. These streams are listed in Exhibit 4.7-2. The baseline conditions are described in detail in the *I-405, Tukwila to Renton Improvement Project (I-5 to SR 169-Phase 2) Ecosystems Discipline Report* (WSDOT 2007) and the *I-405 Renton to Bellevue Corridor Milepost 4.0-13.7 Wetland and Stream Assessment Report* (WSDOT 2018).

Exhibit 4.7-2. Streams in the Study Area

Number	Stream Name	WDNR Stream Type ^a	Jurisdiction
1	Gilliam Creek	F	Tukwila
2	Cottage Creek	F	Tukwila
3	UNT to Gilliam Creek	Np	Tukwila
4	Green River	S, F	Tukwila
5	Springbrook Creek	F	Renton
6	Panther Creek/ East Fork Panther Creek (09.SC-25.7)	F	Renton
7	Rolling Hills Creek (09.SC-2.8)	F	Renton
8	Thunder Hills Creek	F	Renton
9	UNT to Thunder Hills Creek	Np	Renton
10	UNT to Cedar River	F	Renton
11	Cedar River	S, F	Renton
12	Johns Creek	F	Renton
13	Clover Creek	F	Renton
14	May Creek	F	Renton
15	UNT 08.LW.0283 (formerly Gypsy Creek)	F	Renton
16	UNT 08.LW7.7	Ns	Renton
17	UNT 08.LW.7.7A	F	Renton
18	UNT 08.LW.7.8	F	Renton
19	Stream 8.05	Ns	Renton
20	Stream 8.12	Ns	Renton
21	Stream 8.15	Ns	Renton
22	Stream 8.22	Ns	King County
23	Stream 8.31	Ns	King County
24	Stream 8.55	Ns	Bellevue
25	Stream 8.7 (08.LW-8.7)	Ns	Bellevue
26	Stream 8.9	Ns	Bellevue

Exhibit 4.7-2. Streams in the Study Area

Number	Stream Name	WDNR Stream Type ^a	Jurisdiction
27	Lakehurst Creek	F	Bellevue
28	Stream 9.8 (08.LW-9.8)	Ns	Bellevue
29	Stream 9.9 (08.CC-9.9)	Ns	Bellevue
30	Stream 10.0 (08.CC-9.9)	Ns	Bellevue
31	Coal Creek	S, F	Bellevue
32	Richards Creek	F	Bellevue

^a S = Shoreline; F = Fish; Np = Non-fish perennial; Ns = Non-Fish Seasonal; UNT = unnamed tributary

Baseline ecosystem conditions in the study area are largely degraded. Rivers and streams in the study area have been channelized, diked, and straightened to accommodate development. Stream and river buffer sizes are limited by their proximity to elements of the built environment and typically consist of immature trees, shrubs, or grasses intermixed with nonnative invasive plant species.

Despite altered habitat conditions, all native species of salmonids can be found in the study area, including Chinook, coho, chum, pink, and sockeye salmon; steelhead trout; and sea-run cutthroat trout. In addition, bull trout, Dolly Varden, (hereafter referenced synonymously with bull trout), and resident cutthroat trout are known to use the a few of the rivers and streams in the study area for upstream and downstream migration and rearing. The study area also contains limited spawning habitat for Chinook, coho, pink, sockeye, and chum salmon, and steelhead. Resident cutthroat trout use the study area for all life stages.

Other fish species likely to be found in the study area include three spine stickleback, longnose dace, speckled dace, longfin smelt, prickly sculpin, riffle sculpin, reticulate sculpin, shorthead sculpin, torrent sculpin, large scale sucker, peamouth chub, bluegill, redbreast shiner, Pacific lamprey, river lamprey, and western brook lamprey (Wydoski and Whitney 2003). Other aquatic species in the study area include crayfish, frogs, salamanders, freshwater clams, and freshwater mussels.

Terrestrial Resources

Baseline ecosystem conditions in the study area are largely degraded. Terrestrial habitats are fragmented throughout the study area and much of the baseline wildlife habitat is located

in areas where vegetation is regularly maintained, which limits its productivity. The baseline conditions are described in detail in the *I-405, Tukwila to Renton Improvement Project (I-5 to SR 169-Phase 2) Ecosystems Discipline Report* (WSDOT 2007) and the *I-405 Renton to Bellevue Corridor Milepost 4.0-13.7 Wetland and Stream Assessment Report* (WSDOT 2018).

Species composition in the study area is influenced by the highly urbanized condition. Common species present include coyote, opossum, raccoon, American crow, American robin, red-tailed hawk, and other common mammal and bird species. Domestic and feral wildlife, including dog and cats, are also likely to be present.

Threatened and Endangered Species

No federally listed terrestrial species are known to inhabit the study area. Species listed under the ESA, including Canada lynx, gray wolf, marbled murrelet, northern spotted owl, golden paintbrush, marsh sandwort, grizzly bear, or fisher, could occur in King County; however, there are no known occurrences of and no suitable habitat exists for these species in the study area.

Several of the rivers and streams in the study area contain various life stages of Chinook salmon, bull trout, and steelhead, which are currently listed as threatened under the ESA. Waterbodies in the study area known to be used by Chinook salmon include the Green and Cedar Rivers and Springbrook Creek. It is likely that some smaller waterbodies in the study area also support certain Chinook salmon life stages, due to their connections to the Green River, and the lower reaches of Panther Creek due to its association with Springbrook Creek. Chinook salmon primarily use the portions of these waterbodies that are in the study area for upstream and downstream migration and rearing; however, substrate conditions in the Cedar River in the study area could provide some limited spawning habitat. The Chinook salmon found in these waterbodies are a part of the Puget Sound evolutionarily significant unit of Chinook salmon, listed as threatened under the ESA (NMFS 1999). The portions of the Green and Cedar Rivers and Springbrook Creek that are located in the study area are designated as critical habitat for Chinook salmon.

Historically, bull trout were reported to use the lower Green River in “vast” numbers (Suckley and Cooper 1860). However, bull trout are rare in this system today and are likely to be anadromous migrants from other core areas (USFWS and ODFW 2015). The study area contains areas designated as critical habitat for bull trout. The portions of the Green River located in the study area are designated as critical foraging, migratory and overwintering) habitat for bull trout because they provide movement corridors necessary for maintaining essential migratory life history forms. However, freshwater prey-base for anadromous bull trout is limited in this system (USFWS and ODFW 2015)

Waterbodies in the study area known or anticipated to be used by steelhead include the Green and Cedar Rivers and Gilliam, Springbrook, and Panther Creeks, though it is likely that some smaller waterbodies in the study area also support certain steelhead trout life stages. The steelhead trout found in these waterbodies are a part of the Puget Sound distinct population segment of steelhead trout. The final rule to designate critical habitat for Puget Sound steelhead was published on February 24, 2016 (NMFS 2016). It includes approximately 2,031 miles of freshwater and estuarine habitat. The Lake Washington watershed is excluded from the critical habitat designation; however, the final ruling determined that the Green River Cedar River, and Springbrook Creek are critical habitat. There is no critical habitat in Gilliam Creek or Thunder Hills Creek.

The Cedar River is considered critical habitat for its potential to contribute to steelhead recovery and includes 15.5 miles of the Cedar River and its tributaries (NMFS 2016).

What are the expected long-term effects on ecosystems if WSDOT does not build this Project?

Without the Project there would be no capacity improvements made and this section of I-405 would not have ETLs. Ecosystems would be affected from continued operation of I-405 with the No Build Alternative. WSDOT would continue minor routine roadway maintenance. Wetlands and streams in the study area that currently receive untreated stormwater runoff from I-405 continue to be affected by these conditions, since stormwater treatment system would not be improved and retrofitted. In addition, fish passage improvements would

not be built, limiting potential fish habitat, function and access in the study area.

What are the expected short-term and long-term effects on ecosystems with the Project?

Wetlands

Construction activities would occur in and adjacent to wetlands, streams, and their associated buffers. In addition, construction activities would also occur in areas containing wildlife habitat. The construction effects we considered are based on the assumption that all of the components of the Project would be constructed per the Project description found in Chapter 3 of this EA.

As shown in Exhibit 4.7-3, 38 of 62 wetlands in the study area would be affected. The Project would permanently affect 5.31 acres of wetlands and would temporarily affect 0.33 acre of wetlands.

Exhibit 4.7-3. Wetlands Affected by the Project

Wetland Name	Wetland Size (acres)	Permanent Impacts (acres)	Temporary Impacts (acres)
4.9 R	0.01	0.01	0
5.0 R	0.02	0.02	0
5.1 R	0.05	0	<0.1
5.37 L	0.12	0	<0.1
5.38 L	0.26	0.26	0
5.39 L	0.06	0.01	0.01
75.4 L	0.02	0.02	0
7.2 R	5.13	1.58	0
7.3 R	0.48	0.06	0.01
7.35 R	0.28	0.28	0
7.42 R	0.17	0.17	0
7.44 L	0.07	0.02	0.01
7.5 L	0.28	0.03	0.01
7.66 R	0.50	0.50	0
7.78 L	0.7	0.7	0
7.82 R	0.37	0.11	0.02
7.84 R	0.67	0.19	0.02
8.05 R	0.05	0.05	0

Exhibit 4.7-3. Wetlands Affected by the Project

Wetland Name	Wetland Size (acres)	Permanent Impacts (acres)	Temporary Impacts (acres)
8.2 L	0.01	0.01	0
8.2 R	0.03	0.03	0
8.4 L	0.02	0.02	0
8.44 L	0.11	0.06	0.02
8.5 L	0.01	0	<0.01
8.75 L	0.05	0.05	0
8.8 L	0.07	0.07	0
9.3 R	0.25	0.25	0
9.32 R	0.04	0.04	0
9.5 L	0.02	0.02	0
9.68 L	0.1	0.01	0.04
9.82 L	0.09	0.09	0
9.83 L	0.17	0.06	0.03
10.0 L	0.34	0.2	0.03
10.01 R	0.08	0.08	0
10.16 L	0.14	0.14	0
10.25 L-A	0.02	0.02	0
10.25 L-B	0.20	0.02	0.02
10.8 L	41.09	0.1	0.1
10.9 L	0.07	0.03	0.01
Total		5.31	0.33

Most wetlands in the study area provide limited functions due to the lack of stormwater control, conveyance, and management facilities. Wetlands and the water quality functions they provide would likely continue to be affected by untreated runoff entering the wetlands, as well as by sediment transport and erosion. Filling a portion of a wetland or altering its vegetation can reduce the wetland's capacity to store stormwater, filter pollutants, protect stream banks from erosion, and provide wildlife habitat. Overall, wetland buffer habitat in the study area is generally of low quality and typically includes shrub, grass, and herbaceous habitat typically associated with highway right of way.

To build the proposed roadway and stormwater facilities, some construction activities would occur outside of the permanent Project footprint, including clearing of both wetland and upland vegetation. As a result, WSDOT may need to place temporary fill in wetlands and buffers to allow adequate room for construction activities. This construction disturbance would result in a short-term loss of wetland functions.

Potential erosion and sedimentation caused by construction activities would increase the amount of sediment settling within a wetland and reduce the quality of habitat available for invertebrate life and habitat for plants. Additionally, loose sediment would reduce the potential water quality and quantity benefits provided by those wetlands. Loss of tree, shrub, and emergent vegetation would reduce the quality of habitat available for birds and small mammals. After the Project is complete, wetlands where the vegetation is cleared or trimmed would still retain some water quality and quantity function, although at a diminished level until the wetlands are completely reestablished. These temporarily disturbed areas will be restored and replanted with appropriate native vegetation. As described in Chapter 6, Measures to Avoid or Minimize Project Effects, WSDOT will develop a Project specific plan before construction begins to identify how vegetation restoration will occur.

As described in Chapter 6, Measures to Avoid and Minimize Effects, WSDOT will mitigate permanent effects on wetlands from the Project at a variety of mitigation sites. These mitigation sites include the Springbrook Creek mitigation bank and Kelsey Creek for wetland mitigation; May Creek and UNT 08.LW.0283 (Gypsy Creek) for stream and buffer mitigation; and Ron Regis Park, Median Creek, Mercer Slough site (on WSDOT property) for buffer mitigation. Specific mitigation strategies at each of the sites are in development and will be detailed in the Section 404 permit documentation prepared for each of the sites. Wetland buffer and temporary construction effects will be mitigated in accordance with local critical areas ordinances, as appropriate.

Aquatic Resources

Because of the Project, new roadways and roadway structures (e.g., bridges and culverts) would be built within, over, or near river and stream habitats that support fish and other aquatic

species within the study area. Most of these streams are small, seasonal, non-fish bearing streams that cross I-405 and connect to combined drainage systems taking runoff to Lake Washington. In addition, the Project would temporarily and permanently affect riparian buffers due to road widening. A summary of work proposed within or near streams in the study area is provided in Exhibit 4.7-4.

Exhibit 4.7-4. Work Proposed within or near Streams in the Study Area

Stream Name	Fish Presence	Stream Impact
Gilliam Creek	Y	No work in this location
Cottage Creek	Y	No work in this location
UNT to Gilliam Creek	N	No work in this location
Green River	Y	No work in this location
Springbrook Creek	Y	No work in this location
Panther Creek/ East Fork Panther Creek (09.SC-25.7)	Y	No work in this location
Rolling Hills Creek (09.SC-2.8)	Y	No work in this location
Thunder Hills Creek	Y	No work at this location
UNT to Thunder Hills Creek	N	No work at this location
UNT to Cedar River	Y	No work at this location
Cedar River	Y	Widening the southbound bridge on I-405 over the Cedar River.
Johns Creek	Y	Culverts are to remain and an additional outfall would be constructed.
Clover Creek	Y	No work at this location
May Creek	Y	Construct two single span bridges and grade the floodplain, removing rip rap fill at the edge of the channel.
UNT 08.LW.0283 (formerly Gypsy Creek)	Y	Install four fish passable structures; 2 at I-405, 1 at NE 44 th , 1 at Lake Washington Blvd.
UNT 08.LW.7.7	N	Install a culvert extension or culvert replacement
UNT 08.LW.7.7A	Y	Install a fish passable structure and flow restrictor plates until downstream conveyance on private land has been improved.
UNT 08.LW.7.8	Y	Install a fish passable structure and flow restrictor plates until downstream conveyance on private land has been improved
Stream 8.05	N	Encroachment into wetland and stream and associated buffers resulting from construction of retaining walls.
Stream 8.12	N	Install a culvert extension
Stream 8.15	N	Install a culvert extension

Exhibit 4.7-4. Work Proposed within or near Streams in the Study Area

Stream Name	Fish Presence	Stream Impact
Stream 8.22	N	Encroachment into wetland and stream and associated buffers resulting from construction of retaining walls, stormwater pipe extension.
Stream 8.31	N	Install a culvert extension
Stream 8.55	N	No work at this location.
Stream 8.7	N	Install a culvert extension
Stream 8.9	N	Encroachment into stream and associated buffers resulting from construction of retaining walls, roadway widening, stormwater pipe extension.
Lakehurst Creek	Y	No in-water work at this location.
Stream 9.8	N	No work at this location.
Stream 9.9	N	No work at this location.
Stream 10.0	N	There is a single crossing of this stream at I-405, near MP 10.0. The existing culvert would be replaced.
Coal Creek	Y	Encroachment into stream buffers resulting from construction of retaining walls.
Richards Creek	Y	No work at this location.

Y = fish present, N = no fish present, UNT = unnamed tributary

As described in Chapter 6, Measures to Avoid and Minimize Effects, WSDOT will mitigate permanent effects on streams and their buffers on site at the same stream or buffer where the effects occur, in compliance with the local jurisdiction and state requirements as appropriate. Streams with any permanent stream and buffer habitat impacts in addition to temporary stream and buffer impacts are estimated in Exhibit 4.7-5.

Exhibit 4.7-5. Work within Streams

Name	Fish Presence	Temporary Stream Impacts (square feet)	Temporary Buffer Impacts (square feet)	Permanent Stream Impact (square feet)	Permanent Buffer Impact (square feet)
Cedar River	Y	0	1,742	0	4,456
John's Creek	Y	0	2,869	450	6,509
May Creek	Y	0	17,740	3,058	22,380
UNT.08.LW.0283 (formerly Gypsy Creek)	Y	0	11,047	3,224	10,405
UNT 08.LW.7.7	N	11	0	137	0
UNT 08.LW.7.7A	Y	0	894	623	5,175
UNT 08.LW.7.8	Y	0	927	110	0
Stream 8.12	N	136	8,375	108	5,277
Stream 8.15	N	12	586	56	3,619
Stream 8.31	N	10	506	72	3,721
Stream 8.7	N	0	1,452	214	7,252
Stream 8.9	N	0	2,543	442	12,864
Lakehurst Creek	Y	0	596	0	1,127
Stream 9.9	N	0	8,902	50	1,694
Coal Creek	Y	0	1,796	0	4,291
TOTAL		169	59,975	8,544	88,770

Y = fish present, N = no fish present, UNT = unnamed tributary

Most habitat impacts would be associated with buffers, related to culvert replacements and providing site access. Temporary and permanent impacts to aquatic habitat are more limited. At Cedar River, the I-405 southbound bridge widening would have impacts upon the river and riparian buffer. In the case of May Creek, WSDOT would place or move rocks within the ordinary high-water mark to protect utilities, bridge superstructures, and stormwater outfalls from erosion. WSDOT will also construct on-site fish passable crossing structures on UNT 08.LW.7.7A and UNT 08.LW.7.8 and address three fish passage barriers by constructing four fish passable structures on UNT 08.LW.0283, where it crosses Lake Washington Boulevard, NE 44th Street and I-405.

On UNT 08.LW.7.7A and UNT 08.LW.7.8, WSDOT will replace the existing culverts with new larger structures capable of passing the 100-year stream flow. However, the combined

amount of flow is expected to exceed the capacity of the downstream private conveyance infrastructure located in a driveway and along the property line of two Lake Washington waterfront residences.

The estimated natural stream flows for UNTs 7.7A and 7.8 during the 100-year event are expected to be approximately 38 and 10 cubic feet per second (cfs), respectively. The existing capacities of the culverts under I-405 are approximately 14 and 4 cfs, respectively. The estimated capacity of the privately operated 18-inch culvert in the driveway is approximately 13 cfs.

By installing new fish passable structures that have adequate conveyance for the 100-year storm, downstream conveyance facilities would experience larger flows that exceed their capacity, potentially causing damage to property. Flow restrictor plates with orifices matching the diameter of the existing culverts would be placed on the proposed fish passable structures to maintain the existing flow rates so as not to potentially increase erosion and flooding of the downstream properties. These would not be permanent structures. WSDOT would remove the flow restrictor plates within 30 days of receiving notice that the downstream private drainage system has been improved and has the capacity to convey the anticipated stream flows.

The existing riparian vegetation in the impact area at Cedar River does not provide valuable habitat function when compared to the rest of the lower Cedar River. There are riparian tree stands along the banks both upstream and downstream of I-405 that provide more valuable habitat function including shade, large woody debris sources, and contributions of organic matter. Riparian vegetation surrounding the bridge where the impacts would occur is degraded by heavy foot traffic and recreational use on the river banks and consists largely of nonnative invasive plant species including Himalayan blackberry, reed canarygrass, and Scot's broom though some native deciduous and coniferous trees and shrubs are infrequently found along the banks (Kerwin 2001). Illumination near streams will be installed with light shields to direct light away from the channel.

The new bridge structure over the Cedar River would have new footings and piers just outside the ordinary high

watermark. Drilled shafts would be needed to construct the super structure, but they are expected to be installed without disturbing instream sediments or otherwise raising turbidity. If a risk of turbidity is anticipated, BMPs such as silt curtains could be deployed.

Fish and aquatic resources would benefit from the installation of stormwater treatment facilities. Stormwater facilities would collect runoff from all new impervious surfaces created by the Project. In addition, the stormwater system would be retrofitted to provide treatment for an additional 51 percent of the existing PGIS, which is expected to improve the quality of stormwater runoff and discharges from I-405. The Project will provide enhanced stormwater quality treatment before water is discharged to streams as discussed in Section 4.6, Water Resources. Stormwater modeling discussed in Section 4.6, Water Resources, shows that while there may be a minor increase (4 percent) in dissolved copper discharges, total copper would decrease by 36 percent. Increases in dissolved copper discharges are expected at four locations. Two of those locations, the Bagley Lake deep water discharge and the Mercer Slough wetland complex, are locations where fish are not present. At Johns Creek, a fish bearing stream and UNT 08.LW.0283, which may become a fish-bearing stream after fish passage improvements are made as part of the Build Alternative, the dilution assessment demonstrated that the mixing zone is less than 1 foot. As part of WSDOT's ESA commitment, once all stages of the TRIP and Renton to Bellevue projects are constructed, 100 percent of existing PGIS within the study area will be treated.

The Project would replace five fish barriers with six fish passable structures, which would improve habitat and habitat access for fish. The structures that would be constructed include:

- UNT 08.LW.0283 (Gypsy Creek subbasin drainage, NE 44th Street crossing)
- UNT 08.LW.0283 (Gypsy Creek subbasin drainage, I-405 crossing at 2 locations)
- UNT 08.LW.0283 (Gypsy Creek subbasin drainage, Lake Washington Blvd crossing)
- UNT 08.LW.7.7A

- UNT 08.LW.7.8

The five fish barrier replacements would occur on three streams, two of which flow together downstream of I-405 prior to discharging to Lake Washington. UNT 08.LW.7.7A and UNT 08.LW.7.8 run between two houses in an undersized flume, and would require installation of flow restrictor plates until downstream conveyance has been improved as described above. UNT 08.LW.0283 (formerly known as Gypsy Creek) runs through an 800-foot-long pipe under the Virginia Mason Athletic Center property. There are no listed species in the streams where fish barrier culverts would be replaced.

The area of lineal habitat gain for UNT 08.LW.0283 is 1,211 meters (0.75 mile) upstream (east) of I-405. For Streams UNT 08.LW.7.7A and UNT 08.LW.7.8, the lineal gain is 605 meters (0.37 mile) and 303 meters (0.19 mile), respectively. Flow restrictor plates would be removed when downstream barriers are replaced.

In addition, as part of early coordination meetings with the National Marine Fisheries Service (NMFS), U.S. Fish and Wildlife Services (USFWS), the Muckleshoot Indian Tribe, and other resource agencies, WSDOT is proposing habitat improvement work in May Creek beneath the existing bridge as part of the Project. The goal of these enhancements is to maximize habitat benefits while balancing infrastructure protection needs, including the new bridge piers that would be built at May Creek (which are above the existing ordinary high watermark), an existing sanitary sewer pipe that runs under the channel, and the existing sanitary sewer manhole. The conceptual design for the improvements at May Creek is under development, and will be submitted to NMFS, USFWS, other resource agencies, and the Muckleshoot Indian Tribe for review when it is finalized.

Key Project elements for the May Creek habitat enhancement include the following:

- Removal of existing angular rock and fill within the 100-year floodplain that is within WSDOT right of way. Rock would remain in place where it is necessary to protect-in-place the King County sanitary sewer May Creek Interceptor.

- The bridge abutments would provide a minimum of 5 feet between the southern abutment and the 100-year water surface elevation.
- The existing piers (currently set at approximately 65 feet apart) would be removed and replaced with two single span bridges.
- The Project would be designed in accordance with the Integrated Streambank Protection Guidelines and would evaluate the constraints of large woody debris placement under an urban freeway bridge within limited right of way.
- The design incorporates increased floodplain width and reduced abutment slopes under the bridge. The widened floodplain would reduce flow velocities during larger storm events.
- Appropriate riparian plantings will be provided upstream and downstream of the bridge crossing within the WSDOT right of way.
- A 6-foot-wide space under the bridge would provide for a future City of Renton pedestrian trail, which is planned for construction at a later time. There would be a minimum of 5 feet between the edge of the pedestrian trail and the 100-year water surface elevation.

Construction activities that could affect fish and stream habitat include the following:

- Filling and grading
- Removing stream-side vegetation
- In-water construction for culvert replacement

At May Creek, no in-water work would be done. Work would be conducted from the streambank, and no pile driving would occur in the creek.

Terrestrial Resources

The Project would permanently remove approximately 77 acres of vegetation and would temporarily remove approximately 48 acres of vegetation that would be revegetated after construction. As noted, most of the study area has been developed as residential areas and commercial and industrial centers. These areas provide little or poor

habitat for most animals, except those adapted to urban areas. The vegetation in these areas consists of weedy or landscaped vegetation with some disturbed mixed forest. Temporary construction effects include possible disturbance to wildlife from construction noise and temporary habitat loss due to vegetation clearing.

Threatened and Endangered Species

ESA consultation for this Project has a long history, since this Project would construct elements of both the TRIP and the Renton to Bellevue Project. A summary of ESA consultations conducted is provided below.

Tukwila to Renton Improvement Project

In 2007, the FHWA submitted a BA to the NMFS requesting formal consultation for the southern portion of the Project (MP 0 to 4.0) I-405, TRIP I-5 to SR 169. On March 3, 2008 the NMFS and the USFWS issued a joint Biological Opinion (BiOp) (NMFS Tracking No: 2007/04219, USFWS Ref. No. 13410-2007-F-0416) and Incidental Take Statement (ITS) for adverse effects on Puget Sound Chinook salmon and Puget Sound steelhead, under NMFS jurisdiction and bull trout and bull trout critical habitat under USFWS jurisdiction. At that time, the NMFS also determined that the TRIP as proposed was likely to adversely affect designated critical habitat for Puget Sound Chinook salmon; and was also likely to adversely affect Pacific salmon essential fish habitat (EFH). Similarly, USFWS determined the TRIP would adversely affect bull trout critical habitat.

Puget Sound steelhead critical habitat had not yet been designated in 2007 and therefore was not evaluated. Since the original biological assessment was submitted and the BiOp issued in 2008, WSDOT constructed previously funded portions of the TRIP included in the initial consultation. The TRIP Stage 1 Project, was constructed between 2008 and 2011, as described in the original biological assessment. An additional stage of the TRIP Stage 2 Project, was included in the consultation, but not funded until 2015. A biological assessment update and re-initiation for that construction stage of the TRIP was completed with the USFWS and a concurrence letter was issued dated August 12, 2015 (USFWS Ref. 01EWF00-2015-I0636).

As part of the 2015 Connecting Washington legislative package, the WSDOT received the funding necessary to construct Stage 3 of the TRIP, which is evaluated in this EA. Since the initial consultation, the FHWA and WSDOT, determined that project refinements would not change the effect determinations or modify the incidental take statement provided in the original BiOp. However, because Puget Sound steelhead critical habitat was designated under the ESA in 2016, the FHWA has requested concurrence on a not likely to adversely affect determination for Puget Sound steelhead critical habitat for the TRIP Stage 3. A biological assessment update, to address design refinements, and request for consultation, to address informal effects on Puget Sound steelhead critical habitat, was submitted in January of 2017 and a concurrence letter (NMFS Tracking No. WCR-2017-6243) was issued on March 8, 2017. No new species have been listed or critical habitat has been designated since consultation was concluded earlier this year.

Renton to Bellevue Project

In 2006, the FHWA submitted a BA to NMFS requesting formal consultation for the fully configured build out of the northern portion of the Project (MP 3.8 to 11.9) I-405, Renton to Bellevue Project SR 169 to I-90 (Renton to Bellevue Project). On January 3, 2007 the NMFS issued a BiOp (NMFS Tracking No: 2006/01454) and ITS for adverse effects on Puget Sound Chinook salmon and informal effects on designated critical habitat for Puget Sound Chinook salmon. At that time, it was also concluded that the Renton to Bellevue Project would adversely affect Pacific salmon EFH and issued seven conservation recommendations to avoid, minimize, or otherwise offset potential adverse effects on EFH.

In 2007, the FHWA requested reinitiation of formal consultation for Puget Sound steelhead when they were listed as threatened under the ESA. On March 12, 2008, the NMFS issued a BiOp (NMFS Tracking No: 2007/04403) and ITS for adverse effects on Puget Sound steelhead and determined that the seven EFH conservation recommendations remained in effect. Critical habitat for Puget Sound steelhead had not yet been designated in 2007 and therefore was not evaluated. Puget Sound steelhead critical habitat was designated under the ESA in 2016. A request for reinitiation, to address informal effects on Puget Sound steelhead critical habitat, was

submitted to NMFS in November of 2017 and a concurrence letter (NMFS Tracking No. WCR-2017-8088) was received on December 11, 2017. No new species have been listed or critical habitat has been designated since consultation was concluded in December 2017.

The Renton to Bellevue Project (MP 3.8 to 11.9) was consulted on separately by USFWS. A BA was submitted to the USFWS in April 2006. USFWS issued a Letter of Concurrence addressing bald eagle, bull trout, and designated critical habitat for bull trout on November 28, 2006 (USFWS Ref. 1-3-06-I-0253). A biological assessment update was submitted to USFWS under the project name I-405 - Renton to Bellevue Project SR 169 to I-90 in April of 2016, and a concurrence letter confirming prior effect determinations and addressing Western yellow-billed cuckoo (USFWS Ref. 01EWF00-2016-I-0717) was issued on May 26, 2016. No new species have been listed or critical habitat has been designated since consultation was concluded in May 2016.

In addition, the biological assessment completed in support of the 2006 Renton to Bellevue Project EA included an EFH analysis for species regulated under a federal Fisheries Management Plan under the Magnuson-Stevens Fishery Conservation and Management Act. The only group of species with EFH in the action area are Pacific salmon. As described above, the original 2006 consultation concluded that the full build-out of the Project would have adverse effects on Pacific salmon EFH, and NMFS agreed with this conclusion in their 2007 BiOp. This conclusion remains the same, as to the anticipated mechanisms of impact, which include:

1. Entrainment of juvenile or adult fish during work area isolation resulting in injury or death.
2. Increased turbidity or sediment due to construction that will harass juvenile or adult fish out of their preferred habitat.
3. Elimination of habitat that supports juvenile fish invertebrate prey, from the temporary and permanent placement of in-water structures.
4. Death, injury, or migratory/rearing behavior modification of juvenile or adult fish from the effects of implementing the no net increase performance standard for any stormwater effluent (e.g., TSS, total

copper and zinc) discharging to the Cedar River; May, Coal, Johns, Gypsy, and Clover creeks; and the Mercer Slough wetlands and its tributaries.

5. Death, injury, or migratory/rearing behavior modification of juvenile or adult fish from the effects of implementing the performance standard in the Cedar River; May, Coal, Johns, Gypsy, and Clover creeks; and the Mercer Slough wetlands and its tributaries which removes pollutant concentrations of dissolved copper by 43 percent and dissolved zinc by over 58 percent.
6. Death, injury, or migratory/rearing behavior modification of juvenile or adult fish from the indirect effects associated with future development which could include, increased stormwater runoff, increased vegetation removal, increased sediment input, all of which will persist at varying intensities for the life of the Project.

Washington State Priority Habitats and Species

Breeding activities for bald eagles could be disrupted during construction; however, this is unlikely due to the high level of baseline disturbance around Lake Washington, the extensive presence of bald eagles in the area, and the lack of effects on suitable perches or nesting or foraging habitat. The Seattle Audubon Society recorded the presence of 72 individual bald eagles around Lake Washington on December 31, 2016. With the quantity of birds and nest sites surrounding the lake, which includes I-405 to the east, as well as the I-90 and SR 520 floating bridges, they have likely adapted to a high level of baseline disturbance, thus allowing them to continue to use pockets of habitat throughout the lake.

Consistent with the *National Bald Eagle Management Guidelines* (USFWS 2007), WSDOT would monitor bald eagle nest sites that are within 660 feet of the project footprint for use during construction periods, and coordinate with the USFWS Migratory Bird Treaty Office on potential effects on nesting eagles. In addition, WSDOT would coordinate with the USFWS Migratory Bird Treaty Office to determine whether an eagle disturbance permit is needed on a case-by-case basis.

Would the Project have other effects on ecosystems that may be delayed or distant?

Wetlands

WSDOT assessed delayed and distant effects as they relate to the loss of specific wetland functions. These may include a reduction in the habitat area available for wetland dependent wildlife and changes to wetland hydrology resulting from the Project.

Wetlands and buffers permanently affected by the Project would not be available for use by wildlife as habitat. As a result, increased competition in the remaining wetlands would likely occur because of the potential influx of displaced wildlife from the affected wetlands. The effect on wildlife populations from increased competition is difficult to predict. The likelihood and severity of delayed or distant effects caused by increased competition among wetland-dependent wildlife would be highest for wetlands with the most habitat. Similarly, in the wetlands with low wildlife habitat function, the likelihood of delayed or distant effects on wetland-dependent wildlife would be low. The severity of those effects is also likely to be low.

Aquatic Resources

WSDOT would plant a diverse assemblage of native plant species within the buffer, which, over time, would improve the overall condition of the stream buffer. Many of the existing riparian buffers in the study area are dominated by nonnative or invasive vegetation. WSDOT would replant these areas with native species if they are temporarily affected.

Establishing native species in riparian buffers would improve the quantity and quality of riparian habitat in the study area, and over time, would result in beneficial increased shade and nutrient deposition.

Terrestrial Resources

The upland habitat in the study area consists largely of weedy or landscaped vegetation with some disturbed mixed forest. The loss of vegetation could result in delayed or distant effects on wildlife habitat. There could be increased competition among wildlife for available upland habitat in the study area. Also, an increased use of remaining upland habitat by wildlife species in the study area could occur.

CHAPTER 5 CUMULATIVE EFFECTS

This chapter describes cumulative effects on environmental resource areas that could result from the construction and operation of the Project and past and reasonably foreseeable future actions.

What are cumulative effects and why do we study them?

Cumulative effects are important to consider during the evaluation of a project. While project effects may be minor when viewed in the individual context of direct and indirect effects, they can add to the effects of other actions and eventually lead to a measurable environmental change.

In 2008, WSDOT published guidance titled *Guidance on Preparing Cumulative Impact Analysis* (WSDOT 2008) on how to evaluate cumulative effects as required by NEPA. The guidance lays out the following eight-step process for identifying and assessing cumulative effects:

- Identify resources that may have cumulative impacts to consider.
- Define the study area and timeframe for each affected resource.
- Describe the current health and historical context for each resource.
- Identify direct and indirect impacts that may contribute to a cumulative impact.
- Identify other historic, current, and reasonably foreseeable actions that may affect each resource.
- Assess potential cumulative impacts to each resource; determine the magnitude and significance.
- Report the results.
- Assess and discuss potential mitigation for all adverse impacts.

WSDOT's guidance calls for assessing potential cumulative effects for all resources where direct or indirect effects have been identified.

What are cumulative effects?

The *Council on Environmental Quality's* (CEQ) regulations implement the procedural provisions of NEPA. The CEQ/NEPA regulations (40 CFR 1508.7) define cumulative effects as:

"The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions."

It is possible that some environmental resources can be negatively affected and others positively affected by the same proposed project. Cumulative effects can also be positive as well as negative, depending on the environmental resource being evaluated.

WSDOT also considers climate change as part of the cumulative effects analysis. WSDOT's guidance is found in Chapter 412; Indirect and Cumulative section of WSDOT's Environmental Manual.

How does this cumulative effects analysis relate to the I-405 Corridor Program Final EIS?

This cumulative effects analysis for the Project used the analysis in the *I-405 Corridor Program Final EIS* as a starting point. That EIS's cumulative effects analysis focused on air quality, energy, farmlands, fish and aquatic resources, surface waters, and wetlands.

This analysis looked at the resources that would be directly or indirectly affected by this Project, combined with the reasonably foreseeable future projects, and evaluated the potential for cumulative effects on each resource. The cumulative effects evaluation uses the same study areas used in assessing direct effects. In addition, WSDOT considered the information provided in the *I-405 Corridor Program Final EIS* and sought regional data and studies prepared by the Puget Sound Regional Council (PSRC). WSDOT relied on the information in the discipline-specific studies and regional and local comprehensive planning documents. Information provided about existing conditions and direct effects analyses also helped to characterize trends.

WSDOT considered the potential for cumulative impacts to all resource areas analyzed in this EA. In addition, the measures to minimize direct effects of the Build Alternative were evaluated in making the cumulative effect determination. In general, the study focused on operational effects of the proposed Build Alternative.

What is the historical and present context (including reasonably foreseeable projects) for this analysis?

We considered how the Project, in combination with past, present, and future actions, is likely to affect the natural and built environment. The Puget Sound region has experienced substantial population growth since 1960. Because of continued growth, the 2000 population of more than 3 million is projected to reach nearly 5 million by 2030.

Eastside communities that were largely rural in nature in the mid-1900s have been gradually transformed to rural/suburban and then suburban/urban. This transformation was facilitated by major transportation and infrastructure additions such as the first Lake Washington floating bridge (now I-90) connecting Seattle to the Eastside via Mercer Island, the second Lake Washington floating bridge (SR 520), and the construction of I-405 itself. Also playing a key role in the evolution was the establishment of Microsoft and other high-tech businesses along the I-405 corridor in the mid-1980s and 1990s. As a result, residential, commercial, and infrastructure development has been ongoing for decades in the I-405 corridor.

Future private development and growth in the study area is largely limited to the redevelopment of existing areas. Private redevelopment projects are underway and permitted in many locations throughout the study area. Many of these private projects are now being constructed and would be in place by the time construction of the Project begins. For example, three nine-story office towers are currently being built at the Southport mixed use area on South Lake Washington near NE Park Drive and are expected to be completed in fall of 2018 (City of Renton 2018). There are a few known private developments, such as a Residence Inn and an expansion of Merrill Gardens that would likely be under construction when Project construction begins in 2019 (City of Renton 2018). Minor capital improvement projects such as sidewalk additions, lane restriping, changes in signalization, and water and sewer line replacements are ongoing throughout the area and are not likely to result in permanent effects on resources.

Current and reasonably foreseeable actions that may contribute to a cumulative impact were identified by the

project team as projects that are planned, approved, and funded. Projects considered in this cumulative effect analysis are listed in Exhibit 5-1. These projects include mostly funded transportation projects and permitted private development.

Exhibit 5-1. Transportation Projects and Other Planned Developments Considered in this Cumulative Effects Analysis

Project	Description	Jurisdiction/Source
I-405, Downtown Bellevue Vicinity Express Toll Lanes Project (MP 11.9 to 14.6)	Construct a new northbound and southbound ETL between I-90 and NE 6th Street, convert the existing HOV lane to an ETL. Construction expected from 2019–2024.	WSDOT 2019–2024
WSDOT's Ongoing Efforts to Improve Operations of Existing Highway Facilities	As part of WSDOT's ongoing efforts to improve operational efficiencies on existing highway facilities, WSDOT would repurpose existing HOV and transit bypass lane on-ramps into metered lanes. These types of existing on-ramps are located on approximately half of the existing on-ramps on I-405 between I-5 in Tukwila and I-90. The purpose of these operational improvements would be to provide for a smoother flow of vehicles merging onto I-405 and reduce SOV ramp-meter violations (SOV drivers using HOV-dedicated ramps).	WSDOT, Ongoing
I-405 Bus Rapid Transit Improvements and Early Deliverables	As part of the Sound Transit 3 funding packaged passed by voters in 2016, Sound Transit would fund and construct improvements on the SR 518 and I-405 corridors to provide bus rapid transit service between Burien and Lynnwood by 2024. Sound Transit will work with WSDOT and FHWA to implement bus rapid transit service (Sound Transit 2017).	Sound Transit 3 (ST3) 2019–2024
West Valley Highway (I-405 to Strander Boulevard)	Design and construct completion of seven lane sections of West Valley Highway.	City of Tukwila 2017, Capital Improvement Plan, 2017–2022
Strander Boulevard Extension, Phase 3	New roadway extending Strander Boulevard/SW 27th Street from West Valley Highway to Oakesdale Avenue in the City of Renton.	City of Tukwila 2017, Capital Improvement Plan, 2017–2022, Planned completion in 2020
Development projects in Tukwila Future development includes Element by Westin Projects under construction include Holiday Inn Express, Revelle at Southcenter, Washington Place, Woodspring Suites		City of Tukwila 2018
SW 27th Street/Strander Boulevard Connection	Provides a critical four/five-lane arterial that would serve as a connector to West Valley Highway (SR 181) and East Valley Road.	City of Renton 2016, TIP 2017–2022
Lind Avenue SW – SW 16th Street to SW 43rd Street	Widen the existing roadway to five lanes where required.	City of Renton 2016, TIP 2017–2022, Reference 34

Exhibit 5-1. Transportation Projects and Other Planned Developments Considered in this Cumulative Effects Analysis

Project	Description	Jurisdiction/Source
Oakesdale Avenue SW/Monster Road SW/68th Avenue S to SR 900	Widen existing roadway to four lanes plus a two-way, left-turn lane where needed.	City of Renton 2016, TIP 2017–2022, Reference 14
S 7th Street – Rainier Avenue S to Talbot Road S	Widen the existing roadway to three lanes; build a new eastbound right-turn lane at the intersection of S 7th Street and Shattuck Avenue S and add a traffic signal at this location.	City of Renton 2016, TIP 2017–2022, Reference 15
Rainier Avenue N Corridor Improvements – Phase 5	Narrow the existing roadway from five to three lanes where feasible.	City of Renton 2016, TIP 2017–2022, Reference 38
Park Avenue N Extension	Extend Park Avenue N to the north of Logan Avenue N.	City of Renton 2016, TIP 2017–2022, Reference 9
Houser Way N – N 8th Street to Lake Washington Boulevard	Widen a one-lane roadway to a two-lane roadway.	City of Renton 2016 TIP, 2017–2022, Reference 17
Land use development projects in Renton Merrill Garden Expansion is planned for construction in 2018-2019 Projects under construction include Southport on Lake Washington, Residence Inn by Marriott, Renton Commons, Satori Elementary School, and Fire Station 15 & Reservoir		City of Renton 2018
112th Avenue SE and Bellevue way SE/SE 8th Street to I-90 Trail	Develop a 10- to 14-foot-wide multi-use pedestrian and bicycle path on the east side of 112th Avenue SE and Bellevue Way SE from SE 8th Street to 113th Ave SE (I-90 trail).	City of Bellevue 2017, 2018–2023 TIP, Reference 51
Bellevue Way/112th Avenue SE “Y” to I-90	Construct an inside HOV lane and an outside sidewalk or shoulder on southbound Bellevue Way SE between the “Y” intersection of 112th Avenue SE and Bellevue Way on the north and the main entrance to the South Bellevue Park-n-Ride on the south end.	City of Bellevue 2017, 2018–2023 TIP, Reference 17
Land use development in South Bellevue Future development includes the Market Place at Factoria, with construction beginning in spring 2019		City of Bellevue 2018

I-405 = Interstate 405; MP = milepost; ETL = express toll lane; HOV = high-occupancy vehicle; WSDOT = Washington State Department of Transportation; I-5 = Interstate 5; I-90 = Interstate 90; SR 518 = State Route 518; FHWA = Federal Highway Administration; TIP = Transportation Improvement Program

What were the results of the cumulative effects analysis?

WSDOT finds that the Project, together with past, present, and reasonably foreseeable future projects, would have minor contributions, many of which are positive, to cumulative

effects on natural and community resources in the study area, as described below.

Transportation

Over time, population increases have led to increasing congestion on highways and local roadways in the study area. Today, I-405 through the study area is congested for several hours throughout the day. The Project would directly benefit interstate, regional, and local transportation by increasing highway capacity on an increasingly congested section of the I-405 corridor. The Project would reduce travel times for travelers in both the GP and ETLs, increase the volume of traffic accommodated on I-405, reduce congestion and delay at key intersections, and improve safety performance. The Project would not alleviate all congestion on this section of I-405, but the improvements would benefit all travelers—those who use transit, carpoolers, and individual drivers. In addition, improvements proposed to the Eastside Rail Corridor Regional Trail would benefit non-motorized travelers in the area.

Project improvements, coupled with proposed transit improvements related to bus rapid transit service by the end of 2024; operational improvements to ramp meters; and planned roadway improvements identified in Exhibit 5-1, would continue to provide much-needed transportation infrastructure to support planned regional population and economic development in the study area. Indirect transportation effects associated with the Project, which include shifting traffic bottlenecks from this section of the I-405 corridor to areas either south of I-405 at SR 169 or north of I-90 to south Bellevue, are expected because traffic congestion is prevalent for many hours each day on these various routes in the Eastside. Continued targeted investments to reduce bottlenecks, increase roadway capacity, and improve transit are underway, and planning and funding efforts are ongoing to better accommodate the existing population and future planned growth.

Noise

Since the 1960s, land use in the study area has continued to shift from rural/suburban to suburban/urban development. This development has been a result of a robust regional economy and substantial increases in population since the 1960s. As land uses shift from rural to urban, human-caused

noise, including noise from transportation sources, has continued to increase over time.

This Project is not expected to contribute to a cumulative increase in noise from transportation sources because noise mitigation is being incorporated into the Project. As described above, with proposed noise walls, noise from the Project would affect 140 fewer residences than with the 2045 No Build. The noise walls constructed as part of the Project would have a small, positive contribution by reducing noise in the study area. The Project does not preclude future efforts to minimize and mitigate noise effects associated with other planned projects in the area.

Land Use and Socioeconomics

When I-405 was originally constructed in 1965, some neighborhoods were bisected by the new roadway. Since then, neighborhoods have adjusted and formed around I-405. Services and community facilities have also adjusted to the location of I-405, particularly since I-405 is the primary thoroughfare for residents and businesses on the Eastside. Population, housing, and employment have substantially grown since 2000, as described in Section 4.3, Land Use, Socioeconomics, and Environmental Justice. For example, in Renton several waterfront properties along Lake Washington have been transformed into thriving mixed-use developments with housing, commercial businesses, and retail businesses. This trend is expected to continue.

As discussed in Section 4.3, the Project would directly affect about 5.6 acres of existing commercial and residential properties by requiring five permanent displacements and partial property takes or easements at an additional 49 properties. The five displacements would convert two commercial businesses and three residential properties to transportation right of way. This land use change is expected to have a negligible contribution to communities and neighborhoods when added to other reasonably foreseeable projects in the area. Given the scale of growth and development in the study area, these property conversions would be minor in comparison to the transportation and mobility needs in the study area. For land use and socioeconomics, when coupled with other reasonably foreseeable planned roadway improvements, the Project is expected to have a positive contribution to cumulative effects

since it would provide much-needed transportation infrastructure to support planned regional population and economic development.

Environmental Justice

As discussed above and in Section 4.3, the study area has become much more populated and diverse over time. By acquiring four properties owned by individuals coming from a minority population, the Project would have a direct effect on environmental justice populations. WSDOT will mitigate for the direct effects associated with property acquisitions and displacements, so the relocations would not contribute to an adverse cumulative effect on minority populations.

The ETLs would have positive and negative direct and indirect effects on environmental justice populations in the I-405 travelshed. The ETLs would contribute to a positive cumulative effect on regional transportation and likely contribute to a negative cumulative effect on the economic burdens of low-income users of I-405. We explain how we arrived at these conclusions in the following paragraphs.

While projected job and population growth in the region is likely to increase traffic congestion, the ETLs—in conjunction with other reasonable and foreseeable transportation investments in the I-405 travelshed—would improve transportation conditions for most I-405 users, including environmental justice populations.

As described earlier in Section 4.3, the operation of ETLs would disproportionately affect low-income populations because the cost to use the ETLs would represent a higher proportion of their household income than middle- and high-income users. In combination with the trend of rising housing costs in the I-405 travelshed and Washington’s regressive tax system, the ETLs would contribute to a negative cumulative effect on economic burdens of low-income users of I-405.

Operation of the all-electronic toll system could disproportionately affect low-income populations because they are more likely than middle- and high-income populations to not have a credit or debit card, making it more difficult to use the tolling system. The operation of ETLs could disproportionately affect persons with limited English proficiency, who may have difficulty understanding and using all-electronic tolling. These effects would be offset by

improved travel times for most users of I-405. The operation of the ETLs would have an indirect effect on congestion on southbound SR 167, which would disproportionately affect environmental justice populations in the SR 167 travelshed. Note that motorists traveling on northbound SR 167 would experience faster travel times.

None of these adverse effects in combination with other current and future projects (such as transit improvements) would contribute to cumulative effects on environmental justice populations. There are state, regional, and local efforts to improve transportation and land use planning to accommodate growth and reduce negative effects on all, including environmental justice populations.

PSRC's long-term vision for the region in *VISION 2040* and *Transportation 2040* considers regional tolling on multiple highways in the Puget Sound region. Because of this, WSDOT acknowledges that more roads in the Puget Sound area may be tolled in the future and that the cumulative effects of tolls on low-income and/or minority populations would need to be analyzed appropriately as specific projects move forward.

Recreational Resources

Recreational opportunities, including parks, natural areas, and non-motorized trails, have been a long-held value of residents living in the communities surrounding I-405. Over time, neighboring communities have invested in improvements to these recreational areas, such as the May Creek Trail Coal Creek Natural Area, May Creek Greenway, and Eastside Rail Corridor Regional Trail. The Project would require a permanent acquisition of 1.03 acres of the May Creek Greenway. When combined with other reasonably foreseeable projects, this is not expected to contribute to negative cumulative effects to parks in the area. Shifting the Lake Washington Trail to the Eastside Rail Corridor would have a positive contribution to the user experience for non-motorized travelers in the area, which when combined with other reasonably foreseeable projects, would serve as a cumulative benefit to the recreational environment in the study area.

Visual Quality

Since the 1960s, the landscape has shifted from rural/suburban to suburban/urban in the study area. This has changed the visual quality over time from a landscape that had more

vegetation and less hardscape (pavement, cement, buildings, etc.) to one that is now more urban. Over time, the I-405 Program's incorporation of context sensitive solutions (CSS) guidelines, specifically the *I-405 Design Criteria*, would help to create continuity and consistency for visual quality along the I-405 corridor for elements such as bridge design, lighting, and landscape features.

The Project is expected to have a mixture of effects on visual quality in the study area. Of the ten viewpoints considered, the five following viewpoints are expected to improve or remain neutral with the proposed Project:

- View A – I-405 bridges over Cedar and Renton Avenues (from I-405)
- View B – Southbound I-405 bridge over Cedar River (from the Cedar River Trail)
- View C – Southbound I-405 bridge over May Creek (from the May Creek Trail)
- View D – Sound Transit Park-n-Ride (from the May Creek Trail)
- View F – Lake Washington Trail north of Ripley Lane

Of the five viewpoints listed above, four of them represent viewpoints from trails, which tend to have viewers that are have a higher sensitivity to possible effects. Overall, the Project is expected to improve many of the viewpoints for these more sensitive viewers.

The remaining five viewpoints would be adversely affected by the Project. Most of the adverse effects are associated with removing native vegetation and replacing it with a more urban landscape. These viewpoints include:

- View E – NE 44th Street interchange (from and toward I-405)
- Views G and H – 112th Avenue SE interchange
- Views I and J – Coal Creek Parkway

These viewpoints are located in areas of the corridor that are dedicated to transportation uses, such as local roadways, freeway overpasses, and transit facilities. When combined with other expected changes at these locations, development density may increase. Increased development density in these

areas may lead to clearing trees and native vegetation that give the area a natural character, which would add to the trend of the landscape becoming more urban.

When combined with other reasonably foreseeable future projects, the Project is expected to have a small negative contribution to the trend of the landscape becoming increasingly urban. However, the Project would contribute to an improvement for viewers using area trails, which would contribute in a positive way, especially as the area around these trails becomes more urban. Continued implementation of the *I-405 Design Criteria* in the I-405 corridor would help to create a consistent look and feel for roadway improvements in the broader area.

Water Resources

Major waterbodies in the study area were discussed in Sections 4.6, Water Resources and Section, 4.7, Ecosystems. Surface water in the area generally drains from east to west, with surface flows eventually reaching Lake Washington. The Cedar River provides about 70 percent of the water supply for the City of Seattle and surrounding metropolitan areas. The Cedar River also provides a little more than one-half of the inflow to Lake Washington. In addition to the naturally occurring streams, watercourses, and human-made drainage systems, I-405 and associated facilities contribute stormwater runoff during storm events.

Water quality, particularly in Lake Washington, has improved since the early 1960s when the lake's water quality was severely compromised by septic and sewage system discharges. The creation of the Municipality of Metropolitan Seattle and the subsequent construction of regional wastewater treatment plants in Renton and at West Point in Seattle led to the elimination of municipal wastewater discharges to Lake Washington, which resulted in a substantial improvement to the lake's water quality by the mid-1970s. Today, water quality in Lake Washington is much improved since the 1960s, despite the increase in impervious surfaces surrounding the lake and resulting runoff.

Since the 1960s, the regulatory environment for water quality has substantially changed, and regulations have been put in place at the federal, state, and local levels to regulate and manage pollutant discharges from wastewater, industrial sites,

stormwater runoff, and groundwater. This has led to increased treatment and reduced pollutant discharges over time.

When combined with other reasonably foreseeable future projects, this Project's contribution to cumulative effects on surface waters would likely be positive. Enhanced stormwater treatment will be provided for all new pollutant generating impervious surfaces (PGIS), and older I-405 stormwater systems will be retrofitted to provide treatment. The Project would retrofit approximately 51 percent of the existing stormwater system.

The Project would increase the runoff volume to the Mercer Slough wetland complex, while the I-405, Downtown Bellevue Vicinity Express Toll Lanes Project would also increase runoff to the same wetland (although they would discharge in different locations). There is potential for the combined effects of these two projects to change the wetland hydrologic period of inundation. However, the total change in impervious surface added by both projects would be negligible relative to the Mercer Slough wetland complex and the runoff volume would be within Ecology's guidelines for maintaining the hydrology in the Mercer Slough wetland complex.

Ecosystems

Wetland resources in the watersheds have continued to decline over time because of human population increases. Increases in the human population have been accompanied by the construction of homes, retail centers, and industrial facilities and the associated loss of natural landscapes, including wetlands. While environmental awareness and regulatory requirements have increased, the number, size, and function of wetlands has continued to decline. However, the rate of decline has slowed and that trend is likely to continue. The regulatory trend of attaining no net loss (at least as many acres of wetlands created as lost/filled) and improved avoidance, mitigation, and compensation measures are helping to restore wetland areas. Advanced scientific studies, refined regulatory requirements and programs, and use of adaptive management procedures would serve to further enhance the trend of restoring wetlands restoration.

For example, WSDOT and the City of Renton established Springbrook Creek Wetland and Habitat Mitigation Bank (Springbrook Bank) years ago to provide compensatory

mitigation in advance of unavoidable impacts to wetlands within portions of two watersheds: Cedar-Sammamish Watershed (WRIA 8) and the Green-Duwamish Watershed (WRIA 9). This Project is located within WRIAs 8 and 9. The Springbrook Bank consists of five units totaling 129.37 acres, which were some of the last remaining large tracts of undeveloped land in the Lower Green River Basin. The goal of Springbrook Bank is to increase wetland area and encourage improved hydrologic, water quality, and habitat functions, while facilitating environmental education opportunities.

Even though wetlands would be filled to construct the Project, when combined with other reasonably foreseeable future projects, the Project is expected provide a positive overall contribution to cumulative effects to wetlands because wetland mitigation will provide high-quality wetlands and habitats as mitigation for filling wetlands providing lower-quality functions.

As the human population and the extent of development in the study area have increased over time, the area of native vegetation has decreased and habitat for wildlife and aquatic organisms has been eliminated and/or degraded. Natural habitat alteration has taken the form of forest cover and stream-side vegetation removal, channel modification, bank armoring, dredging, removal of woody debris from streams, routing of streams through culverts, alteration of natural stream flow regimes, and construction of barriers to fish passage. These habitat changes have contributed to declining wildlife and fish populations, which in some cases have led to the species being protected by increasing regulatory oversight under the ESA. WSDOT is in the process of complying with the terms of the 2013 United States District Court injunction.

Declining populations have led to increasing regulatory protections for wildlife, aquatic species, and their habitat under federal and state laws. As described in Section 4.7, Ecosystems, several species that are listed and protected under the ESA may live in the study area.

As described Section 4.6, Water Resources, water quality is expected to improve with the Project. With proper maintenance of the stormwater treatment facilities, this should translate to beneficial effects on fish and aquatic habitat. Similarly, the Project has the potential to contribute to beneficial cumulative effects to these resources from improved

water quality and improved fish passage at five stream crossings.

Air Quality, Energy, and Greenhouse Gases

Air quality in the Central Puget Sound Region has varied since 1960. In 1978, air quality had degraded to the point that the Central Puget Sound Region was classified by the EPA as a “non-attainment area” for CO and ozone. The degradation was largely a result of the rise in vehicle miles traveled associated with increasing population and urbanization.

Air quality improved over the next two decades due to technological improvements in emissions control equipment and more stringent regulations. This improvement enabled the EPA to redesignate the region as a “maintenance area” for CO and ozone in 1996. As described in the *I-405 Corridor Program Final EIS*, during that same two-decade period, freeway lane miles increased by approximately 50 percent while the region-wide vehicle miles traveled grew by approximately 200 percent. From 1970 to 1999, the average daily traffic on I-405 north of I-90 increased nearly 500 percent.

Because travel demand has exceeded the capacity of the roadway and transit network, the congestion on all highways, including I-405, has continued to worsen. Transportation improvements such as the Project would help to decrease congestion. As described at the beginning of Section 4 under the Air Quality, Energy, and Greenhouse Gases subsections, air emissions are expected to continue to decrease between now and 2045 due to improved vehicle technology, which would continue the trend of improved air quality in the region. The Project would have similar emissions to the No Build, but both the Project and No Build are expected to continue to decrease compared to existing conditions and, therefore, would not contribute to a cumulative effect.

Geology and Soils

The study area is located along the west facing slopes of a glacially carved trough that contains Lake Washington. Human activities over the last several decades have changed the topography of the area through cutting, filling, and moving soils to make way for increasingly dense urban development. The original construction of I-405, as well as past projects to improve I-405, excavated areas to create bridge footings and facilitate connections with local streets. The

Project would continue this development trend by requiring cut and fill as part of construction. When combined with other reasonably foreseeable future projects, proposed cut and fill associated with the Project would not substantially alter the topography in the study area and would be consistent with current development trends that require soil excavation as development density increases. The Project is expected to contribute to a negligible cumulative effect on changes to topography in the study area.

Hazardous Materials

As discussed above regarding land use, since the 1960s the density of development in the study area has increased, making developable land harder to find. As the population and density in the area has increased, many federal and state regulatory programs have been put in place since the 1960s to regulate and require cleanup of hazardous materials on properties affected by past and present industrial and commercial operations. Over the past few decades, properties with known hazardous materials contamination in the study area have been cleaned up as part of required site remediation and various redevelopment efforts. Stricter regulations on hazardous materials management, cleanup, and overall development have resulted in a current landscape that has fewer contaminated sites, which has a positive contribution on human health, water quality, the overall condition of area soils, and the health of wildlife and aquatic organisms.

If hazardous materials are encountered during Project construction, or if property acquisitions are required on sites with known contamination, impacted materials disturbed as a result of construction activities will be remediated in accordance with state and federal laws. When combined with other reasonably foreseeable future projects, the Project is expected to have a small, positive contribution to the cumulative trend of removing contamination from the landscape.

Public Services and Utilities

As development intensity has increased in the study area, so has the need for public services and utilities that support the growing population. The Project would affect utility services in some areas by requiring some utilities to be moved. In other cases, proposed improvements would expand the existing stormwater conveyance and treatment system in the study

area. When combined with other reasonably foreseeable future projects, the Project is not expected to have much of a contribution to utility infrastructure in the study area, and the proposed stormwater system improvements would have a slightly positive contribution to cumulative effects.

Direct effects to public services with the Project would reduce congestion and improve travel times. These changes would benefit emergency and other service providers in the study area since they would alleviate congestion. Possible indirect effects may include increased congestion during the evening peak period on southbound SR 167 and changes in trip patterns in south Bellevue. These indirect effects may have a slightly negative contribution to increased congestion in areas outside of the I-405 corridor. When combined with other reasonably foreseeable future projects, the net cumulative effect to public service providers should be positive because the Project would reduce congestion.

How were potential climate change and extreme weather risks considered and addressed?

All of WSDOT's major capital projects undergoing environmental review consider climate change and extreme weather events as part of WSDOT's 2014–2017 strategic plan commitment. The project team examined available information about climate trends and the results of WSDOT's assessment of vulnerable infrastructure (WSDOT 2011), which shows the section of I-405 in the study area to be moderately vulnerable to climate-related threats. The study area may experience extreme wind, rain, and snow storms and more days of extreme heat.

The Project includes several features that would improve the resiliency of I-405 by reducing localized flooding and improving floodplain function. As reported in Section 4.6, Water Resources, the Project would add a new storm drainage system and improve water crossing near NE 44th Street in Renton, where flooding has been an ongoing issue. The use of nature-based solutions—like media filter drains, compost amended biofiltration swales, and flow diversion to the Mercer Slough wetland complex—would help make the new facility more climate-ready for temperature changes. The improved conditions for fish passage near the NE 44th Street

interchange and riparian enhancement at May Creek are likely to increase the resilience to changes in annual and severe precipitation.

WSDOT is active in statewide and regional efforts to reduce greenhouse gas emissions and improve multimodal choices. The Project would improve transit reliability and pedestrian and bicycle facilities. Greenhouse gas emissions related to operation of the Project would not be measurably different from the No Build and, therefore, would not contribute to a cumulative effect.

What would be the potential cumulative effects associated with No Build?

If the Project were not built, improvements and enhancements associated with the Project would be built, and there would be no ETLs on this section of I-405. There would be no relief to traffic congestion, and as a result, the rate of localized air quality degradation could increase. The increased traffic volumes expected with the No Build Alternative would reduce travel speeds, extend the traffic bottlenecks that already occur, and negatively affect transit reliability and travel times.

Transit service would continue to operate primarily in the existing I-405 HOV lanes between Renton and Bellevue. Due to congestion in the HOV lanes, Sound Transit would likely not be able to meet travel times and reliability standards for bus rapid transit service and would need to evaluate this impact on planned bus rapid transit service. Improvements to stormwater treatment systems would not be made, and those benefits would not be realized.

Are measures proposed to avoid or minimize cumulative effects?

No measures, beyond those incorporated in the Project design or listed in Chapter 6, Measures to Avoid or Minimize Effects, are proposed.

CHAPTER 6 MEASURES TO AVOID OR MINIMIZE EFFECTS

This chapter describes the established design and construction practices that WSDOT will include to avoid or minimize effects on the various environmental resources during both the construction and operation phases of the Project. We will use best management practices (BMPs), WSDOT Standard Specifications, and design elements to avoid or minimize potential effects on the environment from the Project. We refer to measures that avoid or minimize potential effects on the environment as “avoidance measures.” If the Project has additional effects not addressed in the avoidance measures, we will address these effects through mitigation.

What measures will WSDOT use to avoid or minimize construction effects?

Transportation

- Existing capacity on I-405 will be maintained during construction activities to the extent possible. Lane or roadway closures will be minimized and scheduled to occur when there is the least effect on traffic within the project corridor, such as overnight and weekend time periods.
- Pedestrian and bicycle circulation will be maintained as much as possible during construction. For any road, bicycle lane, and/or sidewalk closure, clearly marked detours will be provided.
- WSDOT will prepare a Traffic Management Plan (TMP) before making any changes to the traffic flow. We will advise the public, school districts, and emergency service providers of the changes ahead of time through a public information process.
- Prior to and during construction, WSDOT will implement strategies to manage the demand on transportation infrastructure. These transportation demand management strategies, such as support for the use of carpools, vanpools, and public transportation programs, will form an important part of the construction management program and will be

What are WSDOT Standard Specifications?

Standard specifications are required materials and procedures established by WSDOT for roadway construction.

What are best management practices?

BMPs are generally accepted techniques that, when used alone or in combination, prevent or reduce adverse effects of a project. Examples include erosion control measures and construction management to minimize traffic disruption.

aimed at increasing public awareness of their travel options in the corridor.

Noise

To reduce construction noise at nearby receptors (such as nearby residences), the following measures will be incorporated, where practicable, into construction plans and specifications:

- As construction is taking place in a specific area, if possible, WSDOT will construct proposed noise walls and barriers before other construction activities.
- WSDOT will equip construction equipment engines with mufflers, intake silencers, and engine enclosures, as appropriate.
- WSDOT will turn off construction equipment during prolonged periods of non-use to reduce noise.
- WSDOT will locate stationary equipment away from receiving properties to decrease noise.
- WSDOT will maintain all equipment and train their equipment operators in good practices to reduce noise levels.
- WSDOT will use Occupational Safety and Health Act approved ambient sound-sensing backup alarms that could reduce disturbances from backup alarms during quieter periods.

Land Use and Socioeconomics

Communities and Neighborhoods

- WSDOT will prepare and implement a TMP. If local streets must be temporarily closed during construction, detour routes will be provided and clearly marked with signs.
- WSDOT will coordinate with school districts before construction. The TMP will be implemented and coordinated with all emergency services organizations prior to any construction activity.
- WSDOT will coordinate with utility providers prior to construction to identify conflicts and resolve the conflicts before or during construction.

- WSDOT will coordinate with City officials/staff regarding citywide special events. Within Renton, this would include Renton River Days, Clam Lights, and limited hydroplane racing.

Businesses

- WSDOT will maintain access to businesses throughout the construction period.
- Because it can be difficult to determine whether a business is open, or how to access the site during the construction period, WSDOT will make provisions for posting appropriate signs to communicate the necessary information to potential customers.
- WSDOT will keep daytime street closures to a minimum.

Property Acquisition/Displacements

- In those situations where it is necessary to acquire property, WSDOT will conform to the requirements set forth in accordance with the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended and implemented by FHWA under 49 CFR Part 24, and according to Chapter 468-100 WAC Uniform Relocation and Assistance and Real Property Acquisition. This will ensure just compensation for all properties and minimize any adverse effect on the current owners and residents. Relocation resources are available, without discrimination, to all eligible residents and businesses.
- WSDOT will prepare a relocation plan in advance of actual displacements. Additional information will be collected, possibly through property owner interviews, to identify the specific needs of any residences and business that will be relocated.

Environmental Justice

We did not identify any construction effects from the Project that would have a disproportionately high and adverse effect on environmental justice populations. However, WSDOT will continue to conduct targeted outreach to minority populations, low-income populations, and persons with limited English proficiency in the study area and I-405 travelshed before and during construction. The following

measures are part of WSDOT's commitment to public involvement for the Project:

- Translate project materials about construction effects if requested.
- Work with transit providers on Project materials about transit re-routes and temporary closures of transit stops.
- During Project design, translate the EA informational handout, the postcard informing the public of the EA public comment period, and other information deemed critical into Spanish and provide Spanish-language interpreters at the EA public hearing in the Renton area.
- Distribute Project materials—especially prior to construction-related closures that would affect motorists and transit riders—through social service agencies, Crossroads Mini-City Hall, community-based organizations, libraries, community groups, and schools.

Recreational, Section 4(f), and Section 6(f) Resources

- WSDOT will coordinate construction activities as needed with the City of Renton at Cedar River Park, Ron Regis Park, Cedar River Trail, Gene Coulon Memorial Beach Park, and May Creek Greenway. At Newcastle Beach Park, WSDOT will coordinate construction activities with the City of Bellevue.
- Use of the Cedar River Trail will be provided during construction. At times, trail users may be detoured to a temporary trail that would be located near the existing trail within WSDOT right of way. Flaggers may be used as necessary to manage trail detours.

Visual Quality

- During construction, visual impacts can be reduced by locating material and equipment storage/staging in areas that are not prominent. Light and glare effects can be reduced by shielding freeway lighting and using downcast lighting so light sources (e.g., light bulbs) are not directly visible from residential areas and local streets.

- Visual effects during construction can further be reduced by restoring areas as work in each area is completed, rather than waiting until all roadway construction is done. By restoring completed areas right away, portions of the I-405 corridor will be returned to permanent landscapes sooner.
- Common signs and public notices with clear directions will be used to enhance visual interest.

Water Resources

- WSDOT will protect groundwater with the use of standard BMPs.
- WSDOT will prepare and implement a temporary erosion and sediment control (TESC) plan and a spill prevention control and countermeasures (SPCC) plan. The SPCC plan will include provision for an environmental compliance assurance inspector to be present during project construction within the sole source aquifer to monitor groundwater quality, storage of hazardous substances and chemical use practices, and the containment of hazardous chemicals, as appropriate.
- WSDOT will protect Renton's sole source aquifer from Project impacts when working in aquifer protection areas (APA) Zones 1 and 2. As appropriate, when working in APA Zones 1 and 2, WSDOT will comply with the following sections of the Renton Municipal Code (RMC), as appropriate: Section 4-4-030, Development Guidelines and Regulations – General; Section 4-4-060, Grading, Excavation, and Mining Regulations; Section 4-9-015, APA Permits; and, Section 4-3-050, Critical Areas Regulations.
- Stormwater flow control and runoff treatment facilities located in the City of Renton's APA Zone will be designed to satisfy the requirements of the City's APA, including prevention of stormwater infiltration. Pipelines will be impervious and designed according to pipeline specifications in the RMC 4-3-050H.6.
- WSDOT will identify and develop staging areas for equipment repair and maintenance away from all drainage courses, according to environmental permit requirements, and outside of the City of Renton's APA

Zone 1. In APA Zones 1 and 2, washout of concrete trucks will not be allowed to infiltrate the ground, and wastewater from vehicle and equipment washing will be disposed to the sanitary sewer

- WSDOT will ensure that fuel and chemical storage, fueling operations for construction vehicles, and equipment during construction are located within secondary containment areas. These areas will be surfaced with an impermeable material and sized to contain the volume of stored fuel and/or chemicals. The SPCC Plan will specify that storage of fuels and toxic materials can only take place away from drainage courses and outside of APA Zone 1. The SPCC Plan will also specify measures to be taken in the event of a spill.
- WSDOT will locate spill response equipment at regular and specified intervals along the project alignment.
- WSDOT will conduct construction within the City of Renton's APA Zones 1 and 2 in compliance with the Washington State Wellhead Protection requirements outlined in WAC 246-290-135(4), RMC 4-3-050 C and H, and RMC 4-9-015.
- During construction, WSDOT will conduct groundwater monitoring and sampling to assess project effects on the aquifer and water quality. In the event of a spill that cannot be mitigated by excavating contaminated soil, WSDOT will conduct groundwater monitoring to monitor for spills that can affect the Cedar Valley sole source aquifer. If necessary, existing City of Renton monitoring wells can be supplemented with additional monitoring wells at key locations and used for monitoring water quality during construction activities in the APA Zone 1. If monitoring indicates there are impacts on the City's water supply, mitigation measures and design elements would be identified as required by WAC 246-290-135.

Ecosystems

Wetlands and Streams

- WSDOT will protect, preserve, and enhance wetlands in the study area during the planning, construction, and operation of transportation facilities and projects,

consistent with United States Department of Transportation (USDOT) Order 5660. 1A, Executive Order 11990, Governor's Executive Order 89-10, and Executive Order 90-94.

- WSDOT will use fencing to clearly mark wetlands in the construction areas that are to be avoided.
- WSDOT will implement avoidance measures to reduce temporal losses of wetland functions prior to creating wetlands. Project-level design and environmental review will include avoidance, minimization, restoration, and mitigation for wetland impacts. Temporary construction impacts will be mitigated in accordance with local critical area ordinances.
- WSDOT will meet local, state, and federal permit requirements.

Aquatic Resources

- WSDOT will implement construction BMPs (such as silt fencing or sedimentation ponds) to avoid disturbing sensitive natural areas.
- As described above for water resources, WSDOT will prepare and implement a TESC plan and an SPCC plan to avoid and minimize effects on water quality during construction.
- Five existing stream culverts will be replaced with new fish-friendly structures.

Terrestrial Resources

- WSDOT will prepare and implement a revegetation plan. When WSDOT permanently removes vegetation for roadway construction, it will be replaced with native vegetation within or in the vicinity of the study area, if possible.

Threatened and Endangered Species

- WSDOT will adhere to conditions identified in the Biological Assessment and agency concurrence letters.
- WSDOT will continue to work with tribal, federal, state, and local authorities to determine mitigation that best offsets impacts on the fish species affected by the Project.

Air Quality, Energy, and Greenhouse Gases

The construction contractor will be contractually obligated to control fugitive dust in accordance with the Memorandum of Agreement between WSDOT and Puget Sound Clean Air Agency Regarding Control of Fugitive Dust from Construction Projects.

The following measures would be used to control dispersion of dust (PM₁₀ and PM_{2.5}), transmission of particulate matter, and emissions of carbon monoxide (CO), oxides of nitrogen (NO_x) and volatile organic compounds (VOCs) during construction:

- WSDOT will encourage contractors to use newer construction equipment and maintain all equipment in good mechanical condition to minimize exhaust emissions.
- WSDOT will assess the viability of carpooling, commute trip reduction, and other transportation demand management programs for construction workers.
- WSDOT will stage construction between other I-405 transportation projects to minimize congestion that contributes to regional emissions of pollutants during construction.
- WSDOT will encourage contractors to reduce construction truck idling.
- Where possible, WSDOT will locate construction equipment and staging areas away from sensitive receptors such as fresh air intakes to buildings, air conditioners, and sensitive populations such as the elderly and the young.
- WSDOT will spray exposed soil with water or other suppressant as needed to minimize emissions of PM₁₀ and reduce deposition of particulate matter.
- WSDOT will cover all loads in trucks transporting materials, wet materials in trucks, or provide adequate freeboard (space from the top of the material to the top of the truck bed) to minimize PM₁₀ and deposition of particulates during transportation.

- WSDOT will provide wheel washers to remove particulate matter that would otherwise be carried off site by vehicles to decrease deposition of particulate matter on area roadways.
- WSDOT will remove particulate matter deposited on paved public roads, sidewalks, and bicycle and pedestrian paths to reduce mud and dust.
- WSDOT will cover and stabilize construction-site dirt, gravel, and debris piles, as needed, to minimize dust and wind-blown debris. This may include using wind fencing to reduce soil disturbance.
- WSDOT will restrict the speed of construction vehicles when operating in areas of exposed earth.
- WSDOT will route and schedule construction trucks to reduce delays to traffic during peak travel times to minimize air quality effects caused by a reduction in traffic speeds.

Historic, Cultural, and Archaeological Resources

- WSDOT will prepare an Inadvertent Discovery Plan for the Project that construction contractors will follow.
- The I-405 Program has a programmatic agreement regarding the Section 106 process. This programmatic agreement puts into place a process for integrating the design-build approach with Section 106 obligations.

Geology and Soils

Seismicity

- WSDOT will design project elements to the American Association of State Highway and Transportation Officials (AASHTO) design standards.
- WSDOT will implement design methods that meet the AASHTO's design event and limit susceptibility to collapse under an unlikely larger event.

Liquefaction-Prone Areas

- WSDOT will identify Project areas where liquefaction-prone soils may be located.
- WSDOT will evaluate the potential effects on Project structures from liquefaction, if structures underlain by liquefaction-prone soils are identified.

- WSDOT will use appropriate measures to reduce long-term liquefaction and lateral spreading risks to Project elements if it is determined that liquefaction risks are unacceptable. Such mitigation might include soil densification such as stone columns, vibratory compaction, compaction grouting, and dynamic compaction. Liquefaction potential along the Project alignment is assessed as low and moderate to high.

Soft Ground Areas

- WSDOT will take appropriate measures to assess and reduce potential settlement problems associated with existing utilities or structures in Project areas underlain by soft, compressible soil. If deemed necessary, structures could be underpinned and utilities relocated or made more flexible. In cases where settlement exceeds WSDOT allowable tolerances and the settlement is allowed any repairs as needed will be made after the settlement is complete. Where soft ground areas are identified, WSDOT will conduct preconstruction surveys and monitor construction settlements.
- WSDOT will assess the potential for settlement for structures and embankments underlain by soft, compressible soil. If the potential for settlement is unacceptable, WSDOT will design the structures and embankments to accommodate or avoid the settlement, such as deep foundations for structures or surcharge fills for embankments.
- WSDOT will develop the means and methods to avoid or minimize settlement resulting from construction vibrations in areas underlain by soft or loose soils.

Slope Stability and Landslide Areas

- WSDOT will develop appropriate construction procedures to maintain or enhance slope stability in areas underlain by landslides or with landslide-prone geology. The design through these areas will include suitable wall types such as soldier piles with tiebacks, possibly supplemented with enhanced drainage such as improved surface drainage or horizontal drains.
- WSDOT will drain suspected or observed seepage in Project areas to reduce the risk of landslide and surface

sloughing through the use of gravel drainage blankets, French drains, horizontal drains, placement of a surface rock facing, or other methods.

Dewatering

- WSDOT will use properly designed, installed, and operated dewatering systems as dewatering for utility trenches can induce ground settlement in areas of soft compressible soils. This might include sheet pile cut-off shoring, recharge wells, a settlement and groundwater level monitoring system, and other procedures. We understand that complete elimination of settlement in proximity to excavations can be difficult, particularly if loose granular soils are densified by installing sheet piles.
- WSDOT will control dewatering discharge to avoid adverse effects. If dewatering occurs in contaminated ground, discharge into storm drains or adjacent surface drainages could affect water quality. This condition is normally mitigated by disposing the discharge in a sanitary sewer or performing on-site treatment.

Erosion

- WSDOT will prepare and implement a TESC Plan to minimize erosion and protect water quality.
- WSDOT will take additional action to minimize erosion, maintain water quality, and achieve the intended environmental performance, should any BMP or other operation not function as intended.

Earthworks

- WSDOT will control dust through the use of a water truck or other dust control measures (see Air Quality, Energy, and Greenhouse Gases above).
- WSDOT will also control soil tracked onto nearby surface streets from truck tires.
- WSDOT will place and maintain stockpiles properly to avoid erosion or slope stability problems. Erosion control of stockpiles will be included in the TESC plan.

Permanent Drainage Systems for Cut Slopes

- WSDOT will locate areas where permanent drainage will be required by site conditions for cut slopes. If

local private groundwater users or down-gradient wetlands and spring water right holders could become affected by drawdown of the groundwater table from these drain systems, these effects shall be avoided on a site-specific basis by designing the permanent drainage system to recharge or replenish the down-gradient water table.

Hazardous Materials

Known or Suspected Contamination within the Project Right of Way

- WSDOT will prepare an SPCC Plan that will provide specific guidance for managing potentially hazardous materials brought on to and/or generated on site.
- Prior to construction, WSDOT will conduct a Good Faith asbestos and hazardous materials survey, completed by an Asbestos Hazard Emergency Response Act certified building inspector. This includes all structures and/or facilities that will be renovated or demolished within the study area.
- If WSDOT's contractor encounters a known or unanticipated underground storage tank within the study area, WSDOT will assume responsibility and provide oversight for the underground storage tank decommissioning, clean up, and disposal activities.
- WSDOT's contractor will dispose of all waste material at approved disposal facilities.
- WSDOT's contractor will prepare (when required) a comprehensive hazardous substance contingency management plan, and a worker health and safety plan to reduce potential risks to human health and the environment.
- WSDOT will prepare a stormwater pollution prevention plan (when required) to prevent the release of contamination and hazardous substances to the environment.

Unanticipated Contamination Encountered within the Project Right of Way

- Unanticipated contamination discovered within the study area, will be addressed by contract language, General Special Provisions and/or special provisions.

Public Services and Utilities

- WSDOT will prepare and implement a TMP.
- WSDOT will post signs to show detour routes if periods of closures are needed.
- WSDOT will coordinate with school districts before construction.
- WSDOT will coordinate with all emergency services prior to or during construction.
- WSDOT will coordinate with utility providers to identify and resolve conflicts prior to or during construction.

What measures will WSDOT use to avoid or minimize operational effects?

Noise

WSDOT will construct new noise walls at four locations. We will also relocate two existing noise walls at or closer to the edge of the I-405 right of way.

Environmental Justice

Although the three full residential property acquisitions have already taken place based on the completed NEPA process for the previously approved Renton to Bellevue Project in 2008, this EA, the must consider the effects of these acquisitions and identify mitigation if there are adverse impacts. The following mitigation was applied to minimize the effects of three residential property acquisitions and displacements associated with the Project.

- WSDOT conducts property acquisition in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended and implemented by FHWA under 49 CFR, Part 24, and according to Chapter 468-100 WAC Uniform Relocation and Assistance and Real Property Acquisition. This ensures just compensation for all properties and a minimal adverse effect on the current owners and residents.
- WSDOT offers interpretation and translation services to property owners and tenants with limited English proficiency to ensure they understand the property

acquisition process and are able to fully participate in negotiations. The property owner who has limited English proficiency engaged their own representative, a bilingual realtor, for translation and interpretation.

WSDOT took the following steps to minimize adverse effects on the three displaced households:

- Collected information to identify the specific needs of any residents to be relocated and prepared a relocation plan in advance of actual displacements.
- Made relocation resources available, without discrimination, to all eligible residential relocates.
- Ensured there was at least one comparable replacement property available to relocate. All three displaced families relocated to comparable homes in the same neighborhood as the homes that were purchased by WSDOT.
- Reimbursed the displaced families for certain costs, including the difference between the cost of the current dwelling and the cost of the comparable replacement.

One of the commercial properties that WSDOT is fully acquiring is owned by a person who identifies as minority. WSDOT is mitigating for the effects by conducting the property acquisition in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended and implemented by FHWA under 49 CFR 24, and according to WAC 468-100 (the Uniform Relocation and Assistance and Real Property Acquisition). This ensures just compensation for all properties and a minimal adverse effect on the current owners and commercial tenants.

WSDOT is implementing the following mitigation measures to minimize the effects of the displacement of the restaurant owned by a person who identifies as minority.

- Preparing a relocation plan. WSDOT has met with the tenant who owns the affected commercial displacement to discuss their needs specific to relocation. At the time of publication, the owner of the business, a restaurant, had decided to relocate the restaurant to Tumwater, Washington, about 40 miles from the current location.

- Collecting information to identify the specific needs of the affected restaurant.
- Paying for the costs of relocating all personal property. As the affected property is a restaurant, some equipment cannot be relocated or requires major reconfiguration to fit in a new space. In that case, WSDOT will pay to replace the property that cannot be moved or reconfigured.
- Providing up to \$2,500 to pay for time invested in searching for an appropriate replacement site.
- Consistent with the Uniform Relocation and Assistance and Real Property Acquisition policy pay for permitting, site feasibility studies, and other costs associated with relocating to a new site.
- Consistent with the Uniform Relocation and Assistance and Real Property Acquisition policy support reestablishment in a new location.

WSDOT is not providing mitigation for the 26 restaurant employees who would likely lose their jobs because of the relocation to Tumwater, Washington.

For the residential property owners affected by partial acquisitions and permanent easements, WSDOT is taking the following measures to minimize adverse impacts:

- Conduct property acquisition in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, to ensure just compensation for all properties and a minimal adverse effect on the current owners and residents.
- WSDOT provides access to interpretation and translation for owners who need language assistance to participate in negotiations upon request. According to the agents who are working with property owners during the acquisition process, one property owners who speaks English as a second language chose to use their own representatives to assist them communication
- For the four residential property owners who will lose a portion of their yards and have the highway closer to their properties, WSDOT has approved a noise wall for

that location, which will reduce the noise impacts compared to existing conditions.

- WSDOT offered these four residential property owners the option to sell their entire properties to WSDOT at fair market value. All four residential property owners declined this option.
- WSDOT will provide temporary relocation to the two property owners who will experience short-term disruption in their sewer service.

For the commercial property owners affected by partial acquisitions and permanent easements, WSDOT is conducting property acquisition in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, to ensure just compensation for all properties and a minimal adverse effect on the current owners and tenants. In cases where WSDOT is rebuilding driveway access to tie into the newly rebuilt street at NE 44th Street, WSDOT would maintain access to all buildings during construction.

Although there is no need for additional mitigation, WSDOT will continue to conduct targeted outreach to engage minority populations, low-income populations, and persons with limited English proficiency in the study area and I-405 travelshed. Ongoing public involvement activities when the Project is complete will include the following measures:

- Maintaining ongoing communications with community-based organizations and social service providers throughout design of the Project, and scheduling briefings with them at Project milestones.
- Distributing Project materials through social service agencies, community-based organizations, libraries, community groups, and schools and host booths at community events in the study area.
- Planning and implementing a public information campaign in multiple languages to explain ETLs, how to obtain a *Good To Go!* pass, and how to set up an account, with the goal of increasing the proportion of passholders who identify as minority, have low incomes, or are persons with limited English proficiency.

- Including information about how to use the ETLs in Spanish and other languages, if requested, as part of the public information campaign, such as how to enter and exit the lanes, how to determine the cost, and how to obtain a free *Good To Go!* pass for carpools.
- Conducting outreach about the Project and ETLs at community fairs and festivals, including events at Bellevue's Crossroads Mini-City Hall, in one of the Eastside's most ethnically and linguistically diverse neighborhoods.
- Conducting media outreach, specifically with ethnic media outlets serving the study area.

To reduce possible barriers to obtaining and maintaining a *Good To Go!* account for persons who have low-incomes or who do not have access to credit or debit cards:

- WSDOT will continue to offer the option for low-income persons who are eligible for public benefits to use their Electronic Benefit Transfer cards to open and maintain their *Good To Go!* accounts.
- WSDOT is working to expand the network of retail location where people can buy *Good To Go!* passes with cash, making it easier for people to purchase a pass without a bank account.

The Project would exacerbate congestion on southbound SR 167, and WSDOT has identified a project in the SR 167 corridor that would address this congestion. An auxiliary lane to southbound SR 167 between the SR 516 interchange southbound on-ramp and the S 277th Street interchange southbound off-ramp could help reduce congestion on SR 167. This project is currently unfunded.

Recreational, Section 4(f), and Section 6 (f) Resources

To mitigate for the unavoidable use of the Fawcett property and temporary occupancy of the Meadow property, WSDOT and the City of Renton have entered into an interlocal agreement. The purpose of this agreement is to set the terms by which WSDOT will pay for the design, permitting, and construction of a segment of the May Creek Trail. A letter of intent documenting the City's understanding of WSDOT's intent to mitigate effects on the two Section 4(f) properties and

the respective commitments of WSDOT is summarized below. A copy of the City's concurrence, letter of intent, and the interlocal agreement is provided in Attachment I, *Recreational, Section 4(f), and Section 6(f) Technical Memorandum*, Appendix B, and Attachment M, Agency and Tribal Correspondence.

Fawcett Property

- WSDOT will reimburse King County for the grant money used by the City of Renton to purchase the portion of the property affected by the Project, contingent upon King County's approval.
- WSDOT will reimburse the City of Renton for all costs associated with designing, permitting (including environmental review), constructing, and observing the construction of an 8-foot-wide soft surface trail and accessory components, and associated mitigation connecting from the existing soft surface May Creek Trail on the west side of I-405 easterly underneath I-405 to Jones Avenue NE (the trail segment).
- WSDOT will secure a trail lease for the City of Renton within WSDOT right of way for the trail segment.
- WSDOT will incorporate the design of the trail segment into the Project.

Meadow Property

- WSDOT will restore the property to original or better condition prior to Project completion, including relocating and restoring any disturbed utilities. WSDOT acknowledges and agrees that mitigation for temporary effects will be evaluated through the shoreline and critical areas permit(s) and will likely address plant establishment and mitigation for tree effects. Mitigation will be at WSDOT's cost.
- With the City of Renton's assistance and cooperation, WSDOT shall design, permit, relocate, and connect existing underground utilities serving the prior property owner to maintain existing or better service, with all work incurred and costs paid for by WSDOT.

Visual Quality

- The Project is being planned, developed, and designed in accordance with context sensitive solutions (CSS) guidelines. These guidelines provide an approach that

incorporates community values and improves compatibility of the transportation facility with the communities and neighborhoods through which it passes. CSS also meets local, regional, and national requirements for the safe, efficient, effective movement of people and goods. CSS consider the elements of mobility, safety, environment, and attractiveness throughout the Project (including construction and operation). Adhering to these guidelines, the Project is being developed to fit its physical surroundings and to preserve scenic, visual, historic, and environmental resources.

- The application of CSS guidelines precludes the need to further mitigate visual impacts. Because the Project is being developed with local input, community concerns relating to appearance, environment, cultural resources, and other areas are being addressed early. Mitigation measures typical for transportation projects, such as retaining existing natural vegetation and planting new vegetation to screen manmade elements, are incorporated within the highway and related transportation features. Other areas subject to CSS include structural elements, landscape features, lighting, and signage. WSDOT will mitigate for visual quality impacts from the increase in manmade structures by adhering to the aesthetic treatments described in the *I-405 Urban Design Criteria* (WSDOT 2016a), which were developed with extensive community and stakeholder input. For Project elements that WSDOT is developing jointly with Sound Transit, Sound Transit and WSDOT will work together to meet the intent of the *I-405 Urban Design Criteria*. These elements include the park-and-ride lot and inline transit station at NE 44th Street and the inline transit station at 112th Avenue SE. Lighting at the transit stations would use fixtures with hoods to minimize light pollution.

Water Resources

- WSDOT will ensure that fuel and chemical spills from vehicles within the Cedar Valley Sole Source Aquifer are captured and contained by the stormwater collection and detention system. The stormwater

system will detain spills in either vaults or ponds. The detention vault or pond will have shut-off capability for containing a spill or release.

- WSDOT will establish a plan in compliance with Washington State Wellhead Protection Requirements outlined in WAC 246-290-135(4) and the City of Renton Municipal Code (RMC) 4-3-050 C and H, and RMC 4-9-015 to ensure protection for the City of Renton's APA Zones 1 and 2.
- Within APA Zones 1 and 2, WSDOT will construct either a lined or piped stormwater conveyance system.
- WSDOT will ensure that the roadway and access ramps over Renton's APA Zone 1 will have berms or curbs to collect and route major spills to the stormwater collection system. The system will be constructed in accordance with City of Renton requirements for sanitary sewage facilities in APA Zone 1 areas and will be sized to contain a liquid spill from a double tanker.
- WSDOT will control stormwater so that peak and base flows of receiving waters are not adversely affected by treated stormwater discharge from the expanded impervious surface areas created by the project.

Ecosystems

Wetlands and Streams

- WSDOT will protect, preserve, and enhance wetlands in the study area during the planning, construction, and operation of transportation facilities and projects consistent with USDOT Order 5660. 1A, Executive Order 11990, and Governor's Executive Orders 89-10 and 90-94.
- WSDOT will implement avoidance measures to reduce temporal losses of wetland functions prior to creating wetlands. Project-level design and environmental review will include avoidance, minimization, restoration, and mitigation for wetland effects. WSDOT will mitigate for wetland and stream impacts at the following sites: Springbrook Creek mitigation bank and Kelsey Creek for wetland mitigation; May Creek and UNT08.LW.0283 (Gypsy Creek) for stream and

buffer mitigation; and Ron Regis Park, Median Creek, Mercer Slough for buffer mitigation. Wetland buffer effects will be mitigated in accordance with local critical area ordinances.

Aquatic Resources

- All temporary effects on streams will be restored. Permanent effects on streams will be mitigated on site whenever possible. The Project would replace five existing culverts, with fish-passable structures, which would improve fish habitat.
- WSDOT will remove stormwater from some streams and discharge it through facilities that are located, designed, and approved to minimize long-term aquatic effects by mixing with large volumes of water in Lake Washington.
- WSDOT will construct headwalls at cross-culvert inlets and outlets when appropriate to minimize the amount of grading and filling and to restore and increase long-term riparian functions at each site.

Terrestrial Resources

- WSDOT will revegetate areas in which vegetation removal will occur. This does not include areas covered by new impervious materials.
- WSDOT's ongoing maintenance of stormwater treatment and detention facilities will avoid application of any chemical weed control agents (herbicides).

Threatened and Endangered Species

- WSDOT will continue to work with tribal, federal, state, and local authorities to determine mitigation that best offsets effects on the fish species that would be affected by the Project.
- WSDOT will adhere to conditions identified in the Biological Assessment and agency concurrence letters.

CHAPTER 7 LIST OF PREPARERS

This EA document was prepared through a collaborative effort among the FHWA, WSDOT, and the I-405 project team.

Exhibit 7-1 lists the people who contributed to the information provided in the document, including their contribution, education, and years of experience.

Exhibit 7-1. List of Preparers

Name Affiliation	Project Role	Education Certifications/Licenses Professional Organizations	Years of Experience
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Jamie Strausz-Clark I-405 Team	Environmental Justice Discipline Report Lead	MA Public Policy	18
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Exhibit 7-1. List of Preparers

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ATTACHMENT K GLOSSARY

Term	Meaning
Access	The ability to enter or approach a facility or to make use of a facility.
Air quality standards	The level of pollutants prescribed by regulations that may not be exceeded during a given time in a defined area.
Ambient	Surrounding atmosphere.
Anadromous fish	A fish species that spends a part of its life cycle in the sea and returns to freshwater streams to spawn.
Area of potential effect (APE)	This is the area in which historic properties, if they are present, could be affected by a project either directly or indirectly.
Best management practices (BMPs)	BMPs are generally accepted techniques that, when used alone or in combination, prevent or reduce adverse effects of a project. Examples include erosion control measures and construction management to minimize traffic disruption.
Buffer	A designated area along and adjacent to a stream or wetland that may be regulated to control the negative effects of adjacent development on the aquatic resource.
Capacity	The maximum sustained traffic flow of a transportation facility under prevailing traffic and roadway conditions in a specified direction.
Code of Federal Regulations	The Code of Federal Regulations (CFR) is the codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the federal government. It is divided into 50 titles that represent broad areas subject to federal regulation. Each volume of the CFR is updated once each calendar year and is issued on a quarterly basis.
Conservation	Defined by the Endangered Species Act (ESA) as the use of all methods and procedures that are necessary to bring any endangered or threatened species to the point at which the measures provided pursuant to the ESA are no longer necessary.
Constructive use	A type of use in which a transportation project's proximity impacts (as opposed to direct impacts) are so severe that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are substantially impaired. Examples include excessive noise level increases, diminished aesthetic features, ecological intrusions, and other indirect impacts to the resource's environment or utility.

Context sensitive solutions (CSS)	A model for transportation project development that has recently received much discussion and broad acceptance. Its essence is that a proposed transportation project must be planned not only for its physical aspects as a road serving specific transportation objectives, but also for its effects on the aesthetic, social, economic, and environmental values, needs, constraints, and opportunities in a larger community setting.
Cultural resources	Any historic (or prehistoric) district, site, building, structure, or object that is either listed or eligible for listing on the National Register of Historic Places (NRHP). Examples include such items as artifacts, records, structures, and remains.
Cumulative effect	Effect on the environment that results from the incremental effect of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such actions. Cumulative effects can result from individually minor but collectively noticeable actions taking place over a period of time.
Delay	Increased travel time experienced by a person or a vehicle because of circumstances that impede the desirable movement of traffic.
Direct effect	Effect caused by the proposed action and occurring at the same time and place.
Dynamic pricing	Electronic monitors along the roadway measure real-time information on the speed, congestion, and number of vehicles in the ETLs. This information is used to determine whether tolls go up or down to optimize lane use. As the ETLs become congested, toll rates increase, and as congestion decreases, toll rates decrease. The use of dynamic pricing allows the lanes to operate with high volumes but avoid becoming congested.
Ecology	Washington State Department of Ecology
Ecosystem	Community of organisms interacting with each other and the environment in which they live.
Effect	Includes ecological effects (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health effects, whether direct, indirect, or cumulative. Effects may include those resulting from actions that may have both beneficial and detrimental effects, even if on balance the agency believes the effect will be beneficial.
Eligible	Refers to properties that meet the National Park Service criteria for listing on the National Register of Historic Places (NRHP).

Emergent	A plant that grows rooted in shallow water or saturated soil, where most of the plant emerges from the water or above the ground surface and stands vertically.
Endangered Species Act (ESA)	The ESA provides a means whereby the ecosystems, upon which endangered and threatened species depend, may be conserved to provide a program for the conservation of such species and to take such steps as may be appropriate to achieve the purposes of the treaties and conventions set forth in the Act.
Environmental justice	Executive Order 12898 provides that each federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations.
Express toll lane (ETL)	A limited-access freeway lane that is actively managed through a variable toll system to regulate its use and thereby maintain express travel speeds and reliability. Toll prices rise or fall in real time as the lane approaches capacity or becomes less used. This ensures that traffic in the ETL remains flowing at express travel speeds of 45 miles per hour or greater a majority of the time. Transit and carpools do not pay a toll.
feasible and prudent	<p>A term that is integral to the Section 4(f) process, feasible and prudent refers to the viability of an alternative that avoids the use of a Section 4(f) resource. The term "feasible" refers to the constructability of a project – whether or not it can be built using current construction methods, technologies, and practices. The term "prudent" refers to how reasonable the alternative is – in essence, whether or not it makes sense. Given a range of options, a transportation agency must select an avoidance alternative rather than adversely affect Section 4(f) resources if it is feasible and prudent. By contrast, an alternative may be rejected if it is not feasible and prudent. An alternative may be considered not feasible and prudent for any of the following reasons:</p> <ul style="list-style-type: none">▪ Does not meet project purpose and need▪ Excessive cost of construction▪ Severe operational or safety problems▪ Unacceptable impacts (social, economic or environmental)▪ Serious community disruption <p>A combination of any of the above</p>

Federal Highway Administration (FHWA)	One of several agencies in the U.S. Department of Transportation, the FHWA provides federal financial assistance to the states through the Federal Aid Highway Program, the purpose of which is to construct and improve the National Highway System, urban and rural roads, and bridges.
Fill	Soil placed by humans, such as for roads or building foundations.
Flood hazard areas	Frequently flooded areas.
Floodplain	The area that is subject to periodic flooding. The jurisdictional floodplain area for this project is that area that has a greater than 1 percent chance of flooding in a given year. We refer to this area as the 100-year floodplain.
General purpose (GP) lane	A freeway or arterial lane available for use by all traffic.
Hazardous materials	Hazardous materials include any material that, because of its quantity, concentration, or physical or chemical characteristics, may pose a threat to human health or the environment.
High-occupancy vehicle (HOV)	Vehicle that carries two or more people, including buses, vanpools, and carpools.
Hydrologic	Pertaining to the study of water and its interaction with the environment. Hydrologic effects may include changes in stream flow, flooding, or channel capacity, backwatering at culverts, or other characteristics.
Impervious surface area	Area that is not permeable to infiltration of precipitation or runoff to groundwater (water will run off this type of surface but not soak in). A high proportion of precipitation that falls onto impervious surfaces drains from the area as stormwater runoff. In contrast, vegetated areas are permeable, and a large proportion of precipitation that falls on vegetated areas is either intercepted by vegetation or infiltrates into the soil.
Indirect effect	Effect caused by the proposed action that is later in time or farther removed in distance, but still reasonably foreseeable. Indirect effects may include effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.
Jurisdiction	A municipal government agency, such as a city or county. As appropriate, the term "jurisdiction" also includes federal and state agencies.

Level of service	For intersection operations, level of service refers to the degree of congestion measured in average delay per vehicle. Level of service A is the best operating condition, with motorists experiencing minimal delay. Level of service F is the worst condition, with motorists experiencing delays at traffic signals of more than 1 minute.
Low-income	A person whose median household income is at or below the Department of Health and Human Services poverty guidelines.
Mitigation	An effort to replace land or facilities either with resources that are comparable in value and function, or with monetary compensation that can be used to enhance the remaining land. Specifically, for Section 4(f) resources, the cost of mitigation should be a reasonable public expenditure in light of the severity of the effect.
Modeling	Use of statistics and mathematical equations to simulate and predict real events and processes.
National Ambient Air Quality Standards (NAAQS)	Under the Clean Air Act, the U.S. Environmental Protection Agency (EPA) has established the NAAQS, which specify maximum allowable concentrations for the six criteria pollutants: carbon monoxide, lead, nitrogen dioxide, particulate matter, ozone, and sulfur dioxide. Primary standards were created to protect public health and secondary pollutant standards were established to protect public welfare and the environment.
National Environmental Policy Act (NEPA)	The National Environmental Policy Act of 1969 (NEPA) is considered to be the basic "National Charter" for protection of the environment. NEPA requires that, to the extent possible, the policies, regulations, and laws of the federal government be interpreted and administered in accordance with the protection goals of the law. It also requires federal agencies to use an interdisciplinary approach in planning and decision making for actions that impact the environment. Finally, NEPA requires the preparation of an environmental impact statement (EIS) on all major federal actions significantly affecting the human environment.

National Register of Historic Places (NRHP)	The Nation's official list of cultural resources worthy of preservation. Authorized under the National Historic Preservation Act of 1966, the National Register is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect our historic and archaeological resources. Properties listed in the register include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archaeology, engineering, and culture. The National Park Service administers the National Register, which is part of the U.S. Department of the Interior.
Official with jurisdiction	The legal representative at the agency owning or administering the resource, unless the agency has delegated or relinquished this authority via formal agreement.
Off-peak direction	Travel direction of the freeway with the lower demand.
Off-street path	WSDOT defines an off-street path as a facility physically separated from motorized vehicular traffic within the highway right of way or on an exclusive right of way. It is designed and built primarily for bicycles but can be used by other non-motorized users.
Palustrine	In the USFWS classification system (Cowardin et al. 1979), freshwater areas (having less than 0.5 part per thousand ocean-derived salts) dominated by trees, shrubs, persistent emergents, mosses, or lichens. These areas can be tidal (waters which alternate by rising and falling) or non-tidal. Palustrine also includes wetlands that lack this vegetation but have the following characteristics: (1) area less than 20 acres; (2) no active wave- formed or bedrock shoreline; and, (3) deepest water depth is less than 6.6 feet at low water.
Peak	The maximum sound level during a given time interval when the normal frequency and time weighting is not used. The noise measurement instrument has a peak detector that responds rapidly to changing sound levels, unlike the normal time weighting of the instrument.
Peak hour	The hour in the morning and in the afternoon when the maximum demand occurs on a given transportation facility or corridor.
Peak period	The period of the day during which the maximum amount of travel occurs. It may be specified as the morning (AM), or the afternoon or evening (PM) peak.
Person throughput	The number of persons traveling through a specific section of a freeway.

Potential effects	Impacts or changes that could occur because of the proposed action. The effects may be ecological, aesthetic, historic, cultural, economic, social, or health-related. Examples might include encroachment on nearby wildlife habitat from widening a roadway or elevated noise levels for adjacent land uses due to increased traffic.
Proximity effects	See “Constructive Use.”
Public services	Public services include fire and police protection, schools, parks and recreational facilities, places of worship, and cemeteries.
Publicly owned	Property that is owned and/or operated by a public entity. If a governmental body has a proprietary interest in the land (such as fee ownership, drainage easements or wetland easements), it can be considered publicly owned. Land subject to a public easement in perpetuity can also be considered to be publicly owned land for the purpose for which the easement exists.
Puget Sound Regional Council (PSRC)	The Metropolitan Planning Organization (MPO) and Regional Transportation Planning Organization (RTPO) for the Central Puget Sound region, which is comprised of Snohomish, King, Pierce, and Kitsap Counties. The MPO and RTPO is the legally mandated forum for cooperative transportation decision-making in a metropolitan planning area.
Recurring bottleneck	A recurring bottleneck is a localized constriction of traffic flow that occurs on a frequent and predictable basis, regardless of weather conditions, crashes, or events. A bottleneck causes congestion because of too much traffic in one area. It can be exacerbated by roadway conditions, such as a narrow roadway or the presence of on- or off-ramps. Generally, slower than posted speeds form upstream of a bottleneck, while speeds closer to posted limits occur downstream of a bottleneck.
Right of way	Land legally established for public use by pedestrians, vehicles, or utilities.
Riparian	Land that occurs along or interacts with flowing water. Pertaining to anything connected with or immediately adjacent to the banks of a stream, river, or other waterbody.

Rolling slowdown	<p>A rolling slowdown is a safe way to accomplish road closures with little disruption to traffic. Traffic is slowed down to a low speed (typically 20 mph or slower) well in advance of the construction area to create a gap in traffic so construction can occur without active traffic in the immediate construction zone.</p> <p>While motorists are traveling slowly, construction crews are completing the required work without anyone driving through the work zone. These slowdowns generally last a few minutes but could be longer if the work zone activity requires it.</p>
Runoff	<p>Rainwater or snowmelt that directly leaves an area as surface drainage.</p>
Section 4(f)	<p>Section 4(f) of the U.S. Department of Transportation Act of 1966 declares that special efforts be made to preserve public park and recreation lands, wildlife and waterfowl refuges, and historic sites of national, state, or local significance. Historic sites are afforded protection under Section 4(f) if listed or determined eligible for the NRHP. Section 4(f) permits the Secretary of Transportation to approve a project that requires the use of land from a significant publicly owned park, recreation area, or wildlife and waterfowl refuge, or any land from a historic site of national, state, or local significance only if the lead federal agency(s) makes the following determinations:</p> <ul style="list-style-type: none">▪ There is no feasible and prudent alternative to the use of such land; and▪ All possible planning has been undertaken to minimize harm to the Section 4(f) lands resulting from such use.
Section 6(f)	<p>Section 6(f) of the 1965 Land and Water Conservation Fund Act provides funding for acquiring property and developing public recreational facilities, and protects against the loss of that property to other uses. This section of the act states, "No property acquired or developed with assistance under this section shall, without the approval of the Secretary, be converted to other than public outdoor recreation uses." Section 6(f) applies when the project acquires property where Land and Water Conservation Grant Funds have been used to either acquire or develop the property.</p>

Section 106	Under Section 106 of the National Historic Preservation Act of 1966, as amended, federal agencies must identify and evaluate cultural resources and consider how undertakings they fund, license, permit, or assist affect historic properties eligible for inclusion in the National Register of Historic Places (NRHP). The federal agencies must afford the State Historic Preservation Officer and the Advisory Council on Historic Preservation the opportunity to comment on these undertakings.
Sound	<p>Sound is created when objects vibrate, resulting in a minute variation in surrounding atmospheric pressure, called sound pressure. The human response to sound depends on the magnitude of a sound as a function of its frequency and time pattern (EPA 1974). Magnitude is a measure of the physical sound energy in the air. The range of magnitude the ear can hear, from the faintest to the loudest sound, is so large that sound pressure is expressed on a logarithmic scale in units called decibels (dB). Loudness refers to how people subjectively judge a sound and how it varies between people.</p> <p>Sound is measured using the logarithmic decibel scale, so that doubling the number of noise sources, such as the number of cars on a roadway, increases the sound level by 3 A-weighted decibels (dBA). Therefore, when you combine two sources emitting 60 dBA, the combined sound level is 63 dBA, not 120 dBA. The human ear can barely perceive a 3-dBA increase, while a 5 dBA increase is about 1.5 times as loud and readily noticed. A 10-dBA increase appears to be a doubling in noise level to most listeners. A tenfold increase in the number of noise sources will add 10 dBA.</p>
Spill Prevention Control and Countermeasures (SPCC) Plan	An SPCC Plan is implemented to minimize effects to soil, surface water, and groundwater. The SPCC Plan addresses procedures, equipment, and materials used in the event of a spill of contaminated soil, petroleum products, contaminated water or other hazardous substances.
Stormwater	Stormwater is that portion of precipitation that does not naturally percolate into the ground or evaporate, but flows overland into a defined surface waterbody or a constructed infiltration facility.
Stormwater detention ponds	Ponds constructed to hold stormwater runoff.
Study area	The area specifically identified for analysis. Study areas vary among individual resources as scientific convention and practice dictate.
Threatened	An animal or plant species that is protected by the Endangered Species Act because likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

Threshold discharge areas	<p>A threshold discharge area (TDA) is an area that drains to a natural or constructed discharge location(s) that combine within one-quarter mile downstream—as determined by the shortest flow path. A TDA delineation begins at the first discharge location that exits WSDOT right of way and is based on pre-project conditions.</p> <p>The limits of a TDA would generally encompass the project footprint, including existing and proposed right of way. The limits of a TDA should be large enough to include all development by the Project.</p>
Traffic congestion	<p>A condition on road networks that occurs as use increases, and is characterized by slower speeds, longer trip times, and increased vehicular queueing.</p>
Upland vegetation	<p>Vegetation associated with dry areas away from water or wetlands; vegetation that is not located within the area influenced by a body of water.</p>
Use	<p>Generally, "use" occurs with a United States Department of Transportation-approved project or program (1) when land from a Section 4(f) site is acquired for a transportation project, (2) when there is an occupancy of land that is adverse in terms of the statute's preservationist purposes, or (3) when the proximity impact of the transportation project on the Section 4(f) site, without acquisition of land, are so great that the purposes for which the Section 4(f) site exists are substantially impaired.</p>
Utilities	<p>Utilities include electricity, natural gas, water, wastewater and stormwater collection, and telecommunications.</p>
Vehicle	<p>Any car, truck, van, motorcycle, or bus designed to carry passengers or goods.</p>
Visual quality	<p>An assessment of the visual character, which identifies the character-defining features for selected views.</p>
Watershed	<p>The region of land that drains into a specific body of water, such as a river, lake, sea, or ocean. Rain that falls anywhere within a given body of water's watershed will eventually drain into that body of water.</p>

Wetland	<p>Wetlands are formally defined by the U.S. Army Corps of Engineers (Federal Register 1982), U.S. Environmental Protection Agency (Federal Register 1988), Washington Shoreline Management Act of 1971 (SMA) (Ecology 1991), and Growth Management Act (GMA) (Ecology 1992) as:</p> <p><i>... those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas (Federal Register 1982, 1986).</i></p> <p>The SMA and the GMA definitions add:</p> <p><i>Wetlands do not include those artificial wetlands intentionally created from non-wetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990 that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands may include those artificially created wetlands intentionally created from non-wetland areas to mitigate the conversion of wetlands.</i></p>
WSDOT standard specifications	Guidelines and procedures established by WSDOT for roadway design and construction.

ATTACHMENT L ACRONYMS AND ABBREVIATIONS

Term	Meaning
AASHTO	American Association of State Highway and Transportation Officials
ADA	Americans with Disabilities Act
APAs	aquifer protection areas
APE	area of potential effect
BA	Biological Assessment
BiOp	Biological Opinion
BMP	best management practice
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CSS	context sensitive solutions
CO	carbon monoxide
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
DAHP	Department of Archaeology and Historic Preservation
dB	decibel
dBA	A-weighted decibel
EA	Environmental Assessment
Ecology	Washington State Department of Ecology
EFH	essential fish habitat
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ETL	express toll lane
FHWA	Federal Highway Administration
FONSI	finding of no significant impact
GP	general purpose
HHS	U.S. Department of Health and Human Services
HOT	high-occupancy toll

HOV	high-occupancy vehicle
I-405	Interstate 405
I-90	Interstate 90
I-5	Interstate 5
ITS	Incidental Take Statement
LWCF	Land and Water Conservation Fund
µg/m ³	micrograms per cubic meter
MP	milepost
mph	miles per hour
MOU	Memorandum of Understanding
MSATs	mobile source air toxics
MT	metric tons
N	North
NAAQS	National Ambient Air Quality Standards
NAC	noise abatement criteria
NE	Northeast
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO _x	oxides of nitrogen
NRHP	National Register of Historic Places
OEO	Office of Equal Opportunity
PGIS	pollutant generating impervious surfaces
PM ₁₀	particulate matter 10
PM _{2.5}	particulate matter 2.5
ppm	parts per million
PSRC	Puget Sound Regional Council
RCW	Revised Code of Washington
REC	Recognized Environmental Conditions
RMC	Renton Municipal Code
ROD	Record of Decision
SE	Southeast

SEPA	Washington State Environmental Policy Act
SHPO	State Historic Preservation Officer
Sound Transit	Central Puget Sound Regional Transit Authority
SO ₂	sulfur dioxide
SOV	single-occupant vehicle
SPCC	Spill Prevention Control and Countermeasures
SR	State Route
ST3	Sound Transit 3
TDA	threshold discharge area
TESC	Temporary Erosion and Sediment Control
TMP	traffic management plan
TNM	traffic noise model
TRIP	Tukwila to Renton Improvement Project
UNT	unnamed tributary
US	United States
U.S.C.	United States Code
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service
VMT	vehicle miles traveled
VOCs	volatile organic compounds
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WRIA	Water Resource Inventory Area
WSDOT	Washington State Department of Transportation
WSTC	Washington State Transportation Commission

