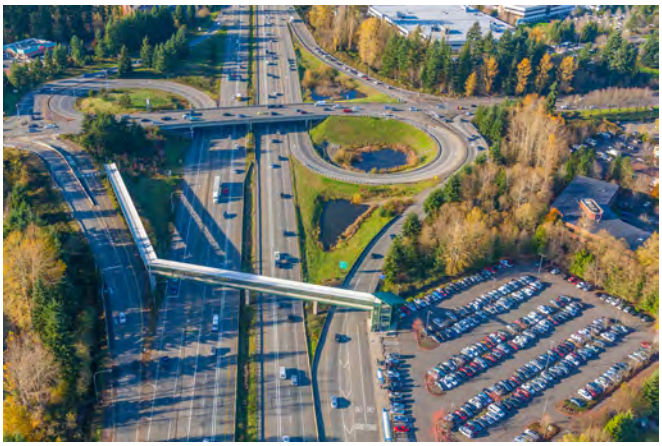
WSDOT

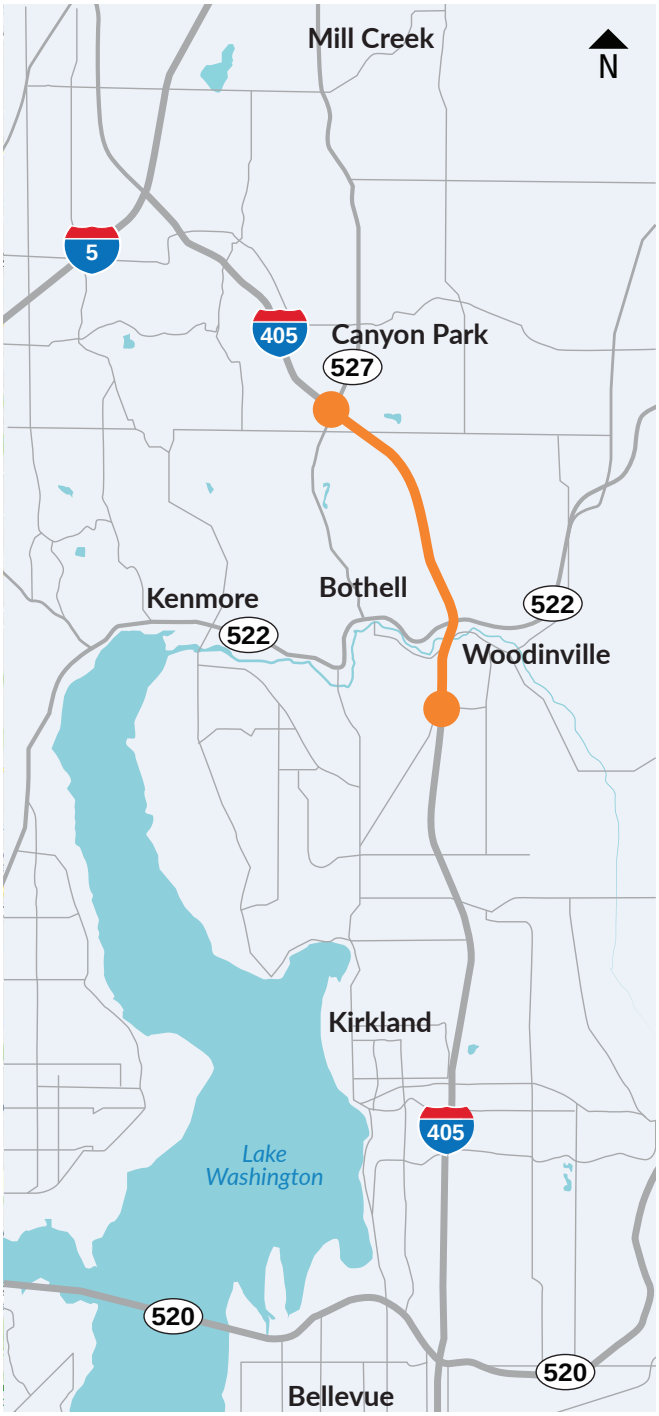
U. S. Department of Transportation
Federal Highway Administration

JULY 2020

ENVIRONMENTAL ASSESSMENT

I-405, SR 522 Vicinity to SR 527 Express Toll Lanes Improvement Project (MP 21.79 to 27.06)





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I-405, SR 522 VICINITY TO SR 527 EXPRESS TOLL LANES IMPROVEMENT PROJECT

King and Snohomish 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

Document signed 6/18/2020. Signed version available upon request.

Megan White, P.E.
Washington State Department of Transportation
Director, Environmental Services Office

Document signed 6/18/2020. Signed version available upon request.

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In compliance with the National Environmental Policy Act, this Environmental Assessment (EA) describes the environmental effects of the **I-405, SR 522 Vicinity to SR 527 Express Toll Lanes Improvement Project (milepost 21.79 to 27.06),** which proposes roadway, structural, nonmotorized, and transit improvements on Interstate 405 (I-405) between south of State Route (SR) 522 and SR 527. The Project would extend the existing dual express toll lane system north to SR 527 and build direct access ramps and inline transit stations at the SR 522 interchange and just south of the SR 527 interchange at 17th Avenue SE.

The EA and all associated documents are available through the following:

- Online at www.wsdot.wa.gov/Projects/i405/sr-522-sr-527/environmental-review/
- A printed copy may be purchased for $24.67, which does not exceed the cost of reproduction, by calling 425-456-8697.
- You may make an appointment to view a printed copy of the EA in WSDOT's office in Bellevue by calling 425-456-8697.

Comments are requested by August 6, 2020, and may be submitted by:

Email: I405comments@wsdot.wa.gov

Online form: An online public meeting will be held from July 2 to August 6, 2020, at engage.wsdot.wa.gov/522-527-ea

Phone: 425-456-8697

Postal Mail:

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Bellevue, Washington 98004

TABLE OF CONTENTS

EXHIBITS

APPENDICES

The following appendices are available by downloading from the project website (www.wsdot.wa.gov/projects/i405/sr-522-sr-527/environmental-review) and are also incorporated by reference within this document:

- Appendix A: Transportation Discipline Report
- Appendix B: Noise Discipline Report
- Appendix C: Community Impact Assessment and Environmental Justice Discipline Report
- Appendix D: Air Quality Discipline Report
- Appendix E: Cultural Resources Survey
- Appendix E1: Cultural Resources Survey Addendum
- Appendix F: Visual Impact Assessment
- Appendix G: Hazardous Materials Analysis Technical Memorandum
- Appendix G1: Hazardous Materials Analysis Addendum
- Appendix H: Recreational, Section 4(f), and Section 6(f) Resources Technical Memorandum
- Appendix I: Ecosystems Discipline Report
- Appendix J: Water Resources Discipline Report
- Appendix K: Geology, Soils, and Groundwater Technical Memorandum
- Appendix L: Draft Wetland and Stream Assessment Report
- Appendix M: Draft Wetland and Stream Mitigation Report
- Appendix N: Biological Assessment
- Appendix N1: Biological Assessment Update
- Appendix O: Cumulative Effects
- Appendix P: Environmental Scoping Report
- Appendix Q: Agency and Tribal Correspondence

ABBREVIATIONS

Abbreviation	Meaning
AASHTO	American Association of State Highway and Transportation Officials
ADA	Americans with Disabilities Act
AHERA	Asbestos Hazard Emergency Response Act
AM peak	morning peak (period or hour with the highest vehicle volumes)
APE	area of potential effect
BMP	best management practice
BRT	bus rapid transit
CPBC	Canyon Park Business Center
CPBCOA	Canyon Park Business Center Owners Association
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CSS	context sensitive solutions
CWA	Clean Water Act
dBA	A-weighted decibel
EA	Environmental Assessment
Ecology	Washington State Department of Ecology
EIS	Environmental Impact Statement
ESA	Environmental Site Assessment
ETL	express toll lane
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
FONSI	Finding of No Significant Impact
GHG	greenhouse gas
GP	general purpose
HOV	high-occupancy vehicle
I-405	Interstate 405
I-5	Interstate 5

Abbreviation	Meaning
IVM	Integrated Vegetation Management
LEP	limited English proficient
LOS	level of service
LWM	large woody material
MP	milepost
mph	miles per hour
MSAT	mobile source air toxic
NAC	noise abatement criteria
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO_x	nitrogen oxides
NOAA	National Oceanic and Atmospheric Administration
NRHP	National Register of Historic Places
PGIS	pollution-generating impervious surface
PM_{10}	particulate matter 10 micrometers or less in diameter
$PM_{2.5}$	particulate matter 2.5 micrometers or less in diameter (fine particles)
PM peak	afternoon peak (period or hour with the highest vehicle volumes)
PSRC	Puget Sound Regional Council
ROD	Record of Decision
SEPA	State Environmental Policy Act
SPCC	Spill Prevention, Control, and Countermeasures
SR	State Route
TESC	Temporary Erosion and Sediment Control
USC	U.S. Code
USFWS	U.S. Fish and Wildlife Service
UW	University of Washington
VMT	vehicle miles traveled
VOCs	volatile organic compounds
WDFW	Washington Department of Fish and Wildlife
WSDOT	Washington State Department of Transportation

SUMMARY

Where is the Project located?

The I-405, SR 522 Vicinity to SR 527 Express Toll Lanes Improvement Project (Project) lies primarily in Bothell on Interstate 405 (I-405) between milepost (MP) 21.79 and MP 27.06. Exhibit 1 shows the Project vicinity.

Exhibit 1. Project Vicinity Map

What elements does the Project include?

The proposed Project scope includes:

- Adding one new express toll lane (ETL) in each direction of I-405 between south of State Route (SR) 522 and SR 527 to create a dual ETL.
- Building a new direct access ramp and inline transit stations in the I-405 median at SR 522 and reconfiguring SR 522 to include three new signalized intersections.
- Building a new direct access ramp and inline transit stations in the I-405 median at 17th Avenue SE just south of SR 527.
- Constructing other associated Project elements, including transit and nonmotorized facilities, local roadway improvements, fish barrier corrections, noise walls, retaining walls, and new stormwater facilities.

Chapter 3, Project Description, provides a more detailed project description and maps showing key Project elements.

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 for I-405 users using the ETLs.
- Provide new direct access for users of the existing ETLs, including bus rapid transit (BRT).
- Increase vehicle capacity and person throughput.
- Improve reliability for transit riders.

Why do we need the Project?

The Puget Sound region needs the Project to increase vehicle capacity and person throughput to improve mobility and reliability in the I-405 ETLs from the vicinity of SR 522 to SR 527. I-405 is one of the most congested routes in the state, particularly during peak travel times. I-405 has some of the largest increases in vehicle volumes in the region. From 2014 to 2018, daily vehicle

volumes on I-405 increased up to 6 percent in some areas between Bothell and Lynnwood (WSDOT 2018). The ETL system north of SR 522 is at or over capacity and is not meeting speed and reliability requirements in the southbound direction. Because direct access is not currently provided to and from the existing I-405 ETLs in this area, I-405 users must travel across the general purpose lanes to reach the ETLs, limiting highway mobility and efficiency . Independent of this Project, Sound Transit is designing and conducting a separate environmental review process for a planned BRT line on I-405 to improve transit service and reliability. Building an additional ETL would support Sound Transit's development of a reliable BRT system. The Project is also responding to resource stewardship needs. These include removing fish barriers and restoring stream connections to provide access to habitat, and the management and treatment of stormwater so that water quality is protected.

How would the express toll lanes work?

How do I get more information about ETLs on I-405?
https://wsdot.wa.gov/Tolling/405/

Currently, there is one ETL in each direction of I-405 between SR 522 and SR 527. WSDOT expects that the new ETL that would be built in this section of I-405 would operate in the same way as the existing ETL. WSDOT expects the ETLs would operate from 5 a.m. to 7 p.m. on weekdays. At all other times and major holidays, the ETLs would be free and open to all without a *Good To Go!* pass. During operating hours:

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

What would be the benefits of the Project?

The Project would deliver faster and more reliable trips on I-405 for most drivers, carpools, and transit riders using both the ETLs and general purpose (GP) lanes. The additional freeway capacity in the Bothell area would increase overall vehicle and person throughput, reduce travel times, and improve safety performance. The addition of direct access ramps at SR 522 and near SR 527 would improve access for ETL users, and the new ETL coupled with new inline transit stations at SR 522 and near SR 527 would support Sound Transit's proposed I-405 BRT system and improve transit reliability.

The Project would benefit water resources by treating 100 percent of new pollution-generating impervious surface (PGIS) and a greater share of existing PGIS, leading to reductions in pollutant loading. Aquatic species would benefit from the removal of four existing bridge piers in the Sammamish River. Replacing five fish barriers with restored stream connections would

improve anadromous fish access to approximately 24,330 linear feet of upstream habitat. Although future noise levels would be similar with and without the Project, the Project's three proposed noise walls would decrease noise levels at 43 more residences than the No Build Alternative.

What is the purpose of this Environmental Assessment?

The purpose of an Environmental Assessment (EA) is to document Project effects to determine if a Finding of No Significant Impact (FONSI) is appropriate or if an Environmental Impact Statement (EIS) is required. This EA describes environmental effects anticipated from the Project. This EA compares two alternatives: a Build Alternative (the Project) and a No Build Alternative (maintaining the *status quo*). Once all final approvals are received, the Project would go through final design, and construction would begin.

How has the public been involved?

Outreach efforts have included neighborhood and business group meetings; public open houses, city council and stakeholder briefings; interviews with social service providers; coordination with agencies and tribes; and online and print distribution of Project materials. WSDOT will continue to meet with members of the public; elected officials; local, state, and federal agencies; and tribes as the Project moves to final design and construction.

How can you stay involved?

WSDOT invites you to attend an online public meeting to learn more about this EA from July 2, 2020, to August 6, 2020 at engage.wsdot.wa.gov/522-527-ea.

The online public meeting will provide an opportunity to learn more about the Project and submit questions and comments on this EA during the comment period from July 2, 2020, to August 6, 2020. Written and oral comments will be given equal weight, and all comments received or postmarked August 6, 2020, will be considered by WSDOT and the Federal Highway Administration (FHWA) in the final NEPA documentation.

What is the timeline for the Project?

After the comment period ends, WSDOT will review the comments and provide responses. Then FHWA will review the comments and responses and determine if the Project qualifies for a FONSI, or if its effects are significant and an EIS is needed. If the Project qualifies for a FONSI, the public comments, responses, and project findings would be published in a FONSI document, and the Project would move into final design and construction after 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. Once the environmental review process is complete, Project construction is expected to begin in 2021 and be completed in 3 to 4 years.

CHAPTER 1 PROJECT PURPOSE AND NEED

1.1 Where is the Project located?

The I-405, SR 522 Vicinity to SR 527 Express Toll Lanes Improvement Project (Project) lies primarily in Bothell on I-405 between milepost (MP) 21.79 and MP 27.06. The Project begins just south of the Interstate 405 (I-405)/State Route (SR) 522 interchange in Bothell and continues to just north of the I-405/SR 527 interchange in Bothell, as shown in Exhibit 1-1.

Exhibit 1-1. Project Area Map

1.2 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 for I-405 users using the express toll lanes (ETLs).
- Provide new direct access for users of the existing ETLs, including bus rapid transit (BRT).
- Increase vehicle capacity and person throughput.
- Improve reliability for transit riders.

1.3 Why do we need the Project?

The Puget Sound region needs the Project to increase vehicle capacity and person throughput to improve mobility and reliability in the I-405 ETLs from the vicinity of SR 522 to SR 527. I-405 is one of the most congested routes in the state, particularly during peak travel times. I-405 has some of the largest increases in vehicle volumes in the region. From 2014 to 2018, daily vehicle volumes on I-405 increased up to 6 percent in some areas between Bothell and Lynnwood (WSDOT 2018). The ETL system north of SR 522 is at or over capacity and is not meeting speed and reliability requirements in the southbound direction. Because direct access is not currently provided to and from the existing I-405 ETLs in this area, I-405 users must travel across the general purpose lanes to reach the ETLs, limiting highway mobility and efficiency . Independent of this Project, Sound Transit is designing and conducting a separate environmental review process for a planned BRT line on I-405 to improve transit service and reliability. Building an additional ETL would support Sound Transit's development of a reliable BRT system. The Project is also responding to resource stewardship needs. These include removing fish barriers and restoring stream connections to provide access to habitat, and the management and treatment of stormwater so that water quality is protected.

1.4 What is the history of the Project?

In 1998, WSDOT joined with FHWA, the Federal Transit Administration (FTA), Sound Transit, King County, and local governments to develop a plan to reduce traffic congestion and improve

mobility in the I-405 corridor. In fall 2002, their combined efforts culminated in the *I-405 Corridor Program Final Environmental Impact Statement* (FHWA et al. 2002) and the related Record of Decision (ROD) (FHWA and FTA 2002), also known as the I-405 Master Plan.

The ROD identified a selected alternative that would widen I-405 by up to two lanes in each direction for 30 miles, build direct access and direct connector ramps at major interchanges, improve transit service, expand park and ride lots, provide local street and nonmotorized transportation improvements (such as bike and pedestrian paths), and allow for future consideration of managed lane operations. Since the ROD was issued, the I-405/SR 167 Executive Advisory Group, composed of elected officials and transportation agencies, has endorsed and reaffirmed support for an ETL system between Auburn and Lynnwood and completion of the I-405 Master Plan.

WSDOT completed the first phase of the ETL system in September 2015. The I-405, Bellevue to Lynnwood Widening and Express Toll Lanes Project built two ETLs in each direction between NE 6th Street in downtown Bellevue and south of SR 522 in Bothell, and converted the former high-occupancy vehicle (HOV) lane to one ETL between SR 522 and I-5 in Lynnwood. Although ETLs and reconfigured lanes and interchanges have helped increase the number of people traveling along I-405 in this area, the single-lane ETL section has growing traffic congestion.

In 2016 the Legislature directed WSDOT to begin evaluating additional improvements on I-405 between SR 522 and I-5. A series of workshops with transit and local agencies and FHWA identified the following potential future improvements to provide needed capacity and improve ETL performance and agreed upon a phased approach for their implementation:

- Add one ETL in each direction between SR 522 and I-5 to create a dual ETL system.
- Build direct access ramps at the SR 522 and SR 527 interchanges.
- Provide infrastructure to support Sound Transit's future planned BRT station for the University of Washington (UW) Bothell/Cascadia College campus.
- Build direct connector ramps connecting the I-405 ETLs and the I-5 HOV lanes at the I-405/I-5 interchange in Snohomish County.

The first phase of these improvements is the Project described in this EA. In April 2019, the Washington State Legislature passed legislation providing permanent toll authorization for the I-405/SR 167 corridors and authorization to bond the toll revenues to fund priority projects on I-405 and SR 167, including this Project.

1.5 What other improvements are being considered on I-405?

The I-405 Corridor Program includes more than 150 unique, coordinated projects. The following improvements shown in Exhibit 1-2 are funded for environmental review, design, and construction by WSDOT in the same timeframe as the Project:

Exhibit 1-2. Map of I-405 Improvements

1. **I-405, Renton to Bellevue Widening and Express Toll Lanes Project** (under construction) will create a two-lane ETL system between SR 167 in Renton and NE 6th Street in Bellevue. This project also includes new general purpose lane capacity, interchange improvements, fish barrier corrections, and direct access ramps and inline transit stations.
2. **SR 520, I-405 to 108th Ave NE Westbound Auxiliary Lane Project** (planned) would restripe westbound SR 520 from the I-405 to 108th Avenue NE interchanges, allowing the I-405 on-ramp to westbound SR 520 to be a two-lane on-ramp.
3. **I-405, SR 520 Interchange Vicinity Improvement Project** (planned) would provide a longer exit ramp on southbound I-405 connecting to SR 520.
4. **I-405, NE 85th Street Interchange and Inline Station Project** (in preliminary engineering), funded by Sound Transit, would build a new inline transit station, direct access ramps, and interchange improvements at NE 85th Street in Kirkland to support Sound Transit's planned I-405 BRT system and address a fish barrier.
5. **I-405, NE 116th Street to NE 85th Street Southbound Capacity Improvement Project** (planned) would restripe southbound I-405 to add a peak-use shoulder lane or auxiliary lane.
6. **I-405, NE 132nd Street Interchange Improvement Project** (in preliminary engineering) would build a new on-ramp to northbound I-405, a new off-ramp from southbound I-405, and a fish barrier correction at NE 132nd Street in Kirkland.
7. **I-405, Brickyard Inline Station Project** (in preliminary engineering), funded by Sound Transit for design, would build a new inline transit station near NE 160th Street and the existing Brickyard Park and Ride to support Sound Transit's planned I-405 BRT system and build a fish barrier correction.
8. **I-5, I-405 to 164th Street SW Northbound Capacity Project** (planned) would restripe northbound I-5 from the I-405 interchange to the 164th Street SW interchange, allowing the I-405 on-ramp to northbound I-5 to be a two-lane on-ramp.

WSDOT also plans to correct fish barriers at two unnamed tributaries to Lake Washington in Renton and at Crystal Creek north of SR 527 in Bothell.

CHAPTER 2 ALTERNATIVES EVALUATED

2.1 What alternatives did WSDOT evaluate?

WSDOT evaluated two alternatives in this Environmental Assessment (EA): (1) Build Alternative (the proposed Project); and (2) No Build Alternative.

2.1.1 Build Alternative

The Build Alternative (Project) would add freeway capacity and make roadway, structural, nonmotorized, and transit improvements in the I-405 corridor between milepost (MP) 21.79 and MP 27.06. The Project would create a dual ETL system by restriping existing lanes from MP 21.79 to MP 22.30 and widening I-405 to add one ETL in each direction between MP 22.30 and MP 26.30. At the SR 522 interchange, the Project would construct direct access ramps to and from the ETL, inline transit stations in the I-405 median, and three new signalized intersections on SR 522, which would change where the freeway portion of SR 522 begins and ends. Just south of the SR 527 interchange at 17th Avenue SE, the Project would construct direct access ramps to and from the ETL and inline transit stations in the I-405 median. The Project would also demolish and reconstruct bridges over the Sammamish River, build noise and retaining walls, construct bicycle and pedestrian facilities, reconfigure local streets, correct fish barriers, and make stormwater improvements. Chapter 3, Project Description, provides a more detailed description and maps of the Build Alternative.

2.1.2 No Build Alternative

WSDOT evaluated a No Build Alternative to compare the effects of maintaining the *status quo* with 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. The No Build Alternative would also include fish barrier correction projects where required.

2.2 How has WSDOT involved the public in Project development?

WSDOT has engaged the public in Project development by:

- Providing ongoing briefings to community groups and councils, such as the Bothell City Council, Snohomish County Council Public Works Committee, Snohomish County Committee for Improved Transportation, Economic Alliance of Snohomish County, Eastside Transportation Partnership, and Canyon Park Business Center Owners Association (CPBCOA).
- Hosting meetings with neighborhood organizations along the Project alignment, including the Village Square Homeowners Association.
- Participating in City of Bothell open houses in October 2017 and April 2019 regarding Canyon Park subarea plan updates and Sound Transit open houses for the SR 522 and I-405 Bus Rapid Transit (BRT) projects in May and October 2018 and July 2019.
- Participating in a community transportation forum and walking tour of the Canyon Park area hosted by Community Transit in March 2018.

- Holding a public scoping open house in Bothell in March and a 30-day comment period in March/April 2019 to present early design concepts and the environmental review process. WSDOT provided advance notice via print and online advertisements in local publications, e-newsletters, a news release, social media, and mailed postcards to more than 4,300 residences and businesses.
- Hosting a limited access hearing in May 2019 at Bothell City Hall to provide abutting property owners Project information and comment opportunities.

Appendices C and P
- Section 4.4.2 and Attachment C of Appendix C, *Community Impact Assessment and Environmental Justice Discipline Report*, provide more detailed information on social service provider interviews.
- Appendix P, *Environmental Scoping Report*, provides more details on the scoping process and a summary of comments received.

- Conducting interviews in spring 2019 with nine social service providers who serve low-income and minority populations in the Project vicinity to share Project information and gather insights on potential benefits or adverse effects.
- Responding to questions and comments from the public through telephone, email, and in-person conversations. Major topics of interest have included the preliminary Project design, noise walls and other noise mitigation efforts, and right of way acquisition.
- Publishing and updating a Project website with information about the Project's scope, benefits, budget, schedule, design, environmental review process, and public involvement opportunities.

2.3 How has WSDOT involved agencies and tribal governments?

Numerous local, state, and federal government agencies and tribal governments have played roles in the development of I-405 projects. Specific to the Project, WSDOT held a scoping meeting in March 2019 attended by about 30 representatives from agencies and tribes. Five agencies provided written comments during the scoping comment period.

2.3.1 Agency Coordination

WSDOT coordinates with the entities listed in Exhibit 2-1 on a range of issues, including design development, permitting, and other approvals needed for the Project.

Exhibit 2-1. Coordinating Agencies and Institutions

Federal	State	Local
Federal Highway Administration National Oceanic and Atmospheric Administration Fisheries U.S. Army Corps of Engineers U.S. Coast Guard U.S. Fish and Wildlife Service U.S. Environmental Protection Agency	Cascadia College University of Washington Bothell Washington State Department of Archaeology and Historic Preservation Washington State Department of Ecology Washington State Department of Fish and Wildlife WSDOT Liaison Program	Cities of Bothell, Kenmore, Kirkland, and Woodinville Community Transit King County Metro King County Parks King County Transportation Snohomish County Sound Transit

2.3.2 Tribal Consultation

WSDOT has Government-to-Government responsibility for coordinating with federally recognized Native American tribes. Although there are no tribal lands within the study area, WSDOT consults tribes about their interests related to cultural and natural resources.

- **Cultural Resources:** In accordance with Section 106 of the National Historic Preservation Act of 1966 (NHPA), WSDOT initiated consultation with the Muckleshoot Indian Tribe, Sauk-Suiattle Indian Tribe, Snoqualmie Tribe, Stillaguamish Tribe of Indians, Yakama Nation, and Duwamish Tribe in March 2019. WSDOT has given tribal representatives opportunities to review and comment on the area of potential effect (APE); Appendix E, *Cultural Resources Survey*; and Appendix E1, *Cultural Resources Survey Addendum*. Section 106 documentation is contained in Appendix Q, *Agency and Tribal Correspondence*.

  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.

- **Natural Resources:** The Muckleshoot Indian Tribe and Yakama Nation have Usual and Accustomed fishing rights in the study area. The Yakama Nation deferred to the Muckleshoot Indian Tribe. WSDOT is consulting with the Muckleshoot Indian Tribe. Ongoing coordination with the Muckleshoot Indian Tribe includes, but is not limited to, regular meetings, field visits, and information sharing.

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

- **SR 522 and Canyon Park transit facilities:** WSDOT has worked closely with Community Transit, Sound Transit, and King County Metro Transit to determine the locations and design of proposed bus infrastructure near the I-405/SR 522 and I-405/SR 527 interchanges. As part of this coordination, WSDOT and the transit agencies participated in series of charrettes and workshops in 2016, 2017, and 2019. Based on input from the transit agencies, WSDOT designed the SR 522 interchange to include a proposed bus station and turnaround loop, pick-up and drop-off facilities for transit passengers, and a new nonmotorized connection to the North Creek Trail to facilitate access to the University of Washington (UW) Bothell/Cascadia College campus and the Sammamish River Trail.
- **Local street traffic near Canyon Park:** WSDOT coordinated with Bothell and the CPBCOA to develop assumptions for the traffic analysis and collect additional local street data. During environmental scoping, the CPBCOA submitted comments requesting a study of cut-through traffic and other potential impacts on their private street network near the proposed direct access ramp at 17th Avenue SE. With input from the CPBCOA, WSDOT conducted traffic counts at intersections in September 2019. Subsequent modeling found that some intersections in the Canyon Park area would operate worse with the Project, and WSDOT is determining potential mitigation. WSDOT also worked with Bothell to reach agreement on appropriate assumptions about future population growth and land uses in Canyon Park.

- **Fish barrier correction:** Through numerous field visits and ongoing coordination, WSDOT, the Washington Department of Fish and Wildlife, and the Muckleshoot Indian Tribe have identified and agreed upon five WSDOT-owned fish barriers within the Project study area that would be corrected with restored stream crossings in the Project. Based on input from the Muckleshoot Indian Tribe, WSDOT also plans to correct two other WSDOT-owned fish barriers within the Project limits (at Juanita Creek and Crystal Creek) as part of other funded I-405 projects during the same timeframe.
- **Other planned I-405 transit infrastructure:** In their scoping comments for the Project, Sound Transit requested that WSDOT analyze the transportation effects of a potential inline transit station at NE 160th Street near the existing Brickyard Park and Ride. WSDOT did not perform this analysis as part of this Project because it was outside the current scope funded by the Legislature. However, based on Sound Transit's scoping comments, WSDOT is now working with them on a separate Sound Transit-funded project to construct a new inline bus station in the median of I-405 at NE 160th Street, enabling buses that serve the Brickyard Park and Ride to remain in the ETLs.

In addition to the comments discussed above that influenced Project design, WSDOT received seven comments from members of the public during the environmental scoping period, including the comments from the CPBCOA described earlier in this section, that were considered as part of developing this EA. Public comment themes included general support for the Project, with some concerns about tolling, questions about the proposed traffic signals at the I-405/SR 522 interchange, an interest in noise walls and tree preservation near local residences, and support for transit service and facilities on SR 522.

2.5 What permits and approvals would be required?

Exhibit 2-2 shows the federal, state and local permits that will or may be required to construct the Project.

Exhibit 2-2. Anticipated Federal, State, and Local Permits

Required Permits	Potential Permits Depending on Final Design
▪ Section 404/10 Individual Permit, U.S. Army Corps of Engineers ▪ Section 408 Permission, U.S. Army Corps of Engineers ▪ Section 9 Bridge Permit, U.S. Coast Guard ▪ Section 401 Water Quality Certification, Ecology ▪ Section 402 National Pollutant Discharge Elimination System Construction Stormwater General Permit, Ecology ▪ Coastal Zone Management Act Consistency Determination, Ecology ▪ Hydraulic Project Approval, WDFW ▪ Shoreline Substantial Conditional Use Permit and a Shoreline Substantial Development Permit, Bothell ▪ Special Use Permit, King County	▪ Notice of Intent for geotechnical borings, Ecology ▪ Notice of Intent for installing, modifying, or removing piezometers, Ecology ▪ Notice of Intent for installing, modifying, or decommissioning wells, Ecology ▪ Request for Chemical Treatment Form, Ecology ▪ Administrative Order for Chemical Treatment, Ecology ▪ Floodplain Development Permit, Bothell ▪ Clearing and Grading Permit, Bothell ▪ Building Permit, Bothell ▪ Noise Variance, Bothell and Kirkland

Ecology = Washington State Department of Ecology, WDFW = Washington Department of Fish and Wildlife

CHAPTER 3 PROJECT DESCRIPTION

3.1 What improvements are proposed with the Project?

The Project begins on I-405 south of the I-405/SR 522 interchange at milepost (MP) 21.79 and continues to just north of the I-405/SR 527 interchange at MP 27.06. Exhibit 3-1 summarizes the improvements and Exhibit 3-2, Sheets 1 through 5, show the locations of the proposed improvements.

Exhibit 3-1. Improvements Proposed with the I-405, SR 522 Vicinity to SR 527 Express Toll Lanes Improvement Project

Project Element	Proposed Improvements
I-405 lanes and shoulders from SR 522 to SR 527	▪ Create a dual ETL system from MP 21.79 (south of the I-405/SR 522 interchange) to MP 27.06 (just north of the I-405/SR 527 interchange). - From MP 21.79 to MP 22.30: Restripe existing lanes to create a dual ETL system. - From MP 22.30 to MP 26.30: Resurface and widen I-405 to add one ETL in each direction. - From MP 26.30 to MP 27.06: Widen I-405 to construct direct access ramps and connect to the existing single ETL starting near MP 26.30.
I-405 tolling from SR 522 to SR 527	▪ Construct new tolling gantries to collect tolls for the ETLs and direct access ramps.
I-405/SR 522 interchange area	▪ Construct new direct access ramps and two inline transit stations (one in each direction) in the I-405 median. Transit stations would include station platforms, signage, artwork, lighting, fare machines, and site furnishing such as shelters, lean rails, benches, bollards, bicycle parking, and trash receptacles. ▪ Construct a bus station and turnaround loop, pick-up and drop-off facilities, and new nonmotorized connection to the North Creek Trail near the SR 522 interchange. Funding and construction timeline to be coordinated with local transit agencies. ▪ Construct new northbound bridge through the SR 522 interchange. - Reconfigure the northbound I-405 to eastbound ramp SR 522 from one lane to two lanes. ▪ Reconfigure I-405 on- and off-ramps. - Realign the southbound I-405 to westbound SR 522 ramp. - Realign the eastbound and westbound SR 522 ramps to northbound I-405.
SR 522 roadway	▪ Add three signalized intersections, which would change where the freeway portion of SR 522 begins and ends. Signals would be added at the following locations: - The northbound I-405 to westbound SR 522 off-ramp and the eastbound SR 522 to northbound I-405 on-ramp. - The southbound I-405 to eastbound SR 522 ramp. - Between the above two locations where the new I-405 ETL direct access ramps connect with SR 522.
228th Street SE	▪ Widen the northbound I-405 bridge over 228th Street SE.

Exhibit 3-1. Improvements Proposed with the I-405, SR 522 Vicinity to SR 527 Express Toll Lanes Improvement Project

Project Element	Proposed Improvements
SR 527 interchange area	▪ Construct new direct access ramps to the north, south and east just south of SR 527 at 17th Avenue SE. ▪ Construct two inline transit stations (one in each direction) in the I-405 median. Transit stations would include station platforms, signage, artwork, lighting, fare machines, and site furnishings such as shelters, lean rails, benches, bollards, bicycle parking, and trash receptacles. ▪ Reconstruct the pedestrian bridge over I-405.
17th Avenue SE, 220th Street SE, SR 527	▪ Reconfigure 17th Avenue SE and portions of 220th Street SE and SR 527 to include a roundabout at the Canyon Park Park and Ride, bicycle and pedestrian improvements, and improvements at the SR 527 and 17th Avenue SE intersections with 220th Street SE.
Fish barrier corrections	▪ Replace five fish barriers with restored stream connections at the following streams: - Par Creek (WDFW ID 993083) - Stream 25.0L (WDFW ID 993104) - North Fork of Perry Creek (WDFW ID 08.0070 A 0.25) - Two fish barriers at Queensborough Creek (WDFW ID 993084 and 993109)
Sammamish River bridges	▪ Remove the existing northbound I-405 to eastbound SR 522 bridge over the Sammamish River, including two bridge piers within the OHWM. ▪ Remove the existing northbound I-405 to westbound SR 522 bridge over the Sammamish River, including two bridge piers within the OHWM. ▪ Build a new bridge for northbound I-405 traffic over the Sammamish River. ▪ Build a new bridge over the Sammamish River for the new direct access ramp at SR 522. ▪ Build a new bridge over the Sammamish River for the northbound I-405 to SR 522 ramp.
Noise and retaining walls	▪ Construct 3 new noise walls near NE 160th Street and SR 527. See Exhibit 3-2, Sheets 1, 4 and 5. ▪ Construct several new retaining walls. See Exhibit 3-2, Sheets 1 through 5.
Stormwater management	▪ Provide enhanced treatment for an area equivalent to 100 percent of new PGIS (approximately 24 acres). ▪ Retrofit about 23 acres of existing untreated PGIS and continue to treat stormwater from the approximately 44 acres of PGIS that currently receives treatment. ▪ Construct three new stormwater outfalls, one on the Sammamish River and two on the North Fork of Perry Creek.
Construction duration	▪ Construction is expected to last 3 to 4 years, beginning in 2021.

ETL = express toll lane; ID = identification number; MP = milepost; OHWM = ordinary high water mark; PGIS = pollution-generating impervious surface; WDFW = Washington Department of Fish and Wildlife

Exhibit 3-2. I-405, SR 522 Vicinity to SR 527 Express Toll Lanes Improvement Project (Sheet 1 of 5)

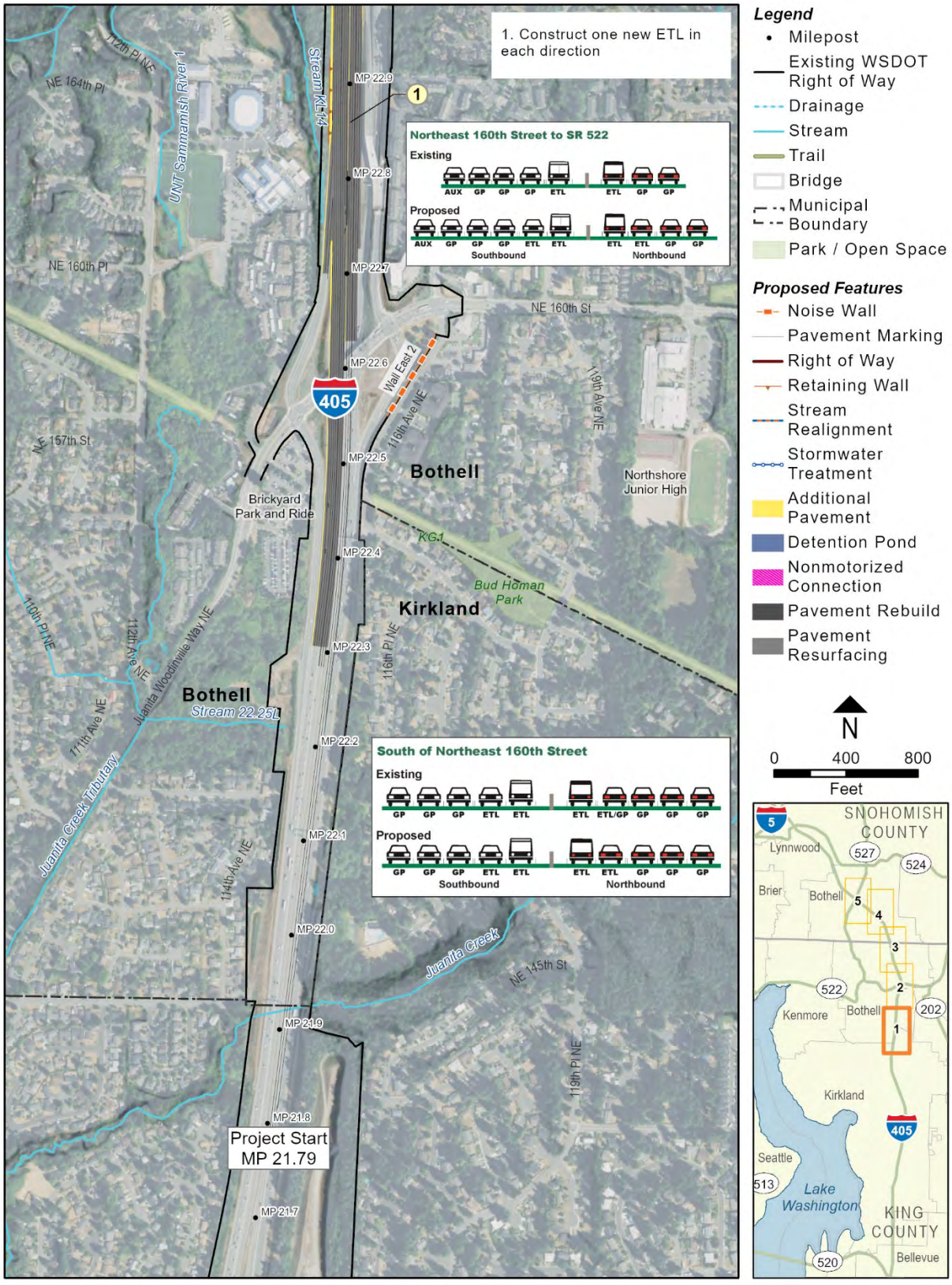


Exhibit 3-2. I-405, SR 522 Vicinity to SR 527 Express Toll Lanes Improvement Project (Sheet 2 of 5)

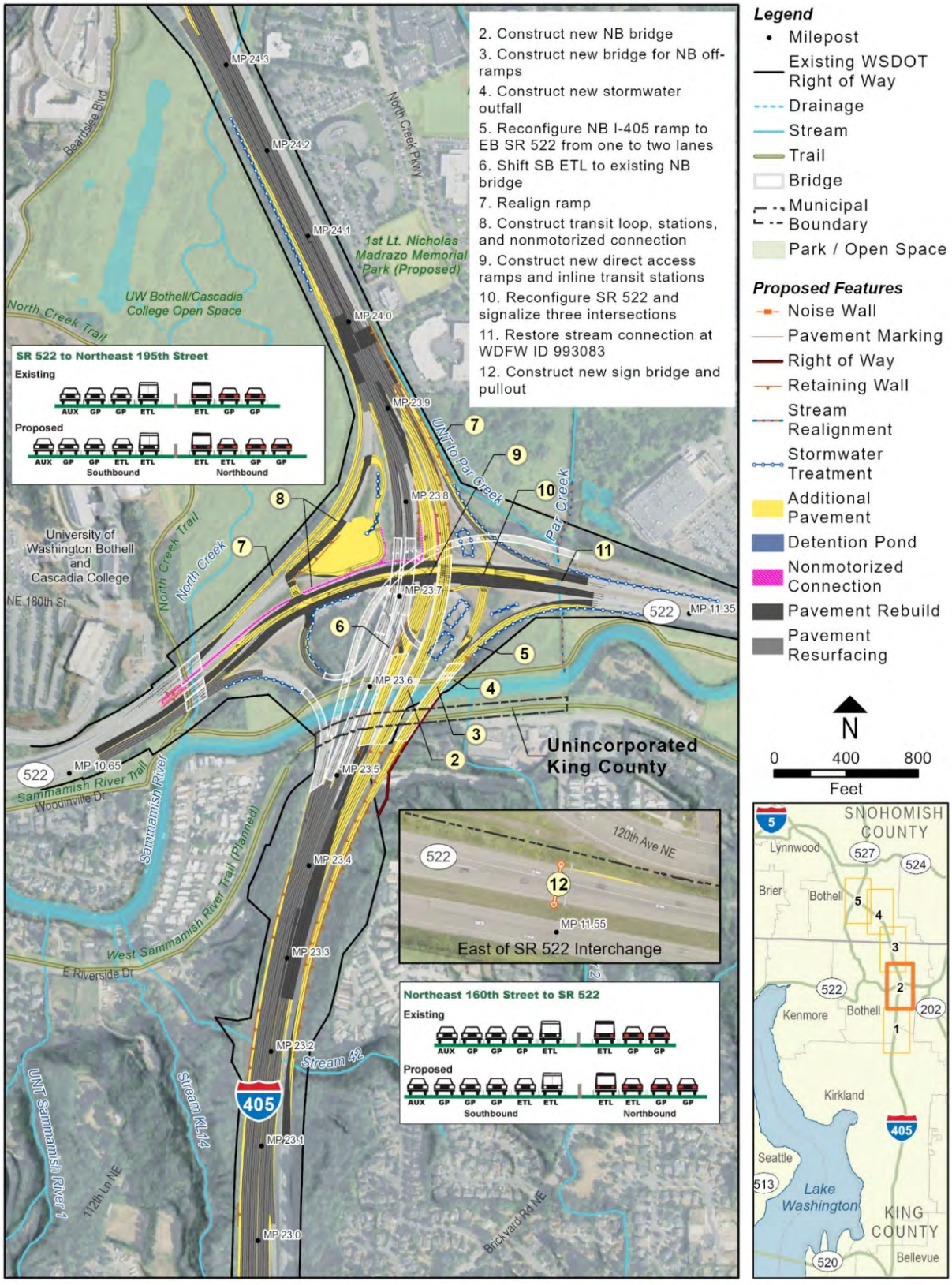


Exhibit 3-2. I-405, SR 522 Vicinity to SR 527 Express Toll Lanes Improvement Project (Sheet 3 of 5)

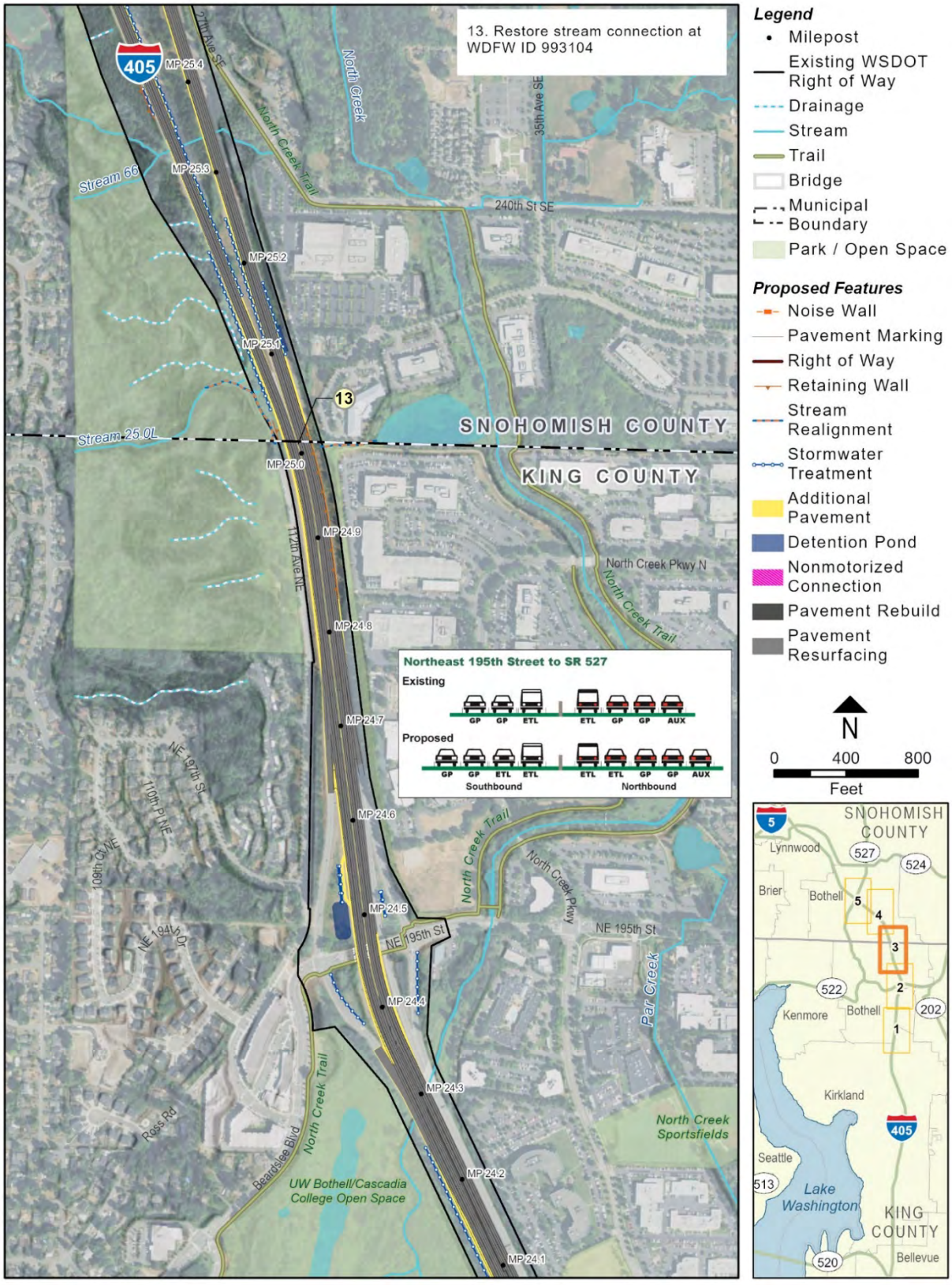
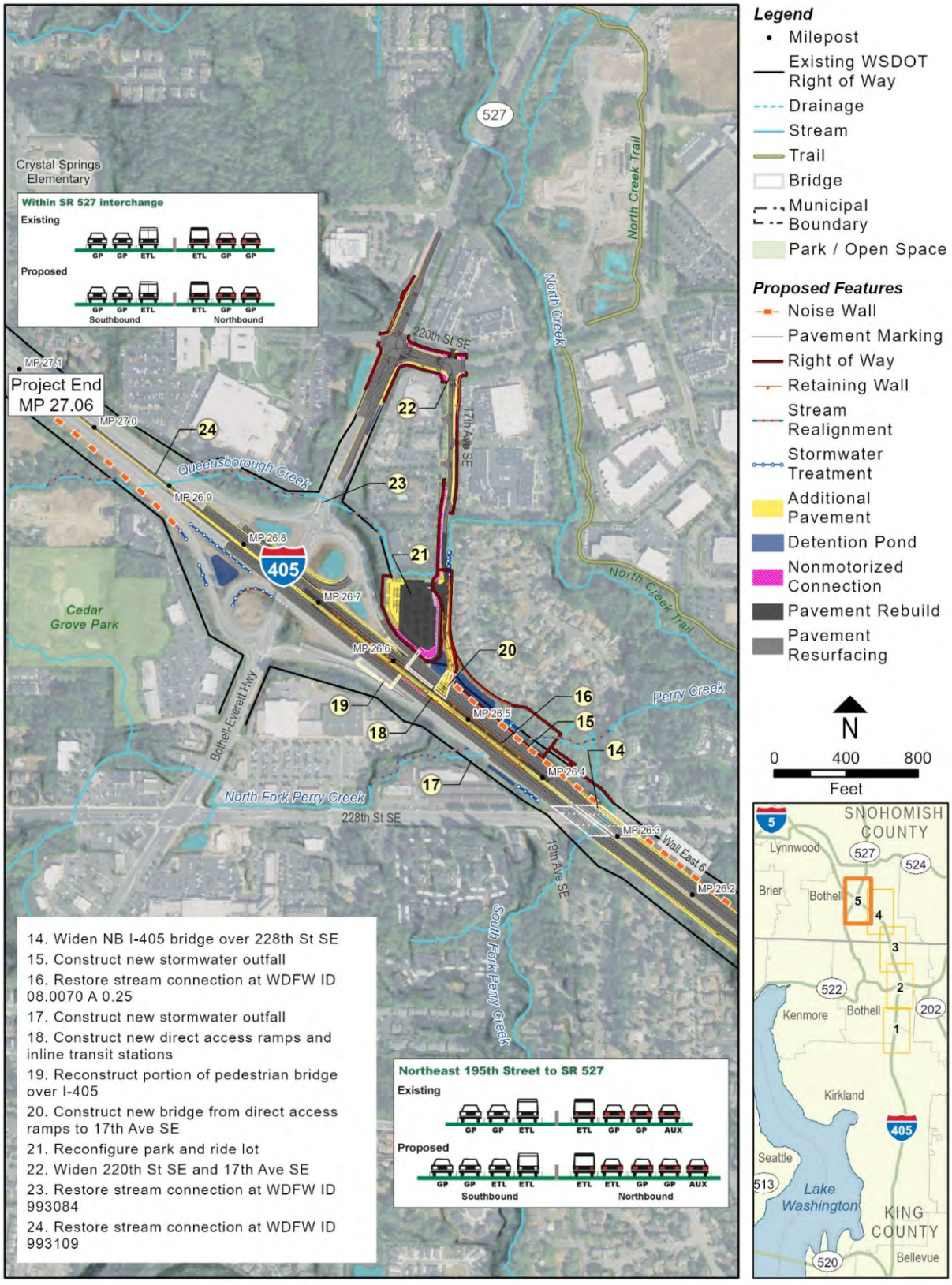


Exhibit 3-2. I-405, SR 522 Vicinity to SR 527 Express Toll Lanes Improvement Project (Sheet 4 of 5)

Exhibit 3-2. I-405, SR 522 Vicinity to SR 527 Express Toll Lanes Improvement Project (Sheet 5 of 5)



3.2 How would the express toll lanes work?

Currently, there is one ETL in each direction of I-405 between SR 522 and SR 527. WSDOT expects that the new ETL in this section would operate in the same way as the existing ETL, from 5 a.m. to 7 p.m. on weekdays. At all other times and on major holidays, the ETLs would be free and open to all without a *Good To Go!* pass. During operating hours:

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

How do I get more information about ETLs on I-405?
https://wsdot.wa.gov/Tolling/405/

3.3 What methods would be used to construct the Project?

WSDOT expects to construct the Project using a design-build delivery method, in which WSDOT executes a single contract with one entity for design and construction services. 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. If the contractor proposes design modifications not covered by this Environmental Assessment, additional environmental review would be conducted as needed.

Construction would generally occur between 2021 and 2025, but construction activities in some areas would be complete prior to 2025. Once a contractor is selected for the Project, they could use multiple work crews in multiple locations to reduce the overall construction period. Work would include removing existing asphalt and concrete surfaces, clearing and grading adjacent areas, laying the aggregate roadway foundation, placing new asphalt and concrete surfaces, replacing culverts, and building and demolishing bridges. Removing bridge piers from the Sammamish River could require the construction of temporary work bridges and would require in-water work, which may include temporary use of cofferdams and a work barge, depending on the contractors' chosen means and methods. Realigning the I-405 mainline would require approximately 170,000 cubic yards of excavation and 166,000 cubic yards of fill.

Construction equipment would include backhoes, excavators, front-end loaders, pavement grinders, jack hammers, trucks, vactor trucks, cranes, drilling rigs and augers, concrete pumping equipment, and slurry processing equipment. Specific haul routes and the number of construction vehicles would not be known until a construction contract is signed. When possible, the work sites would be accessed from I-405 and SR 522. Construction staging areas for employee parking, large equipment storage, and material stockpiles would be located within WSDOT and Bothell right of way to the extent possible. The contractor may also find other locations for construction staging.

CHAPTER 4 PROJECT EFFECTS

This chapter examines the potential effects of the Project on people and the environment and summarizes the analyses contained in the supporting technical documents found in Appendices A through O of this Environmental Assessment (EA). Guidance from WSDOT's *Environmental Manual* (WSDOT 2019a) was used to develop the methods and analysis conducted to assess project effects. Chapter 6, Measures to Avoid, Minimize, or Mitigate Effects, lists specific details about how WSDOT will avoid, minimize, or mitigate adverse effects.

What resources did WSDOT study in this EA?

- Transportation
- Noise
- Ecosystems
- Water Resources
- Visual Quality
- Recreational, Section 4(f), and Section 6(f) Resources
- Land use, Economics, and Community Resources
- Environmental Justice
- Cultural and Historic Resources
- Air Quality
- Energy and Greenhouse Gases
- Geology, Soils, and Groundwater
- Hazardous Materials

Appendix A, *Transportation Discipline Report*

Please see Appendix A for additional information about the study approach, existing conditions, and operational and construction effects on transportation.

4.1 Transportation

4.1.1 How did WSDOT evaluate transportation?

WSDOT analyzed freeways, local street intersections, safety performance, transit operations, nonmotorized networks, and freight mobility. This analysis used existing (2018) and forecasted traffic data with and without the Project for 2025 (anticipated Project year of opening) and 2045.

The transportation study area includes I-405 from NE 116th Street in Kirkland to I-5 in Lynnwood, SR 522 from Campus Way to 131st Avenue NE/132nd Avenue NE, Bothell-Everett Highway/SR 527 from 228th Street SE to SR 524, and local street intersections.

4.1.2 How would operations affect transportation?

Freeway Vehicle Volumes

Higher freeway traffic demand is expected with the Build Alternative compared to the No Build Alternative because new capacity would be added. The additional freeway capacity with the Build Alternative would reduce the number of vehicles that use local roadways to bypass freeway congestion. Total daily freeway vehicle volumes would increase with the Build Alternative as compared to the No Build Alternative. With the Project:

- **In 2025,** daily vehicle volumes on I-405 south of NE 160th Street would increase by 4 percent more than the No Build Alternative—from 203,000 to 211,000 vehicles. Between NE 195th Street and SR 527 on I-405, daily vehicle volumes would also increase by 4 percent more than the No Build Alternative—from 150,000 to 156,000 vehicles.
- **In 2045,** daily vehicle volumes on I-405 south of NE 160th Street are expected to increase by about 4 percent more than the No Build Alternative—from 217,000 to 225,000

vehicles. Between NE 195th Street and SR 527 on I-405, daily vehicle volumes would also increase by about 4 percent more than the No Build Alternative—from 161,000 to 167,000 vehicles.

Freeway Person Throughput

Person throughput on I-405 is expected to increase with the Project in 2025 and 2045 compared to the No Build Alternative because of the added ETL capacity. Exhibit 4-1 and Exhibit 4-2 compare person throughput during the AM (7 to 10 a.m.) and PM (4 to 7 p.m.) peak periods for existing conditions and the 2025 and 2045 No Build and Build Alternatives. For example, in 2025 during the AM peak period, southbound I-405 just south of SR 527 would carry approximately 890 more people in the Build Alternative than the No Build Alternative. In the 2045 AM peak period, that same area would carry about 1,450 more people in the Build Alternative than the No Build Alternative. Overall, there would be more vehicles and people traveling at higher speeds with the Build Alternative than the No Build Alternative.

Exhibit 4-1. I-405 Person Throughput South of SR 527 – 3-hour AM Peak Period

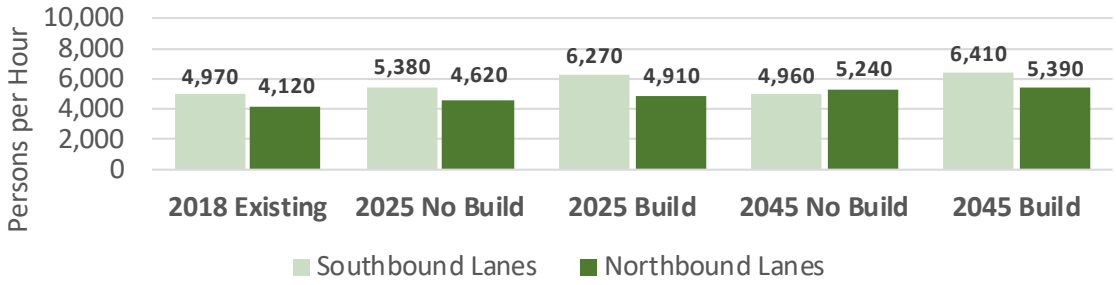
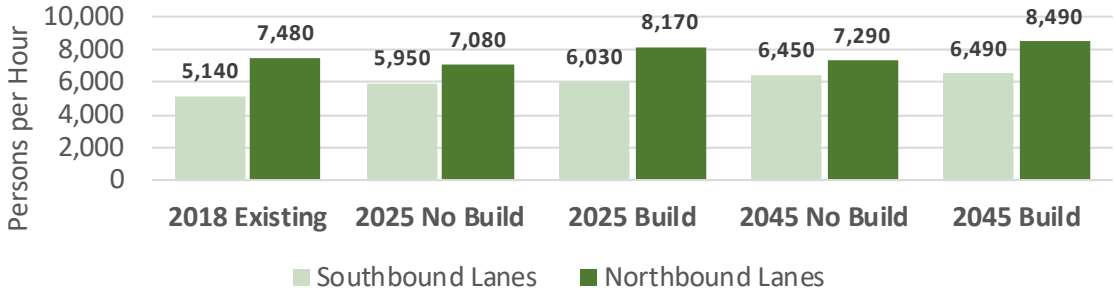


Exhibit 4-2. I-405 Person Throughput South of SR 527 – 3-hour PM Peak Period



Freeway Operations, Speeds, Congestion, and Travel Times

Overall, there would be more vehicles traveling at higher speeds and with faster travel times through most of the study area with the Build Alternative as compared to the No Build Alternative. With the No Build Alternative, the freeway would be too congested to handle additional traffic during the AM and PM peak periods; whereas with the Project, new capacity would be added. The Project's additional capacity would improve operations for some sections of the freeway in the study area, while in other areas, some congestion would shift.

Travel times are reported for the ETL and GP lanes. Two separate travel time trips are reported because the ETL system ends just south of the I-5 interchange.

The first section includes both GP and ETL travel times and is located between NE 116th Street in Kirkland and the end of the ETL just south of I-5 in Lynnwood. The second section is composed of all GP lanes and is located between the ETL end and I-5. Exhibit 4-3 shows the approximate locations of each travel time section.

Exhibit 4-4 and Exhibit 4-5 compare average I-405 travel times during the AM (7 to 10 a.m.) and PM (4 to 7 p.m.) peak periods with and without the Project.

When traveling at the posted speed limit, the trip on I-405 between I-5 (Lynnwood) and the ETL start/end should take slightly less than 1 minute. The trip on I-405 between the ETL start/end and NE 116th Street should take about 9 minutes.

Exhibit 4-3. Locations for Travel Time Analysis

Exhibit 4-4. Comparison of Average I-405 Travel Times – AM Peak

Direction of Travel	I-405 Section	Existing		2025 GP		2025 ETL		2045 GP		2045 ETL	
		GP	ETL	No Build	Build	No Build	Build	No Build	Build	No Build	Build
Southbound	I-5 (MP 29.7) to ETL Start (MP 28.9)	3	NA[a]	2	1	NA[a]	NA[a]	11	1	NA[a]	NA[a]
	ETL Start (MP 28.9) to NE 116th Street (MP 19.8)	33	13	40	9	16	9	46	9	15	9
Northbound	NE 116th Street (MP 19.8) to ETL End (MP 29.0)	9	9	9	9	9	9	9	9	9	9
	ETL End (MP 29.0) to I-5 (MP 29.7)	1	NA[a]	1	1	NA[a]	NA[a]	1	1	NA[a]	NA[a]

ETL = express toll lanes; GP = general purpose lanes; NA = not applicable; MP = milepost
AM Peak 3-hour average = 7 to 10 a.m. Travel times are rounded to the nearest minute.
[a] No ETL exists in the short section; all traffic uses the GP lanes.

In the AM peak period with the Project, southbound I-405 travel times would decrease and freeway operations would improve compared with the No Build Alternative in both the ETLs and GP lanes. GP lane travel times would decrease because the Project would provide additional ETL capacity and eliminate lane-changing movements between the SR 522 on-ramps and the I-405 ETLs by removing the existing ETL access at NE 160th Street. By 2045, average southbound AM peak I-405 travel times between the ETL start and NE 116th Street would decrease by 37 minutes in the GP lanes and by 6 minutes in the ETLs compared to the No Build

Alternative. For northbound AM peak period trips, the GP lanes and ETLs would continue to operate at free-flow speeds with the Build Alternative.

Exhibit 4-5. Comparison of Average I-405 Travel Time – PM Peak

Direction of Travel	I-405 Section	Existing		2025 GP		2025 ETL		2045 GP		2045 ETL	
		GP	ETL	No Build	Build	No Build	Build	No Build	Build	No Build	Build
Southbound	I-5 (MP 29.7) to ETL Start (MP 28.9)	1	NA[a]	1	1	NA[a]	NA[a]	5	1	NA[a]	NA[a]
	ETL Start (MP 28.9) to NE 116th Street (MP 19.8)	9	9	11	9	9	9	16	9	10	9
Northbound	NE 116th Street (MP 19.8) to ETL End (MP 29.0)	19	10	26	17	11	10	24	20	10	10
	ETL End (MP 29.0) to I-5 (MP 29.7)	2	NA[a]	1	3	NA[a]	NA[a]	1	3	NA[a]	NA[a]

ETL = express toll lanes; GP = general purpose lanes; NA = not applicable; MP = milepost

PM Peak 3-hour average = 4 to 7 p.m. Travel times are rounded to the nearest minute.

[a] No ETL exists in the short section; all traffic uses the GP lanes.

In the PM peak period with the Project, northbound I-405 GP travel times would decrease because the existing northbound I-405 bottleneck at the off-ramp to SR 522 in the GP lanes would be improved. Travel times between NE 116th Street and the end of the ETLs would improve by 4 minutes in the GP lanes compared to the No Build Alterative in 2045.

However, the Project's addition of ETL capacity would allow more traffic in all lanes to reach I-5 at a faster rate and would contribute to increased congestion approaching the I-5 interchange. As a result, back-ups in the northbound I-405 GP lanes would extend back approximately 3 miles from the northbound I-5 off-ramp to near the SR 527 interchange. In 2045, GP travel times between the end of the ETLs and I-5 would increase by approximately 2 minutes compared to the No Build Alternative. Overall, the ETLs would operate better with the Build Alternative than with the No Build Alternative because the Project improvements would reduce GP lane congestion and allow for more space for ETL users to enter and exit the lanes at access points. PM peak period travel times in the ETLs between NE 116th Street and the end of the ETLs would remain similar to or slightly lower than the No Build Alternative. This segment would operate near free-flow speeds in 2025 and 2045.

Appendix A, *Transportation Discipline Report*

Please see Appendix A, Attachment D for more detailed graphics that show expected freeway operations and congestion for the No Build and Build Alternatives in 2025 and 2045.

What is a bottleneck?

A 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.

In the PM peak period with the Project, southbound I-405 GP lanes and ETLs would operate near free-flow speeds with the Build Alternative. In 2045, travel times in the southbound I-405

GP lanes between the ETL start and NE 116th Street would decrease by 7 minutes compared to the No Build Alternative. The existing bottleneck at the SR 527 on-ramp merge would be relieved because some entering GP traffic would divert to the new ETL direct access ramp near SR 527 at 17th Avenue SE.

Intersection Operations

Because the Project would increase freeway volumes, more vehicles are expected at many study area freeway ramps and intersections with the Build Alternative as compared to the No Build Alternative. However, most of the projected growth would occur outside of the peak periods. The Project would include changes to local intersections near the SR 522 and SR 527 interchanges, such as adding new turn lanes or converting turn lanes to a roundabout, which would improve operations at some locations compared to the No Build Alternative.

What is level of service?

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

Appendix A, *Transportation Discipline Report*

Please see Appendix A, Exhibits 5-13 and 5-14, for graphics that show expected intersection performance, including expected LOS.

Increases in vehicle volumes during the AM peak hour (7 to 8 a.m.) and PM (4 to 5 p.m.) would cause some intersections or specific movements in an intersection to operate worse than with the No Build Alternative. While some intersections may degrade, in most cases they would operate at level of service (LOS) D or better, with a few exceptions. Exhibit 4-6 summarizes the locations where intersections would operate at LOS E or worse during the peak hour. For the No Build Alternative, 32 intersections were analyzed. For the Build Alternative, 36 intersections were analyzed because the Project would add a total of 4 intersections: 3 at SR 522 and 1 at the new direct access ramp to 17th Ave SE.

Exhibit 4-6. Number of Occurrences of Peak Hour Level of Service E or Worse

Time of Day	Existing	2025 No Build	2025 Build	2045 No Build	2045 Build
Overall Intersections Operating at LOS E or Worse					
AM peak hour	4	5	5	8	9
PM peak hour	5	5	4	8	9
Intersections with One or More Approaches Operating at LOS E or Worse					
AM peak hour	12	15	19	19	22
PM peak hour	12	14	19	19	22

LOS = level of service

SR 522 Interchange

The SR 522 interchange would be modified by adding 3 signalized intersections on SR 522 under I-405. These 3 new signalized intersections would operate at LOS D or better. The three signals would add approximately one minute of travel delay to eastbound and westbound SR 522 through trips.

Visualization of proposed I-405/SR 522 interchange improvements, including signalization, as viewed from eastbound SR 522.

SR 527 Interchange

With the new direct access ramp connection near SR 527 at 17th Avenue SE and the additional lane on I-405 between SR 522 and SR 527, the SR 527 interchange area would have higher vehicle volumes compared to the No Build Alternative. In particular, many intersections in the interchange area would have specific movements that would operate worse than the No Build Alternative. Although operations at some intersections may degrade, in most cases they would operate at LOS E or better.

All intersections in the Canyon Park Business Center (CPBC) that operate at LOS E or worse with the No Build Alternative would continue to operate at LOS E or worse with the Build Alternative. The direct access ramps south of SR 527 at 17th Avenue SE would lead to a small increase in vehicle volumes through the CPBC, mainly along 29th Drive SE and 220th Street SE. As a result, a slight increase in intersection average vehicle delay is expected at most CPBC intersections, and at a few locations, the overall LOS would degrade.

Safety Performance

At most locations, the addition of an ETL in both directions of I-405 and the new direct access ramps are expected to result in a positive or neutral change in safety performance because congestion-related crashes under the Build Alternative are expected to decrease. However, some locations, such as northbound I-405 approaching I-5, may experience degraded safety performance due to the potential for changed traffic conditions.

More vehicles are expected to be present at local ramp terminal intersections because I-405 freeway volumes are expected to increase with added freeway capacity. At intersections where volumes increase, or at new intersections, reduced safety performance is expected. Conversely, improved safety performance is expected at intersections where volumes would decrease, such as SR 527 and the I-405 ramp terminals.

Transit Operations

Without the Project, congested conditions would continue throughout the study area, further degrading transit operations. Transit agencies that use I-405 in the study area would need to account for increased variability in travel times in future budgeting and bus schedules. Sound Transit's planned I-405 bus rapid transit (BRT) would likely serve bus stop locations in the

study area, including the Brickyard Park and Ride, NE 195th Street, and the Canyon Park Park and Ride via freeway bus stops that require traveling in the congested GP lanes.

The Project would provide opportunities for improved transit performance and reliability in the study area. The ETLs would maintain an average minimum travel speed of 45 mph in 2025 and 2045 between NE 160th Street and SR 527. These speeds would be an improvement over existing conditions and the No Build Alternative. The proposed inline transit stations on the direct access ramps at SR 522 and just south of SR 527 at 17th Avenue SE would allow buses, in particular Sound Transit's planned I-405 BRT system, to remain in the ETLs when serving these areas. Many transit routes would still operate in the I-405 GP lanes for some or all trips in the study area.

Buses traveling on SR 522 would see both increases and decreases in speed and reliability. For example, routes on westbound SR 522 approaching I-405 during the AM peak period would have improved operations because the Project would eliminate congestion extending from I-405. Other routes, such as those traveling on SR 522 through the I-405 interchange during off-peak periods, would experience more delay because of three proposed traffic signals on SR 522.

Bicycle and Pedestrian Operations

With the Project, current and proposed pedestrian and bicycle infrastructure provided in the area would remain. The Project includes the following nonmotorized facilities:

- New nonmotorized connections at the SR 522 interchange to connect the proposed new SR 522 bus station and the University of Washington (UW) Bothell/Cascadia College campus.
- New bicycle lanes on 220th Street SE between SR 527 and 17th Avenue SE, and on 17th Avenue SE between 220th Street SE and the Canyon Park Park and Ride.
- Reconstruction of the existing pedestrian bridge over I-405 at the SR 527 interchange as two separate spans to provide access to the new inline transit stations and Canyon Park Park and Ride.

Freight Operations

The Project would not adversely affect freight travel. The Build Alternative would generally decrease congestion in the GP lanes throughout most of the study area in 2025 and 2045, reducing delay for trucks. Approaching the I-5 (Lynnwood) interchange, freight may experience more delay during the PM peak period. The ETLs would continue to have the same vehicle weight limits as the No Build Alternative, so most trucks would not be allowed in the ETLs.

4.1.3 How would construction affect transportation?

During construction, traffic conditions are expected to remain similar to existing conditions during the most congested times of the day, although some short-term delays may occur. Temporary closures would be required to widen the freeway, but they would occur on nights and weekends when traffic demand is lower and detour routes can better accommodate additional vehicles. Increases in vehicle delay would occur through construction areas and along detour routes. Construction is not expected to affect tolling operations.

Full freeway closures in one or both directions of travel would be required during bridge construction and demolition, the setting of bridge girders, and installation of new culverts. Most of these full closures would occur at night. In some cases, such as installation of culverts or bridge demolition, the closures would occur over one or more weekends.

Construction vehicles for the Project are expected to cause temporary increases in traffic delay and volumes in the study area. Temporary delays are also expected to occur on freeways and arterials identified as haul routes. When possible, construction sites would be accessed from the freeway; however, construction traffic on local streets would be unavoidable.

Construction would require adjustments to the existing lane and intersection configurations on some local roadways. As a result, some buses would be affected by increased delay and longer travel times. Bus stops may need to be temporarily relocated or closed during construction. Some bus routes may require rerouting when streets are closed.

The Project would reconstruct the Canyon Park Park and Ride. Construction is not anticipated to reduce the available parking at the park and ride during commute hours (5 a.m. to 7 p.m.) on weekdays. Overnight and weekend parking reductions may be necessary for construction. If parking is temporarily reduced due to construction, WSDOT would coordinate with affected transit agencies to determine if and where replacement parking would be provided. Transit service would continue to operate at the Canyon Park Park and Ride and the I-405 freeway bus stops, but a few weekend closures may be required at the Canyon Park Park and Ride to complete construction. Any closures will be coordinated with affected transit agencies to minimize service disruptions.

Construction activities may also temporarily limit pedestrian and bicyclist movements on local roadways. Routes for nonmotorized users would be maintained to the extent possible, with specified detour routes when needed. Pedestrian access between the Canyon Park Park and Ride and the I-405 inline bus stops would be maintained during Project construction. Construction of the direct access ramp near 17th Avenue SE would be staged to allow for the existing pedestrian bridge across I-405 to remain open during construction until the new segment of the pedestrian bridge is completed. Temporary short-term closures of the existing and new pedestrian bridges would be unavoidable; however, closures would occur during nights and weekends to minimize impacts on transit riders. Up to three weekend closures would be required for connecting the new segment of the pedestrian bridge to the existing bridge near the southbound I-405 inline bus stop. Additional nighttime closures of the new pedestrian bridge would be required for work required to finish the bridge and would occur when transit is not in operation. WSDOT will maintain pedestrian access across I-405 to the park and ride with an Americans with Disabilities Act accessible connection when either the existing or new pedestrian bridge is closed. This detour route may take longer for some users than the existing bridge.

4.1.4 Would the Project have indirect effects on transportation?

Indirect Effects During Operations

What are indirect effects?
Indirect effects are caused by the proposed Project but could occur later in time or farther in distance from the Project study area.

By increasing I-405 freeway capacity, the Build Alternative could lead to changes in traffic operations at the following other locations outside of the Project study area:

- **Southbound I-405, south of Downtown Bellevue,** would experience increased congestion with the Build Alternative during the AM peak period in the GP lanes approaching the I-90 and Coal Creek Parkway interchanges. This is because the Build Alternative would reduce congestion on southbound I-405 near the SR 522 interchange, allowing greater volumes to travel south faster. Between SR 522 and downtown Bellevue, I-405 would have enough capacity to handle this increased vehicle volume, but there would not be enough space south of downtown Bellevue. WSDOT has identified projects in the I-405 Master Plan to improve operations near these interchanges, but these projects are currently unfunded.
- **Southbound I-5 in Lynnwood, south of I-405** would experience congestion during the AM peak period with both the No Build and Build Alternatives. With the No Build Alternative, I-405 would back up onto southbound I-5 past the 164th Street SW interchange. However, with the Build Alternative, the I-405 congestion would no longer extend onto I-5, allowing greater vehicle volumes to travel farther south on I-5. As a result, operations on southbound I-5 approaching the I-405 interchange would improve with the Project, but congestion on I-5 south of the I-405 interchange would increase.
- **I-5 in Lynnwood** would experience congestion on northbound I-5 extending south from the 164th Street SW interchange under both the No Build and Build Alternatives. With the Project, decreased congestion on northbound I-405 would allow more traffic to reach northbound and southbound I-5 and northbound SR 525 during the PM peak period. Because portions of northbound I-5 are already congested without the Project, the increase in traffic volumes would further worsen northbound I-5 congestion. Northbound SR 525 and southbound I-5 south of the I-405 interchange in Lynnwood would have increased volumes with the Build Alternative. Similar to northbound I-5, decreased congestion on I-405 would allow more vehicles to reach these corridors during the PM peak period. The I-405 Master Plan includes projects to add a second ETL in each direction between SR 527 and I-5 in Lynnwood and direct connector ramps between the I-405 ETLs and the I-5 HOV lanes. These improvements, which are currently unfunded, would likely reduce congestion and decrease travel times in the I-405 ETLs approaching the I-5 interchange.

Indirect Effects During Construction

The Project construction period would overlap with other I-405 projects, as described in Section 1.5. Indirect construction impacts would likely peak between 2022 and 2023, when the Project and the Renton to Bellevue, NE 85th, and NE 132nd projects would be under

construction. Regional facilities, including I-5 and SR 99, would experience increased vehicle volumes and vehicle delay.

Freeway haul routes, including I-405, SR 522, and I-5, would likely experience higher truck volumes and delays than if the Project was built in isolation because these haul routes would serve one or more other I-405 construction projects at the same time. The greatest increase in truck traffic is expected at night, when most construction work would occur. Local streets identified as potential haul routes within the Project study area would not likely have any additional truck traffic from other concurrent I-405 projects.

WSDOT may choose to schedule concurrent full freeway closures across projects. In the short term, these concurrent closures would affect a larger portion of I-405, and detour routes and other major facilities, including I-5, would increase vehicle delay. However, consolidated freeway closures would likely reduce the quantity and duration of closures required for all of the I-405 projects, potentially resulting in fewer overall impacts.

WSDOT would coordinate with each project's contractor on the timing of road and ramp closures to minimize traffic impacts. Adjacent ramp closures would not likely be allowed between the different I-405 projects. Freeway lane closures from other projects would not likely impact traffic in the Project study area, with the exception of the NE 132nd project, which is closest in proximity. WSDOT and its contractors would coordinate to confirm that detour routes do not conflict across projects.

4.2 Noise

4.2.1 How would operations affect noise?

Traffic noise effects occur when predicted noise levels approach or exceed Federal Highway Administration (FHWA) noise abatement criteria (NAC). WSDOT used modeling software to predict future noise levels at nearly 1,000 noise-sensitive locations, known as receivers, including residences, outdoor sports areas, places of worship, trails, hotels, day care centers, and playgrounds. WSDOT considers a noise impact to occur if predicted noise levels approach within 1 A-weighted decibel (dBA) of the NAC and/or if there is an increase of 10 dBA or more. In areas where traffic noise with the Project was expected to approach or exceed the NAC, WSDOT evaluated possible noise abatement (mitigation).

Noise levels would be similar with and without the Project.

- Existing (2018) traffic noise levels in the study area are predicted to range from 37 to 75 dBA.
- In 2045, without the Project, traffic noise levels are predicted to range from 38 to 75 dBA.
- In 2045, with the Project, traffic noise levels are predicted to range from 37 to 75 dBA.

> **Appendix B, *Noise Discipline Report***
> Please see Appendix B for additional information about the study approach, existing conditions, and operational and construction effects on noise.

In 2045 with the Project, the number of receivers approaching or exceeding the NAC is expected to be at 221 receivers (representing 293 dwelling units). This is less than the No Build

Alternative, which would affect 227 receivers (representing 307 dwelling units). With the proposed noise walls discussed in the next section, 34 receivers representing 43 residences would drop below the NAC. This means that with the Project, 187 receivers (representing 250 dwelling units) would be affected, which is less than the No Build Alternative.

As part of the Project, a bus station, turnaround loop and pick-up and drop-off facilities would be constructed in the northwest quadrant of the SR 522/I-405 interchange. Noise impacts from transit operations are not anticipated from this facility because the nearest noise sensitive land uses are located approximately 1,000 feet away.

4.2.2 What noise walls are proposed with the Project?

The Project would build three new noise walls, as described in Exhibit 4-7 and shown in Exhibit 3-2, Sheets 1, 4, and 5.

Exhibit 4-7. Description of Proposed Noise Walls

Proposed Wall Name	Description	Benefits of the Proposed Noise Wall in 2045
Wall East 2	▪ Location: Along the northbound I-405 off-ramp to NE 160th Street (see Exhibit 3-2, Sheet 1). Would abut an existing noise wall. ▪ Dimensions: Area of 9,507 square feet (528 feet long and 18 feet high).	▪ Would reduce noise below the NAC for 7 receivers representing 13 residences. ▪ Would reduce noise levels by up to 9 dBA as compared to the No Build Alternative in 2045. ▪ Some upper floor receivers with balconies would continue to experience noise levels that would be above the NAC. Ground floor use areas are the primary area of concern when providing noise abatement, and noise walls are not typically designed to reduce noise levels at upper floors. This noise wall has been designed to reduce noise levels at 2nd floor balconies because the 2nd floor qualifies as the first row of receivers in this area.
Wall East 6	▪ Location: Along northbound I-405 on either side of 228th Street SE (see Exhibit 3-2, Sheets 4 and 5). Would extend an existing noise wall (Wall NW1). The existing noise wall would remain or be replaced as needed. ▪ Dimensions: Area of 31,776 square feet (1,793 feet long and 15 to 18 feet high).	▪ Would reduce noise levels to below the NAC for 16 receivers representing 17 residences. ▪ Would reduce noise levels by up to 9 dBA as compared to the No Build Alternative in 2045.
Wall West 7	▪ Location: Along the west side of southbound I-405, north of SR 527 near 9th Avenue SE (see Exhibit 3-2, Sheet 5). Would abut an existing noise wall. ▪ Dimensions: Area of 14,396 square feet (1,200 feet long and 12 feet high).	▪ Would reduce noise levels to below the NAC for 11 receivers representing 13 residences. ▪ Would reduce noise levels by 5 to 10 dBA as compared to the No Build Alternative in 2045.

dBA = A-weighted decibels; NAC = Federal Highway Administration noise abatement criteria

In addition to the new walls proposed for construction, WSDOT may need to remove and replace one of nine existing noise walls (NW1) in the study area to accommodate the Project design. Wall NW1 may be replaced near its existing alignment and on a retaining wall along

northbound I-405 north of the 228th Street SE bridge, and would connect to the 17th Avenue SE retaining wall as part of proposed Wall East 6. The remaining eight noise walls in the study area would remain in their current locations.

There is a neighborhood screening wall currently attached to Wall NW1 that would be removed with the Project. The proposed elevation of 17th Avenue SE with a retaining wall would provide noise shielding to the neighborhood in place of the screening wall, and traffic noise levels with the Project are not predicted to approach or exceed the NAC in the area of this removed wall. Therefore, no additional abatement or replacement is recommended.

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

Sections 5.2 and 5.3 of Appendix B, *Noise Discipline Report*, provide a detailed explanation of the criteria WSDOT uses to assess the feasibility and reasonableness of noise walls and the analysis WSDOT conducted to determine where noise walls met the criteria. 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 the wall is feasible, WSDOT then assesses the reasonableness of a noise wall, which considers factors such as cost-effectiveness and the expected noise reduction for receivers.

4.2.3 How would construction affect noise?

Construction creates temporary noise that varies depending on the type and location of activities and the 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 one area, so noise from trucks may affect more receivers than other construction noise. Other common noise sources typically include impact equipment, such as jackhammers.

The maximum noise levels of construction equipment typically range from 69 to 106 dBA at 50 feet from the source. Construction noise decreases by 6 dBA per doubling of distance from the source moving away from the equipment. The various pieces of equipment are almost never operating simultaneously at full power. Some would be powered 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. WSDOT will apply for variances or exemptions from local noise ordinances for nighttime construction. Such noise variances or exemptions require construction noise abatement measures that vary by jurisdiction.

4.3 Ecosystems

4.3.1 How would operations affect ecosystems?

Wetlands

A total of 52 wetlands covering approximately 17 acres were delineated in the study area. In general, these wetlands are in degraded condition because they have been affected by urbanization. The Project would result in permanent effects on 21 wetlands (up to 6 acres) and associated wetland buffers (up to 4 acres). Where feasible, design modifications were made to the Project footprint to avoid or minimize permanent effects on wetlands and wetland buffers. All permanent impacts will be mitigated in accordance with local, state, and federal regulations.

Streams and Aquatic Resources

Appendices I, L, and M

- Appendix I, *Ecosystems Discipline Report*, contains additional information about the study approach, existing conditions, and operational and construction effects on ecosystems.
- Appendix L, *Draft Wetland and Stream Assessment Report*, contains additional information on wetlands.
- Appendix M, *Draft Wetland and Stream Mitigation Report*, contains additional information on proposed wetland mitigation.

Permanent Removal of Bridge Piers in the Sammamish River

The Project would demolish and remove four existing bridge piers in the Sammamish River. Removing the piers would benefit aquatic habitat and species that reside in the river, as well as aquatic species that use the river for migration.

Overwater Shading

The Project would construct three new bridges spanning the Sammamish River and would remove two existing bridges, which would increase overwater shading by about 13,000 square feet (0.3 acre). The placement of the new overwater structures would alter the intensities and pattern of in-water shading. Shade effectively creates a different habitat type that contrasts with the adjacent aquatic environment where no shade is present. The transition between light and shade (edge effect) is considered a potential influence on fish behavior and habitat selection. This permanent shading could result in reduced aquatic vegetation density; however, limited aquatic vegetation is present in the Sammamish River where the new bridges will be constructed. The Sammamish River is listed on the Washington State Department of Ecology (Ecology)'s the 303(d) list with impaired water quality for exceeding allowable levels of temperature, bacteria, and dissolved oxygen (Ecology 2019). Temperature is one of the limiting factors for salmonids in the Sammamish River. Overwater shading may potentially provide beneficial effects by reducing the temperature of the Sammamish River. As a result, the shading effects on aquatic vegetation and aquatic species are considered negligible.

Fish Barrier Correction and Related Improvements

To identify which fish barriers required correction as part of this Project, WSDOT consulted with the Muckleshoot Indian Tribe (MIT) and the Washington Department of Fish and Wildlife, as described in Sections 3.3.2, 4.2.1, and 5.2.2 of Appendix I, *Ecosystems Discipline Report*. As part of that consultation, the three parties conducted field surveys at 45 locations and identified a total of 8 WSDOT-owned barriers. Pending further consultation with the MIT, this Project would restore stream connections at 5 fish barriers; retain 1 of the fish barriers as a hydraulic crossing, and restore the 2 remaining barriers as part of separate projects in the I-405 corridor.

The Project would benefit aquatic habitats and species by replacing fish barriers with restored stream connections at Par Creek, Stream 25.0L, and North Fork of Perry Creek, and two at Queensborough Creek The fish barrier corrections would restore full anadromous fish access to approximately 24,330 linear feet of upstream habitat. The Project would result in up to 16,600 square feet (0.37 acre) of permanent stream impacts and up to 15,900 square feet (0.36 acre) of permanent stream buffer impacts.

Stormwater Input

Section 4.4.1, Water Resources, explains how stormwater would be treated with the Project. In general, the Project would reduce the pollutant loads and concentrations by constructing multiple stormwater treatment facilities. Water quality conditions are expected to improve because an additional 23 acres of pollution-generating impervious surfaces (PGIS) would receive treatment compared to existing conditions.

For water quantity, the Project is expected to reduce peak flows from I-405 into streams, except for the Sammamish River. The Project proposes to provide detention for stormwater discharges to North Creek, Par Creek, North Fork Perry Creek, and Queensborough Creek. After construction of detention facilities and fish barrier corrections, the Project would reduce the "flashiness" of stormwater discharged to streams in the study area, which was historically mitigated by pervious soils and dense vegetation.

Outfalls

The proposed Project would build three new stormwater outfalls: one at the Sammamish River and two at the North Fork of Perry Creek. All stormwater runoff created as a result of the Project would be treated before being discharged into its associated water body. Constructed banks for the North Fork Perry Creek outfalls would be stabilized with riprap to prevent bank erosion. No in-water work is anticipated, and no trees will be removed for installation of the outfall at the Sammamish River. No in-water work would occur for installation of the outfalls along North Fork Perry Creek as both outfalls would be constructed on the new channel.

Riparian Buffer Vegetation Removal

The Project would result in the permanent removal of up to 15,900 square feet (0.36 acre) of stream buffers. Disturbance of riparian areas could potentially cause some localized alteration of the adjacent aquatic habitat, including changes in shading patterns, reduction of large woody material (LWM) recruitment, and changes in organic material input. Riparian vegetation removal at the Sammamish River would be limited to the removal of non-native invasive vegetation along the streambanks near the in-water work area. The banks are primarily dominated by Himalayan blackberry, and trees are absent. Some tree removal may be required for construction access at fish barrier correction locations; however, the streambanks at these locations will be replanted with native species once the new culverts are in place. Restoration of temporarily disturbed areas along the Sammamish River and fish barrier correction locations after Project construction will improve riparian habitat by replacing non-native species with native woody species. This restoration work would include planting native woody species near the wetland located between Stream 25.0L and North Creek.

Land-Based Wildlife

The Project would require clearing of approximately 15.5 acres of vegetation in the study area. These trees and vegetated areas do not currently provide suitable habitat for any threatened and endangered species discussed in the next section. Trees will be replaced in accordance with the WSDOT *Roadside Policy Manual* (WSDOT 2015), which aims to replant trees within the

Project limits where feasible and uses a ratio that considers the existing size of the trees. Study area noise levels for wildlife species would be similar to the No Build Alternative, as described in Section 4.2.1.

Threatened and Endangered Species

> Appendices N and N1, *Biological Assessment*
>
> Please see Appendices N and N1 for additional information describing effects to threatened and endangered species.

Based on the effects and exposure analyses and implementation of all best management practices (BMPs), WSDOT has determined that the Project may affect listed species under the Endangered Species Act as summarized in Exhibit 4-8. National Oceanic and Atmospheric Administration (NOAA) Fisheries concurred with the determinations for Chinook salmon and steelhead on June 16, 2020. In addition, NOAA Fisheries concurred that the Project would have an adverse effect on essential fish habitat for Pacific Coast Salmon. NOAA Fisheries also assessed the effects on Southern Resident Killer Whales due to the potential reduction of prey, primarily Chinook salmon, and concluded the Project may affect, but is not likely to adversely affect Southern Resident Killer Whales. The U.S Fish and Wildlife Service concurred with these determinations for bull trout and cuckoo on November 27, 2019.

Exhibit 4-8. Effect Determinations for Listed, Designated, Proposed Species

Species	Effect Determination
Puget Sound Chinook salmon	May affect, likely to adversely affect
Puget Sound steelhead	May affect, likely to adversely affect
Southern Resident Killer Whale	May affect, not likely to adversely affect
Coastal/Puget Sound bull trout	May affect, not likely to adversely affect
Yellow-billed cuckoo	May affect, not likely to adversely affect

4.3.2 How would construction affect ecosystems?

Wetlands

Project construction would temporarily affect about 0.25 acre of wetlands and up to 1 acre of wetland buffers in the study area. After the Project is complete, these temporarily disturbed areas will be restored and replanted with appropriate native vegetation. Habitat functions will be temporarily diminished while these trees, shrubs, and emergent plants become established.

Streams and Aquatic Resources

Bridge Demolition

The Project would temporarily affect Sammamish River in-water habitat during the demolition of four existing bridge piers that are located in the river. The installation of a cofferdam in the Sammamish River would dewater and temporarily displace streambed habitat. Although this effect would be temporary, an impact on prey species (invertebrates) is likely to occur. The

physical disturbance of instream habitat would primarily occur at the Sammamish River during the 16 weeks of pier removal work. A total of up to 0.08 acre of the channel would be temporarily affected in the Sammamish River. In addition, anchoring the temporary barge, if used, could potentially disturb existing riverbed habitat. Barge use would occur for no more than 16 weeks. No spawning habitat for listed fish is present within the Sammamish River where the temporary barge would be anchored. In-stream isolation could result in an immediate and direct loss of riverbed productivity from the dewatered construction zone. However, substrates at the pier removal work and bridge demolition in the Sammamish River are mostly silt and clay and exhibit limited riverbed habitat. Additionally, temporarily affected areas are expected to recover relatively quickly by recolonization and recruitment from nearby undisturbed areas; therefore, displacement of riverbed habitat from dewatering is expected to be limited in severity, extent, and duration.

Overwater Shading

The Project could build temporary work bridges during bridge demolition work, which would have approximately 0.18 acre of overwater shading adjacent to the existing bridges for up to 16 weeks over the 3 to 4 years of construction. If a barge is used during demolition, it is estimated that the barge would be in the Sammamish River up to 8 weeks per bridge. This temporary shading could result in reduced aquatic vegetation density; however, limited aquatic vegetation is present in the Sammamish River where the new bridges would be constructed. As a result, the shading effects on aquatic vegetation are considered negligible.

Fish Barrier Correction and Related Improvements

Construction would result in approximately 5,700 square feet (0.13 acre) of temporary stream impacts and approximately 143,400 square feet (3.3 acres) of temporary stream buffer impacts. The Project's temporary stream and stream buffer impacts would result from the five proposed restored stream connections, channel regrading, roadway widening, and installing bridge abutments and retaining walls.

Construction of the various Project elements, including the roadway, in-water work, retaining walls, and stormwater treatment facilities, could temporarily introduce fine sediments and turbidity into the streams of the action area through erosion and sedimentation. BMPs listed in Section 6 will be implemented to limit construction-related turbidity, and construction will be conducted in accordance with in-water work windows specified in Project permits.

The installation of a cofferdam at the fish barrier correction locations would occur as needed and would dewater and temporarily displace streambed habitat. Although this effect would be temporary, an impact on prey species (invertebrates) is likely to occur where fish species currently inhabit streams in the study area. In-stream isolation could result in an immediate and direct loss of riverbed productivity from the dewatered construction zone. Temporarily affected areas are expected to recover relatively quickly by recolonization and recruitment from nearby undisturbed areas; therefore, displacement of riverbed habitat from dewatering is expected to be limited in severity, extent, and duration.

Resident fish would likely need to be excluded or handled at fish barrier correction sites where fish presence is documented. When fish handling is necessary, WSDOT will follow the agency's fish handling and fish salvage protocols (WSDOT 2016a).

Riparian Buffer Vegetation Removal

The Project would temporarily disturb up to 4 acres of stream buffers because of fish barrier corrections and site access needs. Most of the temporary stream impacts will be mitigated on site by installing restored stream crossings and restoring native riparian vegetation wherever possible. Disturbance of the streambed and banks would be limited to those necessary to construct new outfalls.

Underwater Noise

Temporary noise impacts would occur during Project construction due to the use of a vibratory hammer for installation of the sheet piles around the four piers in the Sammamish River during the approved in-water work window. No impact pile driving is anticipated to occur as a result of the Project. Noise impacts are expected to take approximately 80 hours over a single construction season. In-water work would only occur during the approved in-water work window for fisheries. The underwater sound for installation of the sheet piles is unlikely to result in injury to juvenile anadromous salmonids as they are less likely to be present in the Sammamish River during the in-water work window.

Land-Based Wildlife

Construction would require temporary clearing of approximately 8.5 acres of vegetation. Any temporarily cleared areas would be restored with native species appropriate to the area. Trees will be replaced in accordance with the WSDOT *Roadside Policy Manual (*WSDOT 2015), which aims to replant trees within the Project limits where feasible and uses a ratio that considers the existing tree size. Construction activities and equipment moving to and from work zones would temporarily increase noise in the study area, which may adversely impact nearby wildlife.

Threatened and Endangered Species

Please see text in section 4.3.1 addressing threatened and endangered species.

4.4 Water Resources

4.4.1 How would operations affect water resources?

Surface Water Quality

The Project would benefit water quality in the study area by detaining and treating more stormwater runoff. The Project would provide additional stormwater detention, which limits peak flows and velocities and helps to control flooding. Exhibit 4-9 compares stormwater treatment areas and methods today and with the Project. The amount of pavement, also known as PGIS, that receives stormwater treatment would change from just over 44 acres to about 91 acres. WSDOT would provide enhanced treatment for an area equivalent to 100 percent of

new PGIS created by the Project (about 24 acres), plus about 23 acres of existing untreated PGIS. As long as they meet these proposed enhancement treatment levels, the design-build contractor may elect to implement different stormwater treatment facilities than those specified in Exhibit 4-9. The Project would cause no substantial adverse effects on surface water flows because WSDOT would build facilities to detain increased flows.

Exhibit 4-9. Existing and Proposed Stormwater Treatment and Facilities

Sub-watershed	Receiving Waterbody	TDA	Existing I-405 PGIS (acres)	Existing Type of Facility	Existing I-405 PGIS Treatment (acres)	Proposed New PGIS (acres)	Proposed Type of Facility	Proposed Treated PGIS (acres)
Sammamish River	Stream KL14	F2	4.11	None	0	0.06	None	0
	Stream 42	F3	1.40	None	0	0	None	0
	Sammamish River	G2	52.98	CABS	10.65	15.75	CABS	45.19
				MFD	3.02			
				Wet Vault	3.30		MFD	4.28
	North Creek Confluence	G4	4.85	None	0	0	MFD	0.43
North Creek	North Creek	I1	21.36	MFD	3.52	1.88	MFD	2.27
							CABS	3.62
	Stream 66	I2	3.76	MFD	0.55	0.46	MFD	0.63
							CABS	1.03
	Stream 25.0L	I3	2.61	MFD	0.91	0.41	MFD	1.85
	Stream 70	I4	4.51	MFD	1.26	0.75	MFD	1.51
							CABS	1.47
	Stream C-77	J1	4.01	MFD	1.21	0.70	MFD	1.67
							CABS	0.50
				CSW	0.89		CSW	0.89
	North Fork Perry Creek	J2	10.50	Bioswale	2.16	1.43	CABS	11.51
				Wet Vault	4.45			
	North Creek	NW01	1.92	None	0	0.11	None	0
	Queensborough Creek	NW02	19.86	Wet Pond	9.35	2.36	Wet Pond	8.14
				MFD	0.37		CABS	4.89
				Bioswale	2.45		MFD	0.82
							MF	0.76
	North Creek	NW03	0.39	None	0	0.11	None	0
Totals			132.26		44.09	24.02		91.46

CABS = compost amended biofiltration swale; CSW = constructed stormwater wetland; MF = media filter; MFD = media filter drain; PGIS = pollution-generating impervious surface; PS = Puget Sound; TDA = threshold discharge area

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. As shown in Exhibit 4-10, proposed stormwater facilities with the Project would reduce loading of total suspended solids, total copper, total zinc, and dissolved zinc compared to existing conditions. There would be an increase in dissolved copper. However, because total copper would decrease, the change in the amount of the dissolved copper is more than compensated by the reduction in the non-dissolved copper.

Appendix J, *Water Resources Discipline Report*

Please see Appendix J for additional information about the study approach, existing conditions, and operational and construction effects on water resources.

Please see Exhibit 5-1, sheets 1 through 5, in Appendix J for locations of existing and proposed stormwater facilities. Exhibit 5-4 in Appendix J provides additional information about pollutant loading.

Exhibit 4-10. Comparison of Pollutant Loading in No Build and Build Alternatives

	Total Suspended Solids (lb/yr)	Total Copper (lb/yr)	Dissolved Copper (lb/yr)	Total Zinc (lb/yr)	Dissolved Zinc (lb/yr)
No Build Alternative	71,683	15.9	4.8	96	34
Build Alternative	54,727	13.4	5.2	79	32

lb = pounds; yr = year

Floodplains, groundwater, and aquifers

The Project proposes very minor changes to floodplains. WSDOT and local design criteria mandate a zero rise in floodplain water surface elevations, so floodplain effects are not expected. The study area does not contain wellhead protection areas or a sole-source aquifer, so the Project would not affect groundwater by contamination or reduced well capacity.

4.4.2 How would construction affect water resources?

During construction, work crews would clear, grade, and prepare construction areas for new pavement. Constructing new pavement would expose bare soil, which could be easily eroded by rainfall and surface water runoff. Such soil erosion can have short-term effects on surface water quality. However, because the Project would follow standard BMPs for erosion control, these effects would be minimal if they occur.

Project construction would not negatively affect any of the identified floodplains in the study area because each affected area is anticipated to have sufficient capacity to convey flows without increasing flooding risks. Detention provided by the existing flow control facilities and temporary erosion and sediment controls would help prevent downstream flooding, erosion, and sedimentation during construction. Because the study area does not contain wellhead protection areas or a sole-source aquifer, there would be no groundwater effects.

4.5 Visual Quality

4.5.1 How would operations affect visual conditions?

> Appendix F, *Visual Impact Assessment*
> Please see Appendix F for additional information about the study approach, existing conditions, and operational and construction effects on visual quality.

The Project would have varying effects on visual quality by reducing the natural character of the corridor and shifting it to a more urban condition. Changes in views for travelers on I-405, SR 522, and study area trails and roadways would generally be neutral or beneficial as compared to existing conditions. Through most of the study area, the Project would add narrow bands of pavement and restripe the existing pavement, so impacts on visual quality would be minimal. Three noise walls, shown in Exhibit 3-2, Sheets 1, 4, and 5, would be built as part of the Project. These walls would visually screen and mitigate noise from I-405 for single and multifamily residences. The most noticeable long-term visual impacts would be in the vicinities of the I-405/SR 522 interchange and the I-405/SR 527 interchange, as described below.

I-405/SR 522 Interchange Area

From I-405, there would be visual changes resulting from new retaining walls and wider areas of pavement associated with the new northbound I-405 bridge. Viewers would also experience increased visual complexity due to ramp reconfigurations and new direct access ramps and bus stations. Because overall, the freeway and related structures would remain dominant in views from I-405, the Project would result in neutral impacts on visual quality for I-405 users in the SR 522 interchange area.

SR 522 users would also experience increased complexity due to increased pavement, signals, signs, walls, and other transportation-related structures. New retaining walls and light poles on SR 522 near the I-405 interchange and in the proposed transit loop area would receive aesthetic treatments in accordance with the *I-405 Urban Design Criteria* (WSDOT 2016b). As a result of these changes, views from the highway would shift to match the more suburban character of the intersection of SR 522 and Campus Parkway just west of the study area. The Project would result in an overall neutral impact on visual quality for SR 522 travelers in the interchange area.

The most sensitive viewers near the I-405/SR 522 interchange would be Sammamish River Trail users, who would be moving at a slower pace than motorized vehicles and, thus, would be more likely to notice changes to the visual environment. The Project would increase the shadowing and size of I-405 ramps and roadway structures over the trail. The new bridges would include the aesthetic treatments provided in the *I-405 Urban Design Criteria*, which would improve visual coherence of the transportation facilities for trail users, offsetting the adverse impact of this increased shadowing. Overall, visual impacts are expected to be neutral for trail users near the interchange. The Project would improve visual quality for North Creek Trail users where the trail passes under SR 522 because WSDOT would implement new aesthetic treatments consistent with the *I-405 Urban Design Criteria* and additional underdeck lighting.

Exhibit 4-11 shows an aerial view of the existing conditions, and Exhibit 4-12 shows a visualization of Project improvements at the I-405/SR 522 interchange.

Exhibit 4-11. Aerial View of Existing Conditions at I-405/SR 522 Interchange, Looking North

Exhibit 4-12. Visualization of I-405/SR 522 Interchange Improvements, Looking North

I-405/SR 527 Interchange Area

The Project would shift the Canyon Park Park and Ride to the north and add a roundabout at 17th Avenue SE. The reconstructed park and ride lot would comply with Bothell landscaping requirements, maintaining the existing visual character within the park and ride; therefore, the reconstructed park and ride would have a neutral impact on visual quality for park and ride users.

Exhibit 4-13 is an aerial photo of existing conditions, and Exhibit 4-14 provides a visualization of the Project improvements specific to the inline transit station and Canyon Park Park and Ride.

Exhibit 4-13. Aerial View of Existing Conditions near I-405/SR 527 Interchange, Looking Northwest

Exhibit 4-14. Visualization of Improvements near I-405/SR 527 Interchange, Looking Northwest

Currently, a screening wall and vegetation visually separate a residential neighborhood from the park and ride. The Project would remove the screening wall and vegetation to construct a retaining wall supporting the new direct access ramp, and the trees would not be replanted due to a lack of space. The new retaining wall would include an Ashlar wall texture to match the *I-405 Urban Design Criteria*, and Boston ivy would be planted at the base of the wall to soften its appearance over time. These elements would help integrate the new ramp with the suburban character of the neighborhood. However, the new retaining wall would dominate the backyard views for some residents, which would lower the natural harmony, resulting in adverse impacts on visual quality for these viewers.

Existing view near proposed direct access ramp to 17th Avenue SE from the adjacent neighborhood.

Visualization of retaining wall near proposed direct access ramp to 17th Avenue SE from the adjacent neighborhood.

Views for drivers, pedestrians, bicyclists, and properties on 17th Avenue SE would also change. Currently 17th Avenue SE is a two-lane suburban road that dead ends at the Canyon Park Park and Ride. Existing sidewalks are buffered from the road by grass strips with mature trees, grassy berms, and hedges between the parking lots. The Project would reconstruct 17th Avenue SE by building a roundabout at the park and ride where the direct access ramp ends and by widening 17th Avenue SE by one lane. The reconstructed roadway would have a combination of new sidewalks, protected bike lanes, and on-street bike lanes. WSDOT would clear existing mature trees adjacent to 17th Avenue SE to make room for the improvements and would install a planting strip with grass and trees before the Project is complete. The newly planted trees would be smaller than the existing trees until they reach maturity. While the use of aesthetic treatments described in the *I-405 Urban Design Criteria* would have a beneficial impact on project coherence, the proposed changes would shift the character from suburban to a more urban visual character. Traffic volumes would increase in this area due to the new direct access ramp, which would have an adverse impact on visual quality at this viewpoint.

Existing view of 17th Avenue SE, facing south.

Visualization of the proposed 17th Avenue SE improvements, facing south.

4.5.2 How would construction affect visual conditions?

Construction would temporarily reduce visual quality due to the presence of construction equipment and workers, stockpiled materials, debris, construction signage, lighting, and fencing and staging areas. Detours and lane shifts during construction would demand greater traveler attention, and construction activities could distract travelers from typical views seen in

the corridor. Vegetation clearing would reduce natural harmony, especially in the areas cleared in the forested median between milepost (MP) 25.2 and MP 25.7 north of the I-405/NE 195th Street interchange for roadway widening. However, the impact would be temporary because the Project would restore most of the affected areas with native vegetation.

Travelers near the SR 522 interchange would observe construction of transit facilities and three new signalized intersections on SR 522. Pedestrians and cyclists on the Sammamish River Trail would have close-up views of construction equipment and activities under the I-405/SR 522 interchange because construction materials would likely be stored in this area during construction. There would be noticeable visual impacts just south of SR 527, where the Canyon Park Park and Ride and associated pedestrian bridge would be demolished and reconfigured, and the new direct access ramp would be built. Construction activities on 17th Avenue SE and 220th Street SE would also be noticeable for park and ride users, patrons of local retail businesses, and employees and visitors in nearby office parks. Residents in the neighborhood south of the park and ride would notice temporary visual impacts from vegetation clearing and have increased views of construction activities as the existing screening wall is demolished, the direct access ramp to I-405 from 17th Avenue SE is constructed, and improvements are made along 17th Avenue SE.

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

4.6.1 What Recreational, Section 4(f), and Section 6(f) resources are located near the Project?

The study area contains 14 recreational resources (12 existing and 2 planned), as summarized in Exhibit 4-15 and shown on Exhibit 3-2. Thirteen are Section 4(f) resources, and one is both a Section 4(f) and a Section 6(f) resource.

Exhibit 4-15. Recreational Resources in Study Area

Resource Name	Exhibit 3-2 Location	Resource Type	Ownership	Section 4(f)	Section 6(f)
Parks and Recreational Areas					
Bud Homan Park	Sheet 1	2.2-acre neighborhood park	City of Kirkland	Yes	No
KG1	Sheet 1	0.05-acre open space	City of Kirkland	Yes	No
Brackett's Landing	Sheet 2[a]	0.5-acre mini park	City of Bothell	Yes	No
North Creek Sportsfields (#1-4)	Sheets 2,3	14-acre athletic field	City of Bothell	Yes	No
UW Bothell/Cascadia College Open Space	Sheets 2, 3	58-acre open space	UW	Yes	No
1st Lt. Nicholas Madrazo Memorial Park[b]	Sheet 2	3.5-acre community park	City of Bothell	Yes	No
North Creek Forest	Sheets 3, 4	64-acre open space	City of Bothell	Yes	Yes
Cedar Grove Park	Sheet 5	13.75-acre community park/open space	City of Bothell	Yes	No

Exhibit 4-15. Recreational Resources in Study Area

Resource Name	Exhibit 3-2 Location	Resource Type	Ownership	Section 4(f)	Section 6(f)
Canyon Park Middle School[c]	Sheet 4	School sportsfield	Northshore School District	Yes	No
Crystal Springs Elem. School[c]	Sheet 5	School playground	Northshore School District	Yes	No
Trails					
Tolt Pipeline Trail	Sheet 1	Approx. 14-mile multi-use trail	King County Parks	Yes	No
Sammamish River Trail	Sheet 2	Approx. 10-mile multi-use trail	King County Parks	Yes	No
West Sammamish River Trail[d]	Sheet 2	Approx. 5.4-mile multi-use trail	King County Parks	Yes	No
North Creek Trail	Sheets 2, 3, 4, 5	Approx. 10-mile multi-use trail	Varies[e]	Varies[e]	No

[a] This park is just outside of the map area (located adjacent to the Sammamish River west of the proposed improvements).

[b] This is a planned facility. The park is anticipated to be constructed in 2020.

[c] School district sports fields and playgrounds are available for public use during non-school hours (Bothell 2015).

[d] This is a planned facility. There are currently no plans to construct the trail in the near future.

[e] Trail in study area is owned/maintained by WSDOT, UW, Bothell, and private entities (North Creek and Canyon Park business parks).

In addition, the study area contains two historic properties that are Section 4(f) resources:

- The Dr. Reuben Chase House, constructed in 1885, is located at 17819 113th Avenue NE in Bothell within the UW Bothell/Cascadia College campus. It is eligible for listing on the National Register of Historic Places (NRHP). The house was relocated to its current location to allow for the construction of the UW Bothell/Cascadia College campus.
- The George Shaw House, a 1905 brick Craftsman residence, is located at 11807 Bothell-Woodinville Road in Bothell, south of the Sammamish River and east of I-405. The construction of I-405 has altered the building's setting and feeling. The historic residence is eligible for listing on the NRHP.

> Appendix H, *Recreational, Section 4(f), and Section 6(f) Resources Technical Memorandum*
>
> Please see Appendix H for additional information about the study approach, existing conditions, and operational and construction effects on recreational resources. Section 5 of that report provides the Section 4(f) and Section 6(f) analysis.

4.6.2 How would operations and construction affect Recreational, Section 4(f), and Section 6(f) resources?

The Project would have limited effects on most recreational resources in the study area and no adverse effects on historic resources protected under Section 4(f), as described in Section 4.9.1. The Project would also have no negative effects on the one Section 6(f) resource in the study area. The Project would affect the following resources:

- **Sammamish River Trail** –The Project would require temporary realignment of the trail to allow for construction of three new bridges and demolition of two existing bridges. This work would require nighttime trail closures. In addition, a portion of this trail would need to be permanently realigned outside of its existing footprint to maintain King County trail specifications and/or to improve sight distance. Both the temporary and permanent trail realignments are expected to occur within WSDOT's existing right of way. However, it is possible that some of the temporary and/or permanent realignment may take place on property owned by King County, at the request of the County, to improve sight distance on the trail. Because of this possibility, a Section 4(f) *de minimis* determination has been made. A *de minimis* use is one that would not adversely affect the activities, features, or attributes of a Section 4(f) property. Concurrence from King County Parks, the agency with jurisdiction, is needed to conclude that the use of the Sammamish River Trail would have a *de minimis* use. WSDOT will work with King County Parks to obtain this concurrence. In addition, a 30-day public review and comment period is required. That review will occur as part of the 30-day review and comment period for this EA. After construction is complete, the Project would have no negative effects on the Sammamish River Trail.
- **West Sammamish River Trail** – The Project would not negatively affect future construction of this planned King County trail. The Project would construct a new I-405 bridge, requiring WSDOT to obtain an airspace lease from King County Parks, but there would be no negative effects on the proposed trail because adequate clearance would be maintained. A temporary construction easement would be needed for clearing vegetation and establishing a temporary construction staging area, and the area would be restored after construction is complete. The construction activities meet the criteria for a temporary occupancy exception in Section 23 Code of Federal Regulations (CFR) 774.13(d) and would not result in a temporary use under Section 4(f). Concurrence from King County Parks, the agency with jurisdiction, is needed to conclude that the proposed activities qualify for a temporary occupancy exception. WSDOT will work with King County Parks to obtain this concurrence.

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.

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. Section 6(f) 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 a project acquires property where Land and Water Conservation Grant Funds have been used to acquire or develop the property.

- **North Creek Trail** – The Project would build a new nonmotorized connection between the North Creek Trail and the proposed bus station in the northwest quadrant of the I-405/SR 522 interchange. This work would require a temporary detour and/or flagging during construction at the connection with the North Creek Trail. WSDOT expects that most of the construction would occur outside of the existing trail, minimizing the need for trail closures. Because WSDOT owns this section of the trail and leases the land to UW Bothell, it is not subject to Section 4(f). Furthermore, the lease agreement between WSDOT and the UW Bothell includes language that the highway use is paramount to any other use, including a bicycle and pedestrian trail. After construction is complete, there would be no negative effects on the North Creek Trail.


Visualization of proposed North Creek Trail underpass improvements at SR 522.

- **North Creek Forest** – The Project would reconstruct and realign portions of one stream, Stream 25.0L, within the North Creek Forest to correct a fish barrier. This work would benefit fish and aquatic species by restoring full anadromous fish access to upstream habitat and replacing the existing stream channel, which is currently in a pipe, with an open stream channel. Proposed construction activities would require a temporary construction easement from the City of Bothell. Construction activities would be located within an area of approximately 0.75 acres and would include clearing existing mature trees and vegetation, regrading soils, and constructing ground improvements by driving untreated timber piles to stabilize steep slopes. The Project would restore the area with native trees and vegetation after construction is complete. While the fish barrier correction and stream enhancement would improve the natural setting and features within the park, it would take time for replanted vegetation to mature. Because of this, a Section 4(f) *de minimis* determination has been made. Concurrence from the City of Bothell, the agency with jurisdiction, is needed to conclude that the use of the North Creek Forest would have a *de minimis* use. WSDOT will work with Bothell to obtain this concurrence. The required 30-day public review and comment period will occur as part of the 30-day review and comment period for this EA. Because portions of the North Creek Forest were purchased with Land and Water Conservation Fund grant assistance, it is protected as a Section 6(f) resource. However, the Project would not convert land to a transportation-related use and construction in North Creek Forest would occur for less than 6 months. Therefore, there would be no Section 6(f) use on the North Creek Forest.

4.7 Land Use, Economics, and Community Resources

4.7.1 How would operations affect land use, economics, and community resources?

> Appendix C, *Community Impact Assessment and Environmental Justice Discipline Report*
>
> Please see Appendix C for additional information about the study approach, existing conditions, and operational and construction effects on land use, economics, and community resources.

The Project would result in minimal direct effects on land use, economics, and community resources because it is located primarily in existing WSDOT right of way. WSDOT would acquire 13 properties (2 full and 11 partial), comprising approximately 3.5 acres of existing residential and commercial land uses in Bothell, as shown in Exhibit 4-16. The Project would also acquire permanent easements on 2 properties and limited access rights on 6 properties. Most of these properties would be converted to transportation-related uses. Overall, the conversions would have minimal impacts on land use because the area converted is a small percentage (less than 0.1 percent) of Bothell's total land area.

- The 2 full acquisitions consist of a residential property and a vacant parcel owned by the City of Bothell that is adjacent to their maintenance facility. Although the Project would displace one single-family residence, it would not negatively affect community cohesion because the home is not next to other homes in the larger neighborhood. At the time of publication, WSDOT is purchasing the residential property and the tenant has relocated, as allowed under FHWA's early acquisition process as described in 23 CFR 710.501 and 23 United States Code (USC) 108. Bothell's vacant parcel is undeveloped, so effects would be limited to changing the use from a vacant property with commercial zoning to a transportation-related use.
- The 11 partial acquisitions consist of 1 portion of a maintenance facility property owned by the City of Bothell; 9 acquisitions on 17th Avenue SE, 220th Street SE, and adjacent to SR 527 in the CPBC; and portions of private roads in the CPBC. A portion of Bothell's maintenance facility would need to be demolished and rebuilt, and is a candidate for functional replacement. The property has enough space for the facility to be rebuilt on site and would continue to operate as a maintenance facility. The proposed acquisitions in the CPBC consist primarily of small slivers for sidewalk areas and landscaping on the outer periphery of the property and would not affect the use of the property or result in changes to access or parking. The remaining partial acquisition would convert privately owned portions of 17th Avenue SE and 220th Street SE to a public roadway that would be owned and maintained by the City of Bothell. There would be no changes in the operation of the roadway or access to adjacent parcels.
- The 2 permanent easements would not negatively affect use of the affected properties and would consist of an airspace lease for a new bridge over the Sammamish River and an easement related to a fish barrier correction.
- The limited access rights on 6 properties would not negatively affect the use of these residential properties and would be related to construction of a retaining wall for the new direct access ramp at 17th Avenue SE.

The Project would not divide or bisect neighborhoods, change social patterns, or impede access to neighborhoods or community facilities for those living in, working in, and visiting the study area. The Project would increase existing noise levels above FHWA NAC only along the edge of neighborhoods close to I-405. In three locations shown on Exhibit 3-2, Sheets 1, 4 and 5, noise walls would be constructed because expected conditions would meet WSDOT's noise policy. In these areas, the noise walls would reduce traffic noise effects, which would benefit residents in portions of adjacent neighborhoods. In other locations where noise walls are not warranted according to WSDOT's noise policy, traffic noise levels would increase up to 3 dBA compared to the No Build Alternative, which is not perceptible to most people.

Public service providers would benefit from the Project through improved travel times on I-405. No effects are anticipated for utility providers.

4.7.2 How would construction affect land use, economics, and community resources?

Because construction would largely be within WSDOT's existing transportation right of way, construction effects on land use, economics, and community resources would be limited. Short-term effects during Project construction would include increased noise, fugitive dust, and increased traffic congestion. WSDOT would obtain temporary easements during construction, which would have temporary impacts on land uses. Access to businesses would be maintained during construction. Once construction is complete, affected areas would be restored to pre-construction conditions. Section 4.1.3 provides additional information about specific impacts associated with construction activities at the Canyon Park Park and Ride.

Construction could require short-term outages of utilities if utility relocations are required. WSDOT would coordinate with utility providers on any relocations prior to construction. The Project would provide economic benefits associated with construction-related jobs and purchases of goods and services for Project construction. However, construction-related increases in congestion and travel times that could negatively affect freight movement.

Exhibit 4-16. Proposed Property Acquisitions

ID	Zoning	Total Size (Acres)	Area Acquired (Acres)
1	Commercial	0.15	0.15
2	Residential	0.54	0.54
3	Commercial	7.99	0.34
4	Commercial	2.02	0.04
5	Commercial	3.32	0.03
6	Commercial	6.92	0.15
7	Residential	9.79	1.59
8	Commercial	5.82	0.20
8	Commercial	2.21	0.13
10	Commercial	9.44	0.19
11	Commercial	57.10	0.07
12	Commercial	8.18	0.09
13	Transportation	13.50	2.20*
Total Residential		**10.33**	**2.13**
Total Commercial		**103.15**	**1.37**
Total Converted		**113.48**	**3.50**

4.8 Environmental Justice

4.8.1 How would operations affect environmental justice populations?

According to the latest U.S. Census data, about 33 percent of the study area population identify as minorities, 5 percent identify as low-income, and 3 percent identify as limited English proficient (LEP), which is similar to Bothell, where the majority of the Project is located (U.S. Census Bureau 2017). The highest concentrations of minority populations reside in the Canyon Park and Fitzgerald/35th SE neighborhoods on the east side of I-405 between the NE 195th Street and SR 527 interchanges.

After analyzing the totality of the Project effects, benefits, and associated mitigation, WSDOT has determined the Project would not have disproportionately high and adverse effects on minority populations and/or low-income populations.

Exhibit 4-17 summarizes how WSDOT came to this conclusion.

Appendix C, *Community Impact Assessment and Environmental Justice Discipline Report*

Please see Appendix C for additional information about the study approach, existing conditions, and operational and construction effects on environmental justice. Section 4.4.1 of that report provides more detailed data on study area demographics.

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. Collectively, these groups are known as environmental justice populations.

Exhibit 4-17. Summary of Project Effects on Environmental Justice Populations

Resource	Effects Summary	Relevance to EJ Populations
Transportation	Beneficial Effects ▪ Project would improve travel time reliability and increase travel speeds for most travelers due to added freeway capacity (a second ETL) during peak periods: For most trips, travel times in both the ETLs and GP lanes would be similar to or would improve in 2025 and 2045 compared to the No Build Alternative. ▪ The new direct access ramps and inline transit stations near SR 527 and SR 522 would benefit transit routes and help to reduce transit travel times on I-405. ▪ Project would provide a new connection between the North Creek Trail and SR 522 interchange station area and new bicycle lanes and sidewalks in the Canyon Park Park and Ride area.	Project would result in a number of transportation benefits for all populations (see Section 4.1.2 for additional details). No adverse effects are anticipated. ETLs would continue to have a disproportionate effect on low-income populations and would continue to affect LEP populations.
Noise	▪ Noise modeling indicates that, with proposed noise walls 187 receivers representing 250 dwelling units would approach or exceed FHWA NAC with the Project. Under the No Build Alternative, 227 receivers, representing 307 dwelling units, would approach or exceed the FHWA NAC.	Increases in noise levels above the FHWA NAC would result in adverse effects. See additional discussion below.

Exhibit 4-17. Summary of Project Effects on Environmental Justice Populations

Resource	Effects Summary	Relevance to EJ Populations
Ecosystems	▪ Project would result in up to 6 acres of permanent effects on wetlands and up to 4 acres of permanent effects on wetland buffer. ▪ Project would require permanent clearing of approximately 15.5 acres of vegetation in the study area. Trees will be replaced in accordance with the *WSDOT Roadside Policy Manual* (WSDOT 2015). ▪ Project would result in permanent effects of about 16,600 square feet (0.37 acre) on streams and 15,900 square feet (0.36 acre) of stream buffers. ▪ Project may affect terrestrial wildlife where noise increases are not mitigated. Beneficial Effects ▪ Project would correct five fish barriers, which would restore full anadromous fish access to about 24,330 linear feet of upstream habitat.	No adverse effects are anticipated.
Water Resources	Beneficial Effects ▪ Project would a treat larger area of pollution-generating impervious surface compared to the No Build Alternative, improving water quality. ▪ Project would restore stream crossings to be more resilient to future changes in the 100-year flood condition.	No adverse effects are anticipated.
Visual	Beneficial Effects ▪ Project would change the visual setting in some locations because of introduction of new transportation elements and removal of vegetation.	No adverse effects are anticipated.
Recreational, Section 4(f) and Section 6(f) Resources	▪ Project would have no negative long-term effects on trails, recreational facilities, and historic and cultural resources. There would be no negative effects on the one Section 6(f) resource. Under Section 4(f) there would be a *de minimis* use for trail realignment at the Sammamish River Trail, a temporary occupancy exception at the West Sammamish River Trail, and a *de minimis* use for tree removal associated with stream realignment work at the North Creek Forest. Beneficial Effects ▪ Project would restore an existing stream connection for Stream 25.0L in a portion of the North Creek Forest, benefiting the natural area. ▪ Project would improve nonmotorized access through new connection to North Creek Trail from the proposed SR 522 transit turnaround loop.	No adverse effects are anticipated.

Exhibit 4-17. Summary of Project Effects on Environmental Justice Populations

Resource	Effects Summary	Relevance to EJ Populations
Land Use, Economics, and Community Resources	▪ Project would be consistent with local and regional planning goals and policies. Project would not negatively affect neighborhoods because it would be built mainly within existing right of way and would not create neighborhood barriers or reduce access. ▪ Project would acquire and convert residential and commercial land uses to transportation use. The amount of land converted is small compared to the overall size of Bothell and would not result in negative effects. One residence would be displaced. At the time of publication, WSDOT is purchasing the residential property and the tenant has relocated. ▪ Community facilities and utilities would not be affected. No businesses would be displaced.	No adverse effects are anticipated.
Historic and Cultural Resources	▪ Project would not result in effects on historic and cultural resources.	No adverse effects are anticipated.
Air Quality	Beneficial Effects ▪ Air emissions, including greenhouse gases, would be lower compared to existing conditions because of improvements in vehicle technology.	No adverse effects are anticipated.
Geology, Soils, and Groundwater	▪ Project would address geologic hazards such as ground shaking, liquefaction, erosion, and flooding through typical design standards.	No adverse effects are anticipated.
Hazardous Materials	▪ Hazardous materials could be encountered during construction. If encountered, hazardous materials would be managed and contaminated sites would be addressed in accordance with applicable regulations.	No adverse effects are anticipated.

ETL = express toll lane; FHWA = Federal Highway Administration; GP = general purpose; LEP = limited English proficient; NAC = noise abatement criteria

Operation of the Project would generally have no adverse effects on environmental justice populations, except for the projected increase in traffic noise. With the three proposed noise walls under the Build Alternative, fewer receivers would be affected by noise levels above FHWA NAC than the No Build Alternative. However, with the Project, some areas close to the freeway would continue to experience noise effects above FHWA's NAC where noise walls would not be feasible and/or cost-effective to build under WSDOT's noise policy.

In most areas where noise levels would increase above FHWA NAC, the population is predominantly non-minority and non-low income. However, within parts of the Fitzgerald/35th SE and Canyon Park neighborhoods on the east side of I-405 south of SR 527, the population is predominantly minority. In these neighborhoods, construction of one of the proposed noise walls, Wall East 6 shown on Exhibit 3-2, Sheets 4 and 5, would benefit a number of residents, both minority and non-minority, by reducing traffic noise levels by up to 9 dBA compared to the No Build Alternative. In areas near these neighborhoods where noise levels would still be above the FHWA NAC, there would be either no increase or a 1 to 2 dBA decrease compared to the No Build Alternative. Overall, any increases in traffic noise levels across all study area

neighborhoods would affect all populations to the same degree and would not be more severe or greater in magnitude for minority populations.

4.8.2 How would construction affect environmental justice populations?

Construction activities would have a disproportionate effect on minority populations in the Fitzgerald/35th SE and Canyon Park neighborhoods because of the high percentage of minority populations in these neighborhoods. However, all populations in neighborhoods close to construction would be affected by construction to the same degree, and there would be no disproportionately high and adverse effects on minority populations during construction.

4.9 How would the Project affect other aspects of the built and natural environment?

Because the Project would be built mostly within existing right of way in an urbanized area, it would have few effects on many elements of the natural and built environment. Resources where effects would have limited effects on environmental resources are summarized below.

4.9.1 Historic, Cultural, and Archaeological Resources

WSDOT conducted a cultural resources survey of the area of potential effects (APE) in summer 2019 in compliance with Section 106 of the NHPA. The survey, documented in Appendix E, *Cultural Resources Survey*, identified 17 historic built environment resources, all of which are historic-age single-family residences, and two archeological sites. Two of the historic-age residences qualify as historic properties under Section 106 of the NHPA. The George Shaw House (property 40731) was determined eligible for listing in the NRHP by the Washington State Department of Archaeology and Historic Preservation (DAHP) in 2005, and the Dr. Reuben Chase House (property 39187) was listed in the NRHP in 1990. The Project as currently designed would not adversely affect either historically significant resource. None of the 15 other historic-age residences or two archaeological sites within the study area are NRHP-eligible.

Appendices E, E1, and Q

- Appendices E and E1 contain additional information about the study approach, existing conditions, and operational and construction effects on cultural resources.
- Appendix Q contains correspondence with DAHP, tribes, and other Section 106 consulting parties.

Why do we consider effects on cultural and historic resources?

Under Section 106 of the NHPA, 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 NRHP.

The remaining six historic-age residences are considered contributing elements to two potential historic districts in the Windsor Vista and Queensgate neighborhoods. For purposes of this study, these districts are considered potentially eligible, but have not been formally evaluated. The Project as currently designed would not adversely affect contributing elements of either potential historic district.

No cultural resources were recovered during subsurface investigations (266 shovel tests and 21 deep pit excavations) in the study area. An additional cultural resources survey was conducted in December 2019 to cover an expanded APE near Stream 25.0L, north of NE 195th

Street. This survey and results are documented in Appendix E1, *Cultural Resources Survey Addendum*. The additional survey was conducted due to proposed changes to the design of the fish barrier correction at Stream 25.0L that expanded the APE both east and west of I-405. No cultural resources were recovered during subsurface investigations (21 additional shovel tests). The subsurface investigation conducted for both surveys recommended five locations for monitoring during ground-disturbing activities because they have the potential for buried cultural materials.

On December 16, 2019, and January 16, 2019, WSDOT received concurrence from the Washington Department of Archaeology and Historic Preservation that the proposed Project will have no adverse effect on eligible or listed properties within the APE.

4.9.2 Air Quality

Overall, the Project would have minimal effects on air quality. As shown in Exhibit 4-18, the Project's criteria pollutant emissions under the 2025 and 2045 No Build and Build Alternatives are expected to decrease, compared to existing conditions, because of newer and cleaner automobiles in the future. With the exception of volatile organic compounds (VOCs), emissions would be lower under the Build Alternative than under the No Build Alternative. VOC emissions would be marginally higher (less than 0.5 percent) under the Build Alternative.

What are criteria pollutants?

The Clean Air Act identified several air pollutants of concern nationwide, known as criteria pollutants. The U.S. Environmental Protection Agency established maximum allowable concentrations for the six criteria pollutants in an effort to protect public health, public welfare, and the environment. The criteria pollutants of interest for transportation projects are carbon monoxide (CO), particulate matter (PM_{10} and $PM_{2.5}$), ozone and the ozone precursors, volatile organic compounds (VOCs), and nitrogen oxides (NO_x).

Exhibit 4-18. Criteria Pollutants Daily Regional Emissions Burden Assessment for 2025 and 2045

Daily VMT/ Criteria Pollutant (lbs/day)	2015 Existing Conditions	2025 No Build Alternative	2025 Build Alternative	2045 No Build Alternative	2045 Build Alternative
Daily VMT	2,885,471	3,219,611	3,260,405	3,623,795	3,681,594
CO	63,221.80	32,474.82	30,845.80	18,521.85	18,146.57
$PM_{2.5}$	212.37	114.80	108.48	98.95	95.86
PM_{10}	417.46	355.52	346.33	421.24	409.53
VOCs	5,860.58	2,600.69	2,607.76	1,552.51	1,557.25
NO_x	7,584.30	2,329.36	2,300.18	1,103.23	1,102.32

CO = carbon monoxide; lbs/day = pounds per day; NO_x = nitrogen oxides; PM_{10} = particulate matter of 10 microns or less in diameter; $PM_{2.5}$ = particulate matter of 2.5 microns or less in diameter; VMT = vehicle miles traveled; VOCs = volatile organic compounds

As shown in Exhibit 4-19, mobile source air toxic (MSAT) emissions under the 2025 and 2045 No Build and Build Alternatives are expected to decrease as compared to existing conditions despite increased vehicle miles traveled (VMT) because of improved vehicle technology. Because the estimated VMT with the Project in each forecast year would

What are mobile source air toxics?

Mobile source air toxics (MSATs) are pollutants emitted by vehicles that use gasoline and diesel. Air quality standards have not been established for MSATs.

vary by less than 2 percent compared to No Build Alternative, there would be no appreciable difference in overall MSAT emissions between the Build and No Build Alternatives.

Exhibit 4-19. Toxic Air Pollutants Daily Regional Emissions Burden Assessment for 2025 and 2045

Daily VMT/ MSAT (lbs/day)	2015 Existing Conditions	2025 No Build Alternative	2025 Build Alternative	2045 No Build Alternative	2045 Build Alternative
Daily VMT	2,885,471	3,219,611	3,260,405	3,623,795	3,681,594
1-3-Butadiene	23.29	9.29	9.37	4.29	4.35
Acrolein	4.29	2.08	2.09	1.23	1.24
Acetaldehyde	64.74	31.88	32.03	18.52	18.70
Benzene	172.81	73.55	73.65	38.61	38.84
Ethyl Benzene	100.87	42.57	42.69	25.07	25.13
Formaldehyde	64.58	27.34	27.33	16.62	16.69
Naphthalene	10.28	4.18	4.19	2.24	2.25
Diesel PM	54.21	13.61	13.30	5.34	5.25
PAHs	4.01	1.54	1.52	0.76	0.76

lbs/day = pounds per day; MSAT = mobile source air toxic; PAH = polycyclic aromatic hydrocarbons; PM = particulate matter; VMT = vehicle miles traveled

During construction, effects on air quality would be temporary and would include fugitive dust from excavation and earth moving, and emissions from diesel-fueled construction equipment. WSDOT would implement BMPs to avoid or minimize potential effects on the environment.

Appendix D, *Air Quality Discipline Report*

Please see Appendix D for additional information about the study approach, existing conditions, and operational and construction effects on air quality, energy, and greenhouse gases.

4.9.3 Energy and Greenhouse Gases

Greenhouse gas (GHG) emissions would be lower with the Project than existing conditions or expected conditions with the No Build Alternative, as shown in Exhibit 4-20.

Exhibit 4-20. Greenhouse Gas Emissions in Terms of CO_2e for 2025 and 2045

	2015 Existing Conditions	2025 No Build Alternative	2025 Build Alternative	2045 No Build Alternative	2045 Build Alternative
Daily VMT	2,885,471	3,219,611	3,260,405	3,623,795	3,681,594
Daily CO_2e (MT)	1,363.61	1,180.22	1,167.84	1,104.63	1,094.36
Annual Total CO_2e (MT)	497,718.80	430,779.87	426,262.31	403,190.94	399,440.32

CO_2e = carbon dioxide equivalent; MT = metric tons; VMT = vehicle miles traveled
Annual total CO_2e is calculated by multiplying the daily CO_2e by 365.

During construction, GHG emissions would come from fuel used on site to power equipment, the production of materials, and vehicle delays resulting from construction activities. Maintenance emissions would come from similar sources but would occur over the Project's

lifespan. WSDOT predicts that construction of the Project would emit a total of 7,592 metric tons of CO_2e per year over a 3-year construction period.

4.9.4 Geology, Soils, and Groundwater

With proper construction practices, the Project would have minimal effects on geology, soils, and groundwater. The geology within the study area is heavily influenced by glacial scour and deposition. The soils that would be encountered during construction are anticipated to vary from very soft to dense and very dense. Groundwater levels are variable, ranging from at or near the surface to depths of 75 feet below the ground surface, but no long-term negative effects on groundwater are anticipated. The study area is seismically active and potentially subjected to ground motions resulting from a Cascadia subduction event or rupture along the Seattle and Whidbey Island faults. The potential for liquefaction in the study area ranges from very low to high. Prior work in the area has shown that there are several landslide hazard areas within the study area. Surface erosion resulting from surface soil disruption by construction activities should be anticipated. These risks will be mitigated by implementing BMPs. Anticipated short-term effects of the Project would include increased erosion, construction-related vibration, slope instability, and possible excavation of soft, wet soils.

> **Appendix K, *Geology, Soils, and Groundwater Technical Memorandum***
> Please see Appendix K for additional information about the study approach, existing conditions, and operational and construction effects on geology, soils, and groundwater.

4.9.5 Hazardous Materials

WSDOT identified 18 potential sites of concern for hazardous materials in or near the study area, based on the current Project design and results of the Ecology online investigation and database reviews. These potential sites of concern relate to historical land use, confirmed or suspected past releases of hazardous materials that have the potential of being encountered during construction, and/or properties proposed for acquisitions that are suspected of having contamination. Based on the risk analyses performed for the 18 sites:

- Nine sites have a low anticipated level of impact on the Project. Of these low-impact sites, two have the potential to become a moderate impact risk.
- The remaining nine sites have a moderate anticipated level of impact on the Project. Of these moderate impact sites, two have the potential to become a high impact risk due to the potential for migration of contaminated groundwater.

Contaminated soil and/or groundwater may be encountered at these 18 sites, based on current and historic land uses in the study area. However, minimal, if any effects or spills are expected because WSDOT has identified mitigation measures that would be implemented to manage construction on or near sites with potential contamination, as discussed in Section 6.2.12. WSDOT has also identified mitigation for any unanticipated discoveries during construction.

> **Appendices G and G1**
> Please see Appendices G and G1 for additional information about the study approach, existing conditions, and operational and construction effects related to hazardous materials.

CHAPTER 5 CUMULATIVE EFFECTS

5.1 What are cumulative effects and why do we study them?

Cumulative effects are the incremental effect of an action when added to other past, present, and reasonably foreseeable future actions. 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.

> **Appendix O, *Cumulative Effects***
> Please see Appendix O for additional information about the study approach and a more detailed cumulative effects analysis.

5.2 How did WSDOT study cumulative effects?

WSDOT evaluated cumulative effects by using the process identified in *Guidance on Preparing Cumulative Impact Analyses* (WSDOT 2008). This analysis of cumulative effects used the analysis in the *I-405 Corridor Program Final Environmental Impact Statement* (EIS) as a starting point (FHWA et al. 2002). That EIS's cumulative effects analysis focused on air quality, energy, farmlands, fish and aquatic resources, surface water, and wetlands. This updated cumulative effects analysis looked at resources that would be directly or indirectly affected by the Project, combined with reasonably foreseeable future projects, and evaluated the potential for cumulative effects on each resource. WSDOT also sought regional data and planning documents prepared by the Puget Sound Regional Council (PSRC), WSDOT, and Bothell. Discipline-specific studies for this Environmental Assessment (EA) provided information about existing conditions and to help characterize trends.

WSDOT considered the potential for cumulative effect to all resource areas analyzed in this EA except for historic, cultural, and archeological resources, which would have no operational direct or indirect effects. Proposed measures to avoid, minimize, or mitigate direct or indirect effects of the Build Alternative were considered in making cumulative effects determinations for each resource.

The cumulative effects evaluation considers the same study areas used in assessing direct and indirect operational effects. The study area varies depending on the resource but is roughly up to 0.5 mile from the proposed Project footprint. The time period considered was from when I-405 construction began in the 1960s through 2045, the design year for the Project.

5.3 What is the historical and present context (including reasonably foreseeable projects) for this analysis?

The Puget Sound region (King, Snohomish, Pierce, and Kitsap counties) has experienced substantial population growth since I-405 was built in the 1960s. Because of continued growth, the 2000 population of more than 3 million is projected to reach more than 5.5 million by 2045 (PSRC 2019). Communities east of Seattle that were largely rural in nature in the mid-1900s have been gradually transformed to rural/suburban and then suburban/urban areas. 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. The establishment of Microsoft and other high-tech businesses along the I-405 corridor in the mid-1980s and 1990s also played a key role in this evolution. Related residential, commercial, and infrastructure development has been ongoing for decades in the I-405 corridor. Major employment and activity centers established in late 1980s and early 1990s in the study area include the University of Washington (UW) Bothell/Cascadia College campus near the SR 522 interchange, the North Creek/195th business park area, and the Canyon Park Business Center located near SR 527.

Planned future private development and growth in the study area is largely limited to the redevelopment of existing urbanized areas. Many of these private projects are already permitted or under construction and would be in place by the time Project construction begins. Minor capital improvement projects such as sidewalk additions, pavement preservation, lane restriping, and water and sewer line replacements are ongoing throughout the area and are not likely to result in negative cumulative effects on resources.

WSDOT identified current and reasonably foreseeable actions that may contribute to a cumulative effect by evaluating projects that are planned, approved, and funded. Projects considered in this cumulative effect analysis are summarized in Exhibit 5-1, and a list of projects considered is provided in Attachment A of Appendix O, *Cumulative Effects*. In addition, transportation projects in the I-405 corridor that were included in the baseline condition for the transportation analysis are listed in Attachment C and Section 3.4.1 of Appendix A, *Transportation Discipline Report*.

WSDOT considered but did not include Bothell projects that involve maintenance and preservation of existing facilities, such as repaving 228th Street SE between 19th Avenue SE and Bothell-Everett Highway and replacing sewer Lift Station 4 because these projects would maintain and not expand existing infrastructure in the area.

Exhibit 5-1. Infrastructure Projects and Planned Developments Considered in Cumulative Effects Analysis

Project	Description	Jurisdiction/ Source
I-405 BRT	This multiyear project establishes BRT from the Lynnwood Transit Center to the Burien Transit Center via I-405 and SR 518. BRT service would use the I-405 ETL system where feasible. Project elements include adding several BRT stations, new/expanded parking facilities, interchange improvements, and station access improvements (including bus priority lanes and treatments).	PSRC Regional Transportation Plan 2018 (PSRC 2018); STIP 2019-2022 (WSDOT 2019d)
I-405, Brickyard Inline Station	As part of the development of I-405 BRT, this project would construct a new inline freeway transit station and pedestrian connection to the Brickyard Park and Ride in the I-405 median on I-405 near NE 160th Street.	Sound Transit

Exhibit 5-1. Infrastructure Projects and Planned Developments Considered in Cumulative Effects Analysis

Project	Description	Jurisdiction/ Source
Sound Transit Bus Base North	In support of the development of BRT on I-405, this bus base would be built in the Canyon Park area near 214th Street SE to provide operations and maintenance for additional BRT services on I-405 and SR 522/NE 145th Street. The site would support storage, maintenance, fueling, and washing for up to 80 articulated and 40 double decker hybrid buses. The site would also house offices and support areas for drivers and operations. The bus base would operate 24-hours a day, seven days a week, with approximately 253 employees working over three shifts.	Sound Transit
SR 522/NE 145th Street BRT	This multiyear project proposes design of a BRT system from the proposed Sound Transit Link light rail station at I-5 and Northeast 145th Street along the SR 522 corridor to UW Bothell/Cascadia College campus and proposed I-405/SR 522 interchange transit facilities to be constructed as part of this Project, with connecting service at lower frequencies to Woodinville. The project includes new and upgraded transit centers, new park and ride capacity, and station access improvements.	PSRC Regional Transportation Plan 2018, STIP 2019-2022
19th Avenue SE Nonmotorized Improvements	This project includes building sidewalks, bike lanes, curb and gutter, storm drainage, ADA curb ramps, crosswalks, rectangular rapid flashing beacons, and crosswalk flags on 19th Avenue SE, 232nd Street SE, and 23rd Avenue SE.	2019-2025 Capital Facilities Plan (Bothell 2019b), STIP 2019-2022
Canyon Park Fire Station 45 Replacement	This project includes rebuilding the fire station in its current location to include safety upgrades, technical modernization, and energy efficiency. The site would house a new police satellite office.	Capital Facilities Plan Addendum 2019-2025 (Bothell 2019c)
Cedar Grove Park Field Improvements	This project would complete the development of this park located near the SR 527 interchange.	2019-2025 Capital Facilities Plan
1st Lieutenant Nicholas Madrazo Memorial Park	This project would construct a new park and recreational amenities including a basketball court, walking paths, playfield, parking, landscaping, and other park facilities.	2019-2025 Capital Facilities Plan
East Riverside Drive Drainage and Sediment	This project would construct conveyance improvements, including sediment and debris control to reduce flooding potential.	2019-2025 Capital Facilities Plan
Perry Creek and 228th Street SE Culverts	This project would install a new culvert across 19th Avenue SE and a storm pipe along 19th Avenue.	2019-2025 Capital Facilities Plan
Various private developments are planned, undergoing review, or are being constructed in Bothell (Bothell 2019d). See Attachment A of Appendix O for a list of projects considered in this analysis including larger developments such as: ▪ Projects associated with the UW Bothell Campus Master Plan, including a 5,000 sq ft warehouse and a 40,000 sq ft parking garage. ▪ Commercial developments under construction such as a 32,000 sq ft Gun Club facility and a 110,000 sq ft self-storage facility. ▪ Townhome developments under construction, such as the Preston North Townhomes (94 units) and CP18-19 Townhomes (118 units). ▪ Land subdivisions and plats for between 3 and 25 plots.		

ADA = Americans with Disabilities Act; BRT = bus rapid transit; ETL = express toll lane; PSRC = Puget Sound Regional Council; STIP = State Transportation Improvement Program; UW = University of Washington

In addition to projects listed in Exhibit 5-1, Bothell is proposing to update its subarea plan for the Canyon Park neighborhood located in the study area near SR 527. This area was designated as a Regional Growth Center by PSRC in *VISION 2040* (PSRC 2009). Regional Growth Centers are designated areas where population and employment growth are expected to occur in the future. In December 2019, Bothell published the *Canyon Park Subarea Planned Action Draft EIS* (Bothell 2019a). The *Draft EIS* evaluates a no action alternative that would maintain growth established in the City's currently adopted comprehensive plan, *Imagine Bothell* (Bothell 2015) and three build alternatives that would increase development densities over currently planned growth. The *Draft EIS* identifies possible transportation improvements that may be needed to accommodate growth beyond the City's currently adopted comprehensive plan. The *Draft EIS* does not identify a preferred alternative. The outcome of Bothell's *Draft EIS* and comprehensive plan update process is currently unknown.

Per the *Draft EIS*, the following City of Bothell actions would be required before any of the build alternatives could be implemented:

- Select a preferred alternative, respond to comments on the *Draft EIS* and issue a *Final EIS*.
- Adopt the updated Canyon Park Subarea Plan as part of *Imagine Bothell*.
- Adopt zoning and development regulation amendments within the Bothell Municipal Code.
- Adopt a planned action ordinance.

As documented in the *Draft EIS*, the City plans to select a preferred alternative and issue a *Final EIS* in the first half of 2020. The timeline for other actions listed above is currently unknown, but would be expected to occur after the *Final EIS* is issued. Because the outcome of the City's planning process for the Canyon Park Subarea is currently unknown, this EA evaluates land use densities in Bothell's currently approved and adopted comprehensive plan, *Imagine Bothell* (Bothell 2015). Throughout the development of this EA, WSDOT has been coordinating with Bothell on the Canyon Park Subarea Plan update and *Draft EIS* and will continue to do so as the City's plans progress. The I-405, SR 522 Vicinity to SR 527 Express Toll Lanes Improvement Project would not preclude the City's proposal to increase land use densities in the Canyon Park Subarea.

5.4 What were the results of the cumulative effects analysis?

WSDOT finds that the Project, together with past, present, and reasonably foreseeable future projects listed in Exhibit 5-1, would have minor contributions, many of which are positive, to cumulative effects on natural and community resources in the study area. Exhibit 5-2 summarizes the determinations for each resource.

Exhibit 5-2. Summary of Cumulative Effects Determinations

Resource	Cumulative Effect Determination
Transportation	When combined with proposed transit improvements by others related to I-405 and SR 522 BRT service and planned transportation improvements identified in Exhibit 5-1, the Project would provide a positive contribution to cumulative effects on the transportation network. The Project would continue to provide much-needed transportation infrastructure to support planned regional population and economic development in the study area.
Noise	This Project would provide a positive contribution to cumulative effects on noise because noise mitigation is being incorporated and would affect 43 fewer residences than with the No Build Alternative in 2045.
Ecosystems	▪ For vegetation and wildlife, the Project would continue the trend of replacing vegetated areas with development. There would be a small negative contribution to cumulative effects because small areas of low-quality vegetation would be affected. ▪ For wetlands, even though wetlands would be filled to construct the Project, the Project would make a positive contribution to cumulative wetland effects because mitigation would provide high-quality wetlands and habitats to replace wetlands with lower quality functions. ▪ For aquatic habitat, the Project would make a positive contribution to cumulative effects on fish and aquatic habitat by providing improved stormwater treatment and detention, which would benefit water quality and quantity, and by correcting fish barriers that would restore anadromous fish access to 24,330 linear feet of additional habitat.
Water Resources	This Project's contribution to cumulative effects on water quality and water quantity would be positive. Enhanced stormwater treatment will be provided for an area equivalent to all new PGIS, and older I-405 stormwater systems will be retrofitted to provide treatment to an additional 23 acres of PGIS that is not currently treated. The Project would also add stormwater detention and correct several fish barriers, which would prevent increases in peak flows and velocities and help control flooding.
Visual Quality	The Project would have a small negative contribution to cumulative effects on visual quality since it would continue the trend of modifying the natural character of the area, particularly in the Canyon Park area along 17th Avenue SE, where vegetation would be replaced by a direct access ramp and a widened roadway. Continued implementation of the *I-405 Urban Design Criteria* (WSDOT 2016b) would help to create a consistent look and feel for roadway improvements in the broader area.
Recreational Resources	The Project would have a positive contribution to recreational resources in the community. The Project would add a nonmotorized connection between the North Creek Trail and the proposed bus station at the I-405/SR 522 interchange, reconstruct portions of one stream in the North Creek Forest, which would improve recreational resources.
Land Use, Economics, and Community Resources	The Project would have a positive contribution to cumulative effects on land use, economics, and community resources because it would provide much-needed transportation infrastructure to support planned regional population and economic development.
Environmental Justice	The Project would provide a number of benefits for all people living in, working in, and visiting the study area and would not result in disproportionately high and adverse effects on persons who identify as minority or persons who identify as low-income. The continued 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 make a negative contribution to cumulative effects on the economic burdens of low-income users of I-405. The operation of ETLs could continue to 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.

Exhibit 5-2. Summary of Cumulative Effects Determinations

Resource	Cumulative Effect Determination
Air Quality, Energy, and Greenhouse Gases	The Project would not contribute to a cumulative effect to air quality, energy, or GHG emissions when combined with planned future development. Between now and 2045, air contaminant and GHG emissions are expected to continue to decrease due to improved vehicle technology.
Geology, Soils, and Groundwater	The Project would not contribute to cumulative effects on geology, soils, and groundwater in the study area. The Project would not have long-term effects on groundwater, would not substantially alter the topography, and would be consistent with current development trends that require soil excavation and fill.
Hazardous Materials	The Project would to have a small, positive contribution to the cumulative trend of removing hazardous materials from the landscape.

BRT = bus rapid transit; ETLs = express toll lanes; GHG = greenhouse gases; PGIS = pollution-generating impervious surfaces

5.5 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 the agency's 2014–2017 strategic plan commitment. WSDOT examined available information about climate trends and the results of WSDOT's assessment of vulnerable infrastructure for I-405, SR 522, and SR 527 (WSDOT 2011). WSDOT's assessment showed the section of I-405 in the study area to have a low level of vulnerability to climate-related threats. SR 522 and SR 527 have a moderate vulnerability to climate-related threats; however, the areas with moderate vulnerability are well outside of the affected area for the Project. Therefore, climate-related risks for infrastructure in the study area are considered to be low. Climate-related threats on I-405, SR 522, and SR 527 are mostly related to increased risks for flooding on the Sammamish River and other area streams, because the study area may experience extreme wind, rain, and snow storms and more days of extreme heat as the climate changes.

The Project includes several features that would improve the resiliency of I-405, SR 522, and SR 527. These features include:

- Adding stormwater detention, which would reduce localized flooding and improve floodplain function compared to existing conditions.
- Removing four bridge piers from the Sammamish River, which would improve river and floodplain function by removing the fill material of the piers and removing a constraint in the river.

Northbound I-405 to eastbound SR 522 ramp with two piers proposed for removal in the Sammamish River.

- Correcting fish barriers by replacing culverts with larger spanned structures, which would increase resilience to changes that may occur with increased severe weather and precipitation events. Exhibit 5-3 shows how WSDOT plans to upgrade existing culvert sizes.

Exhibit 5-3. Proposed Fish Barrier Correction Upgrades

Stream	Current Crossing Structure	Proposed Crossing Structure	Current Structure Length	Proposed Structure Length
Par Creek	60-inch precast concrete pipe	25-foot span structure	312 feet	323 feet
Stream 25.0L	30-inch corrugated metal pipe	19-foot span structure	205 feet	229 feet
North Fork of Perry Creek	60-inch precast concrete pipe	21-foot span structure	368 feet	370 feet
Queensborough Creek #1	48-inch corrugated steel pipe	20-foot span structure	209 feet	250 feet
Queensborough Creek #2	42-inch corrugated steel pipe	20-foot span structure	450 feet	439 feet

WSDOT is active in statewide and regional efforts to reduce greenhouse gas (GHG) emissions and improve multimodal choices. GHG emissions would be reduced with the Build Alternative, compared to existing conditions, which would contribute to WSDOT's efforts to reduce GHG emissions.

CHAPTER 6 MEASURES TO AVOID, MINIMIZE, OR MITIGATE EFFECTS

6.1 What measures will WSDOT use to avoid, minimize, or mitigate operational effects?

6.1.1 Transportation

- WSDOT is proposing mitigation to offset traffic impacts at the intersection of 20th Avenue SE and 220th Street SE, a private street located in the Canyon Park Business Center (CPBC). This intersection currently operates poorly and would continue to operate poorly with the Build Alternative. Final mitigation will be determined by WSDOT with input from the Canyon Park Business Center Owners Association.
- WSDOT will provide signs at key locations outside of the CPBC directing all traffic to or from I-405 to use public streets. While not quantitatively analyzed, the signs could reduce the volume of I-405 direct access ramp traffic using private roads within the CPBC, which could further improve operations under the Build Alternative on 29th Drive SE and 220th Street SE. The locations of the signs will include, but are not necessarily limited to:
  - Westbound 228th Street SE approaching 29th Drive SE.
  - Northbound 17th Avenue SE approaching 220th Street SE.

6.1.2 Noise

- Construct new noise walls at three locations (Wall East 2, Wall East 6, and Wall East 7).

6.1.3 Ecosystems

- Prepare and implement a revegetation plan in accordance with WSDOT's *Roadside Policy Manual* (WSDOT 2015) and minimize the amount of vegetation clearing to retain as many trees as practicable to minimize impacts. Replant temporary impacts with appropriate native species, including grasses, forbs, and shrubs adjacent to the roadway, and trees where a suitable setback from the roadway exists.

Wetlands

- Design the Project to avoid and minimize operational impacts on wetlands and their buffers pursuant to regulations outlined in the Clean Water Act (CWA).
- Conduct ongoing maintenance of stormwater treatment and detention facilities.
- Meet local, state, and federal permit requirements to mitigate any permanently affected wetlands and their buffers.

Streams and Aquatic Resources

- Correct the fish barrier at Crystal Creek (ID 934994). WSDOT intends to construct this correction in the same timeframe as the overall Project.

- Direct lighting away from streams and waterbodies wherever possible.
- Prioritize cultural and mechanical control methods for vegetation management as part of ongoing WSDOT highway maintenance after construction. Biological and chemical methods would be considered only as a last resort.

Land-Based Wildlife

- Implement WSDOT's Integrated Vegetation Management (IVM) of the right of way to minimize the spread of non-native species as part of ongoing WSDOT highway maintenance after construction.

6.1.4 Water Resources

- Follow the WSDOT *Maintenance Manual* when construction is complete (WSDOT 2019c).
- Control stormwater so that peak and base flows of receiving waters are not adversely affected by treated stormwater discharge from additional pollution-generating impervious surface areas created by the Project.

6.1.5 Visual Quality

- Plan, develop, and design the Project in accordance with context sensitive solutions (CSS) guidelines described in the *I-405 Urban Design Criteria* (WSDOT 2016b). Generally, the application of CSS guidelines precludes the need to further mitigate visual impacts. These guidelines cover aesthetic treatments for elements such as vegetation, structural elements, lighting, and signage and are designed to offset the increase in humanmade highway and related transportation elements. However, this section describes mitigation measures for some Project-specific items that may not be covered by the CSS guidelines.
- Minimize impacts on existing vegetation to the greatest extent feasible in accordance with WSDOT policy. In areas where vegetation is cleared for construction, the Project will replace trees and vegetation in accordance with the WSDOT *Roadside Policy Manual* (WSDOT 2015).
- Work with Sound Transit to meet the intent of the *I-405 Urban Design Criteria* for joint Project elements, including the transit facilities at the SR 522 interchange and the inline transit stations at the SR 522 and SR 527 interchanges. Lighting at the transit stations will use fixtures with hoods to minimize light pollution.
- Minimize visual impacts of proposed noise walls with a green-over-gray strategy, applying a varied planting structure to include a combination of trees, shrubs, and vines. Where there is no longer room for vegetation, context-appropriate walls will be used to blend the adjacent natural character with the built environment.
- Mitigate for adverse visual impacts along the Sammamish River Trail by restoring areas where existing ramps are removed with native vegetation. Trees will be planted in this area to blend with existing native vegetation and help to screen the new ramps, inline station, and signalized intersections from view. Where the Project removes existing galvanized chain-link fencing adjacent to the trail, WSDOT will install black-coated

chain link fencing in its place to blend with newer sections of fencing on the east side of I-405.

- Install mortar-set cobblestones over the existing sloped abutment walls for the North Creek Trail underpass at SR 522. The existing underdeck light fixtures mounted on the box girder will be replaced with new rectangular box-style fixtures shown in the *I-405 Urban Design Criteria*.
- Install Boston ivy on the retaining walls that support the new direct access ramp near the Canyon Park Park and Ride. These walls will also have an Ashlar texture and pigmented sealer to help blend with I-405 corridor design elements and the surrounding suburban context.
- Design the two new pedestrian bridges at the Canyon Park Park and Ride to match the style of the existing pedestrian bridge, a portion of which will remain west of I-405.

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

- Coordinate with King County Parks on the permanent realignment of the Sammamish River Trail under I-405 to ensure it meets King County trail specifications.

6.1.7 Community Resources

To minimize the effects of permanent property acquisitions and the one residential displacement associated with the Project, WSDOT will apply the following measures:

- Conduct property acquisition in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended and implemented by the Federal Highway Administration (FHWA) under 49 Code of Federal Regulations, Part 24, and according to Chapter 468-100 Washington Administrative Code Uniform Relocation and Assistance and Real Property Acquisition.
- Offer 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.

WSDOT also took the following steps to minimize adverse effects on the one displaced household:

- Collected information to identify the specific needs of any resident(s) to be relocated and prepared a relocation plan in advance of actual displacement.
- Made relocation resources available, without discrimination, to the eligible residential relocatee.
- Ensured there was at least one comparable replacement property available to relocate.
- Reimbursed the displaced resident for certain costs, including the difference between the cost of the current residence and the cost of the comparable replacement.

For the residential property owners affected by partial acquisitions and permanent easements, WSDOT will take the following measures:

- Conduct property acquisition in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended.
- Provide access to interpretation and translation for owners who need language assistance to participate in negotiations upon request.

For the commercial property owners affected by partial acquisitions and permanent easements:

- WSDOT will conduct property acquisition in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended.

6.1.8 Environmental Justice

The Project would not result in disproportionately high and adverse operational effects on environmental justice populations; therefore, no specific environmental justice mitigation is required. As part of the overall tolling program, WSDOT will continue to work to reduce possible barriers to obtaining and maintaining a *Good To Go!* toll payment account for persons who have low incomes or who may not have access to bank accounts that would allow them to load and/or replenish a *Good To Go!* account, through the following measures:

- 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.
- Continue to offer the option to open and maintain a *Good To Go!* account using cash, to allow those without access to a bank account to use a *Good To Go!* account and pay the lowest toll rates.
- Work toward a system that could offer toll accounts that do not require a minimum balance. The Pay As You Go option will allow customers to pay the lowest toll rates and have their toll charged directly to their credit card after the travel.
- Continue to work to expand the network of retail locations where people can buy *Good To Go!* passes with cash, making it easier for people to purchase a pass without a bank account.
- Work with community service organizations that serve low-income populations to provide free passes when WSDOT launches new toll facilities.

6.2 What measures will WSDOT use to avoid, minimize, or mitigate construction effects?

6.2.1 Transportation

- Maintain existing capacity 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 in the study area, such as overnight and weekend time periods.
- Coordinate with the local agencies and other projects to prepare a Traffic Management Plan prior to making any changes to the traffic flow or lane closures. Local agencies, the public, school districts, emergency service providers, and transit agencies will be informed of the changes in advance through the media, the Project website, and an email

listserv. 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.

6.2.2 Noise

- Construct proposed noise walls and barriers before other construction activities, if possible.
- Equip construction equipment engines with mufflers, intake silencers, and engine enclosures, as appropriate.
- Turn off construction equipment during prolonged periods of non-use to reduce noise.
- Locate stationary equipment away from receiving properties to decrease noise.
- Maintain all equipment and train their equipment operators in good practices to reduce noise levels.
- Use Occupational Safety and Health Act approved ambient sound-sensing backup alarms that could reduce disturbances from backup alarms during quieter periods.

6.2.3 Ecosystems

- Prepare and implement a revegetation plan in accordance with WSDOT's *Roadside Policy Manual* (WSDOT 2015) and minimize the amount of vegetation clearing to retain as many trees as practicable to minimize impacts. Replant temporary impacts with appropriate native species, including grasses, forbs, and shrubs adjacent to the roadway, and trees where a suitable setback from the roadway exists.

Wetlands

- Design the Project to avoid and minimize construction impacts on wetlands and their buffers pursuant to regulations outlined in the CWA.
- Follow construction best management practices (BMPs) specified in WSDOT's current *Highway Runoff Manual* (WSDOT 2019b).
- Develop and implement a Temporary Erosion and Sediment Control (TESC) plan and a Spill Prevention Control and Countermeasures (SPCC) plan to avoid effects on wetlands.
- Restore temporary construction impacts in accordance with federal and state laws and regulations and local critical area ordinances.

Streams and Aquatic Resources

- Follow construction BMPs specified in the current *Highway Runoff Manual*. WSDOT will adhere to requirements outlined in the Project's Hydraulic Project Approval issued by the Washington Department of Fish and Wildlife, the Water Quality Standards for Surface Waters of the State of Washington (Chapter 173-201A of the Washington Administrative Code), and regulations outlined in the CWA.

- Develop and implement a TESC plan and an SPCC plan to prevent sediment from entering aquatic areas. Additionally, staging and stockpiling areas will be located away from streams to avoid spills and prevent sediment from entering streams or stream buffers.
- Limit construction lighting for this project, particularly at night, to the amount necessary to complete the work. The lighting will be directed away from the streams and waterbodies whenever possible.
- Adhere to conditions identified in the U.S. Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Administration (NOAA) Fisheries Biological Opinions and agency concurrence letters.
- Prohibit in-water work except during seasonal work windows established as a condition in the Hydraulic Project Approval. Follow permit requirements for in-water work as required by local, state, and federal permits.
- Direct anthropogenic debris from bridge demolition toward storage areas on land or barges and support vessels. Bridge demolition will include sectioning the structure to the extent possible to provide for safer disposal and to minimize debris falling into surface waters.
- Remove all fish species from the work area prior to any in-water work activities. Fish exclusion activities will follow the most recent WSDOT protocol that has been approved by NOAA Fisheries and USFWS.
- Isolate work areas of the Sammamish River with sheet piles or cofferdams as needed prior to pier removal.
- Minimize disturbance to riparian vegetation from the operation of heavy equipment, as practicable, by straddling the vegetation with heavy equipment or by pruning it without damaging the roots. Existing riparian vegetation outside of the work area will not be removed or disturbed.
- Prepare and implement a revegetation plan and minimize the amount of vegetation clearing to retain as many trees as practicable to minimize impacts. Replant temporary impacts with appropriate native species, including grasses, forbs, and shrubs adjacent to the roadway, and trees where a suitable setback from the roadway exists.
- Mitigate permanent buffer impacts through enhancement of degraded sensitive areas within the Project vicinity, focusing on increasing native plant diversity and habitat value.
- Control all Class A noxious weeds, and additional nuisance weeds throughout the life of the Project using WSDOT's IVM.

Land-Based Wildlife

- Develop and implement a TESC plan to minimize impacts on terrestrial habitat and preserve topsoil.
- Adhere to conditions identified in the USFWS and NOAA Fisheries Biological Opinions and agency concurrence letters.

- Minimize the amount of vegetation clearing to retain as many trees as practicable and prepare and implement a revegetation plan with appropriate native species.
- Position exclusion devices and remove nest material before the beginning of the nesting season to prevent Migratory Bird Treaty Act-protected bird species from nesting on the bridge during demolition and construction of bridges.

6.2.4 Water Resources

- Protect groundwater with the use of standard BMPs.
- Prepare and implement a TESC plan and an SPCC plan.
- Locate spill response equipment at regular and specified intervals along the Project alignment.

6.2.5 Visual Quality

- Locate material and equipment storage/staging in less prominent areas, where possible.
- Shield freeway lighting and use downcast lighting so light sources (such as light bulbs) are not directly visible from residential areas and local streets, when possible.
- Restore areas as work in each area is completed, when feasible.
- Use common signs and public notices with clear directions.

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

Sammamish River Trail

- Design temporary trail realignments to maintain access during construction and ensure the trail is consistent with King County Parks specifications for temporary trails, including needed signage.
- Schedule trail closures to build new structures and demolish existing structures at night to avoid peak-use hours. Coordinate the nighttime construction period with King County Parks.
- Use flaggers for short-term trail closures to facilitate construction vehicle access across the trail.
- Restore the property after construction and coordinate with King County Parks on the restoration of the disturbed areas.

West Sammamish River Trail

- Restore the property after construction and coordinate with King County Parks on the restoration of the disturbed areas.

North Creek Trail

- Coordinate with University of Washington (UW) Bothell/Cascadia College campus on any trail closures and detours. Use flaggers as needed to maintain trail access during construction.

North Creek Forest

- Complete construction of improvements in the North Creek Forest in a total of six months or less. This construction duration does not include follow-up visits to inspect Project improvements, such as the fish barrier correction or proposed plantings.
- Coordinate with City of Bothell to replant areas that are disturbed during construction with native vegetation as part of the stream restoration planned for this area. Remove invasive species and noxious weeds, if present, prior to planting native vegetation.

6.2.7 Community Resources

Other topics covered in Section 6.2 describe BMPs that will also reduce potential effects on community resources from construction activities related to transportation, noise, visual quality, air quality, water resources, geology and soils, and hazardous materials. The following measures are also part of WSDOT's commitments related to community resources:

- Notify and coordinate with fire departments if water line relocations are required that could temporarily cause a disruption in service or reduce flow.
- Coordinate closely with utility providers during final design and prior to construction to confirm the locations and depths of utilities and to determine if lines can be protected during construction or if they will require relocation. Potential utility conflicts within the WSDOT right of way will be relocated, and expenses will be determined based on the permit that WSDOT has with the utility owner.
- Coordinate scheduling with utility providers to minimize effects of utility relocations and provide them with time to schedule equipment and construction crews in advance of Project construction.

6.2.8 Environmental Justice

The Project would not result in disproportionately high and adverse construction effects on environmental justice populations; therefore, no specific environmental justice mitigation is required. However, WSDOT will continue to conduct targeted outreach during construction. The following measures are part of WSDOT's commitment to public involvement:

- Translate project materials about construction effects if requested.
- Distribute Project materials—especially prior to construction-related closures that would affect motorists and transit riders—through social service agencies, community-based organizations, libraries, community groups, and schools.

6.2.9 Historic, Cultural, and Archaeological Resources

- Prepare an Unanticipated Discovery Plan for the Project that construction contractors will follow.
- The I-405 Corridor Program has a programmatic agreement regarding the Section 106 process. This programmatic agreement establishes a process for integrating additional Section 106 review, as needed, with the design-build approach during design and construction.

- Conduct monitoring during future ground-disturbing activities at five locations with the potential for deeply buried cultural materials. Please see Exhibits 6-78 and 6-79 of Appendix E, *Cultural Resources Survey*, and Exhibits 17 and 18 of Appendix E1, *Cultural Resources Survey Addendum*, for these locations.

6.2.10 Air Quality

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 (WSDOT 1999).

The following measures will be used, where applicable, to control and minimize the dispersion of dust (PM_{10} and $PM_{2.5}$); transmission of particulate matter; and emissions of carbon monoxide (CO), nitrogen oxides (NO_x) and volatile organic compounds (VOCs) during construction:

- Encourage contractors to use newer construction equipment and maintain all equipment in good mechanical condition to minimize exhaust emissions.
- Encourage contractors to carpool and use commute trip reduction and other transportation demand management programs for construction workers.
- Stage construction between other I-405 transportation projects to minimize congestion that contributes to regional emissions of pollutants during construction.
- Encourage contractors to reduce construction truck idling.
- 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.
- Spray exposed soil with water or other suppressant as needed to minimize emissions of PM_{10} and reduce deposition of particulate matter.
- Cover all loads in trucks transporting materials and wet materials in trucks, or provide adequate freeboard (space from the top of the material to the top of the truck bed) to minimize PM_{10} and deposition of particulates during transportation.
- 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.
- Remove particulate matter deposited on paved roads, public roads, sidewalks, and bicycle and pedestrian paths to reduce mud and dust.
- Cover and stabilize Project-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.
- Restrict the speed of construction vehicles when operating in areas of exposed earth.
- Route and schedule construction trucks to reduce delays to traffic during peak travel times to minimize air quality impacts caused by a reduction in traffic speeds.

6.2.11 Geology and Soils

Seismicity

- Design Project elements to the American Association of State Highway and Transportation Officials (AASHTO) design standards and implement design methods that meet AASHTO's design event and limit susceptibility to collapse under an unlikely larger event.

Liquefaction-Prone Areas

- Identify Project areas where liquefaction-prone soils may be located.
- Evaluate the potential effects on Project structures from liquefaction, if structures underlain by liquefaction-prone soils are identified.
- 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 ranges from very low to moderate to high.

Soft Ground Areas

- 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 necessary, structures could be underpinned and utilities could be 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.
- Assess the potential for settlement for structures and embankments underlain by soft, compressible soil. If the potential for settlement is unacceptable, design the structures and embankments to accommodate or avoid the settlement, such as deep foundations for structures or surcharge fills for embankments.
- 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

- 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.
- 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

- Use properly designed, installed, and operated dewatering systems as dewatering for utility trenches can induce ground settlement in areas of soft compressible soils. These activities may include sheet-pile cut-off shoring, recharge wells, a settlement and groundwater level monitoring system, and other procedures. WSDOT understands that complete elimination of settlement near excavations can be difficult, particularly if loose granular soils are densified by installing sheet piles.
- 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 will be mitigated by disposing the discharge in a sanitary sewer or performing on-site treatment.

Erosion

- Prepare and implement a TESC plan to minimize erosion and protect water quality.
- 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.

Earthwork

- Control dust through the use of a water truck or other dust control measures.
- Control soil tracked onto nearby surface streets from truck tires.
- 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

- Locate areas where permanent drainage will be required by site conditions for cut slopes. At one location, installation of a drainage system adjacent to a new retaining wall has the potential to impact additional wetland areas by drawdown of the groundwater table. If these additional impacts are identified during construction, they would be mitigated in accordance with federal, state, and local regulations.

6.2.12 Hazardous Materials

The following standard mitigation measures apply to typical impacts that may be encountered during construction:

- To reduce the potential for hazardous materials being released to the environment during construction, construction plans should be prepared that include procedures to help mitigate, avoid, control, and manage hazardous materials. These plans include:
  - SPCC plan to provide specific guidance for managing potentially hazardous materials brought on to and/or generated on site.
  - Stormwater Pollution Prevention Plan to prevent the release of contamination and hazardous substances to the environment.

  - Health and Safety Plans to reduce potential risks to human health and the environment.
  - Hazardous substance contingency management plan for handling, transportation, and disposal of known and unanticipated contamination.
- Prior to demolition, a Good Faith Asbestos and Hazardous Materials Survey should be completed by an Asbestos Hazard Emergency Response Act (AHERA)-certified building inspector. The survey should be conducted on all structures and/or facilities that will be renovated or demolished within the Project limits.
- If a known or unanticipated underground storage tank is discovered within the Project limits, the procedures and regulations for decommissioning these tanks should be followed.
- WSDOT's contractor will dispose of all waste material at approved disposal facilities in accordance with federal, state, and local regulations.
- If unanticipated contamination is discovered within the Project limits, it should be addressed by contract language, General Special Provisions, and/or Special Provisions. WSDOT Standard Specifications requires the contractor to comply with environmental regulations and current federal and state laws and regulations.
- Contaminated groundwater originating from properties located up-gradient of the right of way could migrate to the Project limits. WSDOT generally will not incur liability for groundwater contamination that has migrated into the Project limits as long as the agency does not acquire the source of the contamination. However, the contaminated media will be managed in accordance with all applicable rules and regulations.
- Conduct an environmental re-evaluation if subsequent changes are made to the Project, such as project realignment, planned excavation depths, or changes to the proposed property acquisitions.

The following additional mitigation measures will be required at specific sites:

- Include specifications advising contractors of the appropriate handling and disposal of identified or suspected contamination that may be encountered during excavations or soil disturbances near or on the study area. WSDOT routinely uses General Special Provisions or Special Provisions to account for uncertainties of hazardous materials, such as the removal and disposal of unanticipated hazardous materials. (An example of a provision would be to stockpile suspected contaminated soils for laboratory analysis prior to reuse or disposal.)
- Prior to demolition of the I-405 off-ramp bridges at the SR 522 interchange, the building on the Hallett property, and the building on the Bothell City Shop/Public Works UST property, a certified AHERA Building Inspector should conduct a Good Faith Asbestos and Hazardous Materials Survey on the existing bridges/structures/buildings associated with the Project, complying with and providing an AHERA-level assessment in accordance with U.S. Environmental Protection Agency, 40 Code of Federal Regulations 763, and Washington State Department of Labor and Industries standards, Washington Administrative Code 296-62-07721(2)(b)(ii).

- For proposed partial acquisitions and temporary construction easements of properties with Historical Recognized Environmental Conditions and Recognized Environmental Conditions, a Phase II Environmental Site Assessment (ESA) should be considered prior to any purchase agreement, based on proposed Project activities on these properties. A Phase II ESA should be conducted where excavations are proposed near adjoining sites of concern with potential groundwater contamination. Sites to be considered for a Phase II ESA include the Chevron 93299, Former Excell Cleaners, Juno Therapeutics, and Bothell City Shop/Public Works UST/King County parcel 0926059013. For the King County Parks/Former BNSF rail line site, soil should be sampled and pre-characterized to determine baseline conditions.

CHAPTER 7 REFERENCES

Bothell, City of. 2015. *Imagine Bothell Comprehensive Plan*. July.

Bothell, City of. 2019a. *Canyon Park Subarea Planned Action Draft EIS*. December.

Bothell, City of. 2019b. *City of Bothell 2019-2025 Capital Facilities Plan*. Adopted November 13, 2018.

Bothell, City of. 2019c. *Safe and Secure Bothell Capital Facilities Plan Addendum 2019-2025*. Adopted March 5, 2019.

Bothell, City of. 2019d. City of Bothell Development Projects. Website. Accessed November 1, 2019.

Ecology (Washington State Department of Ecology). 2019. *Water Quality Assessment*. Retrieved in February 2019 from https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-improvement/Assessment-of-state-waters-303d.

FHWA (Federal Highway Administration), Federal Transit Administration, King County Department of Transportation, Sound Transit, and Washington State Department of Transportation. 2002. *I-405 Corridor Program NEPA/SEPA Final Environmental Impact Statement and Final Preliminary Section 4(f) Evaluation*. June.

FHWA and FTA (Federal Transit Administration). 2002. *I-405 Corridor Program Record of Decision*. October.

PSRC (Puget Sound Regional Council). 2009. *Vision 2040*. December.

PSRC. 2018. *Regional Transportation Plan – 2018*. Adopted May 31, 2018.

PSRC. 2019. Regional Data Profile: Populations and Households. Retrieved on Dec. 6, 2019 at https://www.psrc.org/rdp-population.

U.S. Census Bureau. 2017. American Community Survey 5-Year Estimates - Geodatabase Format - Tables X01, X03, X16, X17, X19, X25. Retrieved on July 17, 2019, at https://www.census.gov/geographies/mapping-files/time-series/geo/tiger-data.html.

WSDOT (Washington State Department of Transportation). 1999. Memorandum of Agreement between WSDOT and Puget Sound Clean Air Agency Regarding Control of Fugitive Dust from Construction Projects. December.

WSDOT. 2008. *Guidance on Preparing Cumulative Impact Analyses*. February.

WSDOT. 2011. *Climate Impacts Vulnerability Assessment*. November.

WSDOT. 2015. *Roadside Policy Manual M31-10*. August.

WSDOT. 2016a. WSDOT fish exclusion p and standards. Retrieved from https://www.wsdot.wa.gov/sites/default/files/2017/10/26/Env-FW-FishMovingProtocols.pdf.

WSDOT. 2016b. *I-405 Urban Design Criteria*. August.

WSDOT. 2018. *I-405 Express Toll Lanes: 36 Months of Operations*. Retrieved October 23, 2019, from https://www.wsdot.wa.gov/publications/fulltext/LegReports//17-19/I-405_ETL_36MonthUpdate.pdf.

WSDOT. 2019a. *Environmental Manual*. M 31-11.21. Engineering and Regional Operations, Development Division, Environmental Services Office. June.

WSDOT. 2019b. *Highway Runoff Manual*. M31-16.05. April.

WSDOT. 2019c. *Maintenance Manual*. M 51-01.07. June.

WSDOT. 2019d. Washington State Transportation Improvement Plan. 2019-2022. Approved January 2019.

CHAPTER 8 LIST OF PREPARERS

This Environmental Assessment (EA) was prepared through a collaborative effort among FHWA, WSDOT, and the I-405/SR 167 Megaprogram team. Exhibit 8-1 lists the people who contributed to the information provided in this EA, including their contribution, education, and years of experience.

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