

Attachment to the NEPA/SEPA Environmental Re-evaluation Form

PUGET SOUND GATEWAY PROGRAM – PHASE 1 OF THE SR 509 COMPLETION PROJECT

Environmental Re-evaluation

Prepared for
Federal Highway Administration
Washington State Department of Transportation

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- Attachment Q Environmental Justice Technical Report

Acronyms and Abbreviations

ADT	average daily traffic
AM	morning (AM) peak hour
APE	Area of Potential Effect
AVO	average vehicle occupancy
BA	Biological Assessment
BMP	best management practices
CABS	compost-amended biofiltration swales
C/D	collector/distributor lanes
CFR	Code of Federal Regulations
CIP	capital improvement project
CO	carbon monoxide
CO _{2e}	carbon dioxide equivalent
cy	cubic yards
DAHP	Department of Archaeology and Historic Preservation
dB	decibels
dBA	A-weighted decibels
DEIS	Draft Environmental Impact Statement
DMMD	Des Moines Memorial Drive
DPS	Distinct Population Segment
DTA	Dynamic Traffic Assignment
EB	eastbound
Ecology	Washington State Department of Ecology
EDR	Environmental Data Resources, Inc.
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FEIS	Final Environmental Impact Statement
FAA	Federal Aviation Administration
FGTS	Freight Goods Transportation System
FHWA	Federal Highway Administration
FWLE	Federal Way Link Extension
GHG	greenhouse gas
GIS	geographic information system

ACRONYMS AND ABBREVIATION

GP	general purpose
HASP	Health and Safety Plan
HOV	high-occupancy vehicle
HRM	WSDOT <i>Highway Runoff Manual</i>
I-5	Interstate 5
lbs/day	pounds per day
Ldn	24-hour day-night equivalent sound level
Leq	equivalent continuous noise level
Leg(h)	Leq over an hourly interval
LOS	level of service
MAP	million annual passengers
MFD	media filter drains
MP	milepost
mph	miles per hour
MSAT	mobile source air toxics
MT	metric tons
N/A	not applicable
NAAQS	National Ambient Air Quality Standards
NAC	noise abatement criteria
NAE	North Airport Expressway
NB	northbound
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOx	nitrogen oxides
NRHP	National Register of Historic Places
OWSC	one-way stop control
PCE	tetrachloroethylene
PEM	palustrine emergent
PFO	palustrine forested
PGIS	pollutant-generating impervious surface
PM	afternoon (PM) peak hour
PM10	particulate matter 10 micrometers or less in diameter
PM2.5	particulate matter 2.5 micrometers or less in diameter
PSCAA	Puget Sound Clean Air Agency
PSRC	Puget Sound Regional Council

PSS	palustrine scrub-shrub
PUD	public utility district
RCW	Revised Code of Washington
ROD	Record of Decision
ROW	right-of-way
SASA	South Aviation Support Area
SB	southbound
SPCC	Spill Prevention Control and Countermeasures
SCS	Soil Conservation Service
Sea-Tac	Seattle-Tacoma International Airport
SOV	single-occupant vehicle
SPU	Seattle Public Utilities
SPUI	single-point urban interchange
SR	State Route
SWPPP	Stormwater Pollution Prevention Plan
TCE	trichloroethylene
TDA	threshold discharge areas
TESC	Temporary Erosion and Sediment Control Plan
TMP	Traffic Management Plan
TWSC	two-way stop controlled
USC	United States Code
USFWS	United States Fish and Wildlife Service
VMT	vehicle miles traveled
VOCs	volatile organic compounds
VPD	vehicles per day
vph	vehicles per hour
WB	westbound
WDFW	Washington Department of Fish and Wildlife
WISSARD	Washington Information System for Architectural and Archaeological Records Data
WSDOT	Washington State Department of Transportation
WSTC	Washington State Transportation Commission

1. INTRODUCTION

The purpose of this re-evaluation is to determine whether the first phase of the SR 509 Completion Project (Phase 1 Improvements) will have the potential to result in any new significant environmental impacts that were not previously evaluated in the 2003 Final EIS (FEIS) and 2003 Record of Decision (ROD). With the passing of the Connecting Washington Transportation Package in 2015 by the state legislature, funding has become available for the first phase of the SR 509 Completion Project (Phase 1 Improvements) to proceed through environmental review, design, and into construction. The Phase 1 Improvements includes four-general purpose (GP) lanes on the new SR 509 extension (compared to six lanes as analyzed in the 2003 FEIS), and assumes that all lanes will be tolled using one electronic toll point. The toll point will be located south of the 1/2 diamond interchange at 28th/24th Avenue S., and is located such that any user of the SR 509 extension will be charged a toll. The effects related to tolling (which were not previously evaluated) are a key consideration in the re-evaluation, particularly as it relates to transportation and environmental justice effects. Before tolling can begin, a toll authorization bill must be passed by the Legislature. The rate-setting process will be overseen by the Washington State Transportation Commission (WSTC) in advance of the completion of Phase 1 Improvements.

The State Route (SR) 509 Completion Project is based on more than two decades of project planning and development. In 1995, Washington State Department of Transportation (WSDOT) released the *Tier I Corridor Draft Environmental Impact Statement (DEIS)*, which recommended extending SR 509 from S 188th Street southward to connect with Interstate 5 (I-5) and adding a spur roadway, the South Access Road, to connect with Seattle-Tacoma International Airport (Sea-Tac Airport). Within the SR 509 corridor, three routes and a No Build Alternative were evaluated in a project level (Tier II) Draft EIS published in 2002. The Final EIS (FEIS) and Record of Decision (ROD) issued in 2003 identified a six-lane Preferred Alternative (Alternative C2) that included two general purpose (GP) lanes and one high-occupancy vehicle (HOV) lane northbound and southbound on SR 509. It also included interchange connections at S 188th Street, S 200th Street, 24th/28th Avenue, and I-5 and a new South Access Road.

Since the ROD was issued, project progress has included actions such as the purchase of needed right-of-way (ROW), construction of an advanced wetland mitigation site, construction of work elements in coordination with local agencies, and refinements in preliminary design. In addition, WSDOT undertook a Practical Solutions design approach which allowed a fresh look at the previous project plans to ensure that the revised project is designed according to actual demand and needs. Part of the Practical Solutions approach included reengaging stakeholders to review design and potential changes.

2. RE-EVALUATION PROCESS

This Environmental Re-evaluation (Re-evaluation) has been prepared to identify and document changed environmental conditions and effects associated with the Phase 1 Improvements (see 23 CFR §771.129). This Re-evaluation examines the Phase 1 Improvements to determine if the resultant impacts (beneficial and/or adverse) present any new significant environmental impacts from what was previously documented in the ROD issued by the Federal Highway Administration (FHWA) in 2003. Changes in the project, applicable laws or regulations, and the project study area are discussed as they relate to the natural and built environment.

This Re-evaluation summarizes the changes to the affected environment since the 2003 FEIS was released, discusses how the Phase 1 Improvements would affect the natural and built environment in the project study area, and compares those effects with the effects of Alternative C2 as analyzed in the 2003 FEIS. Resource areas were re-analyzed in a series of separate technical memoranda and discipline reports which are presented in Attachments A through Q. This Re-evaluation makes many references to the *SR 509: Corridor Completion/I-5/South Access Road Final Environmental Impact Statement (2003*

FEIS), including the maps and mitigation measures that are still relevant to the updated analyses. The SR 509: Corridor Completion/I-5/South Access Road FEIS can be found on WSDOT's website at <http://www.wsdot.wa.gov/Projects/SR509/completion/Library.htm>.

This document has been completed in accordance with the National Environmental Policy Act (NEPA); the Council on Environmental Quality's regulations implementing NEPA (40 CFR Parts 1500-1508); the FHWA's regulations for Environmental Impact and Related Procedures (23 CFR Part 771); Section 4(f) of the Department of Transportation Act (49 USC §303); the FHWA's regulations implementing Section 4(f) (23 CFR Part 774); the FHWA's NEPA and Transportation Decision-making (FHWA, 1992); and Chapter 400.06 (1), Re-evaluations, of the Washington State Department of Transportation (WSDOT) *Environmental Manual M 31-11.13* (WSDOT, June 2017).

3. PROJECT DESCRIPTION

3.1. Purpose and Need

The purpose and need of the proposed action is the same as described in the 2003 FEIS. The purpose of the proposed action is to improve regional highway connections with an extension of SR 509 to serve current and future transportation needs in southwest King County and to enhance southern access to Sea-Tac Airport. The project area is shown in Figure 1.

The proposed project is needed to create system linkages, accommodate travel demand and capacity needs, and improve intermodal relationships. The SR 509 freeway currently terminates at S 188th Street and does not connect to the regional transportation highway system; this leaves a major gap in the system. As a result, local streets and major transportation routes like I-5 are at or over capacity given current travel demand. This situation is expected to worsen as travel demand for Sea-Tac Airport and major roadways increases.

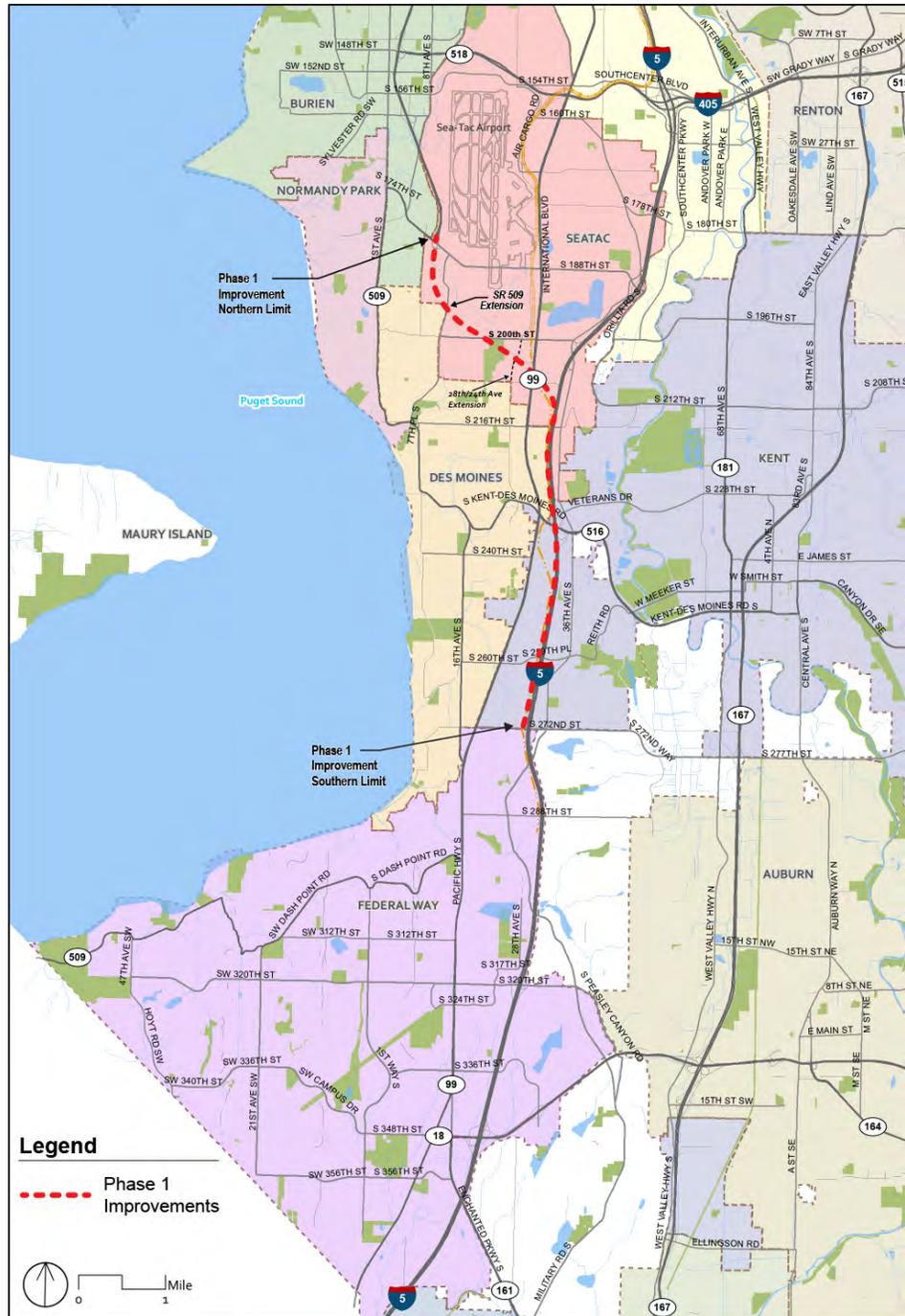
3.2. 2003 FEIS Preferred Alternative (Alternative C2)

A detailed description of Alternative C2 was provided in Section 2.3.4 of the 2003 FEIS. In summary, Alternative C2 included a six-lane extension of SR 509 from S 188th Street to I-5. New interchange improvements were proposed at four locations:

- S 188th Street
- S 200th Street
- 24th Avenue S/28th Avenue S
- I-5

A four-lane limited access roadway (South Access Road) was also proposed to connect SR 509 at 24th Avenue S/28th Avenue S with the Sea-Tac Airport Terminal Drive system, and a second interchange on the South Access Road was proposed at S 200th Street. Improvements on I-5 included adding northbound and southbound collector-distributor (C/D) lanes between SR 509 and SR 516, and adding auxiliary lanes between SR 516 and S 320th Street. Interchange improvements which included a new undercrossing of I-5 to connect to Veteran's Drive were also proposed at SR 516.

Figure 1 Project Vicinity



3.3. Phase 1 of the SR 509 Completion Project (Phase 1 Improvements)

The Phase 1 Improvements are essentially a subset of the improvements that were proposed in the 2003 FEIS. In summary, the Phase 1 Improvements would include four general-purpose lanes on a tolled facility (compared to six lanes on a non-tolled facility as analyzed in the 2003 FEIS) from S 188th Street to I-5. Interchange improvements would occur at three locations (compared to four locations as analyzed in the 2003 FEIS):

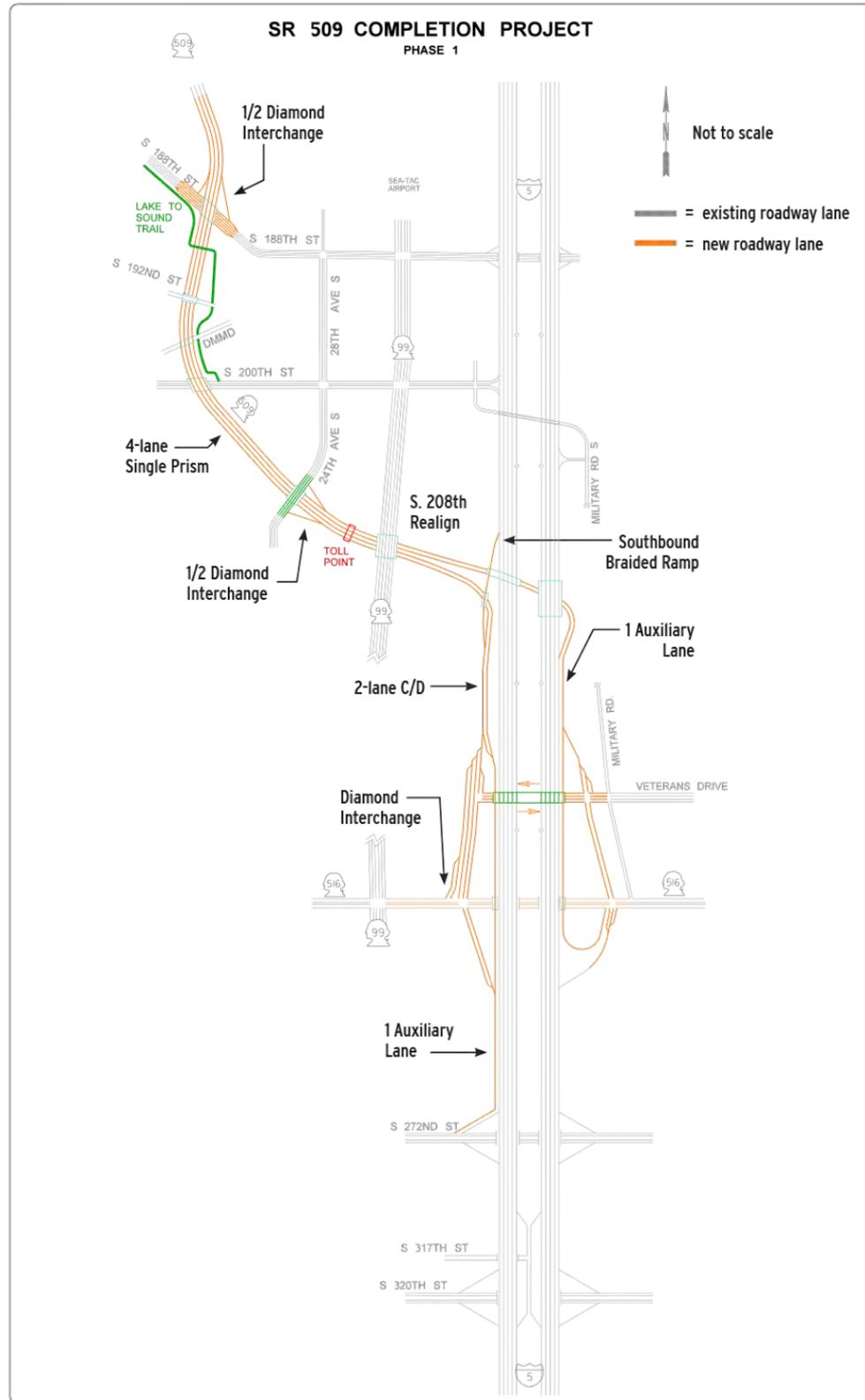
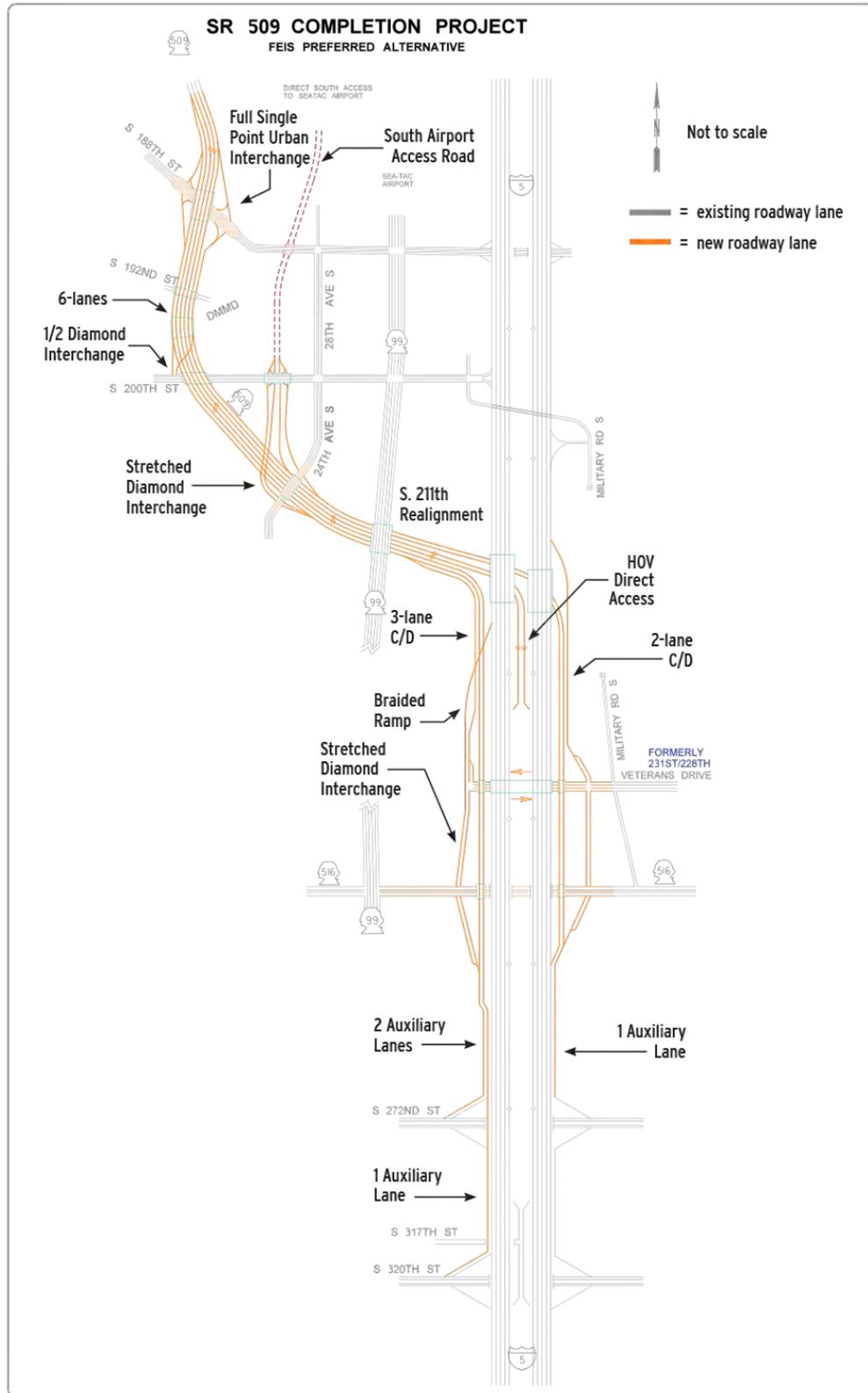
- S 188th Street interchange
- 24th Avenue S/28th Avenue S
- I-5

There would be no South Access Road or interchange at S 200th Street, and improvements on I-5 would be less extensive than those proposed in the 2003 FEIS. The project components as analyzed in the 2003 FEIS are compared to the Phase 1 Improvements in Table 1 and are shown in Figures 2.

Table 1. Comparison of Design Components		
SR 509	Alternative C2 (2003 FEIS and ROD)	Phase 1 Improvements (Re-evaluation)
SR 509: I-5 to S 188th Street	Six lanes (120 feet), 60 mph – 2 GP lanes in each direction and 1 HOV lane each direction	Four lanes (78 feet), 60 mph – 2 GP lanes in each direction
S 188th Street	Full single-point urban interchange (SPUI)	1/2 diamond (ramps to/from north) – but doesn't preclude future construction of full diamond with additional funding.
S 200th Street	1/2 diamond (to/from north) ^a	None– but doesn't preclude future construction with additional funding
South Access Roadway	Four-lane limited access facility to S 200th Street	None– but doesn't preclude future construction with additional funding
24th Avenue S/28th Avenue S	1/2 diamond (to/from south)	1/2 diamond (ramps to/from south)
Tolling	None	2 GP lanes in each direction
Toll Points	None	One south of 24th Avenue S/28th Avenue S
Interstate 5	Alternative C2 (2003 FEIS and ROD)	Phase 1 Improvements (Re-evaluation)
I-5/SR 509 GP connection	60 mph	50 mph
I-5 SB: SR 516 to SR 509	Southern braid – three-lane C/D	Northern braid and two-lane C/D
I-5 NB: SR 516 to SR 509	two-lane C/D	Auxiliary lane– but doesn't preclude future construction with additional funding
I-5/SR 509 HOV Direct Connection	I-5/SR 509 center-to-center HOV direct access roadway	None – but doesn't preclude future construction with additional funding
I-5/SR 516 Interchange ^b	Full diamond and at grade intersection with Veterans Drive connector	Full diamond and at-grade intersection with Veterans Drive connector
I-5 SB: SR 516 to S 272nd Street	Two auxiliary lanes	One auxiliary lane– but doesn't preclude future construction with additional funding
I-5 SB: 272nd to S 320th Street	One auxiliary lane	None– but doesn't preclude future construction with additional funding
I-5 NB: S 272nd Street to SR 516	One auxiliary lane S 272nd Street to SR 516	None– but doesn't preclude future construction with additional funding
<p>^a 1/2 diamond interchange has an on and off ramp that serves traffic to and from one direction.</p> <p>^b The Phase 1 Improvements would also maintain pedestrian connections on both sides of the I-5/SR 516 interchange and construct a new pedestrian path from Veterans Drive to SR 516/Kent Des Moines Road, which would help facilitate pedestrian trips to and from the transit centers around this interchange.</p> <p>C/D = collector/distributor lanes; GP = general purpose; HOV = high-occupancy vehicle; mph = miles per hour; NB = northbound; SB = southbound</p>		

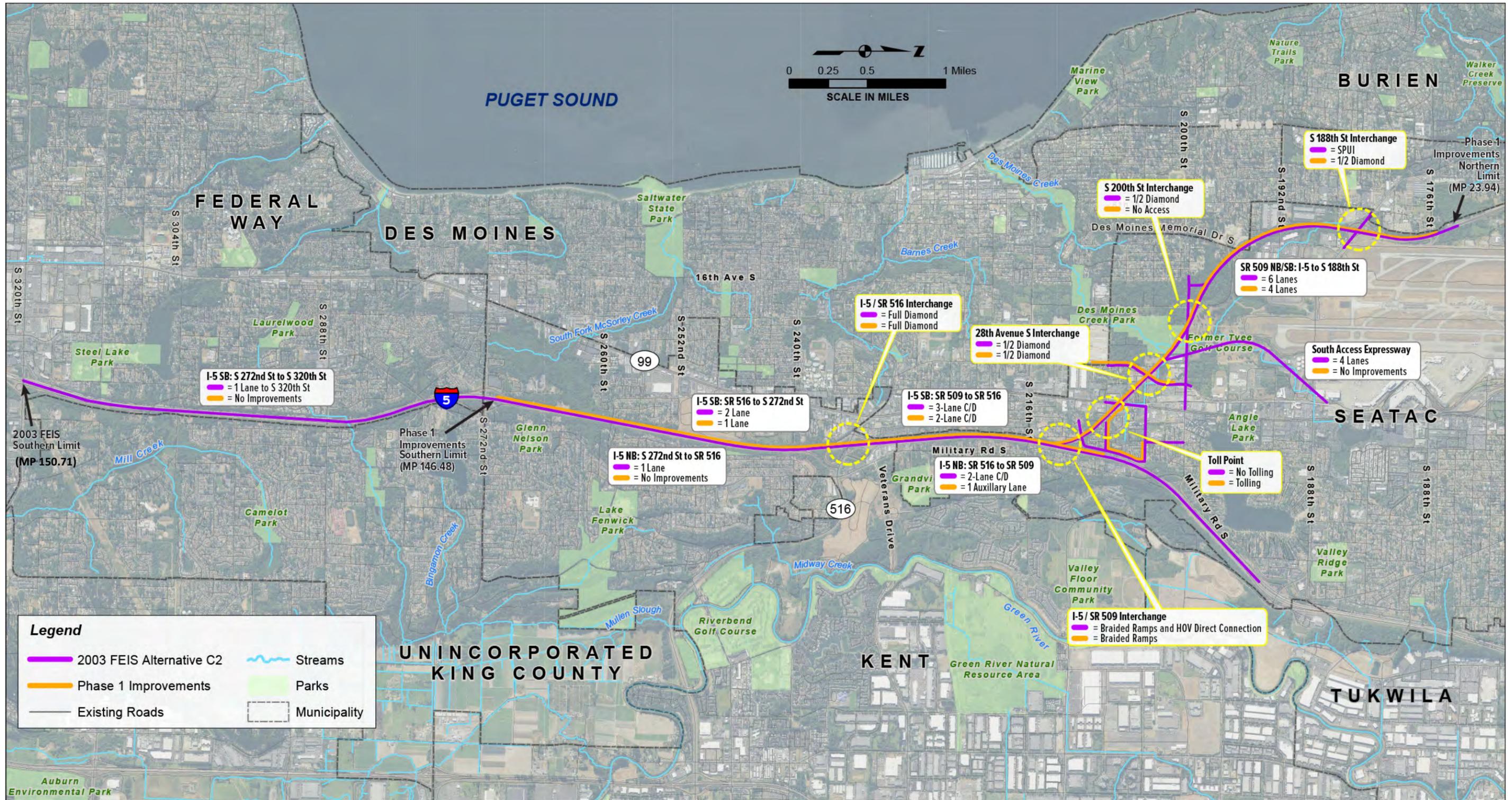
The Phase 1 Improvements also assumes that the extension of SR 509 between S 188th Street and I-5 would be fully tolled. A toll point would be located on SR 509 south of the 24th Avenue S/28th Avenue S interchange.

Figure 2 – Design Components of FEIS Preferred Alternative (Alternative C2) and Phase 1 Improvements



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Figure 3 Overlay Comparison of Alternative C2 and the Phase 1 Improvements



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4. DESCRIPTION OF CHANGED CONDITIONS AND EFFECTS

This section describes the changes to the affected environment since the 2003 FEIS was released, discusses how the Phase 1 Improvements would affect the natural and built environment in the project study area, and compares those effects with the effects of Alternative C2 as analyzed in the 2003 FEIS. The analysis was conducted using current information, including new guidelines or regulations where applicable, and compares the changes and effects between the project footprint described in the 2003 FEIS to the current footprint for the Phase 1 Improvements (see Table 1). Since the 2003 FEIS, toll revenue bonds have also been identified as a means to finance the SR 509 Completion Project. The potential toll adjustments would not change the study limits and, therefore, would not affect physical conditions, property requirements, or natural resources in the study area (i.e., community character, parklands and recreational resources, visual and aesthetic conditions, historic and cultural resources, noise and vibration, energy and climate change, topography, geology and soils, water quality, ecology, hazardous materials, or construction impacts).

The effects related to tolling, however, are a key consideration in the transportation analysis and environmental justice analysis. An updated transportation analyses that assumed tolling was conducted for this Re-evaluation using 2015 existing traffic data and horizon year 2045 traffic projections. The 2003 FEIS presented 1998 existing traffic data and horizon year 2020 traffic projections and did not assume tolling. Potential economic effects on low-income and minority households and overall freeway travelers were also examined. Sections 4.1 Transportation, 4.17 Environmental Justice, and 4.18 Cumulative Effects summarize the effects related to tolling. Transportation and Environmental Justice effects are also detailed in separate discipline reports that are provided in Attachment A and Q.

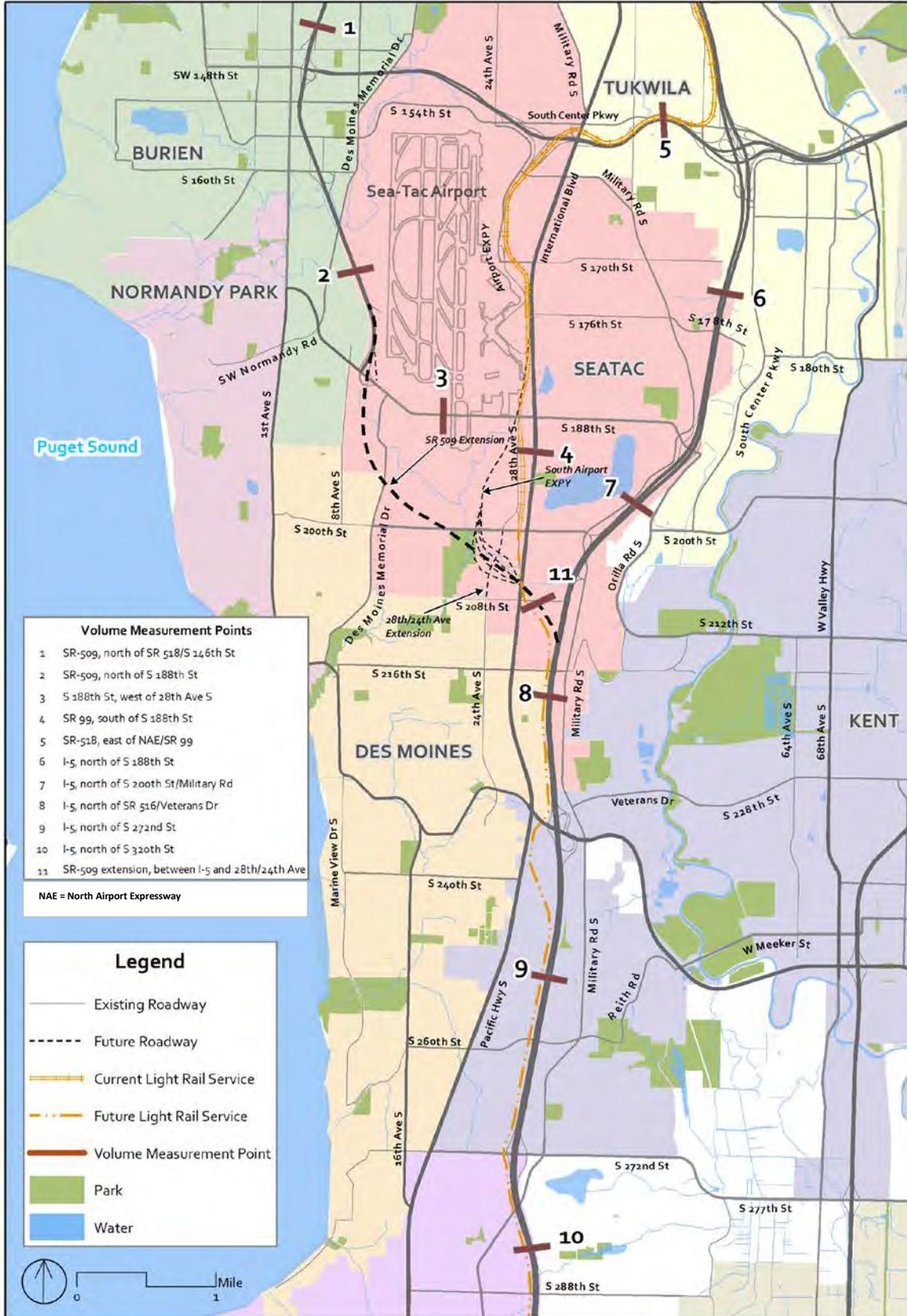
4.1. Transportation

Affected Environment

Existing Traffic Volumes

The 2003 FEIS reported existing traffic volume data from 1998 for the PM peak hour, only. This Re-evaluation provides updated traffic volume data from 2015 for both the AM and the PM peak hours. Figure 5 shows the 10 representative locations where existing peak hour traffic volumes are provided. Table 2 summarizes the existing peak hour volumes by direction for each of these locations. As shown, traffic volumes have not changed considerably since 1998 and remain highest on I-5 and SR 518.

Figure 4: Location of Traffic Volume Measurement Points



Measurement Point	Freeway	Location	2015 AM Peak Hour (total in both directions)	2015 PM Peak Hour (total in both directions)	1998 PM Peak Hour (total in both directions)
1	SR 509	North of SW 146th St	4,470	5,300	5,125
2	SR 509	North of S 188th St	2,320	3,510	3,250
3	S 188th St	West of 28th Ave S	1,630	2,455	2,475
4	SR 99	South of S 188th St	1,880	2,800	2,740
5	SR 518	East of North Airport Expressway/SR 99	7,000	8,490	8,500
6	I-5	North of S 188th St	14,040	15,540	13,800
7	I-5	North of S 200th St/Military Rd S	12,780	15,280	15,530
8	I-5	North of SR 516/Veterans Dr	12,830	15,230	14,830
9	I-5	North of S 272nd St	12,170	15,100	14,050
10	I-5	North of S 320th St	11,510	14,460	12,750
11	SR 509 Extension	Between I-5 and 28th/24th Ave	The SR 509 extension does not exist today, therefore there are no traffic volumes to report.		

Notes: Volume measurement points are displayed in Figure 5. Volumes are in vehicles per hour (vph) for both directions. Volumes reported for 1998 are from the 2003 FEIS.

Existing Freeway Performance

Although the 2003 FEIS did not analyze freeway performance based on speeds, it did conclude that portions of the existing system were highly congested and at the regional level I-5 was congested during the PM peak hour, the only time-frame analyzed. The Re-evaluation, which analyzed the three-hour AM and PM peak periods, found that average speeds are slowest on I-5 in the northbound direction in the AM and in the southbound direction in the PM, with speeds below 40 mph along the segment between SR 599 and S 320th Street (Table 3).

Corridor	Direction	Average Speeds (mph)	
		AM Peak Period (6:00 a.m. - 9:00 a.m.)	PM Peak Period (3:00 p.m. - 6:00 p.m.)
I-5: SR 599 to S 320th Street	NB	38	55
	SB	58	36
SR 518: SR 509 to I-5	EB	54	47
	WB	57	58
SR 509: SR 518 to S 188th Street	NB	59	60
	SB	60	60

Notes: The speeds come from the Dynameq model and are an average of both the GP and HOV lanes.

The re-evaluation also found that speeds on SR 518 are around 55 mph or higher, except for the eastbound direction which experiences spillback from the I-5/I-405 interchange. Speeds on SR 509 are near free-flow at 60 mph in both directions except for some congestion approaching S 188th Street.

Peak Period Travel Times

The 2003 FEIS did not calculate travel times. The Re-evaluation calculated travel times during the peak periods for the regional centers and activity node pairs shown in Figure 5. Table 4 shows the estimated travel times for those activity node pairs. The travel times are averaged for all vehicle types (including single-occupant vehicles [SOVs], HOVs, and trucks). Travel times along paths that use I-5 are typically longer in the northbound direction in the AM and the southbound direction in the PM as evidenced by the speeds shown in Table 3

Table 4. Existing (2015) Peak Period Travel Times (minutes)			
Travel Time Pairs shown on Figure 6 (to/from)	Direction	AM Peak Period (6:00 a.m. - 9:00 a.m.)	PM Peak Period (3:00 p.m. - 6:00 p.m.)
#1 Duwamish to/from #4 Kent	NB	26	22
	SB	22	24
#1 Duwamish to/from #5 Federal Way	NB	31	24
	SB	24	31
#2 Tukwila to/from #5 Federal Way	NB	19	13
	SB	12	20
#2 Tukwila to/from #6 Burien	EB	9	8
	WB	7	8
#3 SeaTac to/from #5 Federal Way	NB	19	15
	SB	14	20
#4 Kent to/from #5 Federal Way	NB	13	11
	SB	12	14
#5 Federal Way to/from #6 Burien	NB	24	20
	SB	19	25
<p>Notes: Travel time routes and location numbers are shown in Figure 6. Travel time results come from the Dynameq model and are the average of all vehicle types, including SOVs, HOVs, and trucks.</p> <p>Travel time locations are as follows: #1 Duwamish (SR 509 at Lucille Street); #2 Tukwila (I-5 at Duwamish River bridge); #3 SeaTac (SR 99 at S 170th Street); #4 Kent (SR 181 at S 220th Street); #5 Federal Way (I-5 at S 320th Street); #6 Burien (1st Avenue S at SW 148th Street).</p>			

Existing Intersection Level of Service

Intersection performance for both the 2003 FEIS and the Re-evaluation was measured based on the average seconds of vehicle delay and was reported in terms of level of service (LOS). This LOS measurement generally describes operating conditions based on a letter-grade system from LOS A to LOS F. LOS A generally represents ideal operating conditions with little to no delay and where movements are not influenced by other vehicles on the roadway. LOS F represents poor operating conditions, including high delays and extreme congestion. Table 5 shows the intersection LOS standards for affected local jurisdictions within the study area.

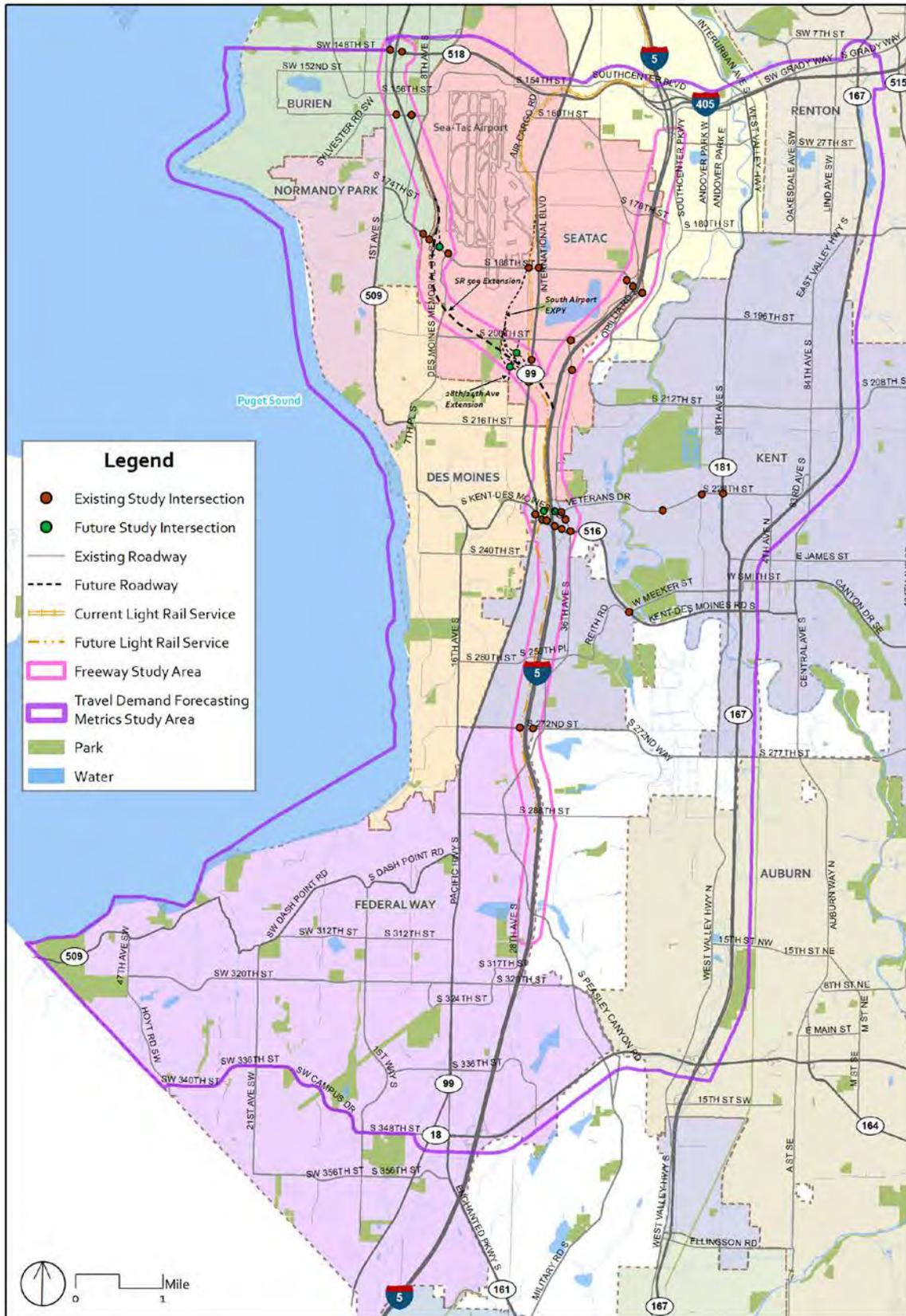
Table 5. Level of Service Standards for Affected Agencies/Jurisdictions	
Agency/Jurisdiction	LOS Standard
WSDOT	LOS D for HSS routes LOS E for regionally significant state highways (non-HSS routes)
City of Burien	LOS D
City of SeaTac	LOS E for principal and minor arterials LOS D for collector and lower classification streets
City of Des Moines	LOS D for signalized intersections, except intersection of SR 99/SR 516 is LOS F (Xc must not exceed 1.20)
City of Kent	LOS E for non-SR 99 intersections
Notes: HSS = Highways of Statewide Significance; LOS = level of service Xc is the volume-to-capacity ratio for critical lane groups at a signalized intersection.	

Thirty intersections were analyzed for this Re-evaluation, including freeway ramp terminals and local streets, as compared to 18 in the 2003 FEIS. Table 6 presents the existing peak hour intersection LOS for the 30 existing study intersections. Figure 6 shows the location of those study intersections. As shown, most of the intersections are operating above the LOS standard (27 intersections during the AM peak hour and 25 intersections during the PM peak hour).

Intersection	Traffic Control	Jurisdiction	LOS Standard	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
SR 509 SB ramps at SR 518	Signal	WSDOT	D	35	C	24	C
SR 509 NB ramps at SR 518	Signal	WSDOT	D	6	A	4	A
SR 509 SB ramps at S 160th St	TWSC	WSDOT	D	18	C	17	C
SR 509 NB ramps at S 160th St	OWSC	WSDOT	D	20	C	22	C
Des Moines Memorial Dr at 8th Ave S	Signal	Burien	D	11	B	10	A
SR 509 SB off-ramp to S 188th St/ Des Moines Memorial Dr	OWSC	WSDOT	D	12	B	21	C
Des Moines Memorial Dr at S 188th St	Signal	SeaTac	E	20	C	16	B
S 188th St at 28th Ave S	Signal	SeaTac	E	47	D	31	C
SR 99/Pacific Hwy S at S 188th St	Signal	SeaTac	E	43	D	73	E
S 188th St at Military Rd S	Signal	SeaTac	E	21	C	22	C
S 188th St at I-5 SB ramps	Signal	WSDOT	D	11	B	14	B
S 188th St at I-5 NB ramps	Signal	WSDOT	D	14	B	16	B
S 200th St at Military Rd S/I-5 SB ramps	Signal	WSDOT	D	37	D	47	D
Military Rd S at I-5 NB ramps	Signal	WSDOT	D	17	B	21	C
SR 99/Pacific Hwy S at S 204th St	Signal	SeaTac	E	7	A	21	C
SR 99/Pacific Hwy S at S 208th St	Signal	SeaTac	E	15	B	8	A
SR 99/Pacific Hwy S at SR 516	Signal	Des Moines	F	45	D	68	E
SR 516 at 30th Ave S	TWSC	Des Moines	D	24	C	22	C
Military Rd S at Veterans Dr	Signal	Kent	E	17	B	27	C
S 228th St at Lakeside Blvd E/58th Ave S	Signal	Kent	E	11	B	7	A
S 228th St at 64th Ave S	Signal	Kent	E	21	C	23	C
S 228th St at SR 181/68th Ave S	Signal	WSDOT	E	69	E	50	D
Military Rd S at Kent Des Moines P&R	OWSC	Kent	E	15	B	24	C
I-5 SB ramps at SR 516	Signal	WSDOT	D	18	B	44	D
I-5 NB Loop off-ramp at SR 516	OWSC	WSDOT	D	17	C	40	E
I-5 NB Slip off-ramp at SR 516	Signal	WSDOT	D	18	B	13	B
Military Rd S at SR 516	Signal	WSDOT	E	81	F	36	D
SR 516 at W Meeker St/Reith Rd	Signal	WSDOT	E	40	D	49	D
S 272nd St at I-5 SB ramps	Signal	WSDOT	D	23	C	52	D
S 272nd St at I-5 NB ramps	Signal	WSDOT	D	31	C	29	C

Notes: Delay is measured in seconds per vehicle. Yellow shading indicates intersection operates at LOS standard, while red shading indicates intersection operates below LOS standard.
OWSC = one-way stop-control; TWSC = two-way stop-control;

Figure 6: Transportation Study Area and Intersections



Updated Assumptions and Methodologies

The key differences between the impact analysis that was conducted for the 2003 FEIS and the updated impact analysis for the Re-evaluation are the years of analysis and the travel demand model and tolling assumptions used to develop traffic volume forecasts. The Phase 1 Improvements assume that the extension of SR 509 would be a new, fully tolled roadway from S 188th Street to I-5. The intent of tolling the facility is to manage the traffic demand and maximize the operational efficiency of the corridor as well as pay for a portion of the construction costs. It was assumed that all vehicles would be tolled and time-of-day tolling would be implemented, with higher tolls in the peak periods and lower tolls in the off-peak periods to manage demand. Tolls were assumed to range between \$1 and \$4, depending on the peak period and peak direction, and would be charged 24 hours per day.

Years of Analysis

The 2003 FEIS assessed future traffic conditions for the year 2020 and assumed a 1.4 percent annual growth rate compared to the 1998 existing volumes to estimate future volumes. Year 2020 land use growth was assumed to be greater with the action alternatives as compared to the No Build Alternative. This Re-evaluation assesses future traffic conditions for the year 2045 and assumes a 1 percent annual growth rate in traffic volumes compared to 2015 existing conditions for the overall study area. In addition, year 2045 land use forecasts assumed land use growth would be the same with or without the project.

Specific to the I-5 mainline, the 2003 FEIS assumed a 1 percent annual growth in traffic volumes as compared to the 0.3 to 0.6 percent annual growth assumed in this Re-evaluation. The assumptions used in the Re-evaluation reflect a more realistic constrained condition. The projected Year 2020 traffic volumes on I-5 southbound in the PM peak hour were, in most cases, higher in the 2003 FEIS than the 2045 No Build condition volumes (with the exception of I-5 southbound north of S 320th Street), thus indicating that much more aggressive forecasts were being used in the 2003 FEIS.

Travel Demand Model

A new travel demand model was developed for this Re-evaluation based on the PSRC 4k travel model. Future year traffic forecast volumes were developed based off the travel demand model. The baseline roadway network for the future (2045) No Build condition assumed that all environmentally approved and funded projects in the study area are completed in the 2045 horizon year. The Puget Sound Gateway Program was assumed to be fully built in the 2045 Build condition, including Phase 1 improvements from both the SR 509 and SR 167 Completion projects. A Dynamic Traffic Assignment (DTA) model was then used to assess future freeway conditions along this network. The DTA model provides a more detailed and more realistic assessment of traffic conditions, including information on corridor-level performance, route and pathway diversion, and the effects of segment-based facility tolling. The DTA model uses an iterative process to assign traffic on the most optimal route.

Effects During Operation

Traffic Volume Forecasts

The 2003 FEIS showed similar trends to this Re-evaluation when comparing No Build to Build volume pattern changes. In both cases, volumes on I-5 north of the SR 509 extension would drop with the Build condition compared to the No Build condition, while volumes south of SR 509 extension would increase (Table 7).

Volumes on the SR 509 extension between I-5 and the 24th Avenue S/28th Avenue S interchange were forecast in the 2003 FEIS to be almost twice the levels shown in this Re-evaluation forecasts. The 2003 FEIS forecasts indicated 7,900 vehicles per hour (vph) total for both directions, while this Re-evaluation

forecasts approximately 4,700 vph total in both directions. The 2003 FEIS did not assume tolling on the SR 509 extension, while this Re-evaluation did assume tolling. The Re-evaluation also indicates that traffic volumes on the existing section of SR 509 north of S 188th Street would increase between 500 and 1,400 vph in the 2045 Build condition. Traffic volumes on SR 518, S 188th Street, and SR 99 would decrease with the 2045 Build condition compared to the No Build condition as trips shift to the new facility.

Measurement Point (Figure 5 shows each measurement point)		AM Peak Hour (vph)			PM Peak Hour (vph)		
		No Build	Build	+/-	No Build	Build	+/-
1	SR 509 (north of SW 146th St)	6,250	6,460	+	6,820	7,120	+
2	SR 509 (north of S 188th St)	3,470	4,930	+	4,590	6,100	+
3	S 188th St (west of 28th Ave S)	2,380	1,990	-	3,140	2,760	-
4	SR 99 (south of S 188th St)	2,150	1,600	-	3,110	2,820	-
5	SR 518 (east of North Airport Expressway/SR 99)	8,930	8,700	-	11,230	10,860	-
6	I-5 (north of S 188th St)	15,890	15,430	-	16,040	15,630	-
7	I-5 (north of S 200th St/Military Rd S)	14,510	13,600	-	16,030	15,300	-
8	I-5 (north of SR 516/Veterans Dr)	14,680	17,090	+	16,560	20,410	+
9	I-5 (north of S 272nd St)	14,490	15,270	+	16,760	18,620	+
10	I-5 (north of S 320th St)	14,230	14,660	+	16,480	16,840	+
11	SR 509 Extension (west of I-5)	N/A	3,700	+	N/A	4,670	+

Notes: Volume measurement points are displayed in Figure 5. Volumes are in vehicles per hour (vph) and include both the northbound and southbound directions. N/A = not applicable

Travel Speeds and Travel Times (Peak Period)

The 2003 FEIS reported that with Alternative C2, there would be increased speeds and potential travel time savings of 10 minutes in the southbound direction between South Seattle and Federal Way in the PM peak period. As shown in Table 8, improved speeds would also occur with the Phase 1 Improvements. Both analyses indicated that traffic congestion would improve on I-5 because traffic would shift to the SR 509 extension. The Phase 1 Improvements also include a new northbound auxiliary lane between the SR 516 and SR 509 interchanges which would also contribute to higher average speeds and improved travel times.

With the Phase 1 Improvements there will be some additional congestion between the S 320th Street and S 272nd Street interchanges because the demand would increase slightly as compared to the No Build (Table 7 shows the increased volumes). Congestion would occur on approximately 1.5 miles of the 3.0-mile-long segment, with speeds on that segment averaging below 30 mph. The net result of these speed changes is a 10-mph speed improvement on I-5 over the 12-mile-long segment. I-5 southbound would not experience congestion in the AM peak period, similar to the No Build condition.

The findings shown in Table 9 indicate that Build condition travel times via current routes would be the same or improve between all pairs except Kent and Federal Way compared to No Build. In the AM and PM peak periods, most of the current routes in the Build condition would see a reduction in travel time as compared to the No Build ranging from a 1- to 11-minute time savings. Travel times on the SR 509 extension would be even faster as compared to the No Build, with a time-savings ranging between 1 and 20 minutes.

Table 8. Future (2045) Peak Period Average Travel Speeds					
Corridor	Direction	Average Speeds (mph)			
		AM Peak Period (6:00 a.m. - 9:00 a.m.)		PM Peak Period (3:00 p.m. - 6:00 p.m.)	
		No Build	Build	No Build	Build
I-5: SR 599 to S 320th Street	NB	24	35	44	48
	SB	57	57	28	33
SR 518: SR 509 to I-5	EB	38	39	32	41
	WB	54	56	53	55
SR 509: SR 518 to S 188th Street	NB	59	58	60	60
	SB	60	60	59	59
SR 509 Extension: S 188th Street to I-5	NB	N/A	59	N/A	60
	SB	N/A	60	N/A	49
I-5: I-405 to SR 599	NB	48	50	54	56
	SB	51	50	46	46
I-5: S 200th St to I-405	NB	28	28	30	43
	SB	57	58	26	44
I-5: S 272nd St to S 200th St	NB	15	41	49	47
	SB	59	59	21	23
I-5: S 320th St to S 272nd St	NB	39	26	56	53
	SB	59	59	50	44
I-5 Corridor Average: I-405 to S 320th St	NB	24	35	44	48
	SB	57	57	28	33

Notes: Speed results come from the Dynameq model and are an average of both the general purpose and HOV lanes.
N/A = not applicable, as this segment of SR 509 does not exist in the No Build condition. EB = eastbound; NB = northbound; SB = southbound; WB = westbound
 Green shading indicates speeds improve by 10 mph or more.
 Red shading indicates speeds degrade by 10 mph or more.

Travel Time Pairs shown on Figure 6 (to/from)	Direction	No Build		Build (Travel Time Reduction)			
		Via Current Route (minutes)		Using roadways other than SR 509 (minutes)		Using SR 509 extension (minutes)	
		AM	PM	AM	PM	AM	PM
Duwamish - Kent	NB	32	25	-1	-1	-9	-6
	SB	25	32	-1	-4	-5	-10
Duwamish - Federal Way	NB	44	29	-8	-2	-19	-9
	SB	25	40	0	-5	-7	-15
Tukwila - Federal Way	NB	30	17	-10	-2	N/A	N/A
	SB	12	25	0	-3	N/A	N/A
Tukwila - Burien	EB	10	9	-1	-1	N/A	N/A
	WB	7	9	0	-1	N/A	N/A
SeaTac - Federal Way	NB	30	17	-11	-1	-18	-6
	SB	14	24	-1	-3	-5	-10
Kent - Federal Way	NB	19	12	-4	+1	-4	+1
	SB	12	17	+1	-1	-1	-3
Federal Way - Burien	NB	36	24	-9	-1	-20	-8
	SB	20	33	-1	-5	-7	-5

Notes: Travel time results come from the Dynameq model and are the average of all vehicle types, including single-occupant vehicles, HOVs, and trucks.
N/A = not applicable as only the current route applies between these destination points. EB = eastbound; NB = northbound; SB = southbound; WB = westbound
 Green shading indicates that travel times will improve by 10 minutes or more.

Intersection Level of Service

The intersection LOS analysis in the 2003 FEIS indicated that under the 2020 No Build condition, study area intersections would deteriorate substantially as compared to 1998 existing conditions. The analysis also found that the Alternative C2 would provide an overall improvement in traffic operations, including I-5 north of the SR 509 extension, SR 99 between S 182nd Street and SR 516, S 188th Street west of SR 99, and SR 516 west of SR 99. The 2003 FEIS indicated, however, that even with the Alternative C2, I-5 and SR 99 south of SR 516 would continue to operate at LOS F.

Overall intersection performance would improve in the 2045 AM peak hour with the Phase 1 Improvements as compared to No Build. The number of intersections that would operate at or below the LOS standard would decrease from 12 to 9 locations due to shift of trips from arterials to the new SR 509 extension. Five of the seven intersections that operate below the LOS standard in the No Build condition would improve and operate at or above the LOS standard due to decreases in demand volume, while one intersection would no longer exist in the Build condition (the I-5 northbound-to-westbound loop off-ramp/SR 516 intersection).

- The I-5 southbound ramps/S 200th Street/Military Road S intersection would improve from LOS F and 160 seconds of delay in the No Build condition to LOS E and 75 seconds of delay in the Build condition and would not require mitigation.
- The SR 509 southbound ramps/S 160th Street intersection in Burien would deteriorate from LOS D and 29 seconds of delay in No Build to LOS E and 44 seconds of delay in the Build condition and would require mitigation. This intersection would deteriorate due to the stop-controlled

southbound off-ramp left-turn movement (which would only affect 15 vph). Possible mitigation measures to improve this intersection include signalization or conversion to a roundabout.

- The SR 509 northbound ramps/S 160th Street intersection in Burien would deteriorate from LOS F and 65 seconds of delay in No Build to LOS F and 91 seconds of delay with the Build condition and would require mitigation. The intersection would deteriorate due to high delays experienced by the stop-controlled northbound off-ramp left-turn movement caused by increased volume on S 160th Street as the SR 509 extension attracts more demand. Possible mitigation measures to improve this intersection include conversion to an all-way, stop-controlled intersection

Overall intersection performance in the 2045 PM peak hour with the Phase 1 Improvements would improve substantially compared to No Build. This is due to the shift of trips from arterials to the SR 509 extension, as well as improvements provided at the I-5/SR 516 interchange. The number of intersections that would operate at or below the LOS standard in the PM peak hour would decrease from 17 to 8 locations due to trips shifting to the new facility. Six of the eight intersections that operate below the LOS standard in the 2045 PM No Build condition would improve and operate at or above the LOS standard due to decreases in demand volume, while one intersection would no longer exist in the Build condition (the I-5 northbound-to-westbound loop off-ramp/SR 516 intersection).

- The I-5 southbound ramps/SR 516 intersection would improve from LOS E and 73 seconds of delay in No Build to LOS E and 57 seconds of delay in the Build condition and would not require mitigation.
- The SR 509 northbound ramps/S 160th Street intersection in Burien would deteriorate from LOS E and 49 seconds of delay in No Build to LOS F and 76 seconds of delay with the Build condition and would require mitigation. The intersection would deteriorate due to high delays experienced by the stop-controlled northbound off-ramp left-turn movement caused by increased volume on S 160th Street as the SR 509 extension attracts more demand. Possible mitigation measures to improve this intersection include conversion to an all-way, stop-controlled configuration.

Safety Performance

The 2003 FEIS indicated that the Alternative C2 would result in lower volumes and levels of congestion that would potentially reduce crash frequency compared to the No Build Alternative. The analysis for this Re-evaluation is generally consistent with this finding and found that safety performance of roads in the study area would be the same or improved in the Build condition compared to No Build. The Phase 1 Improvements would draw traffic demand away from nearby facilities, including SR 518, I-5 between SR 518 and the SR 509 extension, and arterials near the SR 509 extension. In general, the reduction of traffic demand and lower level of congestion on these facilities would potentially cause a reduction in the number of crashes, even though the crash rate may not change compared to No Build.

Table 10. Future (2045) AM Peak Hour Intersection Level of Service				
Intersection	2045 No Build Delay/LOS		2045 Build Delay/LOS	
	AM	PM	AM	PM
SR 509 SB ramps at SR 518	62/E	34/C	28/C	25/C
SR 509 NB ramps at SR 518	8/A	5/A	10/B	4/A
SR 509 SB ramps at S 160th St	29/D	26/D	48/E	34/D
SR 509 NB ramps at S 160th St	65/F	49/E	91/F	76/F
Des Moines Memorial Drive at 8th Ave S	14/B	17/B	10/B	12/B
SR 509 SB off-ramp to S 188th St/ Des Moines Memorial Drive	14/B	66/F	20/C	26/C
Des Moines Memorial Drive at S 188th St	23/C	20/B	17/B	13/B
S 188th St at 28th Ave S	50/D	48/D	40/D	44/D
SR 99/Pacific Hwy S at S 188th St	46/D	179/F	41/D	70/E
S 188th St at Military Rd S	44/D	32/C	38/D	24/C
S 188th St at I-5 SB ramps	17/B	50/D	19/B	31/C
S 188th St at I-5 NB ramps	29/C	24/C	28/C	33/C
S 200th St at Military Rd S/I-5 SB ramps	160/F	150/F	75/E	29/C
Military Rd S at I-5 NB ramps	49/D	79/E	17/B	14/B
SR 99/Pacific Hwy S at S 204th St	12/B	17/B	12/B	15/B
SR 99/Pacific Hwy S at S 208th St	22/C	14/B	10/B	8/A
SR 509 NB On-Ramp at S 188th St	N/A	N/A	5/A	5/A
24th Ave S/28th Ave S at SR 509 NB off-ramp	N/A	N/A	11/B	12/B
24th Ave S/28th Ave S at SR 509 SB on-ramp	N/A	N/A	8/A	8/A
SR 99/Pacific Hwy S at S 206th St	N/A	N/A	21/C	13/B
SR 99/Pacific Hwy S at S Kent Des Moines Rd	58/E	84/F ^a	72/E	73/E
SR 516/Kent Des Moines Rd at 30th Ave S	28/D	26/D	30/D	27/D
Military Rd S at Veterans Dr	29/C	37/D	65/E	59/E
S 228th St at Lakeside Blvd E/58th Ave S	13/B	7/A	12/B	7/A
S 228th St at 64th Ave S	60/E	35/C	37/D	26/C
S 228th St at W Valley Hwy/68th Ave S	161/F	73/E	76/E	53/D
Military Rd S at Kent Des Moines Park-and-Ride	18/C	35/D	14/B	21/C
I-5 SB ramps at SR 516	28/C	73/E	34/C	57/E
I-5 NB Loop off-ramp at SR 516	36/E	55/F	N/A	N/A
I-5 NB Slip off-ramp at SR 516/Kent Des Moines Rd	24/C	75/E	12/B	8/A
Military Rd S at SR 516/Kent Des Moines Rd	83/F	59/E	78/E	53/D
SR 516/Kent Des Moines Rd at W Meeker St/Reith Rd	64/E	77/E	69/E	60/E
S 272nd St at I-5 SB ramps	32/C	38/D	31/C	29/C
S 272nd St at I-5 NB ramps	75/E	40/D	46/D	31/C
I-5 SB ramps at Veterans Dr	N/A	N/A	14/B	18/B
I-5 NB ramps at Veterans Dr	N/A	N/A	18/B	38/D

Notes: Delay is measured in seconds per vehicle. Yellow shading indicates intersection operates at LOS standard, while red shading indicates intersection operates below LOS standard.
OWSC = one-way stop-control; TWSC = two-way stop-control; DMMD = Des Moines Memorial Drive; N/A = not applicable as intersection does not exist in this condition.

Transit and HOV

The 2003 FEIS assumed the SR 509 extension would be six lanes between S 188th Street and I-5, with HOV lanes in both directions and direct HOV ramps to and from I-5. It stated that transit would have the potential to use the new extension and improve travel time and reliability to the Burien Transit Center. The Re-evaluation does not assume HOV lanes on the SR 509 extension or at the I-5/SR 509 interchange. However, HOVs would experience improved traffic operations and reduced travel time with the Phase 1 Improvements, similar to HOV benefits described in the 2003 FEIS. In addition, the Phase 1 Improvements do not preclude HOV direct connector ramps from being built in the future as additional funding becomes available.

The 2003 FEIS assumed the use of transit would increase substantially from 1998 to 2020 No Build with new transit projects such as Link light rail and new HOV lanes on I-5 and SR 99. The 2003 FEIS indicated no change in transit mode split or average vehicle occupancy (AVO) between the No Build and Alternative C2. The Re-evaluation findings are generally consistent with the 2003 FEIS and indicate a transit mode split increase from 2015 existing to 2045 No Build with expansion of Link light rail southward to Tacoma. The transit mode split is similar to that which was assumed in the 2003 FEIS but slightly lower with an AVO that would not differ between No Build and Build. This Re-evaluation found that congestion and travel times for transit and HOV vehicles would generally improve on arterials and major roadways as a result of the Phase 1 Improvements.

Non-Motorized Facilities

The 2003 FEIS recognized the extension of the Lake to Sound Trail as well as other planned improvements for non-motorized facilities in the 2020 No Build Alternative. The analysis found that the Alternative C2 would have either maintained existing non-motorized facilities or constructed new facilities, so that there would be no impacts with the project. This Re-evaluation also finds that non-motorized facilities within the study area in 2045 would be the same or improved in the Build condition compared to No Build. The Phase 1 Improvements would provide new non-motorized facilities at the I-5/SR 516 interchange that connects Veterans Drive to SR 516 on the east side of I-5. Grade-separated crossings of the SR 509 extension at major arterials—such as SR 99, 28th Avenue S/24th Avenue S, S 200th Street, Des Moines Memorial Drive, and S 192nd Street—would reduce the risk for pedestrian and bicycle interaction with vehicle trips diverting to the new roadway. The Phase 1 Improvements would also reduce the amount of traffic volume on arterials in the study area, thus reducing the risk of vehicle collisions with pedestrians and bicyclists.

WSDOT is reimbursing King County for construction of the proposed Lake to Sound Trail, which is mitigation for SR 509 effects as detailed in the 2003 FEIS. The Lake to Sound Trail, which will run parallel to the SR 509 extension between S 188th Street and S 200th Street, would provide an alternate route for bicyclists. The Phase 1 Improvements would also maintain pedestrian connections on both sides of the I-5/SR 516 interchange and construct a new pedestrian path from Veterans Drive to SR 516/Kent Des Moines Road, which would help facilitate pedestrian trips to and from the transit centers around this interchange.

Freight

The 2003 FEIS projected that trucks would experience more congestion between 1998 existing and 2020 No Build Alternative conditions. The analysis also indicated that travel distance and time for trucks would be shortened with the project. Findings from this Re-evaluation are generally consistent with the 2003 FEIS. Freight mobility would improve as a result of the Phase 1 Improvements. Truck traffic would still be able to use the currently designated freight facilities; however, some truck trips would shift to the SR 509 extension and mobility would be substantially improved on existing facilities, including I-5, SR 518, SR 599, and Orillia Road S. The Phase 1 Improvements would create a direct route for freight to and from the Puget Sound marine ports and the industrial areas of Seattle and South King County. The SR 509/28th Avenue S/24th Avenue S interchange would be designed to accommodate the future South

Airport Expressway to connect to and from the north via direct ramps to SR 509. This would provide a new connection for air cargo between Sea-Tac Airport and I-5. Travel times on existing freight routes would be similar or improved with the Phase 1 Improvements, while the SR 509 extension would further reduce travel times between key activity centers.

Airports

The 2003 FEIS stated that Sea-Tac Airport forecasts would reach 44.6 million annual passengers (MAP) by 2020 No Build. Significant congestion was expected to occur at the entrances to the airport on SR 99. As of 2016, existing conditions have reached 45.7 MAP, thus exceeding the forecasts from the 2003 FEIS. The 2003 FEIS also indicated that access to Sea-Tac Airport to and from the south would be substantially improved under 2020 Alternative C2 as compared to No Build conditions, with an overall travel time reduction of approximately 10 minutes for trips using the new roadway.

This Re-evaluation finds similar improvements to vehicle access to and from Sea-Tac Airport with the Phase 1 Improvements and the South Airport Expressway, with travel times to and from the south reduced by up to 18 minutes. Under the Build conditions, access to Sea-Tac Airport to and from the south would be substantially improved with the Phase 1 Improvements. Airport commuters and residents to the south would see improved, direct access to and from the airport either by using existing routes or paying a toll to use the SR 509 extension.

Effects During Construction

The 2003 FEIS did not evaluate the effect construction would have on transportation. In general, construction of the Phase 1 Improvements would require temporary lane closures, traffic detours, construction staging, and the use of oversized equipment. Project construction would be coordinated with all affected state and local agencies and include implementation of a Traffic Management Plan (TMP). The TMP would include recommendations for appropriately managing traffic during the construction period by implementing measures such as incident management, construction schedule restrictions, staging, traffic control, and public outreach. Such measures would promote traffic movement during construction to avoid substantial LOS degradation (i.e., LOS levels that are less than the adopted LOS thresholds) and potential impacts to local traffic. The TMP would be prepared in accordance with the *Manual of Uniform Traffic Control Devices* (FHWA, 2012) and all applicable requirements of the affected local agencies. The TMP would also include procedures for notifying and coordinating with all affected transit operators in advance of construction activities.

Mitigation

The 2003 ROD identified three transportation-related mitigation measures, including integrating a northbound extension of the existing Des Moines Creek Trail into the design of the SR 509 improvements, investigating the feasibility of pedestrian and bicycle access across the roadway to provide a connection between portions of bisected neighborhoods and along key east-west corridors, and redirecting pedestrian and bicycle facilities along the local streets to the nearest arterial that would cross the proposed improvements. The current design of the Phase I Improvements incorporates each of the proposed mitigation measures.

In addition to the measures identified in the ROD, the Phase 1 Improvements would require the following measures to mitigate potential impacts:

- The SR 509 southbound ramps/S 160th Street intersection in Burien would fall below LOS standards in Build conditions during the AM peak hour and require mitigation. This intersection LOS would deteriorate due to the stop-controlled southbound off-ramp left-turn movement (which only affects 15 vph). Possible mitigation measures to improve this intersection include signalization or conversion to a roundabout.

- The SR 509 northbound ramps/S 160th Street intersection in Burien would fall below LOS standards with the Phase 1 Improvements during both the AM and PM peak hours and require mitigation. The intersection LOS would deteriorate due to high delays experienced by the stop-controlled northbound off-ramp left-turn movement caused by increased volume on S 160th Street, as the SR 509 extension would attract more demand. Possible mitigation measures to improve this intersection include conversion to an all-way, stop-controlled intersection.

Conclusion

Overall, this transportation Re-evaluation analysis indicates that with the updated assumptions and methodologies, there would be an overall improvement in traffic operations and with the mitigation as proposed above there would be no new significant traffic effects as a result of the Phase 1 Improvements. See also Attachment A for the Transportation Technical Report.

4.2. Air Quality

Affected Environment

The project area was previously described in Section 3.1.2 of the 2003 FEIS. Since that time, improvements to vehicle technology have contributed to the dramatic decline in carbon monoxide emissions in the region and the project area now meets the National Ambient Air Quality Standards (NAAQS) and is in attainment for carbon monoxide (CO) and ozone. The Clean Air Act does not require conformity determinations for projects in attainment. However, NEPA still requires documenting and, as applicable, assessing air quality effects of projects.

Effects During Operation

Regional Air Quality

Because the project area was in a maintenance area for CO in 2003, the 2003 FEIS conducted a project-level quantitative analysis per the conformity requirements. Four study intersections were analyzed using 2020 traffic volumes. The air quality at all four intersections was found to be below the NAAQs under both the No Action and Alternative C2 conditions.

Because the project area is now in attainment a new conformity analysis is not required, however per NEPA an emissions burden analysis was conducted to determine how the Phase 1 Improvements would contribute to regional emissions of criteria pollutants. The assessment was conducted using the MOVES2014a model and the vehicle miles travelled (VMT) data for the following scenarios:

- Existing (2015)
- No-Build (2025 and 2045)
- Build (2025 and 2045) scenarios

Table 11 summarizes tailpipe emissions for criteria pollutants for the existing and future forecast years. Under the 2025 and 2045 No Build and Build conditions, emissions are expected to decrease over existing conditions due to a newer and cleaner automobile fleet. In 2025, emissions under Build conditions decrease compared to No Build conditions due to the changes in traffic conditions on the affected network. In 2045, Build condition emissions continue to be lower than those under the No Build conditions.

Table 11. Criteria Pollutants Daily Regional Emission Burden Assessment for Forecast Years 2025 and 2045

Criteria Pollutant (lb/day)	Existing 2015	2025 No Build	2025 Project	2045 No Build	2045 Project	% Change 2015 to 2025 No Build	% Change No Build to 2025 Project	% Change 2015 to 2045 No Build	% Change 2045 No Build to 2045 Project
Daily VMT	8,388,569	9,770,869	9,725,661	10,939,599	10,756,165	16%	0%	30%	-2%
CO	69,434	40,352	39,804	18,860	18,523	-43%	-1%	-73%	-2%
PM _{2.5}	1,370	417	409	215	214	-70%	-2%	-84%	-1%
PM ₁₀	1,497	457	449	237	235	-70%	-2%	-84%	-1%
VOCs	3,529	1,268	1,223	744	727	-64%	-4%	-79%	-2%
NO _x	36,129	11,621	11,542	7,467	7,428	-68%	-1%	-79%	-1%

Sources for 2015 conditions: PSRC Travel Demand Model, EPA MOVES Model 2014a
 lb/day = pounds per day
 VMT = vehicle miles traveled

Mobile Source Air Toxics

An MSAT analysis was not conducted for the 2003 FEIS but has been conducted for the Re-evaluation because transportation projects have been identified as a source of these pollutants. Based on FHWA guidance a quantitative analysis was conducted using the MOVES2014a model and the vehicle miles travelled data for the following scenarios:

- Existing (2015)
- No-Build (2025 and 2045)
- Build (2025 and 2045) scenarios

Table 12 summarizes the tailpipe emissions for toxic air pollutants in the project area. As shown, MSAT emissions will decrease substantially from existing conditions to future conditions due to improved vehicle technology and fleet turn over despite increased VMT. Environmental Protection Agency's (EPA) national control programs are projected to reduce annual MSAT emissions by over 90 percent from 2010 to 2050 (Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents, Federal Highway Administration, October 12, 2016).

In 2025 and 2045, MSAT emissions under the Build conditions would be slightly lower than under the No Build.

Table 12. Toxic Air Pollutants Daily Regional Emission Burden Assessment for Forecast Years 2025 and 2045

Criteria Pollutant (lb/day)	Existing 2015	2025 No Build	2025 Project	2045 No Build	2045 Project	% Change 2015 to 2025 No Build	% Change No Build to 2025 Project	% Change 2015 to 2045 No Build	% Change 2045 No Build to 2045 Project
Daily VMT	8,388,569	9,770,869	9,725,661	10,939,599	10,756,165	16%	0%	30%	-2%
1-3-Butadiene	10	2	2	0	0	-83%	-3%	-98%	-1%
Acrolein	12	4	4	3	3	-66%	-3%	-77%	-1%
Acetaldehyde	80	29	28	20	20	-64%	-3%	-75%	-1%
Benzene	79	27	26	14	13	-66%	-3%	-83%	-2%
Ethyl Benzene	40	16	15	10	9	-61%	-4%	-76%	-3%
Diesel PM	1,304	344	336	164	163	-74%	-2%	-87%	-1%
Naphthalene	19	7	6	5	5	-64%	-3%	-75%	-1%
PAH	9	2	2	1	1	-75%	-3%	-92%	-1%

Sources: PSRC Travel Demand Model and EPA MOVES2014a.

lb/day = pounds per day

VMT = vehicle miles traveled

Greenhouse Gas

Greenhouse gases were not considered in the 2003 FEIS but have been considered for the Re-evaluation. The MOVES2014a model was also used to quantify operational GHG emissions from the Phase 1 Improvements. The estimated carbon dioxide (CO₂) emissions for Phase 1 Improvements operations are shown in Table 13. GHG emissions under Build conditions for 2025 slightly increase due to the changes in traffic conditions and the affected network. In 2045, however, GHG emissions decrease below 2045 No Build conditions. The decrease in GHG emissions under Build conditions is a result of traffic improvements that will minimize stop and go conditions and promote more efficient energy consumption by moderating speeds. The Phase 1 Improvements will enable better movement of vehicles in 2045 for project area intersections and on the mainline, thereby reducing traffic congestion. Decreased vehicle delay at off and on ramps further reduces emissions related to idling vehicles.

Table 13. Greenhouse Gas Emissions in Terms of CO_{2e} for Forecast Year 2025 and 2045

Pollutant	2015 Existing	2025 No Build	2025 Project	2045 No Build	2045 Project	% Change 2015 to 2025 No Build	% Change No Build to 2025 Project	% Change 2015 to 2045 No Build	% Change 2045 No Build to 2045 Project
Daily VMT	8,388,569	9,770,869	9,725,661	10,939,599	10,756,165	16%	0%	30%	-2%
Operational MMT CO _{2e} /yr	1.92	2.00	1.98	2.14	2.11	4%	-1%	12%	-1%

Sources: PSRC Travel Demand Model and EPA MOVES2014a.

MMT = Million metric tons

Effects During Construction

Construction air quality effects of the Phase 1 Improvements would be similar to the impacts discussed previously in the 2003 FEIS. The project would consist of soil-disturbing activities, heavy-duty equipment, commuting construction workers, and the laying of asphalt that would generate emissions that can temporarily affect air quality. The total emissions and the timing of the emissions from these sources would vary depending on the construction phasing of the project.

Typical sources of emissions during construction of transportation projects include the following:

- Fugitive dust generated during excavation, grading, and loading and unloading activities
- Dust generated during demolition of structures and pavement
- Engine exhaust emissions from construction vehicles, worker vehicles, and diesel-fueled construction equipment
- Increased motor vehicle emissions associated with increased traffic congestion during construction

Mitigation

The mitigation measures that were imposed under the 2003 ROD that remain relevant to the Phase 1 Improvements are listed below.

- Mitigation measures to control PM10, deposition of particulate matter, and emissions of CO and NOX will be implemented during construction per the Associated General Contractors of Washington guidelines and Puget Sound Clean Air Agency regulations.
- Project construction staging will be managed to reduce overall system congestion and delays, which will reduce regional emissions of pollutants, to the greatest extent practicable

In addition to the measures above and in accordance with WSDOT's *Environmental Manual* M31-11, WSDOT will comply with the procedures outlined in the October 1999 Memorandum of Agreement entered into and by WSDOT and the Puget Sound Clean Air Agency for controlling fugitive dust emissions, which may require the following actions:

- Spray exposed soil with water or other dust suppressant to reduce emissions of particulate matter less than 10 microns in diameter (PM10) by increasing deposition of particulate matter.
- Use phased development to keep disturbed areas to a minimum.
- Use wind fencing to reduce wind disturbance of soils.
- Minimize dust emissions during transport of excavated or fill materials by wetting down loads or ensuring adequate freeboard (space from the top of the material to the top of the truck bed) on trucks.
- Promptly clean up spills of transported material on public roads.
- Schedule work tasks to minimize disruption of the existing vehicle traffic on streets.
- Restrict traffic onsite to reduce soil upheaval and tracking material onto roadways.
- Provide wheel washers to decrease deposition of particulate matter on area roadways by removing particulate matter that would otherwise be carried offsite by vehicles.
- Locate construction equipment and truck staging areas away from sensitive receptors as practical and in consideration of potential effects on other resources.
- Cover dirt, gravel, and debris piles as needed to reduce dust and wind-blown debris.

Conclusion

Overall, this air quality Re-evaluation analysis indicates that even with the updated assumptions and methodologies, there would be an overall improvement in air quality and no new significant effects

would occur as a result of the Phase 1 Improvements. See also Attachment B for the Air Quality Technical Report.

4.3. Noise

Affected Environment

Noise Levels

Noise is measured in units called A-weighted decibels. A-weighted decibels (dBA) are an expression of the relative loudness of sounds in air as perceived by the human ear. Humans can hear sounds between 0 and 140 decibels. The human ear perceives every 10-dBA increase as a doubling of the noise level. People find a noise level increase of 3 dBA or more barely perceptible, and perceive a 5-dBA increase as noticeable. The loudness of highway noise is related to the volume of traffic, the distance of the listener from the highway and whether there is a direct line of sight between the noise source and the listener.

For this Re-evaluation, traffic noise levels were measured at 25 representative receptor locations within the study area. Sensitive receptors were chosen based on accessibility, proximity, and their ability to represent overall conditions in the study area. Short-term measurement data collected at 25 representative receptor locations, and concurrent traffic counts were used to validate the TNM 2.5 computer noise model prior to predicting existing traffic noise levels.

Measured levels from all sources (such as traffic, aircraft, and local noise) ranged between 56 and 76 dBA, which is within 2 dB of the levels measured for the 2003 FEIS. After aircraft noise was removed from the 2017 measurement data set, sound levels ranged between 54 and 73 dBA. Adjustment factors (ranging from 0 to -10 dB) were used to remove aircraft noise from data collected at the 25 measurement sites.

FHWA Noise Abatement Criteria

For federally funded highway projects, traffic noise impacts occur when predicted hourly traffic noise levels, defined as hourly Leq equivalent (A-weighted sound level averaged hourly, or Leq(h)), approach or exceed the noise abatement criteria (NAC) established by the FHWA, or substantially exceed existing sound levels (23 CFR 772 – *Procedures for Abatement of Highway Traffic Noise and Construction Noise*). “Approach” is defined by WSDOT as meaning within 1 dB. “Substantially exceed” is defined by WSDOT as an increase of 10 dB or more over the existing level. The current FHWA NAC for various land activity categories are presented in Table 14.

Table 14. Current FHWA Noise Abatement Criteria - Leq(h) at Evaluation Location (dBA)		
Activity Category	NAC	Current Description of Activity Category
A	57 (exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose
B	67 (exterior)	Residential (single and multi-family units)
C	67 (exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, daycare centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings
D	52 (interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72 (exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A–D or F. Includes undeveloped land permitted for these activities.
F	-	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing
G	-	Undeveloped lands that are not permitted

Effects During Operation

Although the noise analysis for the Phase 1 Improvements was conducted in a similar manner to the 2003 FEIS, there are some notable differences. Noise impacts reported in the 2003 FEIS were determined based on generic noise contours calculated with a simplified version of FHWA Noise Prediction Model Stamina 2.0, assuming ideal propagation conditions. The Phase 1 Improvements noise levels were evaluated based on WSDOT's current Noise Policy using FHWA's updated TNM Version 2.5, with sound levels predicted at individual receptors to identify noise impacts. Future traffic noise levels were predicted for No Build and Phase 1 Improvements under 2045 traffic conditions compared to the 2020 traffic conditions analyzed in 2003. The updated analysis also considered more current noise contours from Sea-Tac Airport and noise from Sound Transit's Federal Way Link Extension (FWLE), including proposed transit noise abatement measures. See Attachment C (Noise Technical Report) for additional information on methodologies used to account for influences of these additional noise sources.

As was discussed in the 2003 FEIS, long-term noise impacts would occur from increased traffic volumes and changes in traffic patterns on area roadways. As shown in Table 15, the 2003 FEIS documented 2,578 affected receptors from Alternative C2 and 1,348 affected receptors from the No Build Alternative. The updated analysis identifies significantly fewer noise impacts—147 affected receptors for the Phase 1 Improvements and 453 affected receptors for No Build.

This reduction in noise impacts compared to the 2003 FEIS is due to a number of factors, including fewer travel lanes, exclusion of the South Access Road, more detailed noise prediction methodology, and quantified accounting of contributions from other dominant noise sources (Sea-Tac Airport and FWLE). The updated analysis also includes noise reductions afforded by transit noise abatement (e.g., sound barriers/walls) planned for installation west of I-5 for the FWLE project, which were not considered in the 2003 FEIS. All traffic noise predictions in the updated analysis used forecasted PM peak hour (4:30 p.m. to 5:30 p.m.) traffic volumes traveling at 60 mph. These volumes are shown in Table 5 in the Transportation section.

Receptor Type	2003 FEIS		Updated Analysis	
	No Build (2020)	Alternative C2 (2020)	No Build (2045)	Phase 1 Improvements (2045)
Single-family residence	683	1,744	110	112
Multifamily residence	655	819	524	287
Schools	1	3	1	1
Libraries	0	0	0	0
Hospitals and retirement homes	3	3	0	0
Parks	2	3	1	1
Churches	4	6	0	0
Total Receptors Affected	1,348	2,578	636	401

In the 2003 FEIS, three parks were impacted by noise: Linda Heights Park, Midway Park, and Des Moines Creek Park. The following summarizes previous determinations and results from the updated analysis conducted for the Re-evaluation:

- Midway Park (KC parcel #2156400365) – would not be affected by Phase 1 Improvements
 - 2003 FEIS: Traffic on I-5 was the dominant noise source. Existing sound levels near the entry to the substation were about 70 dBA (350 feet from I-5), which exceeded the WSDOT/FHWA NAC. Sound levels farther west (600 feet from I-5) were 59 dBA.
 - Updated analysis: The current primary outdoor area of frequent human use is approximately 800 feet west of I-5. Existing traffic conditions for this parcel were modeled at 53 dBA, which does not exceed the WSDOT/FHWA NAC. The 2003 FEIS 70 dBA measurement location appears to be within a parcel now used by an adjacent substation.
- Linden Heights Park (KC parcel #2222049169) – would be affected by Phase 1 Improvements
 - 2003 FEIS: Traffic on I-5 was the dominant noise source. Existing average background noise levels near the west side of the park were in the 70 dBA range, which exceeds the WSDOT/FHWA NAC.
 - Updated analysis: Existing traffic conditions were modeled at 67 dBA, which exceeds the WSDOT/FHWA NAC.
- Des Moines Creek Park (KC parcel #0422049031) – would not be affected by Phase 1 Improvements
 - 2003 FEIS: Aircraft departures from Sea-Tac Airport were the main sources of environmental noise, with measured noise levels in the park averaging 71 to 75 dBA when jet aircraft departures occur. Based on the 1998 aircraft noise contours in the Sea-Tac Airport Part 150 Study Update (Port of Seattle 2000), aircraft noise exposure in Des Moines Creek Park is in the range of Ldn 70 dBA.
 - Updated analysis: Sound levels with the Phase 1 Improvements would be 54 dBA, which is below the WSDOT/FHWA NAC and the predicted peak hour Leq noise level from Sea-Tac Airport (68 dBA).

Traffic Noise Abatement

The evaluation of noise abatement feasibility and reasonableness conducted in 2003 (conclusions found in Table 6 of Appendix I of the 2003 FEIS) has been updated using the current 2012 WSDOT Noise Policy criteria. The Phase 1 Improvements noise abatement analysis evaluates 18 noise wall locations, including new walls, extending existing walls, and increasing the height and/or length of noise walls

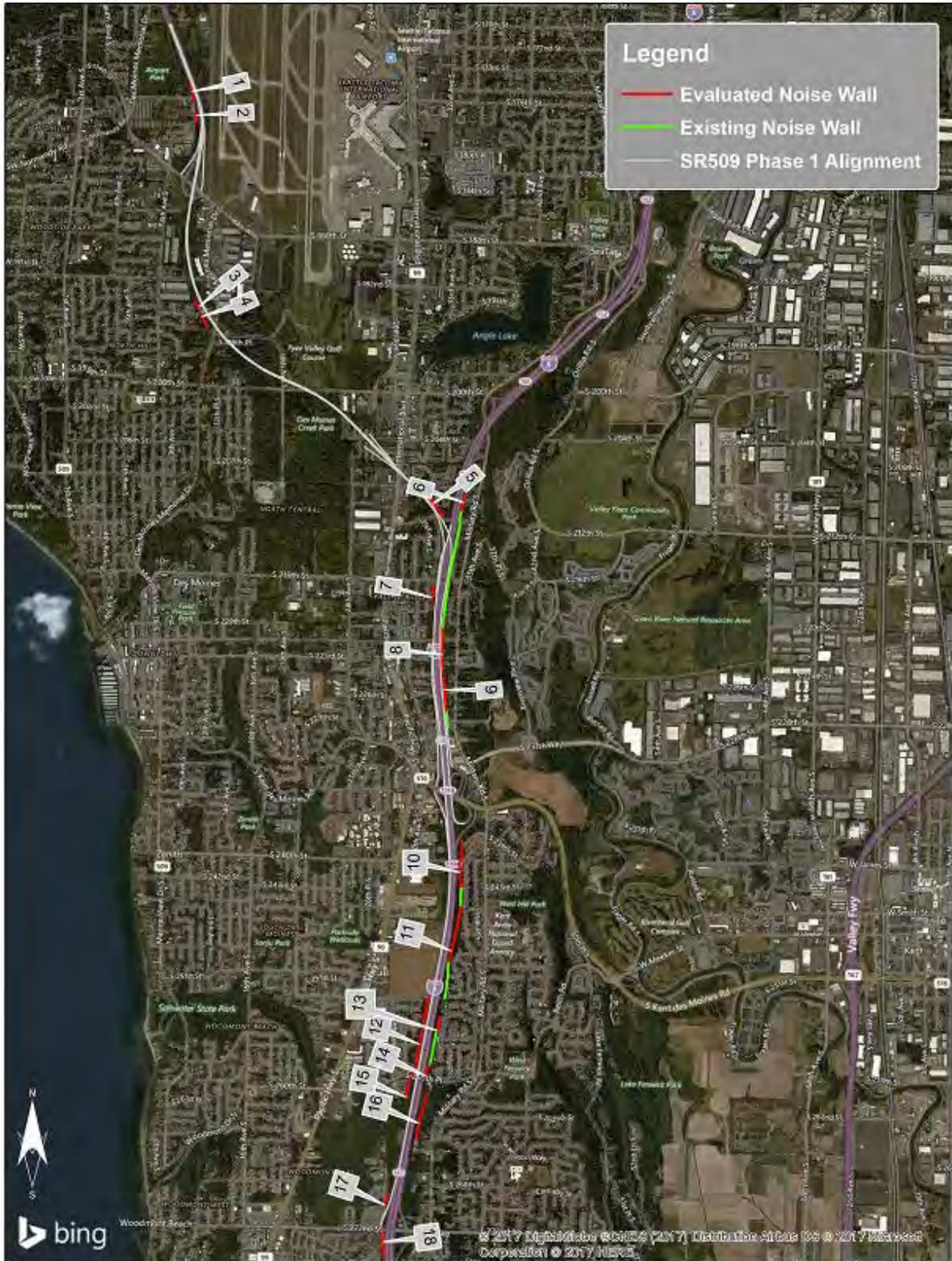
planned for Sound Transit's FWLE project (see Figure 7). The findings from this analysis are shown in Table 16.

Wall Analysis ID# (see Figure 7)	Feasible?	Reasonable?				Proposed Abatement ID#
	Yes/No	Design Goal?	Allowance	Cost	Yes/No	
1	Yes	No ^a	N/A			N/A
2	Yes	Yes	\$79,273	\$105,130	No	N/A
3	No	N/A				N/A
4	Yes	Yes	\$72,254	\$111,478	No	N/A
5	Yes	Yes	\$631,088	\$656,118	No	N/A
6	Yes	Yes	\$499,584	\$272,501	Yes	Noise Wall #1
7	No	N/A				N/A
8	Yes	Yes	\$89,801	\$334,020	No	N/A
9	Yes	Yes	\$110,858	\$177,538	No	N/A
10	Yes	Yes	\$606,930	\$540,305	Yes	Noise Wall #2
11	Yes	Yes	\$252,889	\$604,508	No	N/A
12	No	N/A				N/A
13	Yes	Yes	\$125,928	\$73,493	Yes	Noise Wall #3
14	No	N/A				N/A
15	No	N/A				N/A
16	No	N/A				N/A
17	No	N/A				N/A
18	No	N/A				N/A

^a WSDOT Noise Policy requires that a noise wall provided at least 7 dB of reduction at one receptor for the abatement to be considered reasonable, this was not obtained at this receptor.
N/A = Not Applicable

As a point of comparison, the updated analysis includes approximately 24,000 square feet of proposed noise abatement in the form of noise walls. The 2003 FEIS identified approximately 370,000 square feet.

Figure 7. Locations of Existing and Evaluated Noise Walls



Effects During Construction

Construction activity impacts would be similar to those described in the 2003 FEIS. Construction activities would include clearing and grubbing, excavation, wall construction, pile driving, demolition or resurfacing of existing roadways, bridge construction, paving, and striping. Sound levels predicted in the 2003 FEIS ranged from 69 to 106 dBA at 50 feet and 57 to 94 dBA at 200 feet. Mitigation measures in the 2003 FEIS included placing stationary noise sources away from noise-sensitive receivers, using portable noise barriers, placing limits on idling equipment, minimizing backing of vehicles, avoiding noisy activities to the extent feasible, installing engine exhaust mufflers, using ambient sensitive backup alarms, and limiting night work. Another construction noise control measure that may be considered for Phase 1 Improvements are ambient-sensing broadband backup alarms, which do not have the tonal component of typical backup alarms.

The number of nights work would occur is as of yet undetermined, but would likely be similar to those planned for Alternative C2, as described in 2003 FEIS. Any work done within the following hours would be subject to permitting by the local jurisdiction, either with a nighttime work permit or noise variance.

- King County – all receptor types
 - Weekdays (typical activities) – 7 p.m. to 7 a.m.
 - Weekdays (impact activities) – 5 p.m. to 8 a.m.
 - Weekends (typical activities) – 7 p.m. to 9 a.m.
 - Weekends (impact activities) – 5 p.m. to 9 a.m.
- City of Burien – residential receptors only
 - Weekdays – 10 p.m. to 7 a.m.
 - Weekends – 10 p.m. to 9 a.m.
- City of Federal Way – all receptor types
 - Weekdays – 8 p.m. to 7 a.m.
 - Weekends – 8 p.m. to 9 a.m.
- Cities of SeaTac and Kent – residential receptors only
 - 10 p.m. to 7 a.m. near residential receptors

Mitigation

Operational noise impacts will be reduced by providing noise barriers in some areas not currently protected by barriers, consistent with the appropriate noise impact and abatement criteria of FHWA and WSDOT. These noise wall locations were determined based on the analysis for the Phase 1 Improvements; and therefore, differ from those provided in the 2003 ROD. Proposed preliminary noise wall locations are summarized as follows:

- Noise Wall Area #1
 - Northern extension of existing WSDOT noise wall: east of I-5 and west of Military Road South
- Noise Wall Area #2
 - Northern extension of existing WSDOT noise wall: east of I-5 and west of 35th Avenue South
- Noise Wall Area #3
 - Northern extension of existing WSDOT noise wall: east of I-5 and west of 32nd Place South

Consistent with the 2003 ROD, WSDOT will be required to comply with all state and local regulations governing construction noise, including conditions and restrictions defined within local permits. Numerous techniques will be implemented to minimize the negative effects of construction noise.

Conclusion

The updated analysis identifies significantly fewer noise impacts than were originally estimated in the 2003 FEIS. Based on the information above, WSDOT does not anticipate any new significant impacts that were not evaluated in the 2003 FEIS. See also Attachment D for the Noise Technical Report.

4.4. Energy

Affected Environment

The affected environment as described in Section 3.3.2 of the 2003 FEIS remains applicable to the Phase 1 Improvements. The area continues to be served by I-5 and principal arterials SR 99, S 188th Street, S 192nd Street, and S 200th Street. Minor and collector arterials also provide east-west access across the study area.

Effects During Operation

The 2003 FEIS considered project length, design speed, terrain, traffic flow, and number of street signals to compare energy consumption between the No Build and action alternatives. Table 17 summarizes this comparison as provided in the 2003 FEIS, which concluded that Alternative C2 would use less energy than the No Build Alternative, primarily because of improved traffic flow.

Alternative	Length	Design Speed	Terrain	Traffic Flow	Street Signals
No Build	NA	28/35 mph	rolling	poor	4+
Alternative C2 (2003 FEIS)	9.9 miles	60 mph	rolling	good	0
Phase 1 Improvements	6.9 miles	60 mph	rolling	good	0

Source: SR 509: Corridor Completion/I-5/South Access Road, Final Environmental Impact Statement and Section 4(f) Evaluation (January 2003)

This Re-evaluation also estimated transportation energy as it relates to car and truck travel and overall VMT in the study area. As shown in Table 18, the traffic modeling results indicate that the Phase 1 Improvements would result in a 2 percent lower VMT than the No Build Alternative by 2045 and would therefore result in lower energy use in the study area.

Pollutant	2015 Existing	2025 No Build	2025 Project	2045 No Build	2045 Project	% Change from 2015 to 2025 No Build	% Change from No Build to 2025 Project	% Change from 2015 to 2045 No Build	% Change from 2045 No Build to 2045 Project
Daily VMT	8,388,569	9,770,869	9,725,661	10,939,599	10,756,165	16%	0%	30%	-2%

Sources: PSRC Travel Demand Model and EPA MOVES2014a.

In addition, the level of congestion on north-south arterial corridors within the study area, including SR

99 (International Boulevard) and Des Moines Memorial Drive, would decrease as trips currently made on surface streets divert onto SR 509. Overall mobility along these arterials would improve, thus resulting in better travel speeds and more efficient fuel consumption.

Effects During Construction

The temporary construction effects discussed in the 2003 FEIS remain applicable to the Phase 1 Improvements except that the improvements would result in less area of impact and be of shorter duration than Alternative C2. As discussed in Section 3.3.5 of the 2003 FEIS, construction activities would consume energy during the mining and production of construction materials and the transportation of materials and equipment to the site.

As noted in Section 3.3.5 of the 2003 FEIS, total construction cost is often used as a substitute value to compare energy consumption during the construction period. Phase 1 Improvements construction costs are estimated to be approximately \$747 million, which would be lower than the inflation-adjusted cost of Alternative C2 (\$1.5-\$1.9 billion). Therefore, the Phase 1 Improvements would result in the consumption of less energy when compared to energy consumption presented in the 2003 FEIS, and the energy impacts of the Phase 1 Improvements would generally be consistent with the type of impacts discussed in the 2003 FEIS.

Mitigation

The mitigation measures that were imposed under the 2003 ROD that remain relevant to the Phase 1 Improvements are listed below.

- Contractors will be encouraged to implement a variety of low-cost and simple mitigation measures to reduce construction-related energy consumption to the extent practicable.

The energy mitigation measures as described in Section 3.3-11 of the 2003 FEIS also remain applicable to the Phase 1 Improvements and could include the following:

- Encourage carpooling or vanpools among construction workers to minimize the number of vehicles used by workers to and from work and to reduce congestion at the start and end of construction shifts.
- Limit the idling of construction equipment to the extent practical.
- Plan for the delivery of equipment and supplies during non-peak traffic periods to minimize disruptions to both traffic and construction activities.
- Locate staging/laydown areas as close as possible to work sites to minimize travel distances.

Conclusion

Traffic modeling results indicate that the Phase 1 Improvements would result in lower VMT than the No Build by 2045 and therefore would result in lower energy use in the study area. No new significant impacts to energy from construction and operation would occur as a result of the Phase 1 Improvements that were not previously identified in the 2003 FEIS. See also Attachment E for the Energy Technical Memorandum.

4.5. Geology and Soils

Affected Environment

The geology and soils in the study area as discussed in the 2003 FEIS remain applicable to the Phase 1 Improvements. Surface soils mapped in the study area by the Soil Conservation Service (SCS) in 1973 are

shown in Figures 3.4-1 and 3.4-2 of 2003 FEIS. In summary, surface soils in the study area are mainly composed of Alderwood and Everett soils, which occur on glacial uplands and terraces and are the most common and abundant soils.

As discussed in the 2003 FEIS, portions of the study area are designated as landslide hazards, erosion hazards, and seismic hazards. These areas are defined in the current Critical Area Ordinances of King County and the City of Des Moines. The intent of these ordinances is to regulate areas that have been identified as sensitive to help prevent and avoid activities that could adversely affect property.

Erosion hazard areas generally include soils that are rated as having a severe to very severe potential for erosion. These soils are particularly susceptible to increased erosion as a result of development. Erosion hazard areas occur primarily along the creeks and Puget Sound shoreline.

Landslide hazard areas generally have slopes greater than 15 percent and are potentially unstable as a result of impermeable soils and/or groundwater seepage. Landslide hazard areas occur along portions of the Green River and Des Moines Creek valley walls.

Seismic hazard areas are subject to severe risk of earthquake damage from seismically induced ground shaking, liquefaction, and slope instabilities. Slope stability seismic hazards will generally occur wherever there are steep slopes. The Phase 1 Improvements would not cross any seismic hazards, which are in areas somewhat different than those identified in the 2003 FEIS. However, as indicated in the 2003 FEIS, areas where past landslides have occurred will be particularly vulnerable to future sliding during large seismic events. This is particularly relevant where the Phase 1 Improvements would cross Des Moines Creek.

Effects During Operation

The permanent changes in topography are similar for both Phase 1 Improvements and Alternative C2 because they follow the same alignment. However, the Phase 1 Improvements would require less earthwork and would not include construction of the South Access Road.

Effects During Construction

The potential for erosion and sedimentation impacts is similar for both Phase 1 Improvements and Alternative C2 because their alignments are the same. However, the Phase 1 Improvements would require less earthwork and would not include construction of the South Access Road. The 2003 FEIS indicated that Alternative C2 would create about 3.2 million cubic yards (cy) of cut material and require about 1.2 million cy of fill material, including the I-5 improvements. Current design estimates indicate that the Phase 1 Improvements would create about 1.8 million cy of cut material and 0.7 million cy of fill material, including the I-5 improvements.

Most construction activity would occur in areas of dense to very dense glacial outwash and glacial till soils. These materials generally provide adequate subgrade support for roadways, embankments, and retaining structures. Settlement or stability problems with standard cuts and fills (2 horizontal: 1 vertical or flatter) are not anticipated. Steepening slopes in areas of clean outwash, however, could increase the potential for soil erosion.

Mitigation

The mitigation measures that were imposed under the 2003 ROD that remain relevant to the Phase 1 Improvements are listed below. Advance measures to minimize harm during the design phase include:

- Conduct geotechnical investigations to prepare specific recommendations for liquefaction mitigation, subgrade preparation, roadway embankment, cut and fill, slope stability, foundation design, retaining structures, dewatering measures, and erosion control plans.
- Identify suitable waste sites for unsuitable excavated soils.

- Design structures to meet current seismic standards.
- Retaining walls or other slope protection where embankment fills need to be minimized.
- A detailed erosion and sedimentation control plan will be prepared as part of the construction contract specifications.
- Construction activities will require a permit under the stormwater rules of the National Pollutant Discharge Elimination System (NPDES).
- Conduct regular maintenance for any permanent detention and sedimentation ponds constructed as part of the project.

Conclusion

Overall, the Phase 1 Improvements would require less earthwork than indicated for Alternative C2 in the 2003 FEIS. No new significant impacts to geology and soils from construction and operation would occur as a result of the Phase 1 Improvements that were not previously identified in the 2003 FEIS. No new or revised mitigation measures would be required. See also Attachment E for the Geology and Soils Technical Memorandum.

4.6. Water Quality

Affected Environment

The water resources affected environment was described in Section 3.5.2 of the 2003 FEIS. Figure 3.5-1 from the 2003 FEIS shows the basin boundaries and water features in the study area.

Basin Boundaries and Water Resources

Consistent with the 2003 FEIS, the Phase 1 Improvements would potentially affect the quality of water resources in the following four basins:

- Miller Creek basin
- Des Moines Creek basin
- Lower Green River basin
- Lower Puget Sound basin

The basins and water resources setting discussed in the 2003 FEIS remain applicable to the Phase 1 Improvements, except that the Mill Creek basin would not be affected because there would be no new impervious surface added to I-5 south of S 272nd Street. These basins are shown on Figure 3.5-1 and described on pages 3.5-4 through 3.5-6 of the 2003 FEIS.

Groundwater

The groundwater setting discussed in the 2003 FEIS remains applicable to the Phase 1 Improvements, and groundwater continues to provide an important municipal water supply in the study area. Since the 2003 FEIS, King County has constructed a groundwater pump to augment low base flows during the dry season in Des Moines Creek.

The Phase 1 Improvements would be in the immediate vicinity of Highline Water District's Well #1, Well 2M, Tyee Well, and Well #2 in addition to two private wells. Angle Lake well, Des Moines well, and the Washington Natural Gas well are at least 400 feet from the project footprint. Figure 3.5-3 in the 2003 FEIS shows the location of these wells relative to Alternative C2. These wells are described on pages 3.5-6 and 3.5-7 of the 2003 FEIS.

Although not addressed in the 2003 FEIS, the Phase 1 Improvements would be located within the wellhead protection areas of Well 4, Des Moines Well, and Angle Lake well. Wellhead protection zones have been designated around a number of municipal drinking water supply wells.

Surface Water

Consistent with the 2003 FEIS, the Phase 1 Improvements would potentially affect the quality of the following surface waters:

- Des Moines Creek
- Lower Green River
- McSorley Creek

The setting for Des Moines Creek discussed in the 2003 FEIS remains applicable to the Phase 1 Improvements, with the following exceptions: King County has completed a series of Des Moines Creek habitat restoration projects and the Port of Seattle has begun tree-removal as part of its “Flight Corridor Safety Program,” which are described below:

- Des Moines Creek Habitat Restoration Projects – In 2007 and 2008, King County constructed two phases of the Des Moines Creek Habitat Restoration Project, which included placement of large woody debris in Des Moines Creek between Midway Sewer Treatment Plant and the upstream end of the Marine View Drive bridge. Invasive plants were also removed and native vegetation planted along the stream buffer. A third phase, which has not been completed yet, will install logs and native plants in Des Moines Creek between S 200th Street and Midway Sewer Treatment Plant.
- Flight Corridor Safety Program – The Port of Seattle’s tree removal program, which is mandated by the Federal Aviation Administration (FAA), will result in the removal of trees over a set height within the airport’s landing and takeoff zones. The Port plans to replace the removed trees with native, low-height species such as shore pine, Oregon ash, and red alder (Port of Seattle 2017).

The setting for the Lower Green River and McSorley Creek as discussed in the 2003 FEIS remains applicable to the Phase 1 Improvements.

Clean Water Act Section 303(d) Waters

The 2003 FEIS reported that according to Ecology’s Section 303(d) list (1998), Des Moines Creek, Mill Creek, and some reaches of the Green River do not meet Washington State water quality standards for selected parameters. Des Moines Creek was listed as a 303(d) water because of high fecal coliform bacteria concentrations. Temperature and dissolved oxygen in the creek were also measured above the standards during one monitoring event. Green River was listed as a 303(d) water because of exceedances for mercury, fecal coliforms, chromium, and temperature.

The Clean Water Act Section 303(d) water listings reported in the 2003 FEIS have since been updated. The 303(d) list consists of waters in the polluted water category, for which beneficial uses— such as drinking, recreation, aquatic habitat, and industrial use – are impaired by pollution. Table 19 summarizes the State of Washington’s current 303(d) listings for surface waters in the study area.

	Dissolved Oxygen	Bacteria	Copper	Temperature
Des Moines Creek	✓	✓	✓	✓
Lower Green River	✓	-	-	-
McSorley Creek	✓	✓	✓	-

Effects During Operation

The surface water impacts discussed in the 2003 FEIS remain applicable to the Phase 1 Improvements, except that the Phase 1 Improvements would create substantially less impervious surface area than Alternative C2. The Phase 1 Improvements would create 50 acres of new impervious surface area as compared to the 113 acres of new impervious surface area with Alternative C2 (Table 20).

Roadway	Alternative C2 (acres)	Phase 1 Improvements (acres)
SR 509	76	28
South Access Road		0
I-5	37	22
Total	113	50

As described in Section 3.5.3 of the 2003 FEIS, new impervious highway surfaces would reduce soil infiltration capacity and increase surface water runoff rates and volumes. The water quality analysis performed for this Re-evaluation used a similar method to the 2003 FEIS analysis to calculate pollutant loads. The method required multiplying the acres of new roadway surfaces by the corresponding annual pollutant load values for treated runoff shown in Table 21.

Pollutant	Mean Load from Untreated Runoff	Mean Load from Treated Runoff
Total suspended solids	769	88
Total copper	0.16	0.04
Dissolved copper	0.04	0.03
Total zinc	0.98	0.21
Dissolved zinc	0.31	0.14

Pollutant loads from new roadway surfaces were estimated using the quantitative procedures for surface water impacts assessments recommended in the current WSDOT Environmental Manual (WSDOT, 2016).

The estimated annual pollutant loads from the new impervious surface areas are shown in Table 22. The results indicate that the pollutant loads estimated for the Phase 1 Improvements would be significantly less than those estimated for Alternative C2.

SR 509	New Impervious Surface Area (acres)		Total Suspended Solids ^a	Total Copper ^a	Dissolved Copper ^a	Total Zinc ^a	Dissolved Zinc ^a
Phase 1 Improvements	50.43	Treated	5,196	2.02	1.51	10.59	7.06
Alternative C2	113	Treated	9,944	4.52	3.39	24	16

^a The pollutant loads were calculated by multiplying the acres of new impervious surface area by the corresponding annual pollutant load values shown in Table 21 (pounds per year × acre). The greater the area of impervious surfaces the greater the pollutant loads.

Stormwater Treatment

As assumed in the 2003 FEIS for Alternative C2, the runoff from the new and replaced roadway surfaces created by the Phase 1 Improvements would be detained and treated. The 2003 FEIS proposed infiltration for the SR 509 extension where subsoil and groundwater conditions would allow. In the I-5 corridor, the FEIS proposed detention and then release into stormwater treatment wetlands and

infiltration. The stormwater treatment facilities for the Phase 1 Improvements, differ from those assumed in the 2003 FEIS because treatment facilities are designed using the WSDOT's current *Highway Runoff Manual* (HRM) (2016) and the amount of impervious surface areas created would be less than Alternative C2. Table 23 lists the combinations of flow control and water quality treatment facilities for the Phase 1 Improvement.

In addition to providing stormwater treatment as required by the HRM, WSDOT has helped finance the capital improvement projects (CIPs) that were included in the Des Moines Creek Basin Plan. The stormwater facility design for the Phase 1 Improvements within Des Moines Creek basin would also complement the three CIPs that have been constructed since the 2003 FEIS: (1) the Northwest Ponds, which have been expanded as a regional detention facility; (2) a high-flow bypass pipe, and (3) the culvert under Marine View Drive, which was replaced with a bridge.

Groundwater

The groundwater impacts discussed in the 2003 FEIS remain applicable to the Phase 1 Improvements. Groundwater recharge from the ground surface would be reduced in areas where impervious pavement and fill would be placed and compacted

The Phase 1 Improvements would cross a designated wellhead protection zone: Tye Well. This well is within the SeaTac city limits and is operated by the Highline Water District, which can impose special requirements on projects in the wellhead protection zone. WSDOT would also consult with the Highline Water District during final design regarding proposed stormwater management measures within recharge zones to protect groundwater quality. No adverse impacts on groundwater are expected.

Table 23. Phase 1 Improvements New Impervious Surface Area by Drainage Basin						
TDA	Receiving Basin	Existing (acres)	Replaced (acres)	New (acres)	Flow Control	Water Quality
A	Miller Creek	5.88	0.00	1.20	Maintain the existing hydrology for wetland 43 (headwaters for Walker Creek) by matching pre-project and post-project stormwater discharge to the wetland.	MFD
B1	Des Moines Creek	2.56	0.00	2.91	Detention pond	CABS
B2	Des Moines Creek	0.38	0.16	5.91	Detention pond	CABS
C1	Des Moines Creek	0.09	0.00	1.62	Detention pond	CABS
C2	Des Moines Creek	0.13	0.00	2.78	Detention Pond	CABS
D ¹	Des Moines Creek	0.04	0.14	1.66	Detention pond for TDAs D, E, F, and G-S	CABS
E	Des Moines Creek	0.32	0.04	4.31		
F	Des Moines Creek	1.87	0.38	6.01		
G-S	Des Moines Creek	3.52	0.54	3.03		
G-N	Des Moines Creek	8.90	0.00	0.70	Existing Executel Pond	CABS
F-SeaTac	Des Moines Creek	2.02	0.00	1.46	Existing Executel Pond	CABS
H	Green River	7.90	0.48	4.43	Detention pond	CABS
I	Midway Creek/Green River	29.63	0.65	11.75	Enlarge existing natural detention pond and construct new detention pond	MFD and CABS
J	SPU Regional Detention Pond/McSorley Creek	12.88	0.89	1.00	Detention pond	MFD
K	McSorley Creek/Puget Sound	18.36	1.06	1.51	Existing detention pond and new detention pond	MFD
L	McSorley Creek/Puget Sound	7.68	0.01	0.01	The improvements in this TDA will not meet the size requirements for flow control or runoff treatment (the project will add 0.01 acre of new impervious surfaces in this basin).	
MC	Massey Creek/Puget Sound	1.58	0.00	0.10	The study area encompassing SR 516 west of 30th Ave S drains to the west and is within the Massey Creek Basin. The improvements in this TDA do not trigger flow control or runoff treatment requirements.	
VD	Green River	0.88	0.00	0.00	The study area encompassing Veterans Drive east of Military Road drains to the east and is within the Green River Basin. The improvements in this TDA do not trigger flow control or runoff treatment requirements.	
<p>¹In TDA D, SR 509 will be a new road. The SR 509 crossing over S 200th Street will be a bridge structure. A new bridge surface that will span over an existing road is considered replaced surface. Existing surfaces in this TDA is a gravel road within the old golf course. It has to be noted that the SR 509 drainage will be separated from the S 200th Street drainage.</p> <p>CABS = compost-amended biofiltration swales; MFD = media filter drains; PUD = public utility district; SPU =Seattle Public Utilities; TDA = threshold discharge areas</p>						

Accidental Spills

Impacts related to possible accidental spills discussed in the 2003 FEIS remain applicable to the Phase 1 Improvements. As discussed in the 2003 FEIS, the risk of spills is inherent in all transportation facilities, but can be minimized by designing these facilities to meet safety standards that reduce the risk of accidents. Similar to Alternative C2, the Phase 1 improvements would generally be expected to reduce the potential for hazardous material spills through improved traffic flow and increased safety.

Phase 1 Improvements would not include the South Access Road and therefore would not affect the storage volume of the Tye wetland/stormwater pond. As discussed in the 2003 FEIS, the Tye wetland/stormwater pond was designed to control stormwater flow and allow temporary shutdown of flow to Des Moines Creek in the event of a pollutant spill farther upstream. Alternative C2 would have spanned the pond with a bridge.

Vegetation Management

Vegetation management as discussed in the 2003 FEIS remains applicable to the Phase 1 Improvements. Vegetation would be managed in accordance with the description provided in the 2003 FEIS.

Effects During Construction

The temporary construction effects discussed in the 2003 FEIS remain applicable to the Phase 1 Improvements, except that the area of disturbance would be smaller and the duration would be shorter than Alternative C2. As discussed in Section 3.5.5 of the 2003 FEIS, construction activities could introduce a variety of pollutants into surface waters, including sediment, fuel and lubricants, paving oils, chemicals, construction debris, and uncured concrete. Nutrients from seed mixtures applied for stabilizing soils and creating final landscaping also have the potential to reach adjacent water resources.

Potential construction impacts on groundwater quality would include a range of pollutants used or generated during construction, such as petroleum products and construction waste. Pollution could result from accidental release of these substances, leaking storage containers, or construction equipment maintenance. The potential for these types of impacts, however, would be low because of the short construction period and the use of best management practices (BMPs). As discussed in the 2003 FEIS, WSDOT would coordinate with the Highline Water District and private well owners prior to construction to ensure that there would be no contamination of the existing water supply.

Mitigation

The mitigation measures that were imposed under the 2003 ROD that remain relevant to the Phase 1 Improvements are listed below. Those measures that have been revised since the time of the ROD are shown in italics.

- *Design stormwater treatment in accordance with the current HRM. Note that the stormwater treatment facilities for the Phase 1 Improvements differ from those assumed in the 2003 FEIS because the overall footprint and the amount of new impervious surface area created by the Phase 1 Improvements would be smaller than with Alternative C2. Phase 1 Improvements would construct combinations of flow control and water quality treatment facilities designed according to the current HRM (Table 23).*
- Manage stormwater from the roadways separately from upstream surface water intercepted by the highway to the extent practicable.
- Maintain stormwater management facilities for the proposed project,
- Infiltrate stormwater runoff for the SR-509 freeway extension where subsoil and groundwater conditions allow.
- In the I-5 corridor, detain and release stormwater runoff into stormwater treatment wetlands where practicable, where it will be infiltrated into the soil and cleansed by wetland plants.

- Construct infiltration facilities only at the locations where groundwater is not immediately under the surface, so infiltration from the bottom of the infiltration facilities will not be impeded by high groundwater. Infiltration facilities will not be located in the vicinity of public wells.
- Where infiltration is not feasible, detain and treat stormwater runoff, applying enhanced treatment where practicable.
- Comply with the Des Moines Creek Basin Plan, thereby reducing high flows and stream bank erosion, thus slowing degradation of wetlands and fish and wildlife habitat in the basin.
- Plant trees and shrubs around detention ponds and along stream banks adjacent to the proposed alignment to provide shade and help lower stream temperatures.
- Comply with FAA design standards requiring restrictions on the use of open water impoundments such as wet ponds and biofiltration swales because of their potential for attracting wildlife that could interfere with airport operations.
- Operation mitigation measures will include:
 - Implement design specifications from WSDOT's Municipal NPDES permit for stormwater runoff.
 - Implementation of an accidental spill response plan.
 - Equip flow-control structures at stormwater detention facility outlets with baffles and a spill-control separator to retain buoyant materials (lighter than water) such as petroleum products to help control the spread of accidental spills during highway operation.
 - Limit use of de-icing materials and herbicides for vegetation management within the highway right-of-way. Apply herbicide sprays to control vegetation only in dry weather under zero or mild wind conditions.
 - Spraying will be done by a licensed sprayer. Precautions will be taken when spraying near sensitive water resources.
 - Maintain records to keep track of the date, location, type, and amount of herbicides applied.
 - Follow additional applicable guidelines for vegetation management, as outlined in WSDOT's Roadside Policy Manual M 3110.03 (2015).
 - Bare or thinly vegetated ground surface areas within the right-of-way will be minimized, particularly on slopes.
 - Where practicable, grass vegetation will be used between the edge of pavement and roadside ditches, and in earth-lined ditches, to reduce erosion and encourage biofiltration of stormwater where possible.
- Construction mitigation measures will include:
 - Develop a Stormwater Pollution Prevention Plan (SWPPP) per the requirements of the NPDES permit.
 - Implement effective BMPs to maintain water quality standards at construction sites. This includes minimizing exposed soil surfaces and controlling erosion and sedimentation, to prevent or reduce potential impacts on surface water and groundwater quality.
 - Construction activities will be phased to minimize the amount of earth exposed at any one time to erosive forces.
 - Construction entrances, exits, and parking areas will be designed to reduce tracking of sediment onto public roads.

- Vegetative erosion-control practices will be used (seeding, mulching, soil conditioning with polymers, flocculants, sod stabilization, vegetative buffer strips, and protection of trees with construction fences).
- Implement sediment-control practices (straw bales, silt fences, check dams, sediment traps, sedimentation basins, and flocculation methods).
- Control erosion of stockpiled materials (e.g., diverting upslope water around stockpiles, covering stockpiles, and placing silt fences around stockpiles).
- Preserve the permeability of pervious areas within the project construction site to the greatest extent practical
- Perform routine monitoring and maintenance of erosion and sediment control BMPs.
- A Spill Prevention Control and Countermeasures (SPCC) plan will be adopted as a construction planning element of the project, to reduce accident-related water quality impacts.

Conclusion

Overall, the Phase 1 Improvements would result in less impervious surface area than Alternative C2. No new significant impacts to water resources would occur as a result of the Phase 1 Improvements that were not previously identified in the 2003 FEIS. No new or revised mitigation measures would be required. See also Attachment F for the Water Quality Technical Memorandum.

4.7. Wetlands

Affected Environment

The wetland boundaries from the 2003 FEIS are shown on Figure 8 and characterized in Table 24. These wetlands are described in detail on pages 3.6-2 through 3.6-20 of the 2003 FEIS. The wetlands discussion in the 2003 FEIS remains applicable to the Phase 1 Improvement. However, it should be noted that the cities of Sea Tac and Des Moines have since updated their Critical Areas Ordinances with wider buffer widths. The larger buffer widths have been assumed as part of the Re-evaluation. No new delineations were conducted; however, the continued existence of these wetlands was confirmed using comparative aerial photo interpretation and field verification. Wetlands 21 and 22 were determined to no longer exist because they have been filled by development, and Wetlands K and L were determined to no longer exist because a stormwater detention facility is located where they were originally identified. The wetlands as delineated for the 2003 FEIS will be re-verified using the current standards as determined by the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)*.

Name	Size (acres)	USFWS Classification	Ecology Rating^b	Wetland Rating^c
Wetland A	16.0	PFO, PSS	2	1
Wetland B	6.6	PFO, PSS, PEM	2	1
Wetland D	4.9	PFO, PSS, PEM	2	2
Wetland F	28.8	PFO, PSS, PEM, POW	2	1
Wetland G	7.9	PSS, PEM	2	2
Wetland K ^a	0.09	PEM	3	3
Wetland L ^a	0.2	PEM	3	3
Wetland M	0.1	PSS	3	3
Wetland N	0.1	PSS	3	3
Wetland 15	0.2	PFO	3	3
Wetland 16	0.04	PFO	3	3
Wetland 17	0.06	PFO	3	3
Wetland 21	0.02	PEM	3	IW
Wetland 22	0.01	Ditch	4	IW
Wetland 23	0.01	PEM	4	3
Wetland I-7	0.06	PEM	3	3
Wetland I-10	0.05	PEM, PSS	3	3
Wetland I-11	0.2	PFO, PSS	3	3
Wetland I-12	0.3	PEM, PSS	3	3
Wetland I-13	0.2	PFO	3	3
Wetland I-19	78.5	PFO	1	1

^a Wetlands K and L, which were located on private property, are no longer present.

^b Wetlands were rated using the Washington Department of Ecology's rating system for Western Washington (1993)

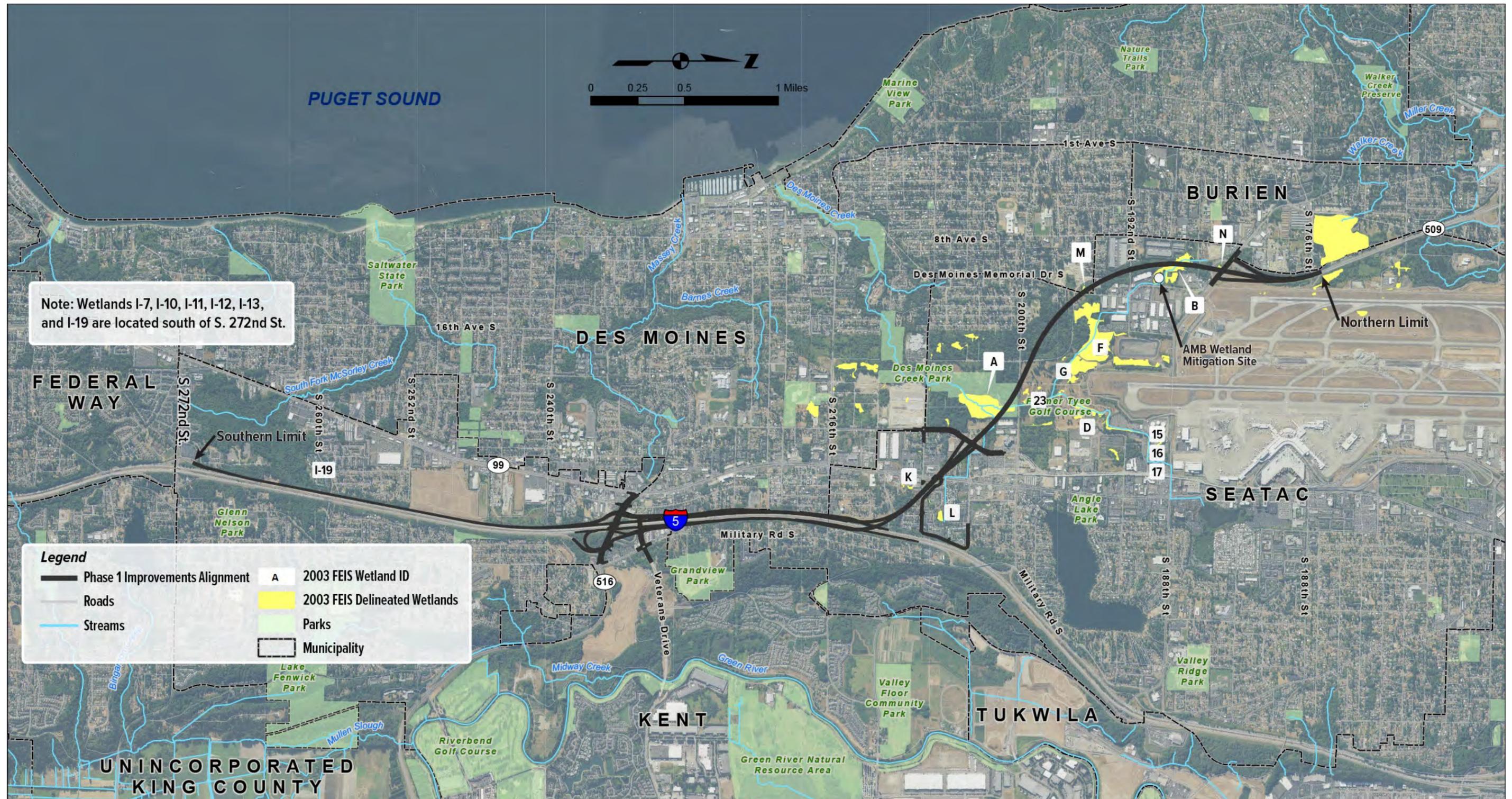
^c Wetlands were rated using the City of SeaTac Environmentally Sensitive Areas Ordinance (1994), and the City of Des Moines Environmentally Sensitive Areas Ordinance (1997)

PEM = palustrine emergent; PFO = palustrine forested; PSS = palustrine scrub-shrub; USFWS = U.S. Fish and Wildlife Service
IW = Important Wetland per City of Des Moines Environmentally Sensitive Areas Ordinance (1997)

Effects During Operation

The 2003 FEIS calculated direct effects on wetlands in the study area and their buffer areas. Direct effects, which are summarized in Table 25, were considered the permanent fill or dredge from cut-and-fill slopes and did not assume any additional offsets. The direct effects calculated for this Re-evaluation assumed an additional 5-foot offset from any cut slope or retaining wall and a 20-foot offset from any fill slope. As noted previously, the cities of Sea Tac and Des Moines have since updated their Critical Areas Ordinances with wider buffer widths. The larger buffer widths have been assumed as part of the Re-evaluation; however, no new delineations have occurred. The anticipated permanent impacts from the Phase 1 Improvements are shown in Table 25 and would total approximately 0.3 acre of wetland and 6.10 acre of wetland buffer. The main difference between the Phase 1 Improvements and Alternative C2 would be in the amount of wetland buffer impacts. Even with the larger buffer widths, the buffer impacts with the Phase 1 Improvements would be below the 7.1 acres described in the 2003 FEIS because the project footprint is smaller, with a narrower SR 509 extension, no South Access Road, and less extensive improvements on I-5.

Figure 8 Wetlands as Identified in the 2003 FEIS



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2003 FEIS		Alternative C2 Direct Impacts			Phase 1 Improvements Direct Impacts		
Name	Size (acres)	Wetland	Wetland Buffer	Buffer Width	Wetland	Wetland Buffer	Assumed Buffer Width
Wetland A	16.0	0.10	0.90	100	0.09	1.55	165-foot
Wetland B	6.6	0.01	1.8	100	0.01	1.78	165-foot
Wetland D	4.9	0	1.7	100	0	0	N/A
Wetland F	28.8	0	0.01	100	0	0.59	165-foot
Wetland G	7.9	0	0.20	100	0	0	N/A
Wetland K ^a	0.09	0	0	25	0	0	N/A
Wetland L ^a	0.2	0	0	25	0	0	N/A
Wetland M	0.1	0.06	0.50	50	0.1	1.54	165-foot
Wetland N	0.1	0.1	0.60	50	0.1	0.64	165-foot
Wetland 15	0.2	0	0.05	50	0	0	N/A
Wetland 16	0.04	0.04	0.40	50	0	0	N/A
Wetland 17	0.06	0	0.05	50	0	0	N/A
Wetland 23	0.01	0.01	0.10	25	0	0	N/A
Wetland I-7	0.06	0	0.05	50	0	0	N/A
Wetland I-10	0.05	0	0.03	50	0	0	N/A
Wetland I-11	0.2	0	0.04	50	0	0	N/A
Wetland I-12	0.3	0	0.10	50	0	0	N/A
Wetland I-13	0.2	0	0.03	50	0	0	N/A
Wetland I-19	78.5	0	0.60	200	0	0	N/A
Totals		0.32	7.16		0.3	6.10	

^a Wetlands K and L, which were located on private property, are no longer present.

Note: The buffers calculated for the Phase 1 Improvements assume a width of 165 feet based on the SeaTac Critical Areas Ordinance. These estimates are conservative and could be reduced after ratings are completed.

As described in the 2003 FEIS, there would be bridges over wetlands A and B. The height of these bridges with the Phase 1 Improvements would be the same as described for Alternative C2 and would help to ensure the preservation of wetland function and health beneath the structures. The impacts to wetlands A and B described in the 2003 FEIS remain applicable to the Phase 1 Improvements, except that the bridge over wetland A and the bridge over wetland B would be narrower and constructed on one structure.

Effects During Construction

The Phase 1 Improvements would result in similar temporary construction effects as those described in the 2003 FEIS. As described, the potential temporary impacts would result from clearing, grading, excavation, and filling. Without proper controls, these activities could expose erodible soils, increasing the potential for erosion and sediment transport to wetlands.

Mitigation

The mitigation measures that were imposed under the 2003 ROD that remain relevant to the Phase 1 Improvements are listed below.

- Plant shade-tolerant native species where appropriate to mitigate for bridge shading impacts and to ensure further preservation of wetland function and health.
- Adhere to guidance from FAA regarding wildlife attractions at or near airports. The FAA discourages the placement of wetland mitigation projects that could attract certain wildlife in areas where air traffic is present. Ongoing coordination with the FAA will continue to ensure that any proposed mitigation within the restricted zones meets appropriate criteria.
- Adhere to BMPs and local environmental protection policies to ensure that stormwater runoff is collected and treated, and that discharge to existing water bodies is controlled. A Stormwater Pollution Prevention Plan and TESC Plan will be prepared and implemented to avoid or minimize construction impacts on wetlands and streams. No storage or disposal of sediments or chemicals will occur within wetlands or wetland buffers.
- Settling ponds, containment berms, silt fences, sediment traps, seeding of exposed slopes, and other measures will be implemented as appropriate.
- Temporary construction impacts, such as construction access, staging areas, and scaffolding, will be designed to minimize impacts on wetlands where structures will be built. Areas with short-term construction impacts will be restored by replanting with native trees and shrubs upon completion of construction activities

The following information is new since the time of the ROD. The cities of SeaTac and Des Moines have updated their Critical Area Ordinances, and all buffer widths for wetlands in the study area have increased since the original wetland analysis in 2003. The buffers calculated for the Phase 1 Improvements assume a 165-foot width based on the SeaTac Critical Areas Ordinance. These estimates are conservative, and could be reduced after new fieldwork and ratings are completed. As the Phase 1 Improvements move to permit acquisition, a full verification will be required and include delineation using the current standards as determined by the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)*.

Since 2003, WSDOT has constructed a mitigation site in the upper Des Moines Creek watershed in the form of wetland re-establishment, wetland enhancement, and wetland buffer establishment. The 509 AMB Property mitigation site is located just south of the Sea-Tac Airport (see Figure 8). It was constructed in 2004 to contain 2.31 acre of wetland re-establishment, 0.31 acre of wetland enhancement, 0.76 acres of wetland preservation, and 0.28 acres of high-quality buffer. This mitigation accommodates all wetland impacts associated with the Phase 1 Improvements; however, additional mitigation to compensate for buffer impacts in accordance with local Critical Areas Ordinances may be needed. Additional buffer mitigation would be negotiated with local jurisdictions at the time of permitting.

Conclusion

The Phase 1 Improvements would result in fewer wetland impacts than those identified in the 2003 FEIS. There may be nominal changes in buffer impacts that would require additional mitigation in accordance with the current local Critical Areas Ordinances, but these changes would not rise to the level of significance. No new significant impacts to wetlands would occur as a result of the Phase 1 Improvements that were not previously identified in the 2003 FEIS. See also Attachment G for the Wetlands Technical Memorandum.

4.8. Vegetation, Wildlife, Fish, and Threatened and Endangered Species

Affected Environment

The vegetation, wildlife, fish, and threatened and endangered species discussion in the 2003 FEIS remains applicable to the Phase 1 Improvements. Vegetation communities in the study area have changed little and continue to include mowed and un-mowed grassland; shrubland; mixed deciduous/coniferous forest; commercial and residential areas containing a fragmented mixture of native, non-native, and ornamental plants; and wetlands. Residential and commercial growth in the study area has continued since 2003, likely resulting in an increase of disturbed habitat. The majority of vegetation communities remain fragmented due to the developed nature of the area.

Mowed grass lands are concentrated in the area of the former Tye Valley Golf Course and adjacent to I-5. The location and general size of fragmented, mixed deciduous/coniferous forests are similar to the conditions in 2003, with this habitat concentrated south of S 192nd Street and in Des Moines Creek Park. There are no old growth forested stands in the study area. The majority of commercial and residential habitats are located south of the former Tye Valley Golf Course site and west of the I-5 section of project corridor. Species assemblages are still the same in the habitats, with a mix of native, non-native, and ornamental species.

Habitat quality is still highest in the forested riparian and wetland areas. Commercial and residential areas continue to support low-quality habitat. The mixed deciduous/coniferous forest in the northern portion of the study area continues to provide valuable nesting habitat for native species. Riparian and wetland areas have a diverse mix of mammal, avian, reptile, and amphibian species, including waterfowl. The developed areas of the study area are still dominated by native and non-native species adapted to disturbance.

Riparian habitat continues to be limited to Des Moines Creek. S 200th Street divides high-quality shrub and forested riparian habitat in Des Moines Creek Park to the south from dispersed, low-quality riparian habitat to the north in the former Tye Valley Golf Course site. Wetlands continue to be distributed throughout the study area. Des Moines Creek also continues to be the only fish-bearing stream in the study area. The riparian habitat, where present, does not meet any criteria for properly functioning habitat and therefore is a limiting factor to natural salmonid production (Washington State Conservation Commission, 2000). Hydrology, lack of large woody debris, and poor water quality are other salmonid-limiting factors. Fish passage barriers are less of a salmonid-limiting factor than when the 2003 FEIS was published because the major blockage at Marine View Drive has been replaced with a bridge.

Several activities have occurred in Des Moines Creek since the 2003 FEIS to improve habitat use as well as the habitat. The Des Moines Creek culvert under Marine View Drive was replaced in the spring of 2007 to allow for anadromous fish passage up Des Moines Creek (O'Rollins, personal communication, 2017). The channel by the new bridge was modified in 2008 to further improve fish passage. This opened up potential spawning habitat south of S 200th Street, where there is higher-quality riparian habitat in the Des Moines Creek Park area.

King County has also been improving aquatic habitat in Des Moines Creek by completing a series of habitat restoration projects starting in 2007 (O'Rollins, personal communication, 2017). Habitat enhancements included placing logs, boulders, and other stream enhancement elements; removing invasive plants; and installing native vegetation within the stream buffer between Marine View Drive Bridge and the Midway Sewer Treatment Plant. Habitat improvements were then completed in the reach below Marine View Drive in 2009 and 2010. In 2010 during Phase III of the habitat restoration projects, the County completed some adaptive management work, invasive species removal, and planting of native plants in the Des Moines Creek buffer between S 200th Street and Midway Sewer

Treatment Plant to enhance fish habitat in that reach. Limited channel improvements also were completed above S 200th Street.

Habitat improvements and reconnecting the study area to Puget Sound has mitigated stream erosion and scouring of spawning gravels. Coho salmon are now using Des Moines Creek up to and above S 200th Street (O'Rollins, personal communication, 2017). The coho salmon have been reported spawning as far upstream as S 200th Street (Fisher, personal communication, 2017).

Federal Threatened and Endangered Species

A new evaluation was conducted of potential impacts of the project on the updated list of species under USFWS and NMFS jurisdiction that may occur in the action area (Table 26). The analysis found that there will be no in-stream work nor will there be direct discharge of stormwater into any streams as part of the Phase 1 Improvements. Stormwater will be treated with enhanced treatment and discharged into wetland systems and/or combined systems. There is no documented use of streams in the action area by Puget Sound Chinook salmon, Puget Sound steelhead or bull trout and there is no documented presence of ESA-listed terrestrial species. Therefore, the analysis concluded that the project will have No Effect on ESA-listed species.

Species/Habitat	Federal Status (2003 FEIS)	Federal Status (2017 Phase 1 Improvements)
Oregon Spotted Frog	N/A	Threatened
Oregon Spotted Frog critical habitat	N/A	Designated; no critical habitat present in study area
Yellow-billed Cuckoo	N/A	Threatened
Yellow-billed Cuckoo critical habitat	N/A	Proposed; no critical habitat present in study area
Marbled Murrelet	Threatened	Threatened
Marbled Murrelet critical habitat	N/A	Designated; no critical habitat present in study area
Bull Trout	Threatened	Threatened
Bull Trout critical habitat	N/A	Designated; no critical habitat present in study area
Chinook salmon	Threatened	Threatened
Puget Sound Chinook salmon critical habitat	N/A	Designated; no critical habitat present in study area
Steelhead	N/A	Threatened
Puget Sound steelhead critical habitat	N/A	Designated; no critical habitat present in study area
Bald Eagle ^a	Threatened	Removed from ESA listing
Coho Salmon ^a	Critical habitat candidate	Not listed

^a Not evaluated under ESA, but addressed in this Re-evaluation.
 NMFS = National Marine Fisheries Service; USFWS = U.S. Fish and Wildlife Service

Washington Sensitive Species or Priority Habitat

The Washington Department of Fish and Wildlife (WDFW) Priority Habitat and Species data system identifies the reach of Des Moines Creek from Puget Sound to S 200th Street as providing a priority anadromous fish presence/migration and priority resident fish presence/migration. This is a change from conditions presented in the 2003 FEIS, when only the first mile of stream was designated for

anadromous fish. The increased length of priority habitat is due to the replacement of the Marine View Drive culvert. Removal of that fish passage barrier has resulted in coho salmon being reported as far upstream as S 200th Street. As identified in the 2003 FEIS, other priority habitats in the project's vicinity include aquatic areas (wetlands) at the northern end of the study area and a biodiversity area/corridor (Des Moines Creek Park). The coho salmon and resident coastal cutthroat trout in Des Moines Creek are priority species.

Following the bald eagle delisting, the state removed it from the state's protected species list (formerly classified as threatened) and from the priority species for management list.

Effects During Operation

As described in the 2003 FEIS for Alternative C2, the Phase 1 Improvements would result in the removal of vegetation and subsequent loss of wildlife habitat. Impacts to higher-quality habitat such as forests and wetlands would be of greater consequence than impacts to commercial and residential areas. Habitats to be cleared would include mowed and un-mowed grass, shrubland, mixed coniferous/deciduous forest, wetlands, and fragmented urban/commercial areas consisting of native, non-native, and ornamental plants. These effects would be the same with Phase 1 Improvements.

The amount of vegetation removal for the 2003 FEIS was calculated based on the edge of the project cut-and-fill slopes and did not assume any additional offsets. The vegetation removal calculated for this Re-evaluation assumed an additional 5-foot offset from any cut slope or retaining wall and a 20-foot offset from any fill slope. Because the analysis is based on a worst-case scenario, actual clearing or disturbance for the Phase 1 Improvements would likely be less than the total area shown on Table 27.

Vegetation/ Land Use Type	Phase 1 Improvements (Acres)	Alternative C2 (Acres)	Change in Area (Acres)
Grassland	32	30.9	+1.1
Shrubland	15	28.1	-13.1
Upland Mixed Forest	47	48.2	-1.2
Wetlands	0.3	0.32	-0.02
Total Natural Vegetation Communities	94.3	107.52	-13.22

As shown in Table 27, with the Phase 1 Improvements, impacts to all vegetation types would be less than with Alternative C2 except for grassland and the residential/commercial land use types. Grasslands in the study area may be more prevalent due to the clearing of other vegetation types since the 2003 FEIS. There is also more residential/commercial vegetation in the study area because WSDOT has acquired ROW and structures have been removed since 2003. Many of these areas now contain a combination of mowed grasses and fragmented mixture of native, nonnative, and ornamental trees and shrubs.

Operational effects on wildlife are also expected to be related to traffic noise levels and wildlife mortality from vehicles in areas where new roads are constructed. Animals that would most likely be affected are black-tailed deer and small mammals such as raccoon, opossum, and skunk.

The operational effects on aquatic resources as discussed in the 2003 FEIS are also applicable to Phase 1 Improvements. However, three bridge crossings of the East Fork of Des Moines Creek would not occur on the former Tye Valley Golf Course site because the South Access Road would not be constructed. An extension of the existing culvert under S 200th Street with Alternative C2 also would not occur with the Phase 1 Improvements.

The amount of new impervious surface area from the Phase 1 Improvements is much less than the amount estimated for Alternative C2 in the 2003 FEIS. The enhanced stormwater treatment BMPs proposed for the Phase 1 Improvements would be designed to achieve greater removal of dissolved metals than basic treatment. There are currently no stormwater treatment facilities in the study area that treat stormwater from impervious surfaces and therefore the stormwater improvements under Phase 1 are expected to improve the quality of water in the fish-bearing waters over current conditions.

Effects During Construction

Water quality in receiving waters is the primary concern during construction. Des Moines Creek is the only fish-bearing stream that the Phase 1 Improvements would cross. Bridge construction over Des Moines Creek would not require in-water work. Implementation of BMPs during construction would protect receiving waters from stormwater-related runoff and/or spills. Therefore, construction-related fisheries impacts are not expected to be significant.

Because the Phase 1 Improvements would not extend the culvert under S 200th Street there would be no in-water work in habitat occupied by resident cutthroat trout and coho salmon. The existing culvert would continue to block fish passage to remain in compliance with Federal Aviation Administration policy that no anadromous fish be allowed to travel north of S 200th Street to avoid attracting raptors close to Sea-Tac Airport.

As with Alternative C2, no federal- or state-listed threatened, or endangered wildlife species regularly breed, forage, or occupy the Phase 1 Improvements study area.

Mitigation

Some of the mitigation commitments for Alternative C2 have been completed since the 2003 FEIS. The commitment to contribute to the construction of the Marine View Drive bridge to replace the existing culvert is no longer needed because that project has been completed. Continued commitments include the following:

- Des Moines Creek would be crossed with a bridge to minimize impacts on streams and fish habitat from the project.
- Enhancement opportunities for Des Moines Creek in the study area are being investigated to compensate for any riparian impacts. The type of mitigation could be enhancement or restoration of the stream or the riparian buffer in locations that are currently biologically or topographically deficient.
- Fish and water quality-related design guidelines would comply with federal, state, and local permit requirements. A Temporary Erosion and Sediment Control Plan (TESC), a Spill Control and Containment Plan (SCCP), and a Stormwater Pollution Plan (SWPP) would be developed prior to construction. Additionally, the design would comply with the King County *Surface Water Design Manual* and WSDOT's *Highway Runoff Manual*.
- Appropriate construction BMPs would be selected during development of the TESC, SCCP, and SWPPP to prevent or reduce potential impacts on surface water quality. Surface runoff from new and replaced impervious surfaces will be detained for flow control and treated with enhanced stormwater treatment.
- WSDOT will apply for a Hydraulic Project Approval permit from WDFW for bridge installation over Des Moines Creek.
- Monitoring would still be part of the mitigation process.

The following are additional mitigation measures imposed under the 2003 ROD remain relevant to the Phase 1 Improvements:

Vegetation and Wildlife:

- Cover, seed, and/or re-vegetate disturbed soils with native species following construction and final grading to help reduce soil erosion and colonization by nonnative species. This will include establishing native plant communities to replace exotic, invasive species where appropriate.
- Implement maintenance practices following construction of the proposed project to create a diversity of grassland habitat over time. This could include a variable mowing schedule for grassy right of way.
- Avoid prime forested areas, wetlands, and riparian areas where possible during construction.
- Leave snags, brush piles, and downed trees in forested and wetland areas (if possible), where they provide a variety of wildlife habitats, such as perch sites for raptors, nesting areas for passerine birds, den habitat for small mammals, and cover for amphibians and reptiles.
- Schedule construction activities to take into account timing recommendations from WDFW and other agencies to avoid disturbing breeding wildlife in sensitive habitats such as wetlands.
- Schedule, to the extent possible, land clearing of woody vegetation so that it does not occur in early spring when most bird species are nesting.
- Use construction procedures that minimize damage to existing vegetation, avoid habitat loss, and minimize soil compaction and erosion.
- Conduct monitoring during and after construction to ensure mitigation measures are successfully implemented and that performance standards are achieved. If mitigation performance standards are not met during post-construction monitoring, additional mitigation will be required and implemented as appropriate.

Fish:

- Bridges will be designed to comply with WDFW criteria for safe fish passage.
- No in-water work will occur with the Phase 1 Improvements.
- Comply with drainage and erosion-control requirements and implementation of stormwater BMPs presented in Section 3.5, Water Quality. These measures will minimize increases in pollutant loading to waters receiving stormwater runoff and reduce potential impacts on aquatic resources from water quality degradation.
- Mitigate potential habitat impacts on anadromous and resident fish habitat at stream crossings based on permitting requirements.
- Reduce potential baseflow impacts by infiltrating stormwater runoff and recharging shallow groundwater to the maximum extent practicable.
- Federal, state, and local agencies will review plans to ensure proposed stormwater management designs avoid or minimize potential impacts.
- Monitor mitigation measures related to water quality and hydrology operational impacts after the proposed project is completed to determine their overall effectiveness and appropriateness.
- Roadway maintenance will be conducted in accordance with the BMPs outlined in the Regional Road Maintenance Endangered Species Act Program Guidelines (NMFS 2001).
- The design team will continue to investigate enhancement opportunities for Des Moines Creek in the vicinity of the project area. This could include enhancement or restoration of the stream or the riparian buffer in locations that are currently biologically or topographically deficient.

Conclusion

Impacts to vegetation and wildlife would be similar between the Phase 1 Improvements and Alternative C2. No new significant impacts to vegetation, wildlife, fisheries, or threatened and endangered species would occur as a result of the Phase 1 Improvements that were not previously identified in the 2003 FEIS and ROD for Alternative C2. No new or revised mitigation measures would be required. See also Attachment H for the Vegetation, Wildlife, Fish and Threatened and Endangered Species Technical Memorandum.

4.9. Land Use

Affected Environment

The existing conditions land use discussion in the 2003 FEIS remains applicable to the Phase 1 Improvements, with the exception of some localized changes. Since the ROD was issued in 2003, WSDOT has proceeded to acquire approximately 50 percent of the ROW for the SR 509 Completion Project. Changes beyond the limits of roadway ROW include the closure of the Tyee Valley Golf Course and the removal of four mobile home parks (Tyee Valley Mobile Home Park, Des Moines Estates, Town and Country Lane, and Town and Country Villa). The mobile home parks were relocated by the Port of Seattle in response to FAA noise mitigation policy (Part 150).

Other changes in the area include the completion of the Connecting 24th Avenue S/28th Avenue South Project (jointly funded by the City of SeaTac, Port of Seattle, and WSDOT), which is a new north-south corridor that provides a direct connection with the SeaTac Regional Growth Center, Des Moines Creek Business Park (private development), Angle Lake Light Rail Station at S 200th Street (Sound Transit), and multiple adjacent developable properties.

Sound Transit has also recently completed preliminary design and environmental study of the FWLE. The FWLE project will extend light rail from the Angle Lake Station at S 200th Street in SeaTac to Kent/Des Moines and to Federal Way Transit Center by 2024. The light rail corridor is about 7.6 miles long and parallels SR 99 and I-5. Construction and ROW requirements of the FWLE and Phase 1 Improvements overlap in some areas: where the FWLE alignment crosses the east side of SR 99 and continues in the SR 509 WSDOT ROW and west of I-5 from S 211th Street to S 231st Street. As design of the Phase 1 Improvements and FWLE projects advance, Sound Transit and WSDOT will work together to identify opportunities for cost sharing, reduced impacts, and combined mitigation.

The local comprehensive plans and policies that were discussed in the 2003 FEIS have also been updated. Similar to the findings in the 2003 FEIS, the current comprehensive plans for the cities of Sea Tac, Des Moines, and Kent recognize the project as a key element in the transportation system and contain a number of goals and policies of direct relevance to the Phase 1 Improvements. SeaTac's *Comprehensive Plan* (City of SeaTac, 2015) advocates the completion of the first phase of the SR 509 extension to increase the City's accessibility to the regional transportation system. The extension is also key element of the City's long-range transportation system. The *Des Moines Comprehensive Plan* contains several references to the SR 509 Extension Project. Policy and implementation strategies state that the "planned extension of State Route 509 to Interstate 5 is a key transportation facility for the City of Des Moines and its construction should be completed as soon as possible." The *City of Kent Comprehensive Plan* states that the City is working closely with the State of Washington, the Port of Seattle, King County, and other jurisdictions and stakeholders to ensure that the SR 509 Completion Project continues to be a priority in the state and the region.

The Puget Sound Regional Council (PSRC) *Destination 2030 Metropolitan Transportation Plan* (Destination 2030) referred to in the 2003 FEIS has also been updated since the FEIS was released. The most current version of the regional plan, *Transportation 2040: towards a sustainable transportation*

system (Transportation 2040), was adopted in 2010 (PSRC, 2010) and updated in 2015 (PSRC, 2015). The new plan is the transportation element of *Vision 2040*, the growth management, environmental, economic, and transportation strategy for the Central Puget Sound region. Transportation 2040 states that completing “key roadway projects that would enhance freight mobility, such as SR 509 extension ...” would be important for the region. This acknowledgement is similar to, but more specific than, what was included in the Destination 2030 that was described in the 2003 FEIS. As was described in the 2003 FEIS for Alternative C2, Phase 1 Improvements would help meet the regional objectives described in Transportation 2040 in ways that would be similar to, or the same as, those described in the 2003 FEIS for Destination 2030. *Appendix J: Regional Freight Strategy* of Transportation 2040 contains a number of references to the SR 509 extension, which is identified as one of the key projects for the movement of freight in the region.

Effects During Operation

As was the case with Alternative C2, Phase 1 improvements would be consistent with goals, policies, and directives contained in updated regional and local comprehensive plans. The SR 509 Completion Project is still identified in many of the updated plans (as it was in previous versions) as being an important future regional and local transportation feature.

Like Alternative C2, the improved access provided by the Phase 1 Improvements would directly benefit the intra- and interregional transport of goods, people, and services, which would support the planning goals and policies of the jurisdiction that would be served. Overall, either Alternative C2 or Phase 1 Improvements would directly improve local and regional access, thereby enhancing the livability of the affected communities.

Effects During Construction

Both the 2003 FEIS Alternative C2 and Phase 1 Improvements would require additional ROW to accommodate new roadway surfaces, shoulder areas, structures, and cut-and-fill slopes. The Phase 1 Improvements, however, would require slightly less area due to fewer project components. Both would use portions of the existing SR 509 ROW extending south of its current northern terminus and portions of the existing I-5 ROW extending between S 216th Street and S 272nd Street (Alternative C2 would have continued south to S 310th Street). The smaller footprint of the Phase 1 Improvements would require somewhat less land than was identified in the 2003 FEIS and would not require the commercial, industrial, and vacant lands in SeaTac along the South Access Road that would have been required for Alternative C2.

Mitigation

The mitigation measures that were imposed under the 2003 ROD that remain relevant to the Phase 1 Improvements are listed below.

- Continue to coordinate with local jurisdictions and regional authorities to integrate the proposed project with other transportation and transit-related projects. Unavoidable adverse effects on land uses from the combination of the projects will be minimized.
- Acquire all applicable federal, state, and local permits and approvals to complete construction and to ensure that the proposed project is consistent with local comprehensive plans, zoning ordinances, and other applicable regulations in effect at the time of review.
- Complete the proposed property trade with the City of SeaTac to offset impacts resulting from the required acquisition of portions of Des Moines Creek Park, as defined in the Interagency Letter of Understanding (Section 4(f) Appendix of the 2003 FEIS).

- People and businesses displaced by new right-of-way acquisition will be entitled to relocation assistance and payment programs. A discussion of these programs is provided in Section 4.10, Relocation.

In addition to the mitigation measures from the 2003 ROD, all applicable federal, state, and local permits and approvals would be acquired to complete construction and to ensure that the proposed project is consistent with local comprehensive plans, zoning ordinances, and other applicable regulations in effect at the time of review.

Conclusion

The Phase 1 Improvements are consistent with local and regional planning efforts. With adherence to the regulatory requirements and mitigation measures described above, no new significant impacts to land use from construction and operation would occur as a result of the Phase 1 Improvements that were not previously identified in the 2003 FEIS. No new or revised mitigation measures would be required. See also Attachment I for the Land Use Technical Memorandum.

4.10. Relocation

Affected Environment

The relocations affected environment was described in Section 3.9.2 of the 2003 FEIS. The Phase 1 Improvements would affect properties in the same cities and neighborhoods as those described in the 2003 FEIS for Alternative C2. Since the ROD was issued by FHWA, WSDOT has proceeded to acquire a portion of the ROW and relocate some of the residences and businesses that were identified as displacements in the 2003 FEIS.

Table 28 indicates the total number of residences and businesses by neighborhood that were initially estimated for acquisition and those residences and businesses that have since been relocated as ROW has been acquired. Figure 3.10-1 from the 2003 FEIS shows the general location of neighborhoods in the study area.

Neighborhood	Alternative C2				Relocations that have Occurred from Early Acquisitions
	Multifamily (structures)	Single Family	Mobile Home	Businesses (structures)	
8th Avenue S/Des Moines Memorial Drive	0	16	1	9 (7)	16 single-family and 1 mobile home
North Hill	26 (5)	3	0	1 (1)	3 single family and 1 commercial structure
Homestead Park	0	0	0	14 (3)	Four mobile home parks have been relocated by the Port of Seattle
Madrona	69 (10)	2	0	1 (1)	4 multifamily structures and 3 single family
City Center	0	0	0	4 (4)	0
Mansion Hill	4 (1)	18	0	0	1 multifamily structure and 18 single family
Pacific Ridge	95 (13)	3	0	0	0
Grandview	2 (1)	38	4	0	3 commercial structures
Midway	0	0	0	2 (2)	0
Total	196 (30)	80	5	31 (18)	5 multifamily structures, 40 single-family, 1 mobile home, and 4 commercial structures

Effects During Operation

The potential future relocations based on updated ROW plans for the Phase 1 Improvements are provided in Table 29. As compared to the 2003 FEIS, the Phase 1 Improvements would result in the relocation of one additional multifamily structure in the North Hill neighborhood and two additional multifamily structures in the Madrona neighborhood. These relocations would occur due to a slight shift in the vertical alignment of the SR 509 extension and the revised S 208th Street connection. No relocations would occur in the City Center neighborhood because the Phase 1 Improvements would not include the South Access Road, and fewer relocations would occur in the Pacific Ridge and Grandview neighborhoods because the I-5 improvements would not be as extensive as those proposed under Alternative C2.

	Alternative C2	Relocations that have Occurred from Early Acquisitions	Phase 1 Improvements
8th Avenue S/Des Moines Memorial Drive	16 single family, 1 mobile home, 7 commercial structures	16 single-family and 1 mobile home	1 mobile home
North Hill	5 multifamily (26 units), 3 single family, 1 commercial structure	3 single family and 1 commercial structure	6 multifamily (31 units), 1 commercial structure
Homestead Park	3 commercial structures	0	0
Madrona	10 multifamily (69 units), 2 single family, 1 commercial structure	4 multifamily and 3 single family	8 multifamily (60 units), 3 single family, 1 commercial structure
City Center	4 commercial structures	0	0
Mansion Hill	1 multifamily (4 units), 18 single family	1 multifamily and 18 single family	0
Pacific Ridge	13 multifamily (95 units), 3 single family	0	7 multifamily (57 units), 3 single family ^a
Grandview	1 multifamily (2 units), 38 single family, 4 mobile home, 3 commercial structures	3 commercial structures	7 single family, 3 commercial structure
Midway	2 commercial structures	0	2 commercial structures
Total	30 multifamily, 80 single family, 1 mobile home, 21 commercial structures	5 multifamily, 40 single-family, 1 mobile home, 4 commercial structures	21 multifamily, 15 single family, 1 mobile home, 9 commercial structures

^a All of these relocations are expected to occur from FWLE acquisitions, which will be completed prior to Phase 1. WSDOT will only be acquiring the vacated surplus property from Sound Transit.

Construction and ROW requirements of the FWLE and Phase 1 Improvements overlap in some areas, particularly through the Madrona and Mansion Hill neighborhoods. Because the FWLE project is expected to progress ahead of Phase 1 Improvements, the ROW acquisitions and displacements identified in the Pacific Ridge and Midway neighborhoods would likely occur from the FWLE project, not the Phase 1 Improvements. If this is the case, WSDOT would coordinate with Sound Transit to acquire the necessary ROW for the Phase 1 Improvements. As design of the Phase 1 Improvements and FWLE projects advance, Sound Transit and WSDOT will work together to identify opportunities for cost sharing, reduced impacts, and combined mitigation.

Effects During Construction

Relocations are discussed above under Effects During Operations.

Mitigation

The mitigation measures that were imposed under the 2003 ROD that remain relevant to the Phase 1 Improvements are listed below.

- The project design team will continue to make all reasonable attempts to avoid and minimize acquiring properties or displacing residents or businesses.
- All relocation activities for the affected residents and businesses will be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policy Act (49 CFR Part 24) and Washington State's Uniform
- Relocation Assistance and Real Property Acquisition Policy (RCW 8.26). Services offered include advisory services from a relocation specialist, payment of moving costs, and re- placement housing payments, including purchase supplements, rental assistance, and down-payment assistance.
- Displaced households will be relocated as close to their original residences as possible, unless otherwise requested. Low-income residents will be relocated in close proximity to places of employment and public transportation.
- Displaced businesses occupying commercial warehouse or retail space near the airport will be relocated with similar proximity to the airport, so that they can maintain their essential nearby access.

Conclusion

Relocation effects were found to be similar between the Phase 1 Improvements and Alternative C2. With adherence to the federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, no new significant impacts from relocations would occur as a result of the Phase 1 Improvements that were not previously identified in the 2003 FEIS. No new or revised mitigation measures are proposed. See also Attachment J for the Relocations Technical Memorandum.

4.11. Social

Affected Environment

The neighborhoods identified in Section 3.10.2 of the 2003 FEIS remain the same. Figure 3.10-1 from the 2003 FEIS depicts the general location of study area neighborhoods. The overall boundaries of the neighborhoods have not changed since the 2003 FEIS. However, WSDOT has acquired and relocated several residences in the North Hill, Madrona, and Mansion Hill neighborhoods through early acquisitions. These acquisitions occurred along the edges of the neighborhoods and have not affected the overall integrity of study area neighborhoods. In addition, the four mobile home parks that once existed in the Homestead Park neighborhood (Tyee Valley Mobile Home Park, Des Moines Estates, Town and Country Lane, and Town and Country Villa) have since been relocated by the Port of Seattle, in accordance with FAA noise mitigation policy (Part 150) and as part of their current noise mitigation plan.

The 2003 FEIS analysis relied on 2000 U.S. Census data. This Re-evaluation considered more current 2010 U.S. Census data and data from the 2009–2013 American Community Survey data, summarized in Table 30. A separate environmental justice analysis that considers the potential economic effects on low-income and minority households as a result of the toll adjustments is provided in section 4.17 of this Re-evaluation.

For King County and the cities, the 2010 owner-/renter-occupied data are similar to the percentages in the 2003 FEIS. In SeaTac neighborhoods, the percentage of owner-/renter-occupied households changed the most, with 8th Avenue S/Des Moines Memorial Drive, Madrona, and Grandview neighborhoods

experiencing at least a 15 percent increase in owner-occupied households. Homestead Park and Mansion Hill experienced a 20 percent increase in renter-occupied households, which is likely due to the loss of the mobile homes in Homestead Park and the construction of an apartment complex in Mansion Hill.

The median value of housing increased between 30 and 40 percent, except for Homestead Park and Madrona, which experienced an increase of over 55 percent. For Homestead Park, the increase is likely due to the removal of mobile homes, which tend to have a lower median value compared to other residential developments. Median household incomes decreased in the Madrona and Mansion Hill neighborhoods compared to the 2003 FEIS data, and Pacific Ridge changed very little. All other areas experienced an increase of between 18 and 37 percent.

Overall, the minority population has increased in all areas, with the biggest changes in the Madrona and Mansion Hill neighborhoods. The smallest change occurred in the North Hill neighborhood, where the minority population increased by about 2 percent. The elderly population remained similar for all areas when compared to the 2003 FEIS except for the Mansion Hill neighborhood, which experienced an approximately 10 percent decrease in the elderly population

Regional and Community Growth

The regional and community growth setting discussed in the 2003 FEIS remains applicable to the Phase 1 Improvements. Population in the study area continues to grow within the urban growth boundaries. Redevelopment in the areas around the Sound Transit Link stations is also planned in SeaTac, and the cities of Kent and Des Moines have developed plans to accommodate future growth in the Pacific Ridge and Midway neighborhoods.

Recreation

The recreational facilities as discussed in the 2003 FEIS remain largely the same except that the planned trail extension (Lake to Sound Trail alignment) through the study area has been approved, with portions already constructed, and the Tye Valley Golf Course has been closed. Figure 3.10-3 from the 2003 FEIS shows the recreational facilities in the study area. The Lake to Sound trail incorporates the Des Moines Creek Trail through the study area and includes an extension north of the trailhead parking in Des Moines Creek Park. The trail extension (Lake to Sound Trail, Segment C) is expected to be completed in 2018/2019.

		Households				Population (%)						
		Owner/ Renter Occupied %	Median Value Owner-Occupied Housing Units (\$)	Median Contract Rent (\$)	Median Household Income (\$)	White	African- American	American Indian, Alaska Native	Asian	Pacific Islander/Native Hawaiian	Hispanic Origin	Elderly
King County	2000	60/40	226,400	695	53,157	75.7	5.4	0.9	10.8	0.5	5.5	10.5
	2010	58/42	377,300	1,000	71,811	68.7	6.2	0.8	14.6	0.8	8.9	10.9
City of SeaTac	2000	54/46	147,000	582	41,202	62.9	9.2	1.5	11.1	2.7	13.0	9.7
	2010	53/47	231,000	827	46,328	45.9	16.8	1.5	14.5	3.6	20.3	9.7
8th Avenue/Des Moines	2000	57/43	135,690	668	45,429	72.3	6.9	1.2	8.6	1.0	9.1	8.9
	2010	81/19	298,650	920	71,980	70.1	5.4	1.3	13.0	1.3	10.9	12.6
Homestead Park	2000	79/21	29,500	503	34,091	61.8	7.6	3.2	12.0	0.7	27.9	4.8
	2010	58/42	204,950	1,700	47,034	49.6	11.4	5.1	8.5	0.6	36.6	3.6
Madrona	2000	19/81	13,106	601	42,730	48.5	19.8	1.1	9.1	5.3	18.6	4.6
	2010	34/66	276,300	932	34,569	29.0	26.3	1.3	10.5	5.2	32.1	4.5
Mansion Hill	2000	60/40	162,200	653	43,125	74.4	3.8	2.3	11.0	3.6	4.3	20.2
	2010	15/85	228,800	932	23,883	39.7	20.0	1.0	12.4	3.7	24.7	10
Grandview	2000	49/51	166,200	705	54,824	69.5	6.8	1.3	6.3	0.3	6.6	8.4
	2010	66/34	261,350	1,244	77,716	51.4	11.7	1.0	16.3	2.5	18.3	6.3
City of Des Moines	2000	61/39	170,000	639	48,971	74.2	7.2	1.0	8.3	1.3	6.6	14.9
	2010	62/38	260,800	898	59,799	63.5	9.1	1.1	10.7	2.4	15.2	14.8
North Hill	2000	88/12	172,000	792	56,835	84.6	3.3	0.9	5.7	0.3	4.7	12.2
	2010	89/11	261,150	1,271	79,304	77.9	3.8	1.1	7.8	1.1	8.7	13.5
Pacific Ridge	2000	18/82	104,438	599	31,892	46.0	17.7	1.4	12.6	4.1	17.5	8.0
	2010	23/77	158,000	713	32,422	35.1	21.4	0.9	7.3	6.6	34.6	7.4
City of Kent	2000	49/51	168,100	655	46,046	70.8	8.2	1.0	9.4	0.8	8.1	7.3
	2010	54/46	261,300	873	57,533	55.5	11.3	1.0	15.2	1.9	16.6	8.8
Midway	2000	62/38	155,052	645	49,159	68.7	8.9	1.5	7.8	1.5	12.1	8.1
	2010	70/30	272,900	941	71,157	61.6	9.6	1.5	10.2	1.9	17.0	11.0

Source: U.S. Census Bureau, 2000 and 2010, and 2009–2013 American Community Survey.

Services and Utilities

The services and utilities setting discussed in the 2003 FEIS remains applicable to the Phase 1 Improvements, with the following exceptions:

- Since the 2003 FEIS, Sound Transit has constructed the initial segment of its light rail system as well as an extension south and within the northern area of the Homestead Park neighborhood. The light rail system connects SeaTac to Seattle, and a future extension of the system (the FWLE) is planned southward to Federal Way. A portion of this extension would generally follow the Phase 1 Improvements and include a new station in the Midway neighborhood. This would provide improved transit access for many of the residents in the surrounding neighborhoods and also encourage additional planned growth in the Pacific Ridge and Midway neighborhoods. The City of SeaTac is also planning for growth in stations areas within the city limits.
- The 2003 FEIS identified two churches near the project, the Puget Sound Church of God Holiness, which has since been relocated, and the St. Columba's Episcopal Church, which is still located at 26715 Military Road.
- The Sea Mar Community Health Centers – Des Moines Medical Clinic located at 2781 S 242nd Street in Des Moines has been open since the 2003 FEIS and serves minority and low-income populations.
- Since the 2003 FEIS, there have been changes in fire protection providers. In 2006, Fire District 26, which covered the City of Des Moines and the Federal Way Fire Department, merged and became South King Fire and Rescue. In 2014, the City of SeaTac joined the Kent Fire Department Regional Fire Authority. There are no changes in the location of any fire stations, and no new stations have been constructed since the 2003 FEIS.

Pedestrian and Bicyclists

The pedestrian and bicycle facilities identified in the 2003 FEIS remain largely the same and consist of sidewalks, paved and unpaved shoulders, walkways, and trails. In addition, progress has been made on the northward extension of the Des Moines Creek Trail. The trail extension (Lake to Sound Trail, Segment C) is expected to be completed in 2018–2019. Besides the Des Moines Creek Trail, there are no other regional trail facilities and there are few signed bicycle routes.

Effects During Operation

Community Cohesion

As described in the 2003 FEIS, community cohesion would be affected to some degree through the loss of single-family and multifamily homes, the physical fragmentation of residential areas, and the disruption of access to community facilities and services. Community cohesion was assessed by observing the pattern of ROW acquisition and the resulting physical disruption (such as demolition of houses and severing of neighborhood streets) that the SR 509 extension would cause.

Overall, the properties and structures that WSDOT would acquire for the Phase 1 Improvements would differ only slightly from those identified for acquisition with Alternative C2. Fewer relocations would occur in the City Center neighborhood because the Phase 1 Improvements would not include the South Access Road, and fewer relocations would occur in the Pacific Ridge and Grandview neighborhoods because the I-5 improvements would not be as extensive as those proposed under Alternative C2. The relocations in the Madrona neighborhood would differ because of a revised alignment of the S 208th Street connection.

No community facilities would be displaced, and any businesses that would be acquired do not provide unique services to the surrounding neighborhoods; most such businesses are warehouse-related and likely able to relocate in the surrounding area. The residential displacements, especially the multifamily units, could represent a loss of affordable housing. As noted in the mitigation section, WSDOT would work with those affected by displacement to find replacement housing in the surrounding area.

As discussed below the community cohesion impacts would be similar to those described in the 2003 FEIS.

- 8th Avenue S/Des Moines Memorial Drive – The 2003 FEIS indicated that Alternative C2 would displace 16 single-family residences and one mobile home near S 196th Street. Since 2003, most of the ROW in this area has been acquired and those residences identified in the FEIS have been relocated. As was the case for Alternative C2, the Phase 1 Improvements would result in the closure of South 196th Street/18th Avenue South, a narrow two-lane local access roadway that travels through vacant WSDOT- and Port of Seattle-owned properties. Closing this roadway would have no effect on community cohesion because it does not serve any residential or business communities.
- North Hill – The 2003 FEIS indicated that Alternative C2 would relocate five multifamily structures housing 26 units and three single-family residences south of S 194th Street in the North Hill neighborhood. Since 2003, WSDOT has acquired some ROW in this area, and three residences identified in the FEIS have been relocated. The Phase 1 Improvements would result in the displacement of the remaining multifamily structures as identified in the 2003 FEIS plus one additional multifamily structure with five units. The SR 509 expansion in this area would occur along the eastern edge of the neighborhood and would not cut off any streets or isolate any residential areas.
- Homestead Park – The 2003 FEIS indicated that Alternative C2 would pass through an area where four mobile home parks existed in the near 24th Avenue S/28th Avenue S. These mobile home parks (Tye Valley Mobile Home Park, Des Moines Estates, Town and Country Lane, and Town and Country Villa) have since been relocated by the Port of Seattle, in accordance with FAA noise mitigation policy (Part 150) and as part of their current noise mitigation plan. The Phase 1 Improvements in this area would extend through these vacant properties and would not isolate any residential areas.
- Madrona – The 2003 FEIS indicated that Alternative C2 would relocate 10 multifamily structures with 69 units and 2 single-family residences in the Madrona neighborhood west of I-5 between S 200th Street and S 211th Street. Since 2003, some ROW in this area has been acquired and four of the multifamily structures and two of the single-family residences identified in the FEIS have been relocated. The Phase 1 Improvements would result in the displacement of the remaining multifamily structures as identified in the 2003 FEIS. Consistent with the original findings, some households receiving federal Section 8 assistance would be displaced. The 2003 FEIS also indicated that Alternative C2 would close S 208th Street just west of SR 99, and WSDOT committed to providing a new access road to preserve connectivity for the remaining residential units. The Phase 1 Improvements would reconnect S 208th Street and maintain access to the residences and businesses on S 208th Street. The SR 509 expansion in this area would not cut off any streets or isolate any residential areas.
- Mansion Hill – The 2003 FEIS indicated that Alternative C2 would relocate 1 multifamily structure with 4 units and 18 single-family residences in the Mansion Hill neighborhood west of I-5 between S 211th Street and S 216th Street. Since the 2003 FEIS, most of the ROW in this area has been acquired and those residences identified in the 2003 FEIS have been relocated. No additional displacements would occur as a result of the Phase 1 Improvements. The SR 509 expansion in this area would not cut off any streets or isolate any residential areas.
- Grandview – The 2003 FEIS indicated that Alternative C2 would relocate 1 multifamily structure with 2 units, 38 single-family residences, and 4 mobile homes in the Grandview neighborhood east of I-5 and south of S 216th Street. The Phase 1 Improvements would result in the same relocations in this area. As indicated in the 2003 FEIS, the acquisitions would occur along the outer edge of the neighborhood, and the SR 509 expansion in this area would not cut off any streets or isolate any residential areas. Since the 2003 FEIS, WSDOT has acquired property from the Puget Sound Church of God Holiness; this acquisition required the removal of buildings immediately adjacent to the proposed ROW. This church was also identified as a relocation in the 2003 FEIS.

- Pacific Ridge – The 2003 FEIS indicated that Alternative C2 would relocate 13 multifamily structures with 95 units and 3 single-family residences in the Pacific Ridge neighborhood west of I-5 and south of S 216th Street. The ROW acquisitions and displacements identified in this neighborhood would likely occur as a result of the FWLE project, which would be constructed along the west side of I-5. If this becomes the case, WSDOT would coordinate with Sound Transit to acquire the necessary ROW for the Phase 1 Improvements. As noted in the 2003 FEIS, the acquisitions are on the edge of the neighborhood but could affect multifamily units that provide affordable housing opportunities. The City of Des Moines is planning for redevelopment in the neighborhood associated with the proposed light rail station in Midway.
- Midway – As was indicated in the 2003 FEIS for Alternative C2, there would be no residential displacements and no impacts on cohesion in the Midway neighborhood as a result of the Phase 1 Improvements.

Regional and Community Growth

The regional and community growth impacts discussed in the 2003 FEIS for Alternative C2 remain applicable to the Phase 1 Improvements. The Phase 1 Improvements would provide needed transportation improvements and is consistent with the local and regional plans. Phase 1 Improvements would support the planned growth in the study area and would not induce any changes in population characteristics as a result of the improvements.

Recreation

The 2003 FEIS indicated that Alternative C2 would affect five recreational facilities: Des Moines Creek Park and Trail, Tyee Valley Golf Course, Midway Park, Linda Heights Park, and Mark Twain Elementary School Playfield. The Phase 1 Improvements would not affect the former Tyee Valley Golf Course because it has since closed, nor would it affect the Mark Twain Elementary School Playfield because it is located south of the Phase 1 Improvements. The effects on the Des Moines Creek Park and Midway Park, however, would remain applicable to Phase 1 Improvements.

The impacts to Des Moines Creek Park and Trail remains applicable to the Phase 1 Improvements, except that the SR 509 mainline would be narrower and constructed on one structure.

Services and Utilities

The services and utilities impacts discussed in the 2003 FEIS remain applicable to the Phase 1 Improvements; however, no streets are expected to be cut off as a result of the Phase 1 Improvements. Overall, the Phase 1 Improvements would result in improved response and travel times for public service providers in the study area. No new impacts beyond those discussed in the 2003 FEIS would occur as a result of the Phase 1 Improvements.

Pedestrian and Bicycle Facilities

The pedestrian impacts discussed in the 2003 FEIS remain applicable to the Phase 1 Improvements and bicycle facilities are being planned through the I-5/SR 516 interchange either along S 228th Street as it crosses under I-5 or on SR 516 under I-5. In addition, progress has been made on the northward extension of the Des Moines Creek Trail. The trail extension (Lake to Sound Trail, Segment C) is expected to be completed in 2018–2019. Additionally, the SR 509 extension would pass through Des Moines Creek Park as an elevated structure at the north edge of the park, therefore minimizing effects on the park and the trail. The Phase 1 Improvements would also reduce the amount of traffic volume on arterials in the study area, thus reducing the risk of vehicle collisions with pedestrians and bicyclists. No new impacts beyond those discussed in the 2003 FEIS would occur as a result of the Phase 1 Improvements.

Effects During Construction

The temporary construction effects discussed in the 2003 FEIS remain applicable to the Phase 1 Improvements, except that the Phase 1 Improvements would result in less area of disturbance and a shorter duration than Alternative C2. As discussed in Section 3.10.5 of the 2003 FEIS, construction activities would include additional traffic on neighborhood streets, detours, congestion, increased dust and exhaust from construction vehicles, and increased noise near construction locations.

Mitigation

The mitigation measures that were imposed under the 2003 ROD that remain relevant to the Phase 1 Improvements are listed below. The measures that have been revised since the time of the ROD are shown in italics.

Community Cohesion:

- *Alternative C2 included an extension of S 211th Street to replace the S 208th Street connection to SR 99 that would have been removed. The 2003 FEIS also committed to the construction of a new connection between S 208th and S 204th Streets. Under the Phase 1 Improvements, S 208th Street would also be reconnected to SR 99 and a new connection between S 208th and S 204th Streets would be constructed.*

Recreation:

Measures identified for Des Moines Creek Park impacts in the 2003 FEIS would still apply, including replacement parkland.

- Replace any parkland acreage acquired with an equal amount of acreage of reasonably equivalent or greater recreational utility within the existing SR 509 right-of-way south of South 200th Street and immediately adjacent to Des Moines Creek Park's western boundary. The land trade to accomplish this is currently being conducted.
- *The planned trail extension (Lake to Sound Trail alignment) through the study area has been approved, and portions of the trail extension are already constructed. The trail extension (Lake to Sound Trail, Segment C) is expected to be completed in 2018/2019.*
- Coordinate closely with the City of SeaTac regarding temporary construction disruptions to Des Moines Creek Park access at S. 200th St., and bike and pedestrian use of the Des Moines Creek Trail. Disruptions to these facilities will be minimized and, when unavoidable, alternative routes and detours will be implemented.
- Continue to coordinate with the local jurisdictions regarding mitigation measures for visual and noise proximity impacts to Midway and Linda Heights Parks. Per the concurrence letters received from the agencies (Section 4(f) Appendix), this may include construction of noise barriers where warranted by WSDOT and FHWA policies; construction or revision of earth berms; installation of new right-of-way fencing and planting of trees and/or small shrubs to minimize noise and visual impacts.

Schools:

- WSDOT will coordinate with local school districts to promote extension of local bus routes for children whose school access will be disrupted due to local access revisions or temporary construction disruptions.
- Provide permanent and temporary pedestrian-safety features (sidewalks, crossing lights, crossing guards) along walking routes from affected areas to neighborhood schools.

Fire and Police Protection:

- Coordinate with area police departments, fire districts and emergency service providers on the location of freeway crossings to develop access plans for emergency services in areas where street access will be permanently or temporarily revised.
- Ensure that water lines at each end of cut-off streets will be of adequate size to meet fire flow standards.
- Investigate providing alternate access by extending existing streets (such as cul-de-sacs) into the affected neighborhoods, if street cutoffs were to result in excessively circuitous neighborhood access routes that could substantially hinder the progress of emergency vehicles.

Pedestrians and Bicyclists:

- *As noted above, the planned trail extension (Lake to Sound Trail alignment) through the study area has been approved, and portions of the trail extension are already constructed. The trail extension (Lake to Sound Trail, Segment C) is expected to be completed in 2018/2019.*
- Where permanent or temporary revisions to pedestrian and bicycle access occur, redirect pedestrian and bicycle facilities along the local streets to the nearest arterial that will cross the proposed improvements.

Utilities:

- Coordinate with project area water and sewer districts on potential relocations of mains, trunk lines, and other facilities.
- Minimize service disruption impacts through early warning notifications to customers regarding scheduled outages.
- Work with PSE to avoid or minimize disruption of the local power and gas supply.
- WSDOT will coordinate with Puget Power to locate new transmission and distribution poles and to ensure that required transmission and distribution line relocations will not result in service interruptions.
- Wood power transmission and distribution poles could be replaced, as necessary, with tall steel poles to provide adequate roadway and flyover ramp clearance.
- Crossings of high-pressure gas pipelines will meet PSE standards for pipeline protection. During final design of the Phase 1 Improvements, WSDOT will submit plans of the crossings to PSE for review and approval prior to construction.

Conclusion

With adherence to mitigation measures presented above, no new significant impacts to social resources from construction and operation of the Phase 1 Improvements would occur that were not previously identified in the 2003 FEIS. No new or revised mitigation measures would be required. See also Attachment K for the Social Technical Memorandum.

4.12. Economics**Affected Environment**

Section 3.11.2 of the 2003 FEIS describes the affected environment for economics in the study area. Overall, the study area continues to support a wide variety of economic activities, ranging from Sea-Tac Airport, with its major airline and air freight operations and surrounding hotel, motel, and rental

car facilities, to the locally oriented shopping, restaurant, and service businesses located along and extending several blocks east and west of SR 99.

Population and Housing Units

As shown in Table 31, population growth since the 2003 FEIS was released has occurred primarily in Kent, which has experienced the largest amount of growth, with a population increase of 56.6 percent since 2000 to nearly 125,000. In contrast, SeaTac grew by 9.1 percent, and Des Moines grew by only 4.5 percent. The same growth trend was experienced in the number of housing units in each city.

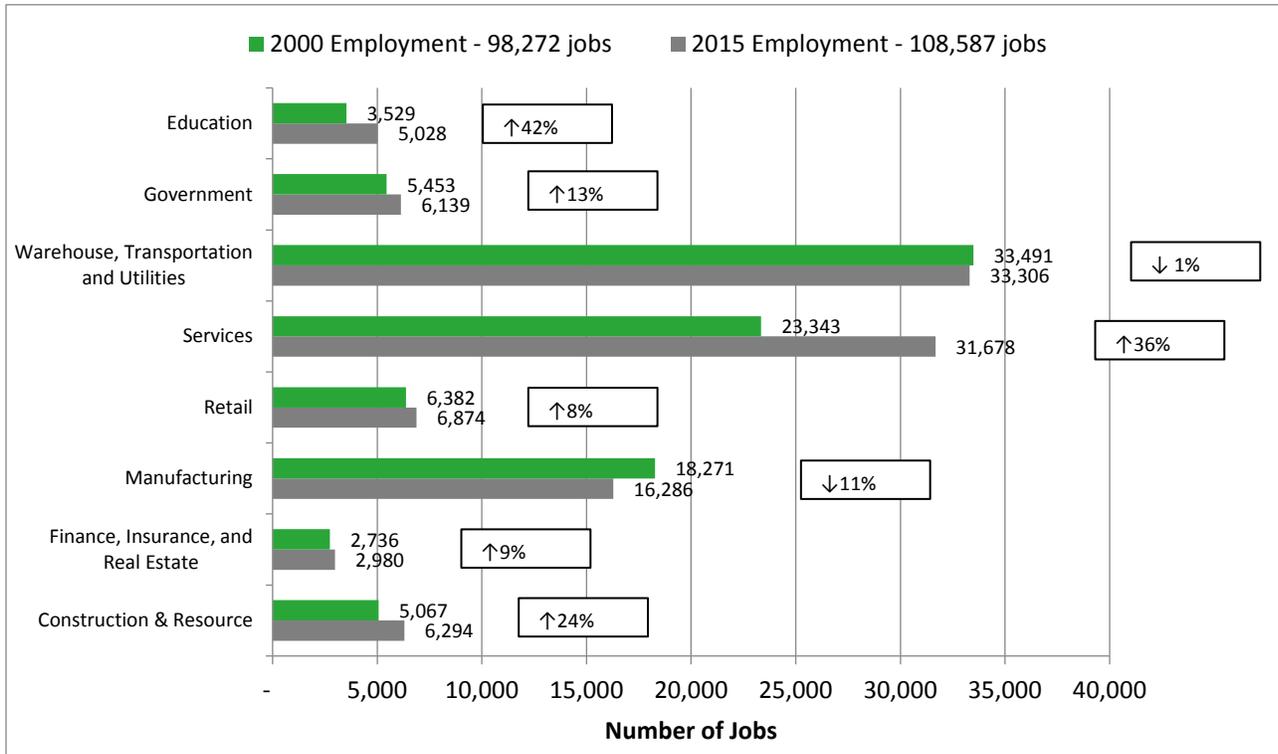
Population	2000	2016	% Change 2000–2016
Des Moines	29,267	30,570	4.5%
Kent	79,524	124,500	56.6%
SeaTac	25,496	27,810	9.1%
Total	134,287	182,880	36.2%
Housing Units	2000	2016	% Change 2000–2016
Des Moines	11,777	12,777	8.5%
Kent	32,488	46,997	44.7%
SeaTac	10,176	10,512	3.3%
Total	54,441	70,286	29.1%

Source: Washington State Office of Financial Management, 2017.

Figure 9 shows the actual employment levels in 2000 and 2015 in the overall study area, where approximately 10,300 jobs from 2000 to 2015 were added. The largest center of employment is Kent, which accounted for approximately 71,000 jobs in 2015. All sectors of the economy added jobs except for the manufacturing sector. The sector of the economy that experienced the greatest amount of growth is the services sector, accounting for 8,300 new jobs over the 15-year period.

As indicated in the 2003 FEIS, the primary retail businesses in the study area are located in Des Moines and Kent. Industrial development in the study area is limited to scattered light-industrial and small-scale manufacturing enterprises located along major arterials, such as Des Moines Memorial Drive, S 200th Street, and S 188th Street.

Figure 9. Study Area Employment by Sector



Source: Puget Sound Regional Council, 2017.

The largest economic influence in the study area, as well as the largest generator of vehicle trips, is Sea-Tac Airport. According to the Port of Seattle, operations at the airport create over 100,000 jobs in the Puget Sound region and generate over \$500 million in state and local sales taxes (McIntosh, 2016). Sea-Tac Airport is the fastest growing among the top 20 U.S. airports, serving nearly 46 million passengers and over 410,000 aircraft operations in 2016 (Port of Seattle, 2017). In 2034, forecasts project Sea-Tac Airport will accommodate 66 million annual passengers (an increase of 20 million from 2016) and 540,000 annual flight operations (up from 410,000 in 2016).

Since publication of the 2003 FEIS, a number of larger commercial and transportation-related projects that were identified 2003 FEIS have either been completed or still being considered:

- South Aviation Support Area.** The 2003 FEIS reported that the South Aviation Support Area (SASA) proposed to relocate existing line maintenance facilities, locate new maintenance expansion facilities (primarily hangars), and accommodate major base maintenance facilities and air cargo uses on approximately 100 acres south of S 193rd Street and north of S 200th Street. The SASA proposal is still being evaluated as part of the Sustainable Airport Master Plan and to date has not been adopted.
- 28th/24th Avenues South Arterial Project.** The 2003 FEIS described this proposed project that involved the cities of SeaTac and Des Moines, the Port of Seattle, King County, Equitable Capital Group, and Alaska Airlines. The project was in the process of being constructed and involved modifying the alignment of 28th Avenue S/24th Avenue S to accommodate local access traffic generated by anticipated development within the cities of SeaTac and Des Moines. The 2003 FEIS reported that construction of the project from S 188th Street to S 202nd Street (which began in April 2000) was substantially complete when the FEIS was completed. The project opened to traffic in late summer 2017.
- Third Runway at Sea-Tac Airport:** Since the 2003 FEIS, Runway 34L-16R (the “third”) runway at Sea-Tac Airport was completed (in 2008).

- **Sound Transit Light Rail Station:** Since the 2003 FEIS, Sound Transit has completed the construction of a light rail station at Sea-Tac Airport and at Angle Lake.
- **Federal Way Link Extension.** Sound Transit recently completed preliminary design and environmental study of the FWLE. Construction and ROW requirements of the FWLE and SR 509 Phase 1 Improvements abut in some areas.
- **Des Moines Creek Business Park.** The Des Moines Creek Business Park has started the final phase of construction. The completed business park is planned to total 1.6 million square feet of office, industrial, and retail space on the 87-acre site just south of the Sea-Tac Airport in Des Moines. In total, the City of Des Moines will see more than 6,000 new jobs from the business park, which will diversify their economic base.

City Revenue Sources

As was the case in 2003, the cities of SeaTac, Des Moines, and Kent receive the majority of their revenues from property, retail sales and use, and other taxes. Tax revenues accounted for approximately 80 percent of general fund revenues for Kent and SeaTac. Des Moines tax revenues represented approximately 63 percent of general fund revenues. All three cities have experienced growth in tax revenues since the 2003 FEIS. Table 32 compares the tax revenues for each city from 1999 to 2017.

City	1999	2017	% Change
Des Moines	\$6,052,639	\$12,514,977	107%
Kent	\$38,243,951	\$66,004,080	73%
Sea Tac	\$21,694,482	\$29,840,000	39%

Source: 2003 SR 509 FEIS: Economics; City of Des Moines, 2017; City of Kent, 2017; City of SeaTac, 2017

Effects During Operation

As discussed in the 2003 FEIS, extending SR 509 will ease congestion on I-5, add a southern access point to Sea-Tac Airport, and improve service between industrial districts by allowing GP traffic and trucks to bypass I-5, SR 99, and local streets. The Phase 1 Improvements will result in decreased travel times for several routes along the Seattle to Tacoma corridor and improved access to a large amount of industrially zoned land, including the Des Moines Business Park south of Sea-Tac Airport. The level of congestion on north-south arterial corridors within the study area, including SR 99 (International Boulevard) and Des Moines Memorial Drive, would decrease as trips currently made on surface streets divert onto SR 509. Overall mobility along these arterials would improve, resulting in better access to businesses.

Because the Phase 1 Improvements would not construct the South Access Road, commercial vehicles and individual passengers traveling to and from Sea-Tac Airport would not experience the same travel time savings as under Alternative C2. However, traffic modeling tests yielded very low usage for those ramps at S 188th St and S 200th St, which is why they were not included in the Phase 1 improvements as part of the Practical Design Solutions process.

Effects During Construction

The temporary construction effects discussed in the 2003 FEIS remain applicable to the Phase 1 Improvements except that construction would be less extensive than with Alternative C2.

Construction-related Employment

The beneficial effects resulting from construction employment are generally consistent with the same type of beneficial effects discussed in the 2003 FEIS. Project construction would also result in “multiplier” effects: Indirect effects would occur as construction firms purchase materials from local suppliers, who in turn would employ workers and purchase materials. Induced effects would occur when wages paid to workers in construction trades or supporting industries are spent on locally produced goods and services.

Business Acquisitions

The Phase 1 Improvements would result in the acquisition of fewer commercial properties and the relocation of fewer businesses than estimated for Alternative C2. An estimated 23 businesses and their employees would be displaced as compared to the 27 to 31 businesses estimated for Alternative C2. These displacements would not affect the regional economy; the businesses are service-oriented, and because the types of businesses are common in the study area, similar commercial space (as well as employment opportunities) exist nearby. Retail and industrial (warehouse) space would be the two types of commercial space needed for relocation.

As discussed in the 2003 FEIS, businesses in the study area are generally engaged in airport operations, tourism, retail, restaurant, and services that cater to neighborhood residents, the surrounding communities, and Sea-Tac Airport. Business displacements might reduce the sales tax revenue collected by the affected jurisdictions, depending on where, when, or whether the affected businesses relocate. Similarly, the employment represented by those displaced businesses would also be affected.

Commercial and industrial vacancy rates in the study area have been decreasing, which could make it difficult for potentially displaced businesses to find similar space in the study area. The Sound Transit FWLE stations can be a catalyst for transit-oriented development and redevelopment when local jurisdictions have planned for a higher density of land use and/or mixture of uses in the surrounding vicinity. With increased commercial exposure and walkability, the land surrounding the future Link station sites would become more desirable for development purposes.

The Phase 1 Improvements would benefit the regional economy through transportation efficiencies in the SR 509 corridor. Overall, the effects from investments in transportation infrastructure would be beneficial to businesses and consumers because of improved accessibility in the study area. Factors that influence accessibility include travel times, safety, and the transportation choices available to users. In particular, businesses that rely on the efficient movement of goods and services (such as business supply companies, service providers, and freight operators) would benefit.

Sales and Property Tax Revenue Impacts

According to the 2003 FEIS, the initial property tax impact of Alternative C2 was not expected to be substantial. The fiscal impacts associated with the initial loss of property tax revenues would represent less than 1 percent of each jurisdictions’ total tax revenues. The Phase 1 Improvements would acquire less ROW than Alternative C2 and, as such, would result in fewer fiscal impacts. The initial impact to property tax revenues from the Phase 1 Improvements is not expected to be substantial and would likely be less than with Alternative C2.

Mitigation

The mitigation measures that were imposed under the 2003 ROD that remain relevant to the Phase 1 Improvements are listed below.

- Contractors will be required to submit and receive approval of a construction plan to maintain access for all properties and businesses adjacent to construction activity.

- Coordinate with affected business owners to develop and implement strategies to maintain access to businesses during construction.
- Temporary signs will be installed to inform drivers that access to businesses during construction is unchanged, temporarily changed, or restricted.
- Inform businesses displaced by new right-of-way acquisition or other construction activities that they are entitled to relocation assistance in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policy Act (49 CFR Part 24) and Washington State's Uniform Relocation Assistance and Real Property Acquisition Policy (RCW 8.26).

Conclusion

Economic effects were found to be similar between the Phase 1 Improvements and Alternative C2. With adherence to the mitigation measures described above, no new significant impacts to economics from construction and operation would occur as a result of the Phase 1 Improvements that were not previously identified in the 2003 FEIS for Alternative C2. No new or revised mitigation measures would be required. See also Attachment L for the Economics Technical Memorandum.

4.13. Historic and Archaeological Resources

Affected Environment

The cultural resources affected environment was described in Section 3.12.2 of the 2003 FEIS. An updated survey has since been conducted for this Re-evaluation. The updated analysis included a search of site files available on the Washington Department of Archaeology and Historic Preservation (DAHP) Washington Information System for Architectural and Archaeological Records Data (WISAARD) database; field survey of the project resource evaluation area, including shovel test excavations, and inventoried properties.

A total of 55.03 acres within the project Area of Potential Effect (APE) was surveyed which included all areas where ground disturbance is planned in high archaeological resources probability areas. Historic properties located either one tax lot on each side of the affected rights-of-way or 200 feet from their margins, whichever is less were also inventoried.

The entire 55.03-acre project APE was surveyed using a combination of meandering survey transects in thick vegetation and 10-m intervals in more open and developed areas. Shovel test excavations were conducted at select locations. No prehistoric or historic artifacts were observed during the survey or shovel test excavation.

WSDOT identified 66 buildings/structures with construction dates of 1943 and older within the project APE and associated buffer zones. All 66 buildings, mostly residences, were recorded through the DAHP historic property inventory WISAARD database. Nearly all of the recorded buildings have been altered, with the most common modification being the replacement of original wood sash windows with vinyl sash windows. Other changes include changes to roof or exterior wall surface cladding. Washington State Historic Property Inventory forms were completed for each of the properties. None of these houses were found to be eligible for listing in the National Register of Historic Places (NRHP).

Effects During Operation

Consistent with the 2003 FEIS, the Phase 1 Improvements would not result in any long-term impacts on known state or NRHP listed or eligible cultural resource sites.

Effects During Construction

In the unlikely event that cultural resources are identified during construction or other project-related activities, work should be halted in the immediate vicinity of the find and a professional archaeologist notified to assess the resource.

Mitigation

The mitigation measures that were imposed under the 2003 ROD that remain relevant to the Phase 1 Improvements are listed below.

- Subsurface construction operations will be monitored by a qualified archaeologist when ground disturbance is expected to occur.
- If the archaeological monitor observes what appear to be cultural deposits, construction will be temporarily halted in the “find” location until a preliminary analysis of the find can be made.
- In the event that potentially significant archaeological remains are found during construction, WSDOT late discovery procedures will be applied.

Conclusion

The updated analysis found that there are no historic properties or properties eligible for listing in the NRHP in the study area. No new significant historic and archaeological resources effects would occur as a result of the Phase 1 Improvements that were not previously identified in the 2003 FEIS. See also Attachment M for the Historic and Cultural Resources Technical Memorandum.

4.14. Hazardous Waste

Affected Environment

Section 3.13.2 of the 2003 FEIS described the hazardous waste affected environment. Since 2003, the potentially contaminated sites have changed; some of the previously identified sites are no longer relevant, some sites have undergone complete remediation, and some new sites have been identified. In January 2017, Environmental Data Resources, Inc. (EDR) conducted database searches of all available federal, state, and local environmental regulatory databases for properties within 3 miles of the project alignment. Because the South Access Road would not be constructed as part of the Phase 1 Improvements, many of the sites identified in the FEIS were found to be outside of the project footprint and irrelevant to the Phase 1 Improvements. Although there have been minor changes in land use within or directly adjacent to the project alignment, contaminants within the study area are similar to those described in the 2003 FEIS.

The sites identified in the EDR search have potentially affected soil and/or groundwater and consist mainly of auto repair facilities, fueling stations, dry cleaners, and businesses with underground storage tanks containing hazardous substances. Similar to the 2003 FEIS findings, the majority of contaminants are likely to be petroleum hydrocarbon, solvents, and heavy metals. Furthermore, there are several commercial and residential properties that do not contain soil or groundwater contamination but are likely to contain hazardous materials such as asbestos, lead-based paints, and petroleum products. Due to the size and alignment of the Phase 1 Improvements, encountering petroleum contamination at some point during construction is likely, and soils should be screened during earthwork.

Effects During Operation

The operational impacts discussed in the 2003 FEIS remain applicable to the Phase 1 Improvements, and no new significant impacts were identified.

Effects During Construction

An updated risk analysis was conducted for the Re-evaluation in accordance with WSDOT's HazMat Discipline Report Guidance for each of the sites identified in the EDR search. The analysis assigned a risk category to each of the sites of concern and then considered the expected complexity of the mitigation measures for each site (straightforward or complicated). For the purposes of the Re-evaluation, the risk categories are defined as follows:

- **Low Impact** – This risk level identifies sites of concern where the likelihood for the site to have significant impacts on the project is low because the known or suspected contamination can be easily and inexpensively cleaned up. This category includes many former gas stations, auto repair shops or spill sites where the extent of the contamination is expected to be low and easily managed, or where cleanup efforts have remediated the soil to a point where minimal additional work will be required. Sites with petroleum contamination are generally considered low-risk within the context of this project due to the low cost and relative simplicity of handling and disposal.
- **Moderate Impact** – This risk level identifies sites of concern where the likelihood for the site to have significant impacts on the project is moderate because the type or extent of contamination may be expensive or difficult to clean up. This category includes historic dry-cleaning operations or sites with a long history of storing or generating hazardous materials.
- **High Impact** – This risk level identifies sites of concern that may be substantially contaminated and are likely to create a major liability for WSDOT. In general, high impact sites are properties that have large volumes of contaminated soil, groundwater, or sediment, or properties that have multiple complex types of contaminants requiring special handling and disposal that expensive to manage.

Four moderate impact sites and one high impact site were identified for the Phase 1 Improvements (Table 33). Two of the sites (Battery Power Systems, Inc. and Midway Landfill) were identified as substantially contaminated in the 2003 FEIS. Three additional High or Moderate Impact sites (Kent Highlands Landfill, Hertz Corp, and Jet Dry Cleaners/Kings Dry Cleaners) have been identified within the project area since 2003. These sites are expected to have construction impacts similar to the previously identified substantially contaminated sites identified in the 2003 FEIS. As such, the construction impacts described in the 2003 FEIS remain applicable to the Phase 1 Improvements. Specific impacts fall into the following general categories and are discussed in Section 3.13.3 of the 2003 FEIS:

- Building demolition debris, asbestos, and lead-based paint
- Contaminated soil
- Contaminated groundwater
- Worker protection
- Underground storage tanks
- Air quality
- Storm and surface water

Table 33. Summary of High or Moderate Impact Sites that could be Affected by Phase 1 Improvements		
Site Name	Distance from Construction	Concerns & Recommendations
Hertz Corp. 18625 Des Moines Memorial Drive S	>100 ft. No Acquisition	This site was removed from the Voluntary Cleanup Program in April 2017 after failing to respond to Ecology's request for status updates. Subsurface conditions are currently unknown, but it is likely that the soil and groundwater on site remain contaminated. Though design information indicates no construction within site boundaries, a review of readily available documents indicated that shallow contaminated groundwater may have migrated off site in the direction of adjacent clearing and grading activities. If contaminated groundwater is encountered, a permit for proper treatment and subsequent discharge will likely be necessary.
Battery Power Systems 2367 S 200th Street	On site Partial acquisition	This site was listed as a site of concern in the 1999 EIS and the 2003 FEIS due to the site's historical use as a battery recycling facility and the lack of any records indicating soil or groundwater sampling. Because the suspected contamination remains unquantified, the site could potentially affect the project. The primary risk associated with this site is that of soil disposal. The southern portion of the site has been acquired by WSDOT for bridge and pier abutment, fill placement, clearing, and grading. WSDOT will conduct a Phase II investigation prior to the start of construction. Any soils being exported from the site will need to be characterized and may require a contained-in determination, depending on the type and extent of contamination.
Kent Highlands Landfill 23076 Military Road S	>300 ft. No acquisition	Ecology-supervised site cleanup is complete, but groundwater contamination was still present at the time of the most recent periodic review (2014). Monitoring is ongoing. Due to the topography of the site, contaminated groundwater migration is unlikely to affect construction. However, a review of readily available monitoring records indicates soil vapor migration into the vicinity of SR 516 and Military Rd S, where earthwork will occur. Methane gas poses an inhalation hazard to workers and can be explosive at high concentrations. A detailed Health and Safety Plan will be necessary for work in this area.
Jet Dry Cleaners/ Kings Dry Cleaners 23418 S Pacific Hwy	>100 ft. No acquisition	This site has no recorded violations; however, it still presents a moderate risk of affecting the project based on its historical use as a dry-cleaning facility. No construction activities are planned within the boundaries of this site, but any potential releases to the soil would be likely to affect nearby work on SR 516 and SR 99. WSDOT will conduct pothole sampling and soil analysis for adjacent ground-disturbing work. Soils found to be contaminated with PCE (tetrachloroethylene) and TCE (trichloroethylene) should be expected to constitute soil management and worker safety issues.
Midway Landfill 24800 Pacific Hwy S	>50 ft. No acquisition	Federally supervised cleanup efforts are complete, but groundwater contamination was still present at the time of the most recent periodic review (2015). Monitoring is ongoing. Similar to Kent Highlands Landfill, contaminated groundwater migration is unlikely to affect construction. However, a review of readily available monitoring records indicates soil vapor migration along the west side of I-5. Methane gas poses an inhalation hazard to workers and can be explosive at high concentrations. A detailed Health and Safety Plan will be necessary for work in this area.

In general, the Phase 1 Improvements will remediate the past contamination at sites within the right-of-way and result in improved conditions. The public health impacts discussed in the 2003 FEIS remain applicable to the Phase 1 Improvements, and no new significant impacts were identified.

Mitigation

The mitigation measures that were imposed under the 2003 ROD that remain relevant to the Phase 1 Improvements are listed below. In summary, WSDOT would:

- Conduct assessments of sites where contamination may be present to identify the presence and extent of any contaminants
- Locate underground storage tanks and fuel lines before construction to reduce the potential for breakage and resulting spills

- Survey structures that would be demolished to determine whether they contain hazardous building materials like asbestos, lead-based paint, and PCBs (polychlorinated biphenyls)
- Specify construction techniques that minimize disturbance to areas where contamination may exist
- Comply with WSDOT's *Environmental Manual* M31-11 (June 2017), which provides standard protocols for dealing with hazardous materials during construction
- Prepare a spill prevention, control, and countermeasures plan and a stormwater pollution prevention plan to prevent the release of pollution and hazardous substances to the environment

Conclusion

Hazardous materials effects were found to be similar between the Phase 1 Improvements and Alternative C2. No new significant impacts related to hazardous materials would occur as a result of the Phase 1 Improvements that were not previously identified in the 2003 FEIS. No new or revised mitigation measures would be required. See also Attachment N for the Hazardous Materials Technical Memorandum.

4.15. Visual Quality

Affected Environment

The key views that were selected for Alternative C2 and described in the 2003 FEIS are still relevant to the Phase 1 Improvements. These views are shown on Figure 10 and listed in Table 34 and generally represent locations at which major viewer groups could be expected to look toward the proposed project and would be likely to see its principal visual effects. This Re-evaluation added a new key view (Key View 14) to account for Sound Transit's new Angle Lake Station and the potential viewers from this location.

Key Views¹	Visual Resource	Key Views and Viewers
Key View 1 - S 192nd Street at Prince of Peace Church parking lot	East-facing hillside with intermittent views to Cascade Mountains; mature coniferous trees; established single-family residential neighborhood and airport-related industrial development on lower slopes; Des Moines Memorial Drive South (tree-lined historic route); existing visual quality is moderate.	Low numbers of residential viewers with high viewer sensitivity, but exposure to east limited by dense tree cover.
Key View 2 - S 200th Street near 18th Avenue S Key View 8 - S 200th Street at Des Moines Creek Trailhead	Moderately broad stream valley with internal views; wooded slopes, bottomland meadows, and riparian trees; Tyee Valley Golf Course (which has subsequently been closed) and Des Moines Creek Park and Trail; existing visual quality is moderately high to high.	Moderate numbers of recreational users with high viewer sensitivity and high viewer exposure to foreground and middle ground views (trail development in the City of Des Moines with connection to Puget Sound will increase user numbers; City of SeaTac also proposes future extension of the trail northward, across S 200th Street and west of Sea-Tac Airport).
Key View 6 - S 182nd Street and SR 99	Gentle east-facing slope of Bow Lake basin with internal views; street trees and ornamental plantings along International Boulevard South (SR 99); massive airport terminal on west side of boulevard faced by large, multistory hotel and office structures, which are replacing remaining small commercial buildings; existing visual quality is moderate.	High numbers of visitors and employees with moderate viewer sensitivity and high viewer exposure to foreground views.

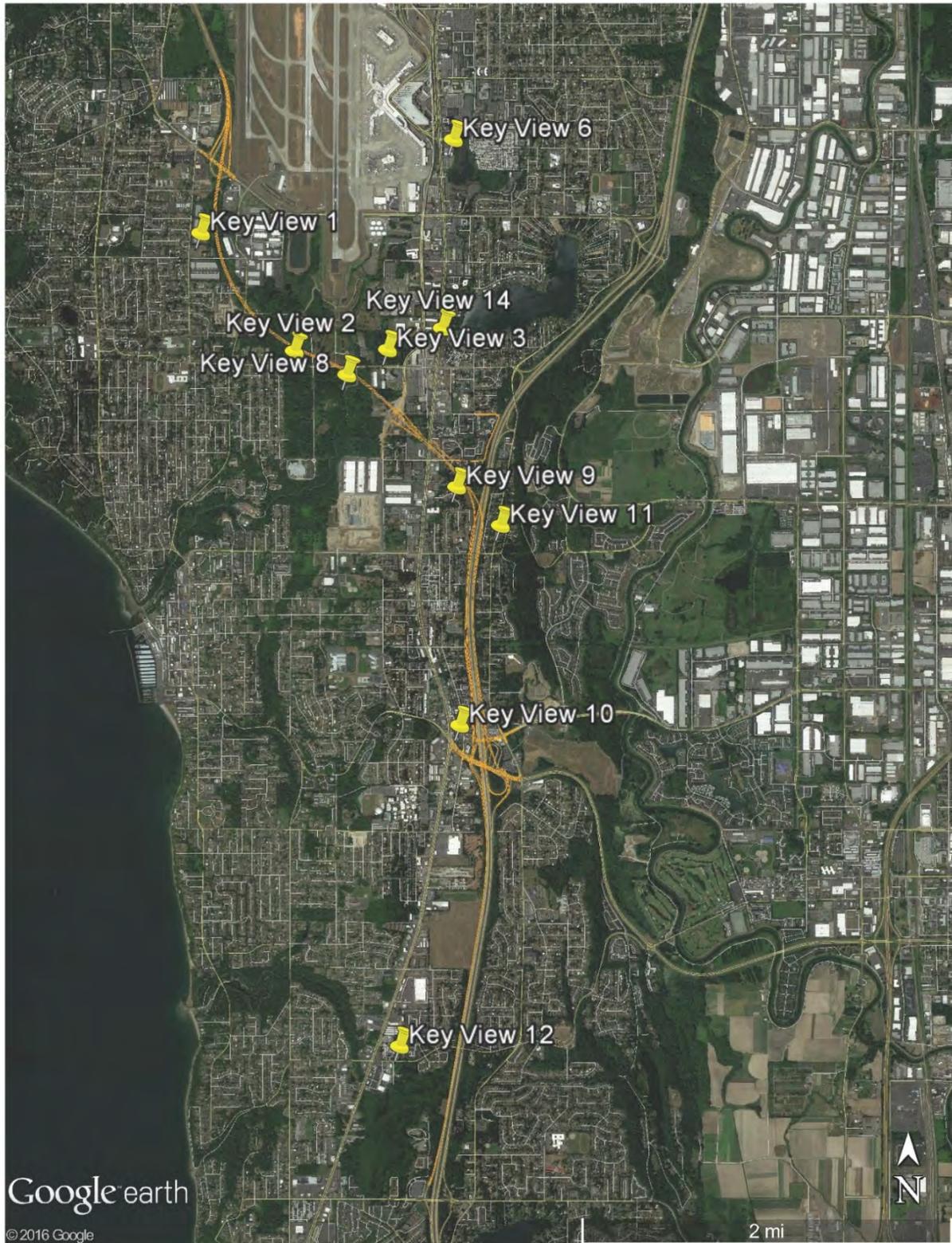
Table 34. Key Views, Visual Resources, and Viewers		
Key Views¹	Visual Resource	Key Views and Viewers
Key View 3 - S 200th Street and 26th Avenue S	Gentle ridgetop with views east to Angle Lake basin and west to Des Moines Creek valley; street trees and ornamental plantings along SR 99; remnant residential plantings within west side of 28th Avenue S; large, multistory hotel and office structures (including the Federal Detention Center just to the left of the key view) are replacing remaining small commercial buildings along SR 99; one- to three-story multifamily residential buildings along I-5 buffered by strip of mature coniferous trees; existing visual quality ranges from moderate (most views) to moderately high (views from edge of plateau).	Moderate numbers of visitors and employees with moderate viewer sensitivity and viewer exposure limited to foreground views except along edge of plateau; moderate numbers of residential viewers with high viewer sensitivity in multifamily portion of unit, but exposure is limited to foreground views.
Key View 9 – S 212th Street and 31st Avenue S	Gentle ridgetop with views on west slope over SR 99 to Olympic Mountains; mature trees in established single-family neighborhood between SR 99 and I-5 buffered by strip of mature coniferous trees; existing visual quality ranges from moderate (most views) to moderately high (distant views from western slope).	Moderate numbers of residential viewers with high viewer sensitivity in mixed multifamily and single-family housing, but exposure to existing roadways is generally limited to foreground views.
Key View 10 – Kent-Des Moines Road to S 216th Street Key View 11 - S 260th Street to S 252nd Street	Gentle ridgetop with views on west slope over SR 99 to Olympic Mountains; commercial uses along SR 99; mixed multifamily and single-family neighborhood between SR 99 and I-5, buffered by mature trees from both roadways; existing visual quality ranges from moderate (most views) to moderately high (distant views from multifamily buildings on western slope).	Moderate numbers of residential viewers with high viewer sensitivity in mixed multifamily and single-family housing, but exposure to existing roadways is generally limited to foreground views.
Key View 12 - S 260th Street to S 252nd Street Key View 13 - S 310th Street to S 298th Street	Rolling topography with few ridgetop views; mature coniferous and deciduous trees; established single- and multifamily residential neighborhoods with schools and playfields; existing visual quality is moderate.	Moderate numbers of residential viewers with high viewer sensitivity, but exposure is generally limited to foreground views by terrain and tree cover.
Key View 14 – Angle Lake Station	View toward Angle Lake Station. S 200th Street and 28th Avenue S, in foreground looking southeast. New light rail guideway and parking visible in middle ground.	High numbers of visitor and employee viewers, with moderate viewer sensitivity

¹ The 2003 FEIS included Key Views 1 through 13. Key views 4, 5 and 7 were not applicable to Alternative C2 and the Phase 1 Improvements and therefore are not listed in this table.

Key Views

The key views that were selected for Alternative C2 and described in the 2003 FEIS are still relevant to the Phase 1 Improvements. They generally represent locations at which major viewer groups could be expected to look toward the proposed project and would be likely to see its principal visual effects. A new key view (Key View 14) has been added since the 2003 FEIS to account for Sound Transit's new Angle Lake Station and the potential viewers from this location.

Figure 10. Key Views and Phase 1 Improvements



Effects During Operation

The visual quality analysis provided in the 2003 FEIS for project operation remains applicable to the Phase 1 Improvements. The viewer response and visual quality change would be similar to those

described for Alternative C2, except that fewer visual changes would occur because the Phase 1 Improvements would not include construction of the South Access Road and the SR 509 roadway under Phase 1 would be narrower than Alternative C2. Under the Phase 1 Improvements, the SR 509 roadway would follow the same horizontal alignment as Alternative C2.

Table 35 summarizes the key visual impacts from Alternative C2 and identifies whether these impacts would differ with the Phase 1 Improvements. As shown, the level of change for the Phase 1 Improvements would be less than or similar to the change described for Alternative C2 in the 2003 FEIS.

Table 35. Comparison of Key Views Visual Quality Impacts			
Key View ¹	Location	Alternative C2	Phase 1 Improvements
1	South 192nd Street at Prince of Peace Church parking lot	Moderate impact Foreground views of SR 509 (including S 188th Street interchange) with associated cut slopes and tree clearing, seen by low numbers of residential viewers with high viewer sensitivity; includes a bridge over a wetland	Foreground views of SR 509 would be similar to those described for Alternative C2. SR 509 would be narrower, and the S 188th Street interchange would be smaller than Alternative C2.
2	S 200th Street near 18th Avenue S	High impact Foreground views of SR 509 bridge and foreground and middle ground views of South Access Road seen by moderate numbers of recreational users with high viewer sensitivity; City of SeaTac proposes future extension of Des Moines Creek Trail to the north, across S 200th Street.	The South Access Road would not be constructed as part of the Phase 1 Improvements. Foreground views of SR 509 would be similar to those described for Alternative C2.
3	S 200th Street and 26th Avenue S	High impact Foreground views of South Access Road with associated cut slopes, retaining walls, and tree clearing, as well as widened S 200th Street with associated tree clearing in valley bottom and Des Moines Creek Park entry, seen by moderate numbers of visitors and employees with moderate viewer sensitivity. Foreground views of noise walls along SR 509 and ramps between SR 99 and I-5, seen by moderate numbers of residential viewers with high viewer sensitivity in multifamily housing.	The South Access Road would not be constructed, and S 200th Street would not be widened as part of the Phase 1 Improvements. Foreground views along SR 509 and ramps between SR 99 and I-5 would be similar to those described for Alternative C2.
6	S 182nd Street and SR 99	Low impact Foreground views of widened South Access Road, with associated steeper slope, loss of existing trees and landscaping, and new overpass, seen by high numbers of visitors and employees with moderate viewer sensitivity; views of project may be partially obstructed by first phase of the Sound Transit Central Light Rail Transit project.	The South Access Road would not be constructed as part of the Phase 1 Improvements; therefore, there would be no changes to views at this location.
8	S 200th Street at Des Moines Creek Trailhead	High impact Foreground views of SR 509 bridge and foreground and middle ground views of South Access Road seen by moderate numbers of recreational users with high viewer sensitivity; City of SeaTac proposes future extension of Des Moines Creek Trail to the north, across S 200th Street.	The South Access Road would not be constructed as part of the Phase 1 Improvements. Foreground views of SR 509 would be similar to those described for Alternative C2.
9	S 212th Street and 31st Avenue S	High impact Foreground views of tree clearing and noise walls along collector/distributor lanes on both sides of I-5, seen by moderate numbers of residential viewers with high viewer sensitivity in single-family housing.	Foreground views of light rail guideway and tree clearing along I-5 would be similar to those described for Alternative C2.

Table 35. Comparison of Key Views Visual Quality Impacts			
Key View ¹	Location	Alternative C2	Phase 1 Improvements
10	Kent-Des Moines Road to S 216th Street	High impact Foreground views of tree clearing and noise walls along collector/distributor lanes on both sides of I-5, seen by moderate numbers of residential viewers with high viewer sensitivity in single-family and multifamily housing.	Foreground views of tree clearing and noise walls along I-5 would be similar to those described for Alternative C2.
11	S 216th Street to S 228th Street	Same as described for Key View 10.	Views would be similar to those described for Alternative C2.
12	South 260th Street to South 252nd Street	Same as described for Key View 10.	Views would be similar to those described for Alternative C2.
13	S 310th Street to S 298th Street	Same as described for Key View 10.	Improvements to I-5 would not extend beyond S 272nd Street; therefore, there would be no changes to views at this location.
14	Angle Lake Station	Was not analyzed in the 2003 FEIS.	Foreground views of SR 509 seen by high numbers of visitors and employees with moderate viewer sensitivity and high viewer exposure to foreground views.
¹ The 2003 FEIS included Key Views 1 through 13. Key views 4, 5 and 7 were not applicable to Alternative C2 and the Phase 1 Improvements and therefore are not listed in this table.			

Effects During Construction

Temporary visual impacts during construction would be similar to those described in the 2003 FEIS and would include the presence of construction equipment, materials, signage, disturbed areas, and staging areas in the construction zone that would reduce the visual quality of the immediate area. In addition, temporary lighting may be necessary for nighttime construction of certain project elements or at certain locations. Examples may include nighttime construction along existing road or highway ROWs to minimize disruption of daytime traffic. This temporary lighting could impose impacts on residential areas by exposing residents to uncomfortable glare from unshielded light sources or by increasing ambient nighttime light levels.

Mitigation

The mitigation measures that were imposed under the 2003 ROD that remain relevant to the Phase 1 Improvements are listed below.

- Use an interdisciplinary design team to incorporate aesthetic considerations in project design subsequent to the environmental review process.
- Minimize clearing for construction and preserve existing stands of mature trees and other attractive natural vegetation as practical.
- Plant appropriate vegetation within the project ROW to preserve the semi-urban character of existing views; to screen views of the roadway, elevated structures, retaining walls, noise walls, and other project features from areas with high viewer sensitivity; and to blend the project appearance with adjoining natural landscapes to the maximum feasible extent.
- Consider using long-span bridge crossings at trails, streams, and wetlands to minimize view obstruction and interruption of visual continuity.

- Employ the SR 509 Visual Guidelines and Updates to enhance the appearance of project features, such as retaining walls and noise walls.
- The project will replace trees according to WSDOT's Roadside Policy Manual M 3110.03 (2015) requirements, with highly sensitive/highly affected locations responding directly to the impacts and other locations as contextually appropriate.
- Investigate opportunities to acquire sufficient ROW to provide space for plantings near retaining and noise walls that adjoin areas with high viewer sensitivity. Retain remainder parcels that contain attractive natural vegetation that could contribute to the quality of view toward the proposed project or that could screen views from sensitive viewers.

Conclusion

Visual quality effects of the Phase 1 Improvements were found to be somewhat less than Alternative C2. With adherence to the mitigation measures described above, no new significant impacts to economics from construction and operation would occur as a result of the Phase 1 Improvements that were not previously identified in the 2003 FEIS for Alternative C2. No new or revised mitigation measures would be required. See also Attachment O for the Visual Quality Technical Memorandum.

4.16. Section 4(f)

Affected Environment

Des Moines Creek Park and Trail

Section 4.2 of the 2003 FEIS described the Section 4(f) resources affected environment. Figure 4.2-1 from the 2003 FEIS shows the Des Moines Creek Park property and the Des Moines Creek Trail alignment in the study area. The discussion on the current use and value of the Des Moines Creek Park and Trail in the 2003 FEIS remains applicable to the Phase 1 Improvements, with the exception that the legal transfer of 51.9 acres of park property from King County to the City of SeaTac has been completed.

As discussed in the 2003 FEIS, the future use of the Des Moines Creek Park and Trail is formally guided by the Parks, Recreation, and Open Space element of the current SeaTac Comprehensive Plan. Although this plan has been updated since the 2003 FEIS, the intent of the primary policies are the same as those described the previous analysis. The primary policy (Policy 9.3F) of the current plan (adopted June 23, 2015) is to "Provide multiple open space benefits for lands preserved for public parks or open space whenever possible. Multiple benefits include, but are not limited to, active or passive recreation opportunities accessible to all visitors, scenic vistas, and fish or wildlife habitat, many of which can be provided by natural surface water drainage systems, including wetlands." The plan also identifies the need to complete a Master Plan for the large open space in Des Moines Creek Park.

The City of Des Moines also has an updated Parks, Recreation, and Senior Services Master Plan (adopted in 2009). As it was in 2003, the Des Moines Creek Park is classified as "Conservancy" and intended for the protection and management of the natural/cultural environment, with recreation use as a secondary objective.

Effects During Operation

In the 2003 ROD, the FHWA made a determination that Alternative C2 (the Selected Alternative) incorporated all possible planning to minimize harm to the Section 4(f) land and resources to the extent allowable, based on the level of detail available when the 2003 FEIS was prepared. Furthermore, the determination found that there were no feasible and prudent locations or alternatives for the action to avoid the use of Section 4(f) land and resources, and no other feasible and prudent alternative was more effective in minimizing potential harm to Section 4(f) resources.

As discussed below, the Phase 1 Improvements would not result in any new impacts to Des Moines Creek Park and Trail, and the determination as described in the 2003 ROD remains applicable to the Phase 1 Improvements.

Des Moines Creek Park and Trail

Similar to Alternative C2, the Phase 1 Improvements would cross the northeast corner of Des Moines Creek Park on a bridge structure that would vary in height between 30 and 46 feet. As shown in Figure 11, the Phase 1 Improvements would be narrower, with one 82-foot-wide structure as compared to the two separate 60-foot-wide structures that were proposed under Alternative C2. Like Alternative C2, the narrower Phase 1 Improvements would accommodate the continued use of the trail. Although, the width of the Phase 1 structure would be narrower than the combined width of the two structures proposed under Alternative C2, the amount of property to be acquired for the bridge structure would be the same (4.2 acres of parkland).

Figure 11 Phase 1 Improvements over Des Moines Creek Park



Under the Phase 1 Improvements, the existing trailhead parking area along S 200th Street would be adjacent to the new SR 509 roadway structure but would not be covered. Alternative C2 would have covered a portion of this parking because of its wider footprint.

As was the case for Alternative C2, the new SR 509 bridge would separate a small 2.1-acre triangular area to the northeast from the remainder of Des Moines Creek Park to the south. Except for the trailhead parking area, much of this separated northern area is wetland and wetland buffer and is not currently used for recreation nor planned for future recreational development. The bridge span over the park would vary in height between 30 and 46 feet, and the bridge structure would not make this area any less usable than it is currently. As explained in the 2003 FEIS, except for the trailhead parking area, much of this separated northern area is wetland and wetland buffer and not currently used for recreation nor planned for future recreational development. The rest of the park would remain unaffected and contiguous.

As shown in Table 36, the Phase 1 Improvements would not construct the South Access Road, and therefore would result in the acquisition of less park area than Alternative C2.

Bridge Structure	Alternative C2	Phase 1 Improvements
Width	Two separate 60-foot-wide elevated structures with 30- to 40-foot space between the structures	One 82-foot-wide elevated structure
Length	1,000 feet long	1,000 feet long
Clearance	Approximately 35 feet of clearance	Approximately 35 feet of clearance
SR 509 - Land acquisition	4.2 acres of parkland	4.2 acres of parkland
South Access Road - Land acquisition	0.5 acre of parkland	No acquisition of parkland

As was the case for Alternative C2, the Phase 1 Improvements would cross Wetland A within Des Moines Creek Park on a wetland structure. The bridge span over Wetland A would vary in height between 30 and 46 feet. The Phase 1 structure would be narrower than the combined width of the structures under Alternative C2.

As was the case for Alternative C2, the presence of a new bridge structure would cause a visual impact for park/trail users. The structure would be a dominating visual feature for those who use the immediately adjacent trailhead parking area and the trail. Sound levels with the Phase 1 Improvements would be 54 dBA, which is below the WSDOT/FHWA NAC and the predicted peak hour Leq noise level from Sea-Tac Airport (68 dBA).

Effects During Construction

Construction of the SR 509 bridge structure over Des Moines Creek Park with the Phase 1 Improvements would result in some temporary impacts to park and trail users. As was the case for Alternative C2, construction of the elevated structure would likely require the temporary closure of the trailhead parking area and the northernmost 275 feet of the trail between the trailhead and the southern edge of the structure for safety reasons. This closure would be timed to occur during off-peak periods.

Construction within the park is expected to take approximately 36 months. Timber or steel temporary work bridges would be used where conditions won't support construction equipment. Construction of the work bridge would likely be accomplished from a crane located in upland areas where the crane could swing out to install a row of piles. When a row of piles has been installed, a steel cap beam would be set on top to create what is called a pile bent. Support beams would then be welded from one pile bent to the next. Timber deck panels would then be bolted to the support beam, and the crane would be advanced out onto the span. This type of operation would continue until all the bents and work bridge spans are in place.

The permanent bridge within the park area would be constructed from the work bridges. The permanent bridge would be supported by reinforced-concrete, drilled shaft foundations topped with cast-in-place concrete bridge columns. The bridge superstructure (girders and bridge deck) would be constructed on top of the support structure. The main spans for the bridge are expected to be steel girders (or similar long span superstructure), which would be lifted into place from the work bridge. The permanent bridge deck would be formed in-place and cast from the deck level. The temporary work bridge would be removed in a similar manner to its construction when construction of the permanent bridge is completed.

Mitigation

As stated in the 2003 ROD, consistent with 23 CFR Section 771.135, the FHWA has made a determination that the Selected Alternative incorporates all possible planning to minimize harm to the

Section 4(f) land and resources to the extent allowable based on the level of detail available at the Final EIS. Furthermore, this determination finds that there are no feasible and prudent locations or alternatives for the action to avoid the use of Section 4(f) land and resources; and no other feasible and prudent alternative is more effective in minimizing potential harm to Section 4(f) resources. Details regarding the effects to Section 4(f) resources, the proposed mitigation to offset and minimize those effects, and concurrence from all relevant local jurisdictions is included in Chapter 4 and the associated Section 4(f) Appendix of the 2003 FEIS.

The mitigation measures discussed in the 2003 FEIS would remain applicable to the Phase 1 Improvements. As discussed in Section 4.5.1 of the 2003 FEIS, WSDOT would replace the parkland acquired with an equal amount of acreage of reasonably equivalent or greater recreational utility within the existing SR 509 ROW north of S 208th Street and immediately adjacent to Des Moines Creek Park's western boundary, or another mutually agreeable location. This land trade agreement is currently in progress. WSDOT has also fulfilled its commitment to help fund the construction of the new Marine View Drive bridge over Des Moines Creek. This new bridge has been constructed and includes an underpass that will allow Des Moines Creek Trail users to reach the Puget Sound shoreline, thus expanding trail use opportunities. The new bridge is also one of five projects that comprise the Des Moines Creek Basin Plan (to which WSDOT is a partner), and thus helps implement the water quality and fish habitat improvement goals of the plan which will, in turn, result in greater recreational value for the park.

The Phase 1 Improvements would not require the relocation of the trailhead and associated parking area within Des Moines Creek Park, as was described in the 2003 FEIS for Alternatives C2. If the trailhead parking area and trail need to be closed during construction for safety reasons, alternative facilities would be provided to ensure continued use of the park.

WSDOT and the Sea Tac Parks Department also had agreed to integrate a northward extension of the Des Moines Creek Trail into the design of the SR 509 improvements. Since the 2003 FEIS, progress has been made on the northward extension of the Des Moines Creek Trail. King County has completed 30-percent design of the 2.2-mile Lake to Sound Segment C trail and will construct the multi-use trail from Des Moines Creek Trail at South 200th Street to South Normandy Road. WSDOT has agreed to pay for construction of this segment of trail to satisfy the previously approved Section 4(f) mitigation. City of Sea Tac staff have reviewed the County's design, and concur that WSDOT's funding of the trail specifically meets the portion of the approved mitigation package pertaining to trail extension. The Lake to Sound Trail, Segment C is expected to be completed in 2018–2019. The trail alignment is shown on Figure 12.

Figure 12 Northward Extension of Des Moines Creek Trail



Conclusion

The impacts to Des Moines Creek Park and Trail described in the 2003 FEIS and ROD remain applicable to the Phase 1 Improvements, which would have no new significant impacts. As was stated previously, in the 2003 ROD, the FHWA made a determination that Alternative C2 (the Selected Alternative) incorporated all possible planning to minimize harm to the Section 4(f) land and resources to the extent allowable based on the level of detail available when the Final EIS was prepared. Furthermore, the determination found that there were no feasible and prudent locations or alternatives for the action to avoid the use of Section 4(f) land and resources, and no other feasible and prudent alternative was more effective in minimizing potential harm to Section 4(f) resources.

With adherence to the measures described above, no new significant impacts to Section 4(f) resources would occur as a result of the Phase 1 Improvements that were not previously identified in the 2003 FEIS. No new or revised mitigation measures would be required. See also Attachment P for the Section 4(f) Technical Memorandum.

4.17. Environmental Justice

Since 2003, the FHWA guidance for conducting environmental justice has been refined. Current guidance recommends that the use of thresholds to identify environmental justice communities be avoided. Guidance recommends that a demographic analysis be conducted of affected communities first and then consideration of project impacts be given to any low-income, minority or limited English speaking populations. The potential for disproportionately high and adverse effects, not the population size, should be the basis for environmental justice.

Current demographic analyses indicate that minority, low-income, and persons who are limited English proficient reside in the project study area. There are also minority, low-income, and limited English proficient individuals living in the SR 509 travelshed (the geographic area from which traffic on SR 509 originates).

Table 37 compares demographic conditions in 2000 to 2017. This analysis shows that, since 2000, the percentage of individuals identifying as a minority has increased—in some cases, substantially—in 12 of the 16 census block groups in the study area. The percentage of households with incomes at or below the federal poverty level has also increased in 7 of the 16 census block groups. The Table 37 source notes indicate whether the percentages reflect actual data or estimates.

Census Block Group	Percent Identifying as Minority		Percent Households at or below poverty level	
	2003 ^a	2017 ^b	2003 ^{c,d}	2017 ^e
Average for Study Area	39%	59%	18%	15%
King County	32%	32%	8%	10%

^a Source: U.S. Census Bureau *Census 2000* (2001)

^b Source: U.S. Census Bureau *2011-2015 American Community Survey 5-Year Estimates* (2016a)

^c Source: U.S. Census Bureau *Census 2000* (2001) (estimated)

^d In 2000, the U.S. Census did not report poverty status. To calculate poverty status, the analyst added the number of households with incomes at or below the 2000 U.S. Department of Health and Human Services poverty guidelines for the 48 contiguous states and D.C., which was \$19,950 for a household of five individuals.

^e Source: United States Census Bureau *2011-2015 American Community Survey 5-Year Estimates* (2016b)

Data from the 2015–2016 school year includes the percentage of students identifying as a minority in each of the five elementary schools in the study area and the percentage of students eligible for free- and reduced-price lunches, which is a proxy for low-income status. Data on minority-identifying students is available for the 2003–2004 school year at the elementary school level, but is not available on eligibility for free- and reduced-price lunches. Table 38 compares conditions in 2003 to the present.

These data closely match the results of the demographic analysis and show that the percentage of students identifying as a minority has increased from 56 percent in 2003 to 77 percent today.

Elementary School	Percent of Students Identifying as Minority		Percent of Students Eligible for Free- and Reduced-Price Lunch		Percentage of Transitional or Bilingual Students	
	2003	2017	2003	2017	2003	2017
Des Moines	41%	59%	Was not evaluated	50%	Was not evaluated	23%
Gregory Heights	37%	60%	Was not evaluated	53%	Was not evaluated	52%
Madrona	83%	93%	Was not evaluated	82%	Was not evaluated	42%
Midway	62%	91%	Was not evaluated	75%	Was not evaluated	12%
North Hill	43%	55%	Was not evaluated	50%	Was not evaluated	30%
Average for all elementary schools in study area	56%	77%	Was not evaluated	63%	Was not evaluated	13%

Source: Washington Office of Superintendent of Public Instruction (2016)

The 2003 FEIS, did not consider limited English proficiency in its analysis. The U.S. Department of Justice recommends translating materials for each eligible limited English proficient language group that constitutes 5 percent or 1,000 individuals, whichever is less, of the population eligible to be served or

likely to be affected. In the study area as a whole, 18 percent of residents have limited English proficiency.

Effects During Operation

The adverse effects to environmental justice populations from the Phase 1 Improvements would be similar to those described in the 2003 FEIS, with one important exception: The 2003 FEIS did not assume tolling on SR 509, so the 2003 FEIS did not identify environmental justice benefits or effects related to tolling. Following the guidance of a 2009 research report conducted by the University of Washington and funded by WSDOT the environmental justice analysis below asked the following questions to determine whether a specific toll will have a disproportionately high and adverse effect on certain populations (Plotnick et al., 2009):

1. How would different households use the transportation facilities after a toll is imposed?
2. How would tolls affect the economic status of low-income and non-low-income households, on average?
3. How would travel times improve for residents who choose tolled routes and worsen for those who do not?
4. How would the potential travel behavior changes differ by income status?

How would different households use the transportation facilities after a toll is imposed?

A key assumption of tolling for Phase 1 improvements is that no tolls would be charged on existing facilities. As such, tolls on the proposed new facility are unlikely to affect most existing SR 509 users, including low-income, minority, and limited English proficient individuals who currently use the existing SR 509.

Currently, all potential future users of the new SR 509 extension—low-income and non-low-income—use I-5 and arterials to travel in the study area. When the Phase 1 Improvements are operational, traffic analysts forecast that some people who are currently using I-5 and arterials would change to using SR 509.

Toll rates are assumed to be \$1 to \$4 per trip, to be determined by the Washington State Transportation Commission in the future. If the tolls are at the low end of the potential range (\$1-2), which are relatively low compared to other tolled facilities in the region, we anticipate there would not be a substantial income difference between people who choose to use the new facility and people who use untolled alternatives. Evidence from other facilities with similarly priced tolls support this assumption.

Tolling could affect the extent to which individuals with limited English proficiency use the new Phase 1 Improvements facility:

- The electronic toll system could adversely affect limited English proficient users who have difficulty understanding the toll system.
- Limited English proficient residents who do not understand the system could accumulate significant collection debt. A \$1 trip for someone who understands the system can quickly grow to \$40 for someone who doesn't, when WSDOT adds the toll surcharge plus late fees for those individuals who do not pay their bill on time.

All-electronic tolling could adversely affect individuals who do not have debit, credit card, or EBT accounts; do not have enough funds to start an electronic toll account; or do not have Internet access. Many of these individuals are low-income and/or limited English proficient. Individuals would be able to open an account in person using cash at one of three customer service centers located in Seattle, Bellevue, or Gig Harbor. Some customers, especially those living in South King County, may have difficulty getting to one of these customer service centers. The WSDOT Toll Division has a first-time

penalty forgiveness program, which may help for those new to tolling. Residents can also receive language support by calling the “Good to Go!” call center.

How would tolls affect the economic status of low-income and non-low-income households, on average? Any toll, even relatively low-cost tolls, would disproportionately affect low-income households. As shown in Table 39, the toll would represent a higher proportion of annual income for low-income users. For a daily user who has a Good to Go! pass, the annual cost for traveling on the new facility 5 days a week, two times a day, 48 weeks of the year to be approximately \$480–\$1,920.

Toll Rate	Yearly Cost	Low-Income User ^a	Middle-Income User ^b	High-Income User ^c
		\$28,780/year or less	\$82,000/year	\$123,000/year or more
\$1/each trip	\$480	1.7% of annual income	0.6% of annual income	0.4% of annual income
\$4/each trip	\$1,920	6.7% of annual income	2.4% of annual income	1.6% of annual income

^a Health and Human Services federal poverty level of household of 5 individuals
^b Median household income for King County
^c 1.5 x median household income for King County

For users of the Phase 1 Improvements who do not have a Good To Go! pass, the costs would be even higher. WSDOT would charge a \$2 surcharge on each trip for customers who pay by mail, instead of using a Good to Go! pass. These surcharges could add up very quickly for a regular user of the tolled facility. For example, if someone uses the new SR 509 facility just twice a week and pays by mail, their annual cost would be \$288–\$576. For a daily user who pays by mail, their annual cost would be \$1,440–\$2,880. This would represent 5 to 10 percent of a low-income household’s annual income compared to 2 to 3.5 percent for higher-income users.

3How would travel times improve for residents who choose tolled routes and worsen for those who do not? A key benefit of the Phase 1 Improvements is that all users—including low-income, minority, and limited English proficient users—would have a new travel option in the study area. For those motorists who cannot afford or do not want to pay the toll, I-5 and local arterials would provide an untolled option.

Although individuals with low incomes may choose to use the tolled route, we know that for many low-income individuals, even a relatively low toll may make using SR 509 cost-prohibitive. SR 509 may also not be accessible to limited English proficient residents, who may have difficulty understanding how to obtain a Good to Go! pass and pay the toll.

To understand the extent to which a toll may disproportionately affect low-income and limited English proficient individuals, we compared travel times for motorists who use existing tolled and non-tolled routes to travel between Burien and Kent during peak travel periods. Table 40 shows that while there will be some travel time benefit in using the new tolled route, the travel time difference between tolled and non-tolled routes is not substantial. Motorists who pay the toll will save 5 to 7 minutes, on average. Furthermore, the transportation analysis for this project shows that all routes—tolled and non-tolled—will have improved travel times compared to the No Build (WSDOT, 2017).

Table 40. Comparison of Average Travel Times for Tolled and Non-Tolled Routes between Burien and Kent

Timing	Route	Northbound Travel Time (minutes)		Southbound Travel Time (minutes)	
		2045 No Build	2045 Build	2045 No Build	2045 Build
Morning Peak (6 a.m. to 9 a.m., weekdays)	SR 509 extension	n/a	14	n/a	15
	I-5	21	18	19	17
	Local arterials	23	21	20	19
	Light rail (fare applies)	12	12	12	12
Afternoon Peak (3 p.m. to 6 p.m., weekdays)	SR 509 extension	n/a	15	n/a	15
	I-5	17	16	21	18
	Local arterials	21	20	25	20
	Light rail (fare applies)	12	12	12	12

Source: WSDOT SR 509 NEPA Re-Evaluation Transportation Discipline Report, 2017

How would the potential travel behavior changes differ by income status?

Outcomes from WSDOT’s interviews with community-based organizations and social service providers in the study area suggest there may be some differences among income groups on how they use the new tolled facility with Phase 1 Improvements. In general, interview participants expressed concern that a toll would dissuade low-income individuals from using the new SR 509 facility. Several interview participants explained their clients cannot afford gas for their automobiles, and expressed skepticism that these clients would be able to afford a toll. On the other hand, interview participants indicated the majority of their clients use Pacific Highway South (SR 99) to get to jobs, school, doctor’s appointments, and other errands. In other words, the Phase 1 Improvements might not be a route they would choose to use anyway. The transportation analysis indicates that all routes between Kent and Burien will experience improved travel times over the No Build, so individuals who rely on Pacific Highway South for most of their travel should benefit from the project.

Based on the analysis above, and consistent with the University of Washington report that concluded that most low-income residents in the Puget Sound region would not be adversely affected by tolling, as long as there were accessible and convenient alternatives to paying the toll, we conclude the toll will not have a disproportionately high and adverse impact on low-income, minority, or limited English proficient users. concluded. Since I-5 and arterials would remain accessible and convenient alternatives to the new tolled facility and are expected to offer improved travel times for both motorists and transit over the No Build conditions, tolls would be unlikely to adversely affect low-income or limited English proficient residents who travel in the study area.

Other Effects

Because Phase 1 includes fewer travel lanes and the analysis uses a more detailed noise prediction methodology and accounts for contributions from other dominant noise sources (Sea-Tac Airport and the future Federal Way Link Extension), the SR 509 NEPA Re-Evaluation Noise Technical Memo concludes Phase 1 improvements would result in fewer noise impacts throughout the study area—including Madrona and Pacific Ridge— than Alternative C2.

Phase 1 improvements would also result in slightly fewer relocations and community cohesion impacts than Alternative C2. WSDOT has already relocated some of the residences and businesses that were identified in the 2003 FEIS and are associated with Phase I improvements. Because many displacements have already taken place and others will be handled by Sound Transit, the Phase 1 Improvements would have fewer impacts to community cohesion than Alternative C2. Impacts to the Des Moines Creek Park

and Trail would be similar to Alternative C2. The SR 509 mainline would still cross the northeast corner of Des Moines Creek Park.

Similar to Alternative C2, the Phase 1 Improvements would relieve traffic congestion on arterials and at intersections in the study area. According to the transportation analysis the LOS at most intersections would improve. Phase 1 improvements would also accommodate proposed improvements to transit services and facilities in the study area, including future Link light rail between the Angle Lake Station in SeaTac and the Federal Way Transit Center in Federal Way. The transportation analysis also found that travel times and reliability for transit vehicles would be generally improved on arterials and major roadways in the study area. The SR 509 extension would provide the potential for transit agencies to shift routes to the new facility to improve access between SeaTac and areas to the south. The most recent King County Metro Transit Rider/Non-Rider Survey (King County Metro Transit, 2015) indicates that nearly one out of three transit riders in South King County have household incomes below \$35,000. Outcomes from interviews with social service providers echo these findings, indicating that many of their clients use transit service to travel. As such, we conclude improvements to transit facilities, travel times, and reliability will benefit environmental justice populations.

Effects During Construction

Temporary construction-related effects to environmental justice communities within the study area could include the following:

- Noise, dust, and visual impacts
- Traffic congestion
- Reduced or inhibited access to community resources, such as parks and recreational facilities, public services, utilities, and minority-owned businesses or businesses that provide services to low-income, minority, or limited English proficient populations

Similar construction-related effects are described in the 2003 FEIS, but the Phase 1 Improvements would affect a smaller area and for a shorter duration than Alternative C2.

In addition, social service providers who work with low-income, minority, and limited English proficient populations also worried there could be construction-related impacts to transit stops and reliability in the project study area.

Mitigation

Improved travel times on untolled routes through the project study area will offset most of the effects of the toll on environmental justice populations. To further mitigate for the effects of the all-electronic toll system on limited English proficient populations, WSDOT will translate information about electronic tolling into multiple languages. Our demographic analysis indicates that all information should be translated into Spanish, but stakeholder interview participants also recommended translation into Russian, Samoan, Vietnamese, Chinese, and Cambodian.

Among mitigation strategies that WSDOT will consider, as suggested by service providers and WSDOT's past experience, are the following two strategies it has used on other tolled projects to further minimize the effects of tolls on environmental justice populations:

- Exempt transit and paratransit from the tolls.
- Make it easy for individuals without a bank account to purchase and pre-load a Good To Go! pass—for example, selling them in local grocery stores and pharmacies and allowing individuals to use cash to load them.

See also section 4.11 which summarizes other community effects and provides a more detailed list of mitigation measures.

WSDOT will continue outreach for the Phase 1 Improvements through project design, construction, and operation. Ongoing public involvement activities will include:

- Maintaining ongoing communications with community-based organizations and social service providers throughout design and construction of Phase 1 Improvements, and scheduling briefings and project milestones
- Translating all project materials into Spanish
- Providing Spanish-language interpreters at public meetings and events
- Distributing project materials through social service agencies, community-based organizations, libraries, community groups, and schools
- Hosting booths at community events in the study area
- Conducting media outreach, specifically with ethnic media outlets serving the study area
- Planning and implementing a public information campaign in English and the languages recommended by service providers who participated in interviews—Spanish, Cambodian, Chinese, Russian, Samoan, and Vietnamese—to explain tolling, how to obtain a Good to Go! pass, and how to set up an account

Many service providers discussed the importance of face-to-face communication for low-income populations, with many providers recommending community meetings with interpretation services. They added that a number of limited English proficient residents of the study area may have low literacy in their native language, thus reinforcing the importance of sharing information orally.

Conclusion

The adverse effects to environmental justice populations with the Phase 1 Improvements would be similar to those described in the 2003 FEIS, with one important exception: The 2003 FEIS did not assume the project would be tolled. Our analysis considers the effects of tolling on environmental justice populations and concludes that, with accessible and convenient untolled alternatives available, tolling will not have a disproportionately high and adverse effect on environmental justice populations. See also Attachment Q for the Environmental Justice Technical Report.

4.18. Cumulative Effects

The cumulative effects as described in Section 3.17.2 of the 2003 FEIS remains applicable to the Phase 1 Improvements with the exception of updating the historical and present context for the study area and analyzing the cumulative impacts to environmental justice and climate change. Updates to the analysis were conducted using the joint guidance issued by WSDOT, FHWA Washington Division, and the U.S. Environmental Protection Agency Region 10, entitled: *Guidance on Preparing Cumulative Impact Analyses (2008)*. Consistent with the joint guidance, WSDOT's study of cumulative effects only focused on the resource areas where a potential direct and indirect effect was identified. If there are no project impacts on a particular resource, then WSDOT did not include that resource in the cumulative effects report since the project cannot contribute toward a cumulative effect.

Historical and Present Context (including Reasonably Foreseeable Projects)

Early Euro-American contact with local Native American groups was by a small number of explorers, fur traders, miners, and missionaries. It was not until the mid-nineteenth century that successive waves of settlers began to encroach permanently on traditional Indian lands. Settlement in the project area

occurred in the mid to late 1800s primarily along Military Road. This road was constructed in the 1850s for the U.S. military by mandate of the territorial legislature, and followed a tribal trade route from the Duwamish River in south Seattle to Fort Steilacoom, south of Tacoma.

Between 1870 and 1915 settlers farmed and logged in the area, and lived in small communities with limited road access to one another. In 1928, Highway 99 was completed, dramatically changing the possible land uses and patterns of settlement in the area. The regional connection provided by this roadway facilitated growth that would ultimately transform the area into a suburban community.

In the 1940s, there was dramatic growth in population and housing that was partially attributable to the growth in defense industry activity in the area. Another related, large scale change in the area was the siting and building of Seattle-Tacoma International Airport which began full scale operation in 1949. The completion of Interstate Highway 5 and expansion of the Seattle-Tacoma International Airport in the 1960s both contributed to accelerated economic activity and growth in the area. In just over three decades, access to what is currently the City of SeaTac and its surrounding area had gone from having only two major passable roadways and rough paths between isolated settlements, to having an International Airport and being at the intersection of national and regional highways serving a major defense industry and the surrounding suburban area. In that same period, economic activities in SeaTac had gone from largely logging and farming to overwhelmingly transportation-related industry and business.

Throughout the late 1960s and early 1970s, the Airport expanded and modernized significantly. Its impacts on area residents increased, exemplifying the issues associated with increased intensity and variety of land uses. The 1970s saw population decline slightly, due in part to major layoffs in the aircraft industry, and declining family size in general. The Port's noise remedy program, including areas of residential acquisition, was initiated in 1973. Commercial development increased in the SeaTac area during the 1980s.

Future projects differ somewhat from those that were considered in the 2003 FEIS cumulative effects; some have since been completed and some new projects have been added. The projects listed in Table 41 were identified in the 2003 FEIS and some additions were identified as part of the land use, economics and transportation analyses prepared for the Re-evaluation and include a number of larger commercial and transportation-related projects.

Table 41. Comparison of Reasonably Foreseeable Actions considered in the 2003 FEIS and the Re-evaluation		
Reasonably Foreseeable Future Actions	2003 FEIS	Re-evaluation
Sound Transit Light Rail Station		✓
Federal Way Link Extension		✓
Sea-Tac Airport Master Plan development, including the third runway and SASA	✓	✓
Sea-Tac Airport Noise Remedy Program	✓	✓
Des Moines Creek Business Park.	✓	✓
City of SeaTac 24th/28th Avenue South Arterial	✓	✓
Des Moines Creek Basin Plan	✓	✓
Flight Corridor Safety Program		✓
City of Des Moines Pacific Ridge Neighborhood Improvement Plan	✓	✓
City of Sea Tac City Center	✓	✓
City of Sea Tac Aviation Business Center	✓	✓

Current and future development patterns are directed by the comprehensive plans and other land use policies developed by regional, county and local jurisdictions. The status of these projects are described further below.

- Sound Transit Light Rail Station
 - Since the 2003 FEIS, Sound Transit has completed the construction of a light rail station at Sea-Tac Airport and at Angle Lake.
- Federal Way Link Extension
 - Sound Transit recently completed preliminary design and environmental study of the FWLE. Construction and ROW requirements of the FWLE and Phase 1 Improvements about in some areas.
- Sea-Tac Airport Master Plan development, including the third runway and SASA
 - Since the 2003 FEIS, Runway 34L-16R (the “third”) runway at Sea-Tac Airport was completed (in 2008).
 - The 2003 FEIS reported that the SASA proposed to relocate existing line maintenance facilities, locate new maintenance expansion facilities (primarily hangars), and accommodate major base maintenance facilities and air cargo uses on approximately 100 acres south of S 193rd Street and north of S 200th Street. The SASA proposal is still being evaluated as part of the Sustainable Airport Master Plan and to date has not been adopted.
- Sea-Tac Airport Noise Remedy Program
 - Three mobile home parks were removed between 2003 and 2016.
- Des Moines Creek Business Park. The business park is planned to total 1.6 million square feet of office, industrial, and retail space on the 87-acre site just south of the Sea-Tac Airport in Des Moines. In total, the City of Des Moines will see more than 6,000 new jobs from the business park, which will diversify their economic base.
- City of SeaTac 24th/28th Avenue South Arterial
 - The 2003 FEIS described this proposed project that involved the cities of SeaTac and Des Moines, the Port of Seattle, King County, Equitable Capital Group, and Alaska Airlines. The project was in the process of being constructed and involved modifying the alignment of 28th Avenue S/24th Avenue S to accommodate local access traffic generated by anticipated development within the cities of SeaTac and Des Moines. The 2003 FEIS reported that construction of the project from S 188th Street to S 202nd Street (which began in April 2000) was substantially complete when the FEIS was completed. The project opened to traffic in summer 2017.
- Des Moines Creek Basin Plan
 - In 2007 and 2008, King County constructed phase I and phase II of the Des Moines Creek Habitat Restoration Project, which included placement of large woody debris in Des Moines Creek between Midway Sewer Treatment Plant and the upstream end of the Marine View Drive bridge. Invasive plants were also removed and native vegetation planted along the stream buffer. Phase III, which has not been completed yet, will install logs and native plants in Des Moines Creek between S 200th Street and Midway Sewer Treatment Plant.
- Flight Corridor Safety Program – The Port of Seattle’s tree removal program, which is mandated by the FAA, will result in the removal of trees over a set height within the airport’s landing and takeoff zones. The Port plans to replace the removed trees with native, low-height species such as Shore Pine, Oregon Ash, and Red Alder (Port of Seattle 2017).

- City of Des Moines Pacific Ridge Neighborhood Improvement Plan – This plan remains in effect and continues to provide policy guidance and regulatory controls to re-vitalize the area known as Pacific Ridge. The vision for Pacific Ridge includes building five or more stories in height that are designed for the pedestrian as well as the motorist. Land uses will include “people-oriented” activities such as employment centers, indoor retail, and inviting multifamily developments.
- City of Sea Tac City Center – This plan remains in effect and continues to provide policy guidance for City Center redevelopment with goals for developing a pedestrian-oriented urban center.
- City of Sea Tac Aviation Business Center – The Aviation Business Center zoning remains in effect and continues to promote a major commercial center supporting high concentrations of customers, visitors, employees, and pedestrian activity; to create a quality development in which people can work, shop and access child care; and to create a market geared toward a business orientation to the airport which is compatible with airport operations.

In addition, other changes have occurred to land use with the largest change resulting from the closure of the Tye Valley Golf Course, which was located on Port of Seattle property west of 24th Avenue S between S 200th Street to the south, and the toe of the slope that supports Runway 34R-16L to the north. The former golf course site is being transformed into habitat to attract native animal species while discouraging open space where Canada geese (which can be a navigation hazard for aircraft) gather (Angle Lake Shore Club Blog, 2014).

Transportation improvements were also included in the cumulative effects analysis. The 2003 FEIS, considered the improvements shown on Figure 2.3-3 of the FEIS and this Re-evaluation considered the list of transportation improvements provided in Appendix D of the Transportation Technical Report (Attachment A).

Effects during Operation

Consistent with the 2003 FEIS, this Re-evaluation focuses on the following resources where potential direct or indirect effects were identified: surface water quality, fish and wildlife habitat, wetlands, and displacement and relocation. Consideration of environmental justice and climate change have been added.

Surface Water Quality

As discussed in the 2003 FEIS, urban development and the discharge of untreated stormwater over the last several decades, have reduced water quality in the resource study area. Stormwater regulations since the 1990s have been aimed at treating and reducing pollutants in runoff before discharge to streams and lakes. State and local governments are now actively working to maintain and improve water resources.

The likely future condition of the surface water bodies of the study area will be gradual and steady improvement in quality. This is due to requirements for improved stormwater management and treatment of new development projects and the improvement in stormwater treatment technologies. The Phase 1 Improvements would add less impervious surface than Alternative C2 and would provide long-term stormwater treatment. Consistent with the 2003 FEIS, the Phase 1 Improvements would not contribute to any negative cumulative effect on water resources.

Fish and Wildlife Habitat

As discussed in the 2003 FEIS, human development and land use patterns impact fish and wildlife habitat and vegetation. Past development actions, Sea Tac airport, road construction, and housing have adversely affected wildlife habitat within the study area. The area has also more recently benefitted from Des Moines Creek habitat improvements, and will benefit from the closure of the Tye Golf Course and its transformation into habitat to attract native animal species.

Similar to Alternative C2, the Phase 1 Improvements will have a minor, short-term construction effects on the vegetation along the right of way, and will convert some land cover to impervious surface. Phase 1 Improvement's minimization measures for effects to vegetation in combination with other current and future projects that seek to improve habitat and the environmental protection provided through local agencies' critical area ordinances would result in a minor positive and beneficial contribution to cumulative effects.

Displacement and Relocation

Cumulative displacement and relocation impacts would be related to the additive effects of displacements related to the Phase 1 Improvements and other area past, present, and future projects: the Federal Way Link Extension, the 28th/24th Avenue South Arterial construction, the Seattle-Tacoma International Airport Third Runway, and the Port of Seattle's Noise Remedy Program. The Port of Seattle has already removed a number of mobile home parks, and single-family and multifamily residences within the Noise Remedy Program acquisition area, primarily in the City of SeaTac.

The Phase 1 Improvements would displace a similar number of residences as identified for Alternative C2. As discussed in Section 3.9.4 of the 2003 FEIS, WSDOT would conduct property acquisition and relocations in accordance with the federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. Displaced residences would be relocated through the use of relocation assistance programs such that the Phase 1 Improvements would not contribute to additional cumulative effects on displacements. This finding is consistent with the 2003 FEIS.

Climate Change

Puget Sound is experiencing a suite of long-term changes as a result of human-caused climate change (Climate Impacts Group University of Washington 2015). These include increasing air temperatures, a longer frost-free season, nighttime warming, and a possible increase in the intensity of heavy rainfall events. Projected changes in annual precipitation are generally small, although summer precipitation is projected to decrease and heavy rainfall events are projected to become more severe. Continued increases in average annual and seasonal Puget Sound air temperatures are projected as a result of climate change, as well as increases in extreme heat. As a result, Washington State is likely to experience the following over the next 50 years:

- Increased temperature (extreme heat events, changes in air quality, glacial melting)
- Changes in volume and timing of precipitation (reduced snow pack, increased erosion, flooding)
- Ecological effects of a changing climate (spread of disease, altered plant and animal habitats, negative impacts on human health and well-being)
- Sea-level rise, coastal erosion, saltwater intrusion

All of WSDOT's major capital projects undergoing environmental review consider climate change and extreme weather events as part of the agency's strategic plan commitment. The results of WSDOT's recent vulnerability assessment (WSDOT, 2011) show the project area to be of low vulnerability to climate-related threats. The project area may experience extreme wind, rain and snow storms and more days of extreme heat, but the SR 509 corridor and I-5 are not prone to severe flooding and are out of the zone for potential impacts from sea-level rise. As part of its standard design, the Phase 1 Improvements has incorporated features that will provide greater resilience and function with the potential effects brought on by climate change, including elements that address stormwater flow to reduce the likelihood of localized flooding.

The construction and operation of the Phase 1 Improvements would consume energy and emit GHGs into the atmosphere. Construction of the Phase 1 Improvements would have temporary release of emissions. WSDOT has taken steps to minimize fuel use during construction to reduce GHG emissions by construction equipment by setting up construction areas, staging areas, and material transfer sites in

ways that reduce equipment and vehicle idling. In 2045, however, after completion of the project, GHG emissions are expected to decrease as compared to the No Build Alternative and thus would not contribute to a cumulative effect. Considered with the effects of past, present, and reasonably foreseeable future actions, the Phase 1 Improvements would have a negligible contribution to cumulative effects on energy and GHG emissions. WSDOT is active in statewide and regional efforts to reduce VMT and GHG emissions.

Environmental Justice

Since 2003 there have been several reasonable and foreseeable changes in the study area. In 2016, Sound Transit completed preliminary engineering and the FEIS for the Federal Way Link Extension. Sea-Tac Airport continues to see increased air traffic and is in the process of developing its Sustainable Airport Master Plan (to be completed in 2018). The Sustainable Airport Master Plan is assuming growth in commercial aircraft taking off from and landing at Sea-Tac Airport. These plans and projects, combined with the effects of the Phase 1 Improvements, are likely to contribute to the cumulative effect on the neighborhoods in the study area. Specifically, the property acquisitions associated with the Federal Way Link Extension, combined with WSDOT's property acquisitions for the Phase 1 Improvements, would result in a greater loss of housing and commercial space in the study area than the Phase 1 Improvements alone. The cumulative loss of housing and commercial space would affect the general population to a similar degree and displaced residences would be relocated through the use of relocation assistance programs.

In addition, the Phase 1 Improvements include tolling of the SR 509 extension. A key benefit of the project is that all users including low-income and minority populations would have a new travel option in the study area. For those motorists who cannot afford or do not want to pay the toll, I-5 and local arterials would provide a convenient and accessible alternative to the toll road. The transportation analysis also finds travel times and reliability for transit vehicles would generally improve on arterials and major roadways in the study area. The Phase 1 Improvements, combined with other current and future transit projects, will contribute to improving local and regional travel for all users.

Conclusion

Cumulative effects were found to be similar between the Phase 1 Improvements and Alternative C2. No new cumulative effects would occur as a result of the Phase 1 Improvements that were not previously identified in the 2003 FEIS.

1 **5. CONCLUSION**

2 As discussed in the Re-evaluation and shown in Figures 2 and 3, the Phase 1 Improvements are
3 essentially a subset of the improvements that were proposed in the 2003 FEIS. The Phase 1
4 Improvements would occur along the same alignment as Alternative C2 and the current conditions of
5 the project area remain largely unchanged from the time of the preparation of the 2003 FEIS. As
6 discussed in detail in Section 4.0, the changes that have occurred do not affect the conclusions reached
7 in the 2003 FEIS. Therefore, the impacts and mitigation measures set forth in the 2003 FEIS remain
8 applicable to the Phase 1 Improvements, and there is no significant new information and will be no new
9 significant impacts.

10 The project remains in compliance with the Determinations and Findings listed in the 2003 Record of
11 Decision, including Environmental Justice, Conformity with Air Quality Plans, Endangered Species Act,
12 Magnuson-Stevens Act, Section 4(f) and Section 106.

13

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Attachments

