SR 509: Corridor Completion/I-5/South Access Road

REVISED DRAFT ENVIRONMENTAL IMPACT STATEMENT AND DRAFT SECTION 4(f) EVALUATION

U.S. Department of Transportation
Federal Highway Administration

Washington State Department of Transportation

Port of Seattle

KING COUNTY

City of SeaTac

City of Des Moines

January 2002

FHWA-WA-RDEIS-95-2

SR 509: Corridor Completion/I-5/South Access Road

King County, SeaTac, Des Moines, Kent, and Federal Way, Washington

NEPA/SEPA
Revised Draft Environmental Impact Statement and Draft Section 4(f) Evaluation

Submitted Pursuant to 42 USC 4332(2)(c), 23 USC 138, and 49 USC 303, and RCW 43.21C, WAC 197-11 and WAC 468-12.

by the
U.S. Department of Transportation, Federal Highway Administration (FHWA); the Washington State Department of Transportation (WSDOT); the Port of Seattle, King County, City of SeaTac, and City of Des Moines
in cooperation with:
SR 509/South Access Road Executive Committee

This action complies with Executive Order 11990, Protection of Wetlands; and Executive Order 12898, Environmental Justice in Minority and Low-Income Populations.

1/15/02 — Date of Approval — Judith Kilgore, Comm. Dev. Dir., City of Des Moines

1/15/02 — Date of Approval — Stephen Butler, Dir. of Planning, City of SeaTac

January 8, 2002 — Date of Approval — Mike D. Feldman, Dir. Aviation Facilities, Port of Seattle

January 9, 02 — Date of Approval — Paul Toliver, Dir. of Transportation, King County

1/14/02 — Date of Approval — Jim Leonard, Urban Transportation and Environmental Engineer, FHWA

1/11/02 — Date of Approval — Jerry Alb, Director of Environmental Services, WSDOT

The following persons may be contacted for additional information concerning this document:

Jim Leonard
Urban Transportation and
Environmental Engineer
Federal Highway Administration
711 South Capitol Way, Suite 501
Olympia, Washington 98501
Telephone (360) 753-9480

Jerry Alb
Director of Environmental Services
WA State Dept of Transportation
310 Maple Park Avenue SE
P.O. Box 47331
Olympia, Washington 98504-7331
Telephone (360) 705-7480

The Federal Highway Administration, the Washington State Department of Transportation, the Port of Seattle, King County, and the Cities of Des Moines and SeaTac propose to improve regional highway connections with an extension of SR 509 to serve future transportation needs in southwest King County and to enhance southern access to Seattle-Tacoma International Airport. Improvements to I-5 between approximately South 210th Street and South 310th Street are also proposed. The corridor width of the SR 509 extension would be a minimum of 200 feet to accommodate two general purpose travel lanes and a center high occupancy vehicle lane in each direction. The South Access Road width would be at least 120 feet and consist of two general purpose lanes in each direction. The width of the improvements to I-5 would vary depending on their location. Three build alternatives and a no-action alternative are considered in the EIS for the SR 509 freeway extension, differing in their proximity to Des Moines Creek Park, the airport runway protection zone, and their connection to I-5.

Comments on this Draft EIS are due by March 25, 2002, and should be sent to: John White, P.E., Project Engineer, 6431 Corson Avenue South, WSDOT MS 61, Seattle, WA 98108. He can also be contacted at (206) 768-5680.

The cost of this document is $50, which does not exceed the cost of printing.

Title VI Statement

WSDOT assures full compliance with Title VI of the Civil Rights Act of 1964 by prohibiting discrimination based on race, color, national origin, and sex in the provision of benefits and services.

ADA Statement

Persons with disabilities may request this information be prepared and supplied in alternate formats by calling Ben Brown (collect) at (206) 440-4524 or the Washington State Department of Transportation ADA Accommodation Hotline collect at (206) 389-2839. Persons with hearing impairments may access Washington State Telecommunications Relay Service (TTY) at 1 (800) 833-6388, or Tele-Braille at 1 (800) 833-6385, or Voice at 1 (800) 833-6384, and ask to be connected to (360) 705-7097.

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Acronyms

APE	Areas of Potential Effect
AGC	Associated General Contractors
AQMP	Air Quality Maintenance Plans
BA	Biological Assessment
BMP	best management practice
BOD	biological oxygen demand
CAA	Controlled Activity Area
CBD	Central Business District
C/D	collector/distributor
CEQ	Council on Environmental Quality
CO	carbon monoxide
COD	chemical oxygen demand
cy	cubic yard
DEIS	Draft Environmental Impact Statement
DNL	day-night average noise level
DPS	Distinct Population Segment
EDR	Environmental Data Resources, Inc.
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESU	Evolutionary Significant Unit
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
GMA	Growth Management Act
GMPC	Growth Management Planning Council
GWMA	Groundwater Management Area
HCT	high-capacity transit
HOV	high-occupancy vehicle
HPA	Hydraulic Project Approval
I-5	Interstate 5
I&M	inspection and maintenance
IVM	Integrated Vegetation Management
IWS	Industrial Wastewater System

L_{eq}	average noise level
L_{eq}[h]	predicted hourly traffic noise level
LOS	level of service
MPO	metropolitan planning organization
MTP	Metropolitan Transportation Plan
NAAQS	National Ambient Air Quality Standards
NAC	noise abatement criteria
NEPA	National Environmental Policy Act
NHP	Natural Heritage Program
NMFS	U.S. National Marine Fisheries Service
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPL	National Priority List
NRHP	National Register of Historic Places
NURP	Nationwide Urban Runoff Program
OAHP	Office of Archaeology and Historic Preservation
OFA	Object-Free Area
OSHA	Occupational Safety and Health Administration
PAH	polynuclear aromatic hydrocarbons
PCB	polychlorinated biphenyl
PHS	Priority Habitat and Species
PM	particulate matter
PPE	personal protective equipment
ppm	parts per million
PRT	Personal Rapid Transit
PSCAA	Puget Sound Clean Air Agency
PSE	Puget Sound Energy
PSRC	Puget Sound Regional Council
RCP	*Roadside Classification Plan*
RM	river mile
RPZ	Runway Protection Zone
RSA	Runway Safety Area
RST	Tri-Star
RTA	Regional Transit Authority
SAC	Signatory Agency Committee
SASA	South Aviation Support Area
SCCP	Spill Control and Containment Plan
SCS	Soil Conservation Service; now Natural Resources Conservation Service
SDS	Storm Drain System
SEPA	State Environmental Policy Act

SIP	State Implementation Plan
SO_2	sulfur dioxide
SPCC	Spill Prevention Control and Countermeasures
SR	State Route
SSP	Stormwater Site Plan
TCI	Telecommunications, Inc.
TCPs	traditional cultural properties
TDM	Transportation Demand Management
TESC	Temporary Erosion and Sedimentation Plan
TIP	Regional Transportation Improvement Program
TKN	total Kjeldahl nitrogen
TP	total phosphorus
TPH	total petroleum hydrocarbons
TRB	Transportation Research Board
TSM	transportation system management
TSP	total suspended particulates
TSS	total suspended solids
UBG	Urban Growth Boundary
USACOE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UST	underground storage tank
VE	Value Engineering
vht	vehicle hours of travel
vmt	vehicle miles of travel
VOC	volatile organic compound
vph	vehicles per hour
vphpl	volume per hour per lane
VRM	visual resource management
WDFW	Washington State Department of Fish and Wildlife
WDNR	Washington State Department of Natural Resources
WDW	Washington State Department of Wildlife
WIDM	*Washington State Wetland Identification and Delineation Manual*
WISHA	Washington Industrial Safety and Health Act
WRIA	Water Resource Inventory Area
WSDOT	Washington State Department of Transportation
WSRHP	Washington State Register of Historic Places
XOFA	Extended Object-Free Area

sea0 Acronym List.doc/020220008

SEPA Fact Sheet

Project Title

SR 509: Corridor Completion/I-5/South Access Road

Project Description

The Federal Highway Administration (FHWA), the Washington State Department of Transportation (WSDOT), the Port of Seattle, King County, and the Cities of Des Moines and SeaTac propose to improve regional highway connections with an extension of SR 509 to serve future transportation needs in southwest King County and to enhance southern access to and from Seattle-Tacoma International Airport (Sea-Tac Airport) by means of a new South Access Road. To accommodate an interchange at Interstate 5 (I-5) and SR 509, improvements to I-5 between the vicinity of South 210th Street and South 310th Street are also proposed.

The configuration of the SR 509 freeway extension would be six lanes: two general purpose travel lanes and an inside high-occupancy vehicle (HOV) lane in each direction. The South Access Road would consist of two general purpose lanes in each direction, for a total of four lanes. In general, right-of-way widths would be at least 200 feet for the SR 509 freeway extension and at least 120 feet for the South Access Road. The width of the improvements to I-5 would vary depending on their location. Three build alternatives (Alternatives B, C2, and C3) and a no-action alternative (Alternative A) are considered in the Environmental Impact Statement (EIS) for the SR 509 mainline. In addition, three design options are considered for the last 1,000 feet of the South Access Road, known as the South Airport Link. The improvements to I-5 would be the same for each build alternative.

Under Alternative A (No Action), the SR 509 freeway extension, the South Access Road to Sea-Tac Airport, and the improvements to I-5 would not be built. This alternative, as well as the other alternatives, is defined in Chapter 2.

Under Alternative B, the SR 509 mainline would extend southward from its existing terminus at South 188th Street/12th Place South and intersect with I-5 in the vicinity of South 210th Street (Figure S-6). The freeway extension and the South Access Road would generally parallel each other in a north-south orientation on the west and east sides of Des Moines Creek Park, starting in the vicinity of South 208th Street and 24th Avenue South. The alignment would cross over Des Moines Creek and through Des Moines

Creek Park at its narrowest point. The length of the SR 509 freeway extension (including the South Access Road) under Alternative B would be approximately 3.8 miles.

Alternative C2, the Preliminary Preferred Alternative would begin at the existing SR 509 terminus at South 188th Street/12th Place South and intersect with I-5 in the vicinity of South 212th Street (Figure S-7). Alternative C2 would cross to the east on the north side of Des Moines Creek Park. The alignment would be elevated as it crossed the northeast corner of Des Moines Creek Park. The South Access Road interchange with SR 509 would be in the vicinity of South 208th Street and 24th Avenue South. The length of Alternative C2, including the South Access Road, would be approximately 3.2 miles.

Alternative C3 would begin at the existing SR 509 terminus at South 188th Street/12th Place South and intersect with I-5 in the vicinity of South 212th Street (Figure S-8). Like Alternative C2, Alternative C3 would cross to the east on the north side of Des Moines Creek Park; however, it would encroach further into the park than Alternative C2. Alternative C3 would also be elevated as it crossed the northeast corner of Des Moines Creek Park. The South Access Road interchange would occur in the vicinity of South 204th Street and 24th Avenue South. Under Alternative C3, the length of the SR 509 freeway extension, including the South Access Road, would be approximately 3.5 miles.

The South Airport Link, the last 1,000 feet of roadway connecting the South Access Road to the existing airport roadways, has three design options. At the south end, each design option crosses beneath South 188th Street and the southeast corner of Sea-Tac Airport via a tunnel. At the north end, the options would maintain both southbound and northbound connections from the upper and lower terminal drives.

The southbound improvements to I-5 would include two new collector-distributor (C/D) lanes between the SR 509 convergence and SR 516, two new auxiliary lanes from SR 516 to South 272nd Street, and a new auxiliary lane from South 272nd Street to approximately South 310th Street, where the proposed action would match with an auxiliary lane to be constructed for the Sound Transit I-5 @ South 317th Street Direct Access Ramp project. On northbound I-5, a new auxiliary lane would extend between South 272nd Street and the SR 516 interchanges, and two new C/D lanes would start at the SR 516 interchange to serve I-5 traffic exiting to SR 509 and SR 516 traffic entering I-5. In addition, a South 228th Street extension and underpass would be constructed, providing a direct connection to northbound I-5 from South 228th Street and from southbound I-5 to South 228th Street. Figure S-5 presents a schematic of the I-5 improvements. These improvements would cover approximately 6.7 miles.

Project Proponent and Lead Agency

The Washington Department of Transportation is the project proponent. The lead agencies are the Federal Highway Administration, Washington State Department of Transportation, Port of Seattle, King County, City of SeaTac, and City of Des Moines, working in cooperation with the SR 509/South Access Road Executive Committee. This document is a combined NEPA/SEPA EIS.

Proposed Implementation Date

Full buildout of the project would be completed and operational by approximately 2009.

Responsible Official and Contact Person

Martin Palmer
Environmental Program Manager
Washington State Department of Transportation
P.O. Box 330310
Seattle, WA 98133-9710
Telephone: (206) 440-4548

Permits, Licenses, and Other Required Actions or Approvals

- U.S. Army Corps of Engineers
  - Section 404 of the Clean Water Act Permit
- Washington State Department of Ecology (Ecology)
  - Water Quality Certification, Section 401 of the Clean Water Act
  - National Pollutant Discharge Elimination System (NPDES) Stormwater Permit
  - NPDES Stormwater Site Plan—Individual
  - Coastal Zone Management Permit
  - Washington Department of Natural Resources
- Washington State Department of Natural Resources
  - Forest Practices Permit
- Washington State Department of Fish and Wildlife (WDFW)
  - Hydraulic Project Approval
- Cities of SeaTac, Des Moines, Federal Way, and Kent, and King County
  - Noise Variance

  - Clearing Permit
  - Critical Area Determination

- King County
  - Landfill Disturbance Permit (to be obtained by others)
- Federal Aviation Administration
  - Airport Highway Clearance

Authors and Principal Contributors

This Revised Draft Environmental Impact Statement was prepared under the direction of the Federal Highway Administration and Washington State Department of Transportation. Research, analysis, and document preparation were provided by CH2M HILL, Shapiro and Associates, and other members of the consultant team as noted in Appendix C.

Date of Issue of Revised Draft EIS

January 30, 2002

Time and Place of Public Open House and EIS Hearing

Public Open House—February 12, 2002, from 4:00 p.m. to 8:00 p.m.

Public Open House and EIS Hearing—February 27, 2002, with open house from 4:00 p.m. to 6:30 p.m. immediately followed by the hearing at 6:30 p.m.

Location of Open House and EIS Hearing:

Highline Community College, Building #2
2400 South 240th Street
Des Moines, WA 98198

Date Comments on the Revised Draft EIS Are Requested

March 25, 2002

Date of Final Action

A Final EIS and a Record of Decision on the selected alternative are anticipated in late 2002.

Location of Background Data

The technical discipline reports and other supporting documentation are maintained at the following locations:

Jim Leonard
Federal Highway Administration
711 South Capitol Way, Suite 501
Olympia, WA 98501-1284
(360) 753-9480

Benjamin Brown
Washington State Department of Transportation
Documentation Program Manager
15700 Dayton Avenue North
PO Box 330310
WSDOT MS NB82-138
Seattle, WA 98133-9710
(206) 440-4528

John White
Washington State Department of Transportation
Project Engineer
6431 Corson Avenue South
WSDOT MS 61
Seattle, WA 98108
(206) 768-5680

Cost of Document and Availability

Additional copies of the Revised Draft EIS can be obtained by contacting:

John White, P.E.,
Project Engineer
6431 Corson Avenue South
WSDOT MS 61
Seattle, WA 98108
(206) 768-5680

The cost of this document is $50, which does not exceed the cost of printing and mailing.

sea0 SEPA Facts.doc/020220057

Summary

Purpose of the Proposed Action

The Federal Highway Administration (FHWA), the Washington State Department of Transportation (WSDOT), the Port of Seattle, King County, and the Cities of Des Moines and SeaTac propose to improve regional highway connections with an extension of State Route (SR) 509 to serve future transportation needs in southwest King County and to enhance southern access to and from Seattle- Tacoma International Airport (Sea-Tac Airport). (Figure S-1 shows the location of the project area within the larger metropolitan area and Figure S-2 shows the detail of the project area.)

Description of the Proposed Action

The proposed action would extend the SR 509 freeway from its current terminus at South 188th Street /12th Place South to a new interchange with Interstate 5 (I-5) in the vicinity of South 210th Street. To accommodate this interchange, improvements to I-5 between approximately South 210th Street and South 310th Street are also proposed. The SR 509: Corridor Completion/I-5/South Access Road Project would improve regional highway connections, enhance southern access to and from Sea-Tac Airport, and improve related local traffic circulation patterns.

Three build alternatives (Alternatives B, C2, and C3) and a No Action Alternative (Alternative A) are considered in this Revised Draft Environmental Impact Statement (DEIS).

Alternative A (No Action)

The No Action Alternative (Figure S-3) represents the baseline conditions assumed to exist in the future regardless of whether or not the proposed project is constructed. Under the No Action Alternative, the SR 509 freeway extension, the South Access Road to Sea-Tac Airport, and the improvements to I-5 would not be built. This alternative, as well as the other alternatives, is defined in Chapter 2.

Features Common to All Build Alternatives

Each alternative for the SR 509 freeway extension would originate at approximately South 188th Street/12th Place South. The northern terminus of the South Access Road would be at the south end of the airport terminal drives. The southern terminus of the South Access Road would connect with

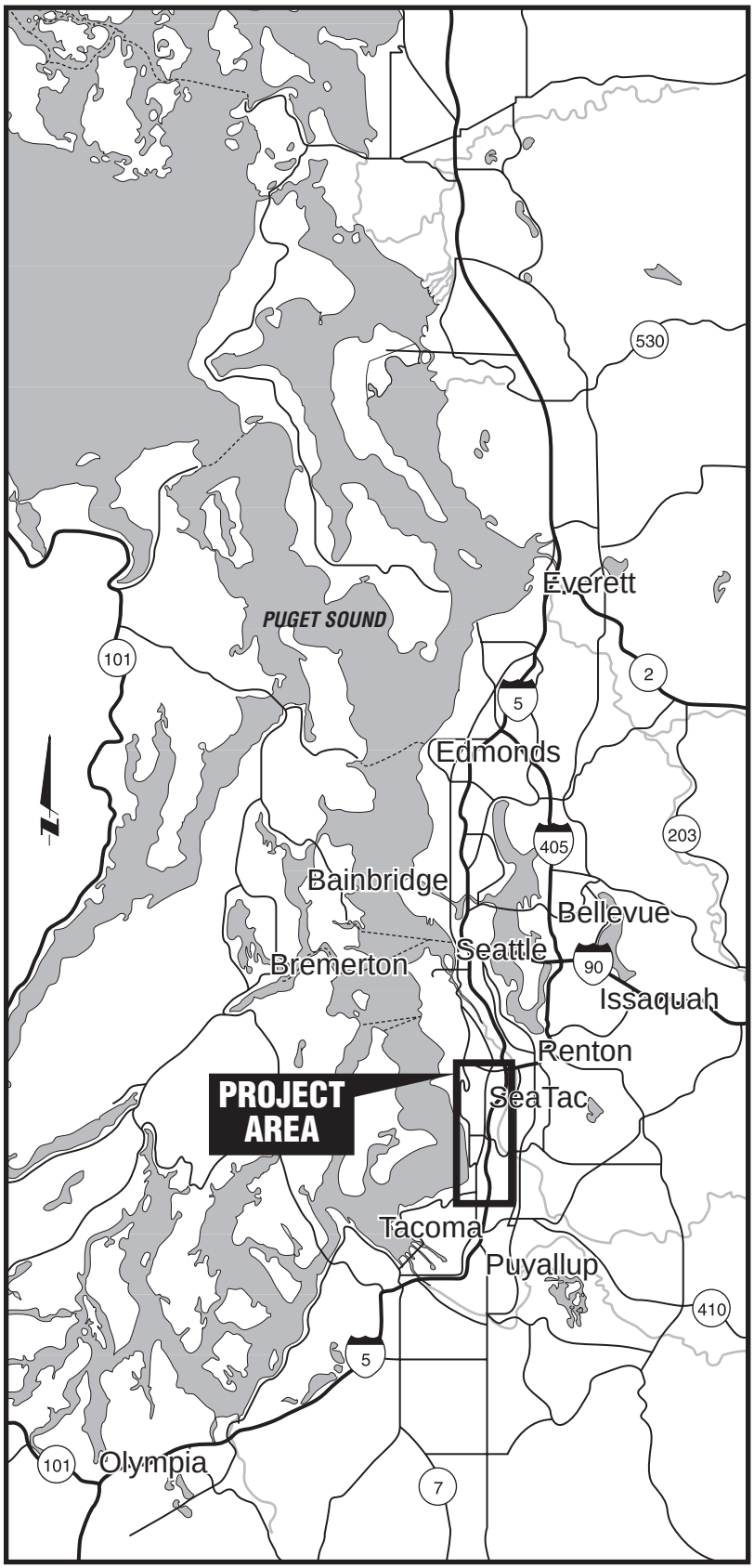
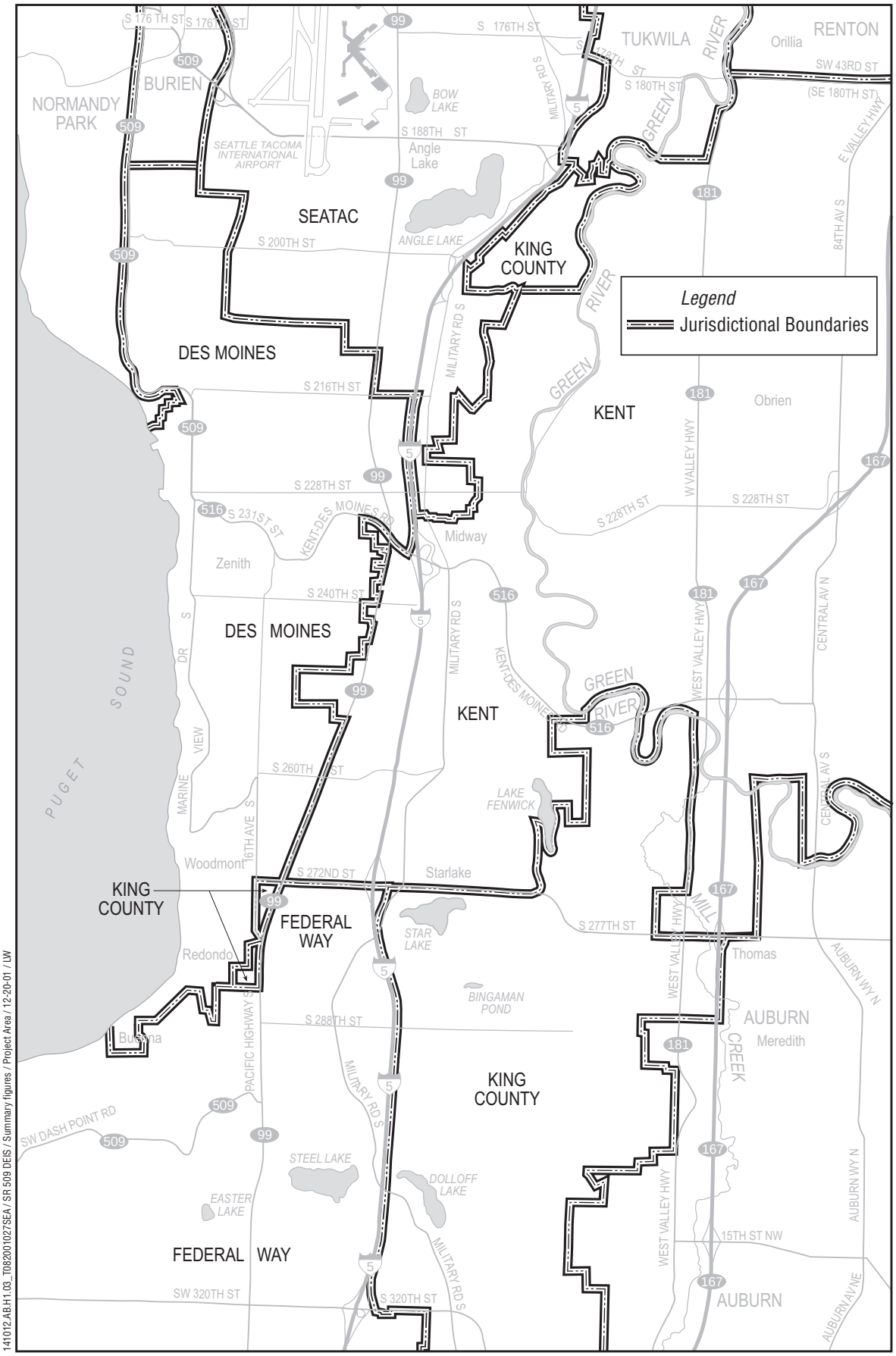


FIGURE S-1

Project Area Location Map

SR 509: Corridor Completion/
I-5/South Access Road
Environmental Impact Statement



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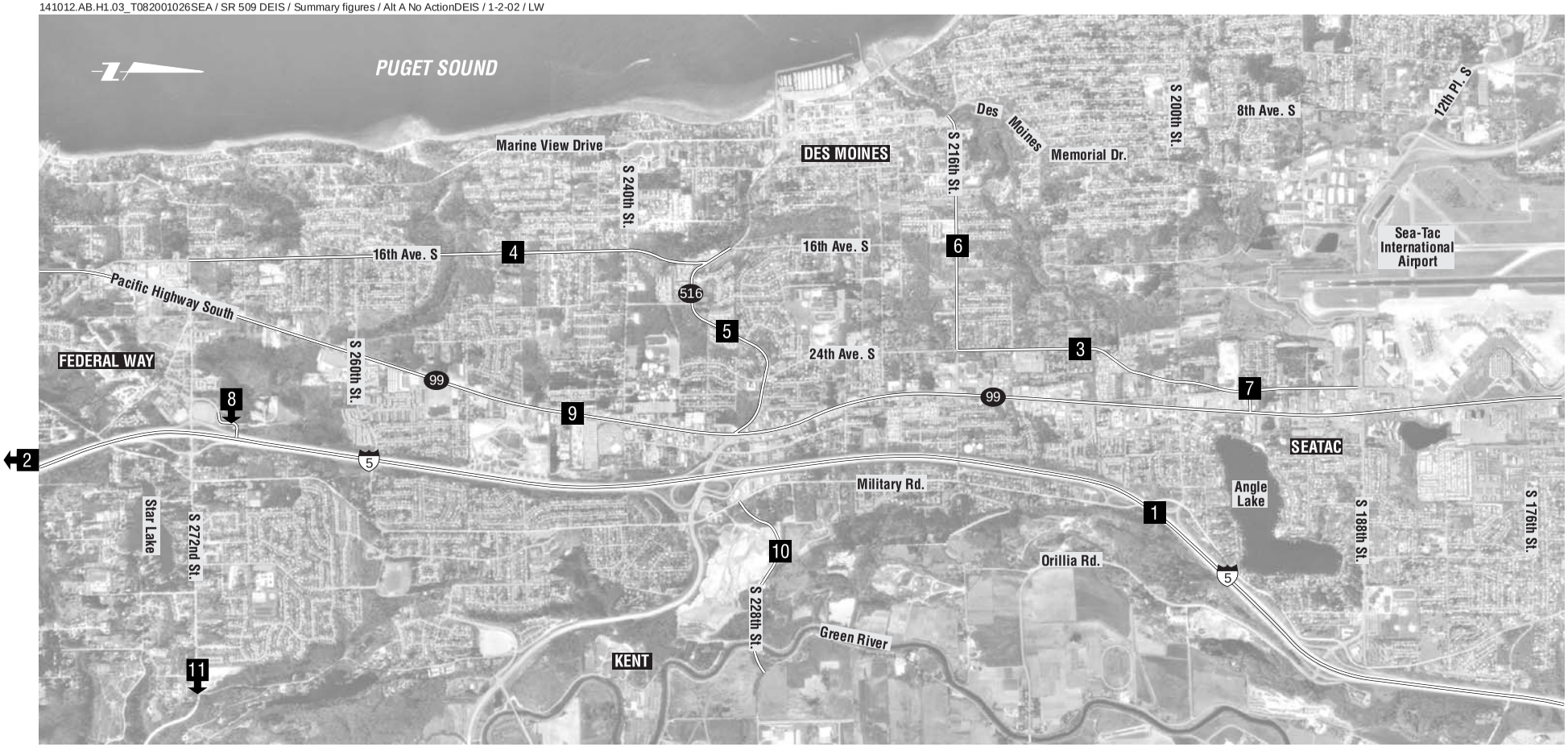
0 1900 3800
Scale in Feet

North

FIGURE S-2

Project Area

SR 509: Corridor Completion/I-5/South Access Road
Environmental Impact Statement



Legend

Baseline Projects by others

0 1/4 1/2 3/4 1 MILES

Baseline Projects Assumed for No Action Alternative.

1. I-5 HOV Lanes
2. I-5 @ S. 317th Street Direct Access Ramp
3. 28th/24th Avenue S. Arterial (Phase 1 completed – S. 188th to S. 204th Streets)
4. 16th Avenue S.
5. Kent-Des Moines (SR 516) Road
6. S. 216th Street
7. S. 195th Street
8. I-5 @ S. 272nd Street In-Line Station
9. Pacific Highway S./International Boulevard (SR 99) (Phases 1 and 2 completed – S. 170th to S. 200th Streets)
10. S. 228th Street
11. S. 272nd/S. 277th Street Corridor

FIGURE S-3

Alternative A (No Action)

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the SR 509 freeway extension; the location and design of this connection would vary with each alternative. Improvements to I-5 would be the same for all build alternatives.

SR 509 Mainline/South Access Road

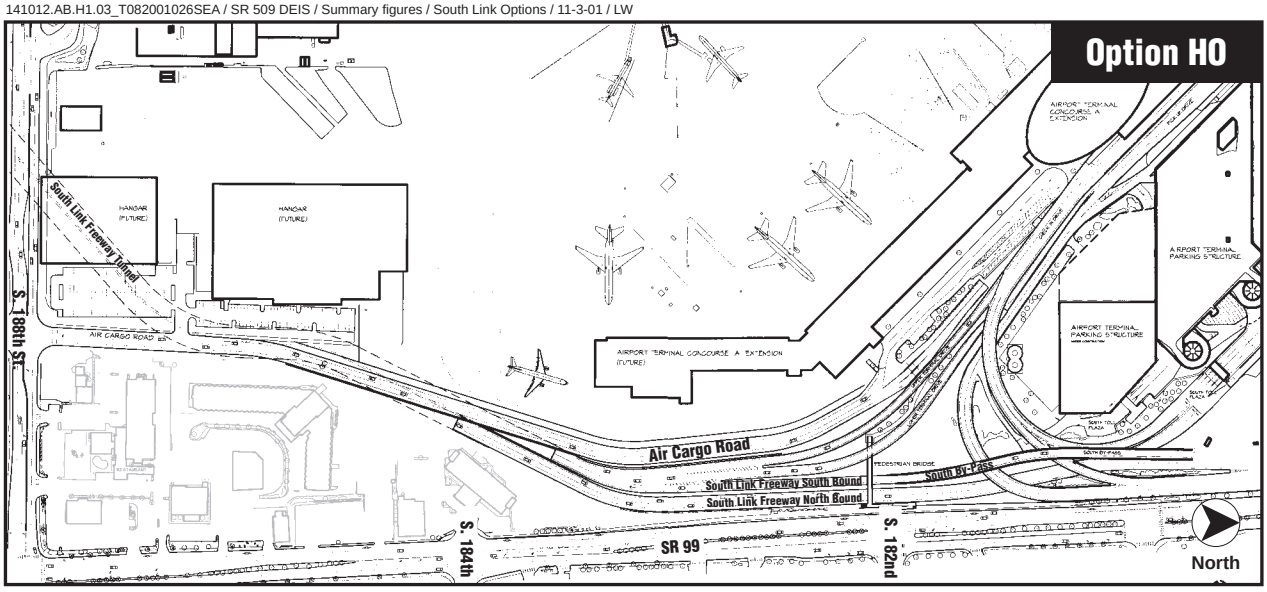
The configuration of the SR 509 freeway extension would be six lanes: two general purpose travel lanes and an inside high-occupancy vehicle (HOV) lane in each direction. The South Access Road would consist of two general purpose lanes in each direction, for a total of four lanes. In general, right-of-way widths would be at least 200 feet for the SR 509 freeway extension and at least 120 feet for the South Access Road. The SR 509 freeway extension would be designed to level of service (LOS) D and a speed of 70 miles per hour (mph). The South Access Road would be designed to LOS D and a speed of 35 to 45 mph.

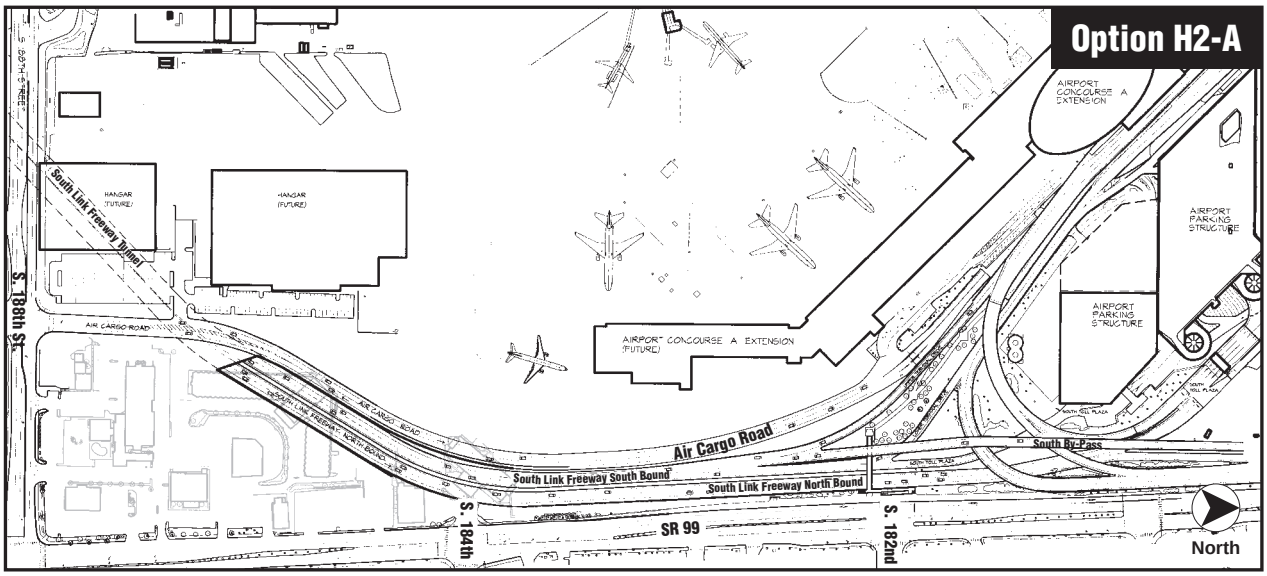
South Airport Link

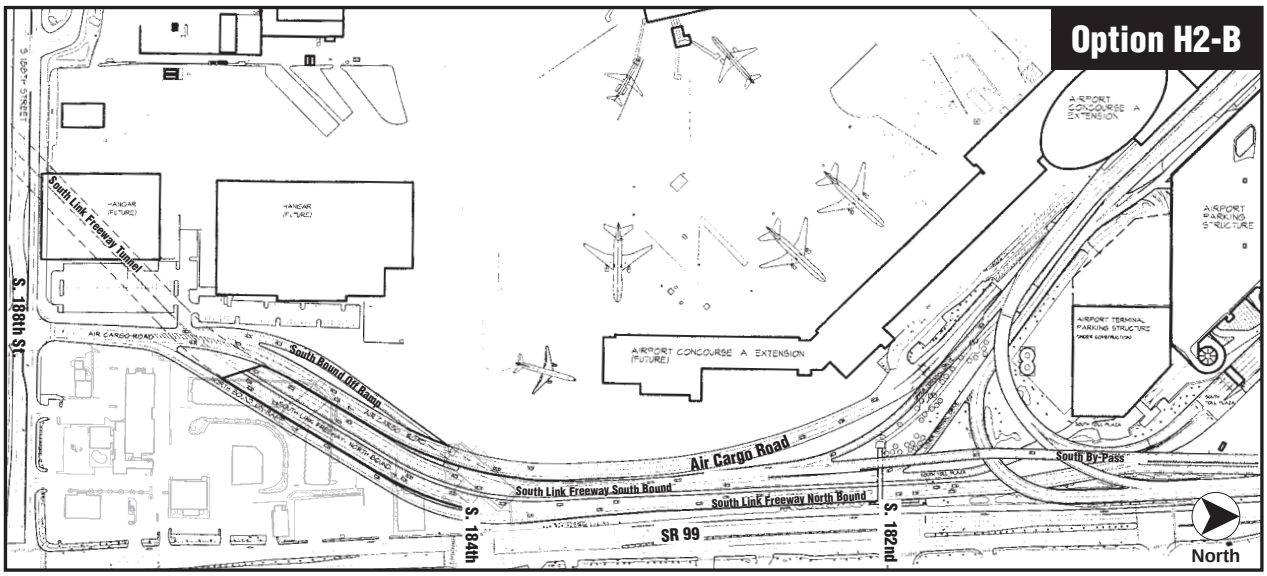
The South Airport Link, the last 1,000 feet of roadway connecting the South Access Road to the existing airport roadways, has three design options. At the south end, each design option crosses beneath South 188th Street and the southeast corner of Sea-Tac Airport via a tunnel. At the north end, the design options would maintain both southbound and northbound connections from the upper and lower terminal drives. Under Design Option H0, Air Cargo Road and the South Access Road would be "stacked" via an extended “S”-curve tunnel structure (Figure S-4). Under Design Option H2-A, Air Cargo Road and the South Access Road would generally parallel each other and would be separated by medians (Figure S-4). Design Option H2-B would be essentially the same as Design Option H2-A, except that it would provide local access routes for northbound and southbound traffic at the intersection of South 188th Street and 28th Avenue South (Figure S-4).

Improvements to I-5

The southbound improvements to I-5 would include two new collector-distributor (C/D) lanes between the SR 509 convergence and SR 516, two new auxiliary lanes from SR 516 to South 272nd Street, and a new auxiliary lane from South 272nd Street to approximately South 310th Street, where the proposed project would match with an auxiliary lane to be constructed for the Sound Transit I-5 @ South 317th Street Direct Access Ramp project. On northbound I-5, a new auxiliary lane would extend between South 272nd Street and the SR 516 interchanges, and two new C/D lanes would start at the SR 516 interchange to serve I-5 traffic exiting to SR 509 and SR 516 traffic entering I-5. In addition, a South 228th Street extension and underpass would be constructed, providing a direct connection to northbound I-5 from South 228th Street and from southbound I-5 to South 228th Street. Figure S-5







0 100 200
Approx. Scale in Feet

FIGURE S-4
South Airport Link Design Options

SR 509: Corridor Completion/I-5/South Access Road Environmental Impact Statement

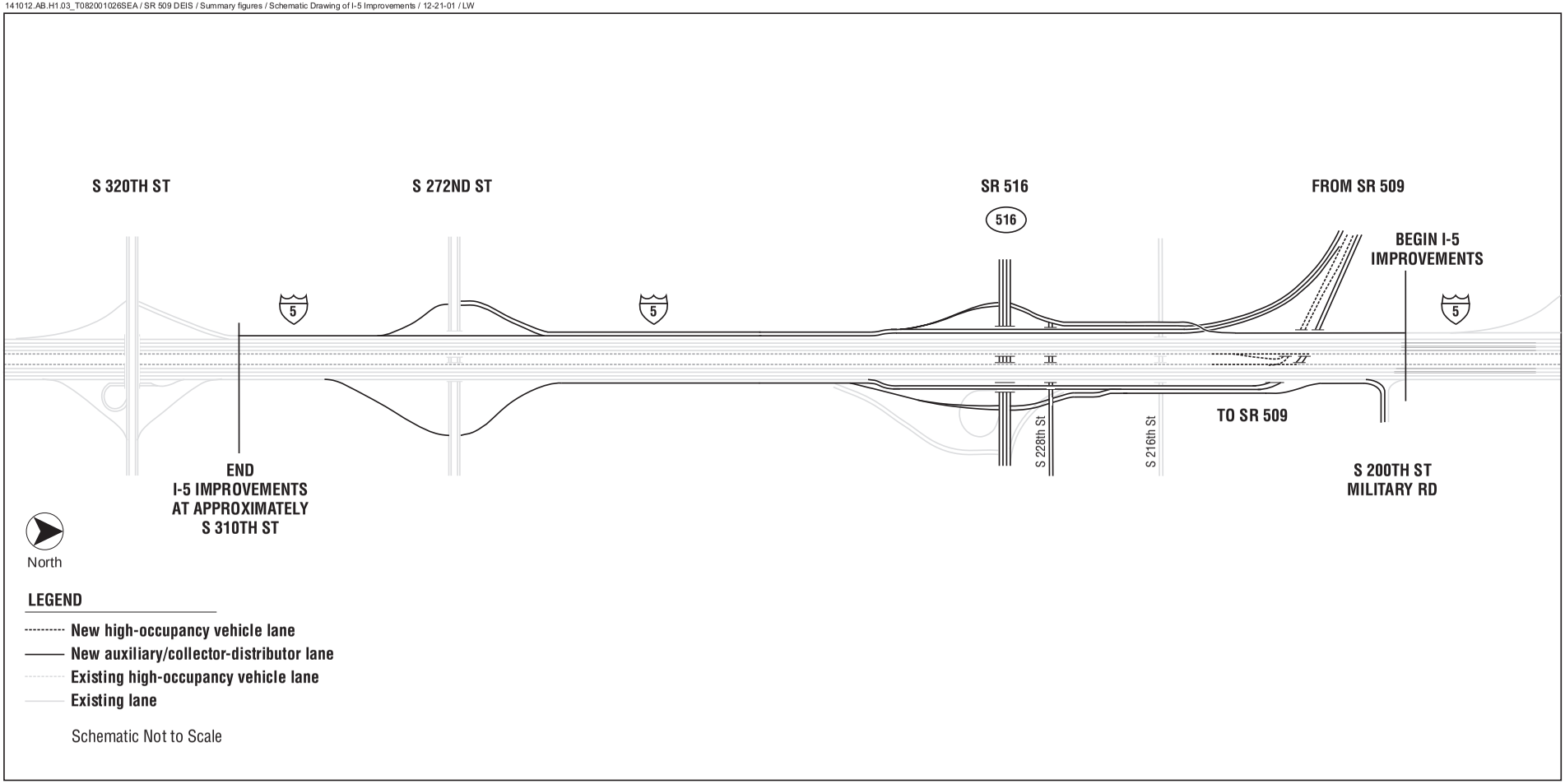


FIGURE S-5

Schematic Drawing of I-5 Improvements

SR 509: Corridor Completion/I-5/South Access Road
Environmental Impact Statement

presents a schematic of the I-5 improvements. These improvements would cover approximately 6.7 miles.

Alternative B

Under Alternative B, the SR 509 mainline would extend southward from its existing terminus at South 188th Street/12th Place South and intersect with I-5 in the vicinity of South 211th Street (Figure S-6). The freeway extension and the South Access Road would generally parallel each other in a north-south orientation on the west and east sides of Des Moines Creek Park, starting in the vicinity of South 208th Street and 24th Avenue South. The alignment would cross over Des Moines Creek and pass through Des Moines Creek Park at its narrowest point. The length of the SR 509 freeway extension under Alternative B would be approximately 3.8 miles.

Alternative C2

Alternative C2, the Preliminary Preferred Alternative, would begin at the existing SR 509 terminus at South 188th Street/12th Place South and intersect with I-5 in the vicinity of South 212th Street (Figure S-7). Alternative C2 would cross to the east on the north side of Des Moines Creek Park. The alignment would be elevated as it crosses the northeast corner of Des Moines Creek Park. The South Access Road interchange with SR 509 would be in the vicinity of South 208th Street and 24th Avenue South. The length of Alternative C2 would be approximately 3.2 miles.

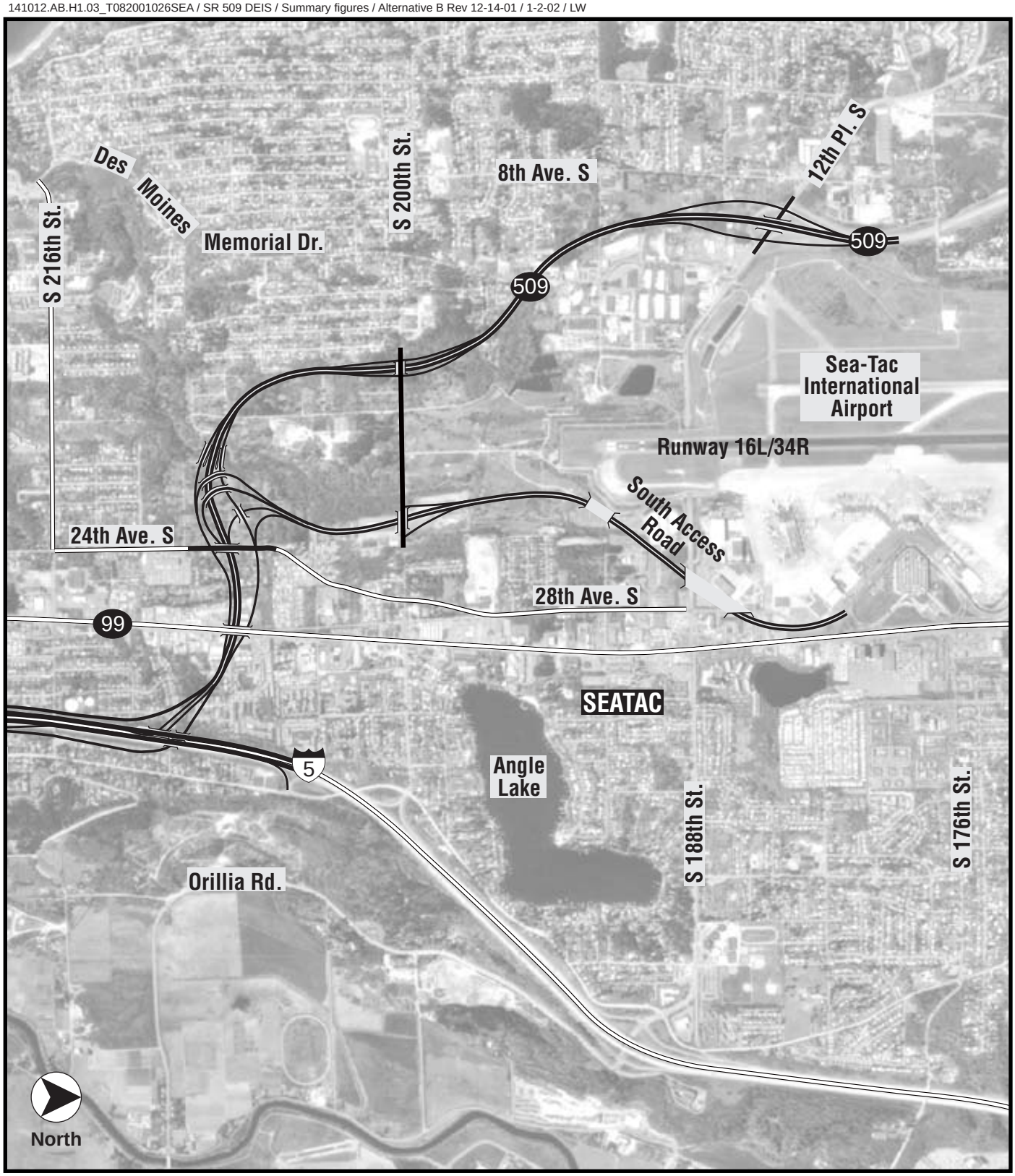
Alternative C3

Alternative C3 would begin at the existing SR 509 terminus at South 188th Street/12th Place South and intersect with I-5 in the vicinity of South 212th Street (Figure S-8). Like Alternative C2, Alternative C3 would cross to the east on the north side of Des Moines Creek Park; however, it would encroach further into the park than Alternative C2. Alternative C3 would also be elevated as it crosses the northeast corner of Des Moines Creek Park. The South Access Road interchange would occur in the vicinity of South 204th Street and 24th Avenue South. Under Alternative C3, the length of the SR 509 extension would be approximately 3.5 miles.

Related Actions

Related actions proposed by other government agencies include the following:

- Development of the South Aviation Support Area (SASA) for Sea-Tac Airport
- Construction of the third runway at Sea-Tac Airport



0 1/4 1/2 3/4 1 MILES

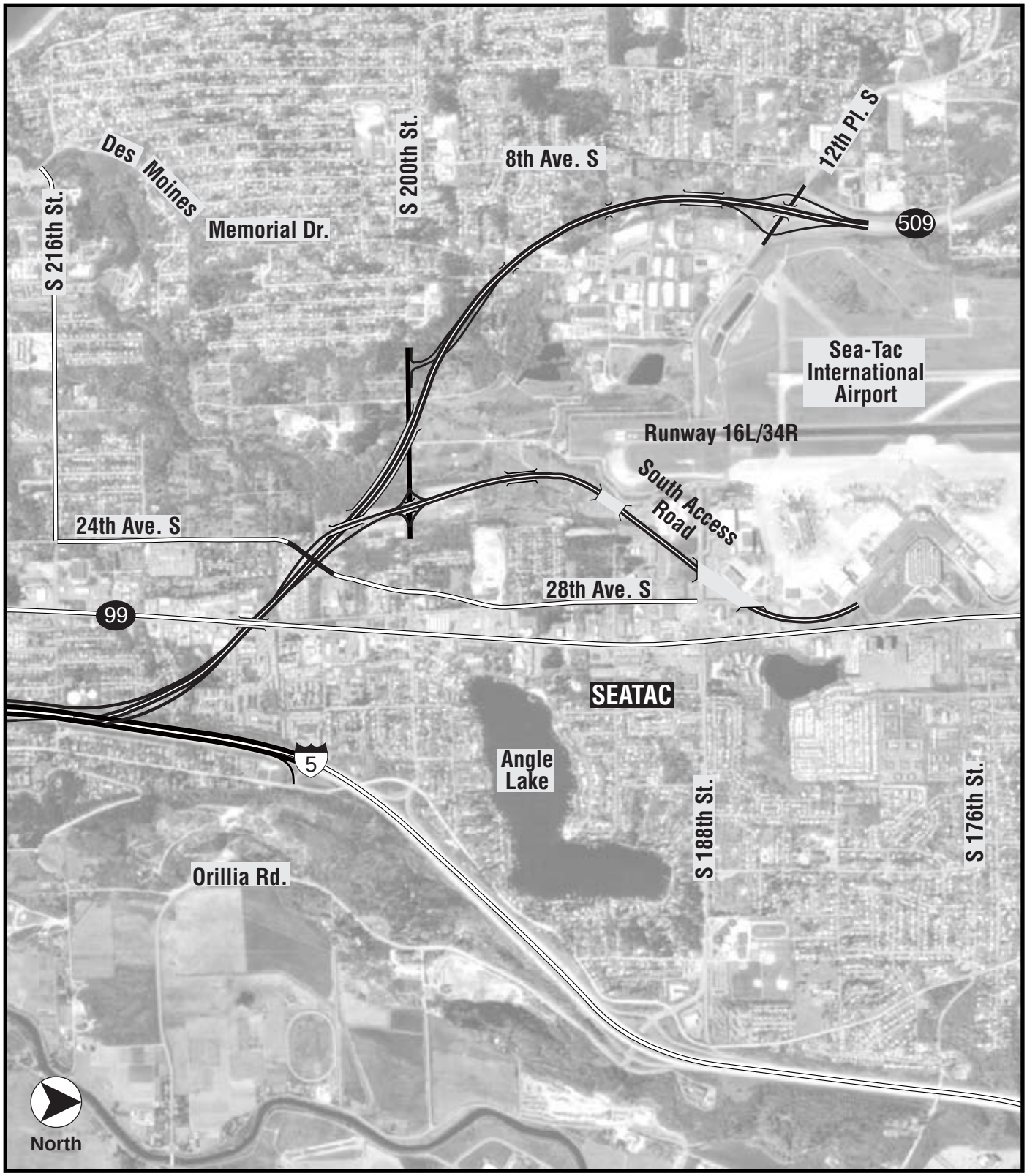
Legend

SR 509/South Access Improvements

FIGURE S-6

Alternative B

SR 509: Corridor Completion/I-5/South Access Road Environmental Impact Statement



0 1/4 1/2 3/4 1 MILES

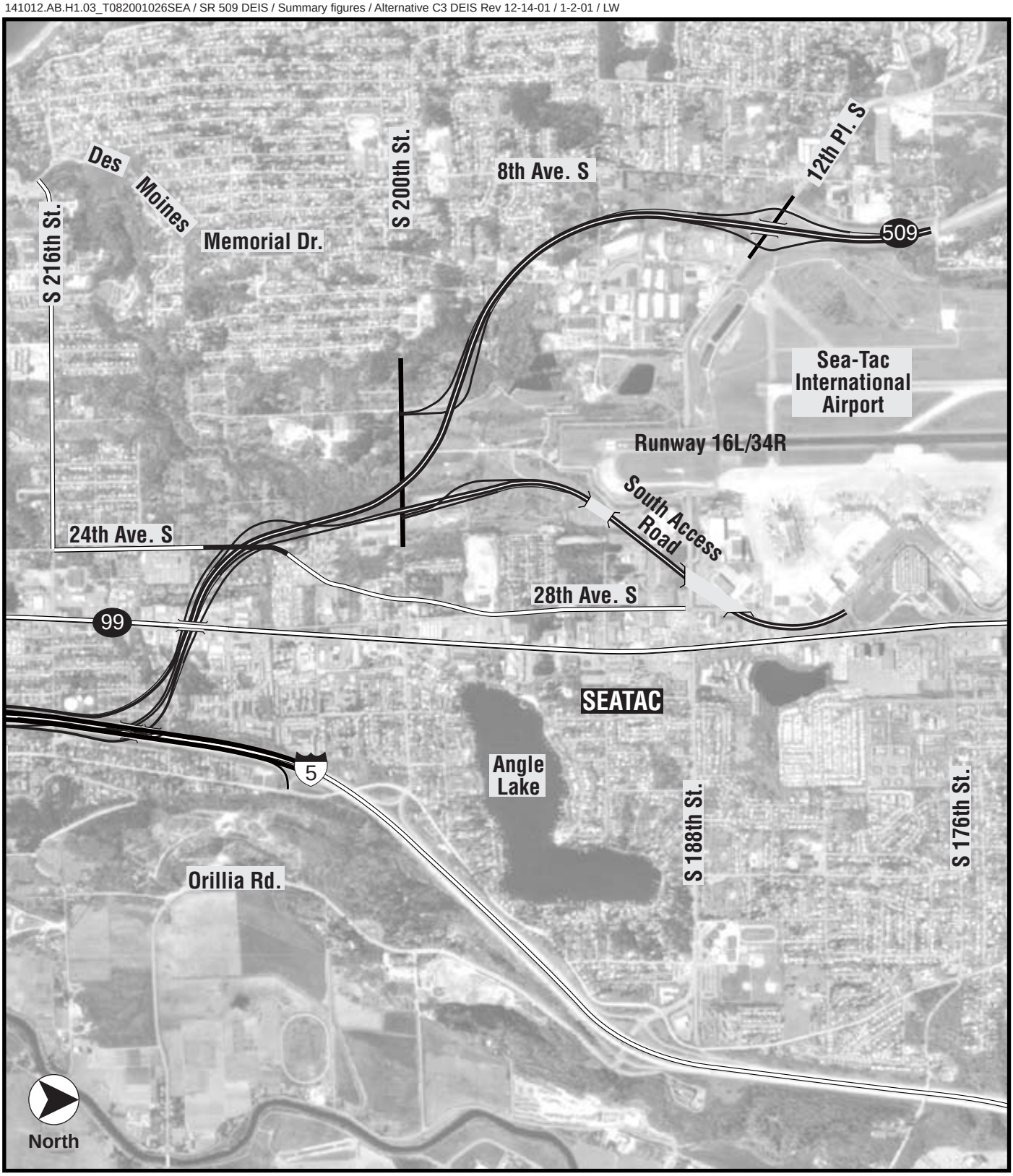
Legend

SR 509/South Access Improvements

FIGURE S-7

Alternative C2 (Preliminary Preferred)

SR 509: Corridor Completion/I-5/South Access Road Environmental Impact Statement



0 1/4 1/2 3/4 1 MILES

Legend

SR 509/South Access Improvements

FIGURE S-8

Alternative C3

SR 509: Corridor Completion/I-5/South Access Road Environmental Impact Statement

- Redevelopment within the Port of Seattle Noise Remedy Program area
- Development of City of SeaTac Central Business District and Aviation Business Center proposals
- Implementation of the Des Moines Creek Basin Plan
- Execution of the Sound Transit Move Program

In addition, there are a number of currently planned local and regional transportation improvement projects that will be constructed in the project area and/or that would have a potential effect on traffic operations in the project area. These transportation projects, shown on Figure S-3, are programmed to be in place by 2020. The development and transportation projects are expected to affect traffic capacity and operation within the project area. These projects have already been, or will be, subject to separate environmental reviews; analysis of their specific impacts is not included in this report.

Summary of Major Environmental Impacts

Table S-1 summarizes the major impacts each alternative is likely to have on the elements of the environment, along with any measures that are recommended or proposed to mitigate those impacts.

Areas of Concern/Unresolved Issues

Over the past 6 years since the SR 509/South Access Road Project Corridor DEIS was issued, ongoing coordination with the numerous public agencies and jurisdictions involved with the development of the proposed action, as well as ongoing public involvement efforts (including open houses, newsletters, web sites, and presentations to various community and business groups), has resulted in the resolution of many complex issues associated with the proposed project. Although many previous areas of concern have been resolved, there are a couple of remaining issues that will require ongoing coordination efforts and more complete resolution for the project design to advance. These are listed and briefly discussed below.

Relocation Plan

The relocation studies performed in conjunction with the preparation of this Revised DEIS indicate that the number of families and businesses anticipated to require relocation can successfully be relocated within the project vicinity over the anticipated relocation time frame. Nonetheless, this remains an area of concern due to the overall number of relocations, the resources needed to successfully manage the relocations program, and the correlation and

prioritization of relocations according to the final staging of the proposed project, which has yet to be determined.

Stormwater Detention and Treatment

Throughout the development of this Revised DEIS, WSDOT has closely coordinated with the jurisdictional agencies involved with stormwater detention and treatment standards. While WSDOT has made commitments to treat the new pavement for the proposed project, there remain a number of unresolved issues. These primarily pertain to the amount of existing pavement within the I-5 corridor project limits that may require some level of stormwater retrofit, and the overall amount of acreage required to treat and detain the stormwater for the entire project. WSDOT is currently working to identify more specific treatment needs and is investigating the amount of land available to accommodate the necessary facilities.

Permits, Licenses, and Other Required Actions or Approvals

- U.S. Army Corps of Engineers
  - Section 404 of the Clean Water Act Permit
- Washington State Department of Ecology (Ecology)
  - Water Quality Certification, Section 401 of the Clean Water Act
  - National Pollutant Discharge Elimination System (NPDES) Stormwater Permit
  - NPDES Stormwater Site Plan—Individual
  - Coastal Zone Management Permit
- Washington Department of Natural Resources
  - Forest Practices Permit
- Washington State Department of Fish and Wildlife (WDFW)
  - Hydraulic Project Approval
- Cities of SeaTac, Des Moines, Federal Way, and Kent, and King County
  - Noise Variance
  - Clearing Permit
  - Critical Area Determination
- King County
  - Landfill Disturbance Permit (to be obtained by others)
- Federal Aviation Administration
  - Airport Highway Clearance

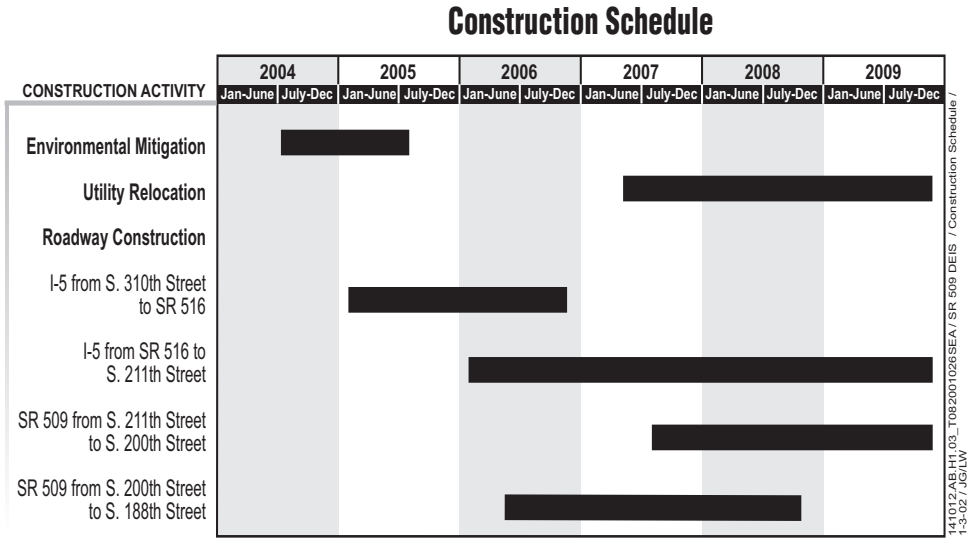
Estimated Cost and Construction Schedule

The estimated cost of constructing the SR 509: Corridor Completion/I-5/ South Access Road Project for each alternative is as follows:

- Alternative B—$715 to $735 million
- Alternative C2—$690 to $710 million
- Alternative C3—$695 to $715 million

These cost estimates are based on preliminary design information, and may be revised during the final design and construction phases of the project. These costs do not include the South Airport Link, the last 1,000 feet connecting the South Access Road to airport roadways.

If one of the build alternatives is selected, construction could begin in 2004. This anticipated start date is based on the availability of funds, which are not currently appropriated for the project. If funding is not available, the start of construction will be delayed.



Note: Because the proposed project requires many activities, some of which depend on the availability of project funding, the actual construction sequence has not been identified in detail. This construction schedule provides the general phasing of project construction. It is not to be construed as the final project sequencing plan, which would be proposed by the contractor if a contractor is awarded.

Table S-1 Summary of Major Environmental Impacts				
Environmental Element	**Alternative A (No Action)**	**Alternative B**	**Alternative C2 (Preliminary Preferred)**	**Alternative C3**
3.1 Air Quality	**Operation (Long-Term) Impacts** Localized pollutant concentrations would not exceed the NAAQS. **Mitigation Measures** None. **Construction (Short-Term) Impacts** None. **Mitigation Measures** None required.	**Operation (Long-Term) Impacts** Same as the No Action Alternative. **Mitigation Measures** None. **Construction (Short-Term) Impacts** Construction activities would result in temporary emissions of pollutants. **Mitigation Measures** Use of best management practices during construction would control particulate emissions.	**Operation (Long-Term) Impacts** Same as the No Action Alternative. **Mitigation Measures** None. **Construction (Short-Term) Impacts** Same as Alternative B. **Mitigation Measures** Same as Alternative B.	**Operation (Long-Term) Impacts** Same as the No Action Alternative. **Mitigation Measures** None. **Construction (Short-Term) Impacts** Same as Alternative B. **Mitigation Measures** Same as Alternative B.
3.2 Noise	**Operation (Long-Term) Impacts** Approximately 1,348 impacted receptors (within the projected 66 dBA noise contour based on 2020 PM peak hour traffic volumes) would include mostly residences, plus a school, 2 parks, and 4 churches (this number will decrease as noise barriers planned by WSDOT are completed along I-5 as mitigation	**Operation (Long-Term) Impacts** Approximately 2,458 impacted receptors (within the projected 66 dBA noise contour based on 2020 PM peak hour traffic volumes) would include mostly residences, plus 3 schools, 3 parks, and 5 churches (this number will decrease as noise barriers planned by WSDOT are completed along I-5 as mitigation	**Operation (Long-Term) Impacts** Approximately 2,578 impacted receptors (within the projected 66 dBA noise contour based on 2020 PM peak hour traffic volumes) would include mostly residences, plus 3 schools, 3 parks, and 6 churches (this number will decrease as noise barriers planned by WSDOT are completed along I-5 as mitigation	**Operation (Long-Term) Impacts** Approximately 2,390 impacted receptors (within the projected 66 dBA noise contour based on 2020 PM peak hour traffic volumes) would include mostly residences, plus 3 schools, 3 parks, and 6 churches (this number will decrease as noise barriers planned by WSDOT are completed along I-5 as

Table S-1 Summary of Major Environmental Impacts				
Environmental Element	**Alternative A (No Action)**	**Alternative B**	**Alternative C2 (Preliminary Preferred)**	**Alternative C3**
	for other projects). Noise levels would increase at locations near I-5 and decrease at locations away from I-5. **Mitigation Measures** None proposed. **Construction (Short-Term) Impacts** No impacts. **Mitigation Measures** None proposed.	for previous projects). Noise levels along I-5 would increase slightly over 1 dBA relative to the No Action Alternative. **Mitigation Measures** Noise barriers would be provided at appropriate areas where residents would likely be impacted by traffic noise and where the construction of the barriers is justified. Other possible mitigation measures could include building insulation, retaining existing trees and vegetation, thereby reducing noise annoyance psychologically by removing the noise source from view, and constructing land forms. **Construction (Short-Term) Impacts** Typical construction-related activities—engine-powered equipment, truck movements, impact equipment—would result in short-term and localized noise impacts. **Mitigation Measures** Contractors would comply with all state and local regulations governing equipment source	for previous projects). Noise levels along I-5 would increase slightly over 1 dBA relative to the No Action Alternative. **Mitigation Measures** Same as Alternative B. **Construction (Short-Term) Impacts** Same as Alternative B. **Mitigation Measures** Same as Alternative B.	mitigation for previous projects). Noise levels along I-5 would increase slightly over 1 dBA relative to the No Action Alternative. **Mitigation Measures** Same as Alternative B. **Construction (Short-Term) Impacts** Same as Alternative B. **Mitigation Measures** Same as Alternative B.

Table S-1 Summary of Major Environmental Impacts				
Environmental Element	**Alternative A (No Action)**	**Alternative B**	**Alternative C2 (Preliminary Preferred)**	**Alternative C3**
		levels and noise resulting from construction site activities. Stationary noise sources would be placed as far from sensitive receivers as possible, idling equipment would be turned off, work that does not need to be done at night would be confined to daytime hours, and trucks would be equipped with properly sized and maintained mufflers.		
3.3 Energy	**Operation (Long-Term) Impacts** Continued consumption of energy due to traffic congestion, stopping and poor traffic at signals, and slower vehicle speeds. **Mitigation Measures** None. **Construction (Short-Term) Impacts** Minor energy consumption due to maintenance of existing road system. **Mitigation Measures** None.	**Operation (Long-Term) Impacts** Less consumption of energy than the No Action Alternative due to good flow of traffic at higher vehicle speeds compared to the No Action Alternative. Slightly more energy consumption than Alternatives C2 and C3. **Mitigation Measures** None. **Construction (Short-Term) Impacts** Highest energy consumption of the build alternatives. **Mitigation Measures**	**Operation (Long-Term) Impacts** Less consumption of energy than the No Action Alternative due to best flow of traffic at higher vehicle speeds compared to the No Action Alternative. **Mitigation Measures** None. **Construction (Short-Term) Impacts** Lowest energy consumption of the build alternatives. **Mitigation Measures** Same as Alternative B.	**Operation (Long-Term) Impacts** Less consumption of energy than the No Action Alternative due to good flow of traffic at higher speeds compared to the No Action Alternative. **Mitigation Measures** None. **Construction (Short-Term) Impacts** Similar energy consumption to Alternative C2, but less than Alternative B. **Mitigation Measures** Same as Alternative B.

Table S-1 Summary of Major Environmental Impacts				
Environmental Element	**Alternative A (No Action)**	**Alternative B**	**Alternative C2 (Preliminary Preferred)**	**Alternative C3**
		Encourage carpooling and ontime delivery of equipment and material, limit idling of construction equipment, and locate construction laydown and staging areas close to work sites.		
3.4 Geology and Soils	**Operation (Long-Term) Impacts** No impacts on earth sensitive areas. **Mitigation Measures** None proposed. **Construction (Short-Term) Impacts** No erosion or sedimentation impacts. **Mitigation Measures** None proposed.	**Operation (Long-Term) Impacts** Excavation and construction in seismic hazard areas. Approximately 4.2 million cubic yards of cut material and 3.5 million cubic yards of fill. **Mitigation Measures** Structures would be designed to Seismic Zone 3 standards. **Construction (Short-Term) Impacts** Highest potential for erosion and sedimentation. Clearing, grading, and excavation could result in erosion and sedimentation to streams and wetlands. Temporary increases in noise, dust, and traffic from hauling cut and fill material.	**Operation (Long-Term) Impacts** Excavation and construction in seismic hazard areas. Approximately 3.2 million cubic yards of cut material and 1.2 million cubic yards of fill. **Mitigation Measures** Same as Alternative B. **Construction (Short-Term) Impacts** Lowest potential for erosion and sedimentation. Other impacts same as Alternative B. **Mitigation Measures** Same as Alternative B.	**Operation (Long-Term) Impacts** Excavation and construction in seismic hazard areas. Approximately 3.8 million cubic yards of cut material and 3.6 million cubic yards of fill. **Mitigation Measures** Same as Alternative B. **Construction (Short-Term) Impacts** Greater potential for erosion and sedimentation than Alternative C2, but lower than Alternative B. Other impacts same as Alternative B **Mitigation Measures** Same as Alternative B.

Table S-1 Summary of Major Environmental Impacts				
Environmental Element	**Alternative A (No Action)**	**Alternative B**	**Alternative C2 (Preliminary Preferred)**	**Alternative C3**
		Mitigation Measures Implementation of appropriate erosion control standards during construction.		
3.5 Water Quality	**Operation (Long-Term) Impacts** No additional runoff from new impervious surface would be generated. **Mitigation Measures** None. **Construction (Short-Term) Impacts** None. **Mitigation Measures** None.	**Operation (Long-Term) Impacts** Approximately 126.5 acres of new impervious surfaces would be created, increasing the potential for higher flows during storms, pollution from highway runoff, and accidental spills. After stormwater treatment, annual pollutant loadings to Des Moines and Miller Creek Basins would be the highest of the build alternatives. Accidental spills and sand and de-icing chemicals applied during maintenance could affect water quality of all receiving waters. Potential for impacts would be highest at one crossing of Des Moines Creek and four crossings of East Fork of Des Moines Creek. Groundwater recharge would be reduced in areas with fill. **Mitigation Measures** Detention and water quality measures, according to the King County basic water quality menu, WSDOT Endangered Species Act (ESA) stormwater effects guidelines, and WSDOT	**Operation (Long-Term) Impacts** Approximately 113 acres of new impervious surfaces would be created, and less stormwater runoff would be generated than for Alternative B. After stormwater treatment, annual pollutant loadings to Des Moines and Miller Creek Basins would be the lowest of the build alternatives. This alternative would have one crossing of Des Moines Creek and four crossings of East Fork of Des Moines Creek. Other impacts would be the same as for Alternative B. **Mitigation Measures** Same as Alternative B. **Construction (Short-Term) Impacts** Same as Alternative B. **Mitigation Measures** Same as Alternative B.	**Operation (Long-Term) Impacts** Approximately 113.5 acres of new impervious surfaces would be created, generating less stormwater runoff than Alternative B, and slightly more than Alternative C2. After stormwater treatment, annual pollutant loadings to Des Moines and Miller Creek Basins would be similar to Alternative C2, and lower than Alternative B. Stream crossings would be the same as for Alternative C2. Other impacts would be the same as for Alternative B. **Mitigation Measures** Same as Alternative B. **Construction (Short-Term) Impacts** Same as Alternative B. **Mitigation Measures** Same as Alternative B.

Table S-1 Summary of Major Environmental Impacts				
Environmental Element	**Alternative A (No Action)**	**Alternative B**	**Alternative C2 (Preliminary Preferred)**	**Alternative C3**
		Roadside Classification Plan (RCP), including Integrated Vegetation Management, would be implemented. Operation mitigation measures would include operation and maintenance of stormwater management systems and implementation of a spill prevention and control plan. Groundwater infiltration would be increased through bioswales. **Construction (Short-Term) Impacts** Vegetation removal, interception of sheet flow, and soil compaction could temporarily increase runoff rates and cause erosion and sedimentation in receiving waters. Other pollutants, including fuel and lubricants, paving oils, chemicals, construction debris, and uncured concrete could enter surface waters. These pollutants could infiltrate to groundwater. **Mitigation Measures** A Stormwater Site Plan (SSP) would be developed to fulfill requirements of NPDES permit. The SSP would include provisions for implementation of BMPs to protect groundwater		

Table S-1 Summary of Major Environmental Impacts				
Environmental Element	**Alternative A (No Action)**	**Alternative B**	**Alternative C2 (Preliminary Preferred)**	**Alternative C3**
		and public drinking water supply, measures to protect water and sewer lines, and construction monitoring. A Temporary Erosion and Sedimentation Plan (TESC) would also be developed according to King County guidelines. In addition, a Spill Prevention Control and Countermeasures (SPCC) plan would also be adopted as a construction planning element of the project to reduce accident-related water quality impacts.		
3.6 Wetlands	**Operation (Long-Term) Impacts** None. **Mitigation Measures** None. **Construction (Short-Term) Impacts** None. **Mitigation Measures** None.	**Operation (Long-Term) Impacts** 7.7 acres of direct wetland impacts on Wetlands A, B, D, F, N, 1, 2, 6, 7, 8, 9, 16, 18, 21, and 22 (Ecology Category 2, 3, and 4 wetlands). 23.3 acres of wetland buffer impacts on Wetlands M, 5, 17, 15, 19, 23, I5-7, I5-10, I5-11, I5-12, I5-13, and I5-19 (without direct wetland impacts). Reduction in wetland functions (i.e. flood water detention/retention, groundwater recharge/discharge, and water quality improvement). Disruption of biological and wildlife support.	**Operation (Long-Term) Impacts** 0.2 acres of direct wetland impacts on Wetlands A, B, M, N, 16, and 23 (Ecology Category 2, 3, and 4 wetlands). Potential shade effects from bridges to Wetlands A, B, and D. Direct wetland impacts would be limited to placement of bridge piers. 13.9 acres of wetland buffer impacts on Wetlands A, B, D, F, G, I5-7, I5-10, I5-11, I5-12, I5-13, and I5-19 (without direct wetland impacts). Additional impacts are the same as Alternative B.	**Operation (Long-Term) Impacts** 5.4 acres of direct wetland impacts on Wetlands A, B, D, G, H, K, M, N, S, 16, 20, and 23 (Ecology Category 2, 3, and 4 wetlands). Potential shade effects to Wetland A from bridge structure. Direct wetland impacts would be limited to placement of bridge piers. 21.5 acres of wetland buffer impacts on Wetlands F, 15, and 17 (without direct wetland impacts). Additional impacts are the same as Alternative B.

Table S-1 Summary of Major Environmental Impacts				
Environmental Element	**Alternative A (No Action)**	**Alternative B**	**Alternative C2 (Preliminary Preferred)**	**Alternative C3**
		Mitigation Measures Avoidance of wetland impacts through alternative alignment and engineering design. This design impact has been reduced to 7.7 acres. Minimization of wetland impacts could be further reduced through design of bridges and vertical wall structures. Compensatory mitigation for wetland impacts by creation of new wetlands, or restoration or enhancement of existing wetlands. Requirements include creation and/or restoration at a minimum 1:1 mitigation ratio. Additional mitigation is required to satisfy Ecology's wetland mitigation guidelines. **Construction (Short-Term) Impacts** Temporary wetland and buffer impacts during construction include clearing, grading, excavation, and filling. Exposed soils can erode and increase sediment transport to wetlands. Wetland water quality could be	**Mitigation Measures** Avoidance of wetland impacts through alternative alignment and engineering design. This design impact has been reduced to 0.2 acres. WSDOT has committed to avoiding Wetland F (northwest pond) and spanning Wetlands A, B, and D (Tyee Pond). Additional mitigation measures are the same as Alternative B. **Construction (Short-Term) Impacts** Same as Alternative B. **Mitigation Measures** Same as Alternative B.	**Mitigation Measures** Avoidance of wetland impacts through alternative alignment and engineering design. This design impact has been reduced to 5.4 acres. Minimization of wetland impacts could be further reduced through design of bridges and vertical wall structures. Additional mitigation measures are the same as Alternative B. **Construction (Short-Term) Impacts** Same as Alternative B. **Mitigation Measures** Same as Alternative B.

Table S-1 Summary of Major Environmental Impacts				
Environmental Element	**Alternative A (No Action)**	**Alternative B**	**Alternative C2 (Preliminary Preferred)**	**Alternative C3**
		adversely affected during construction as a result of onsite storage and use of fuel and lubricants for construction equipment. **Mitigation Measures** Wetlands impacted by short-term construction would be restored upon completion of construction. Affected wetlands and buffers would be replanted with native vegetation. Federal, state, and local best management practices would ensure that stormwater runoff is collected and treated before entering existing bodies of water. Settling ponds, containment berms, silt fences, sediment traps, seeding of exposed slopes, and other measures would be implemented as indicated. A spill prevention plan will be in place during construction.		
3.7 Vegetation, Fish, and Wildlife	**Operation (Long-Term) Impacts** None. **Mitigation Measures** None.	**Operation (Long-Term) Impacts** Bridge structures that would cross wetlands and Des Moines Creek could restrict sunlight and precipitation to vegetation communities beneath the	**Operation (Long-Term) Impacts** Same as Alternative B. **Mitigation Measures** Same as Alternative B.	**Operation (Long-Term) Impacts** Same as Alternative B. **Mitigation Measures** Same as Alternative B.

Table S-1 Summary of Major Environmental Impacts				
Environmental Element	**Alternative A (No Action)**	**Alternative B**	**Alternative C2 (Preliminary Preferred)**	**Alternative C3**
	Construction (Short-Term) Impacts None. **Mitigation Measures** None.	bridges. Operation-related impacts on wildlife are expected to be minor and related principally to ambient noise levels associated with vehicular traffic. Potential operation impacts on streams include water quality degradation from operation and maintenance activities and accidental spills associated with stormwater runoff to receiving waters. No federal- or state-listed sensitive, threatened, or endangered plant or wildlife species regularly breed, forage, or occupy the project area. No impacts on threatened or endangered species are anticipated. **Mitigation Measures** Mitigation measures for operation impacts would be similar for all build alternatives. Following construction, native plant communities would be established to replace exotic, invasive species. Disturbed soils would also be covered, seeded, and/or revegetated with native species following construction. Water quality degradation is not expected as long as stormwater	**Construction (Short-Term) Impacts** Alternative C2 would disturb less vegetation than Alternatives B and C3. Substantially less forested and wetland habitat would be cleared under Alternative C2. Other impacts would be the same as for Alternative B. Alternative C2 would result in one new bridge crossing of Des Moines Creek and four new crossings of the East Fork of Des Moines Creek. Anadromous fish runs do not occur in the reaches of Des Moines Creek that will be affected. Alternative C2 does not alter any existing culverts or stream crossings and does not involve in-water work. Potential construction impacts on Des Moines Creek would be the same as for Alternative B. **Mitigation Measures** Same as Alternative B.	**Construction (Short-Term) Impacts** Alternative C3 would disturb less vegetation than Alternative B and more than Alternative C2. Other impacts would be the same as for Alternative B. Impacts associated with stream crossings would be similar to Alternative B and C2. **Mitigation Measures** Same as Alternative B.

Table S-1 Summary of Major Environmental Impacts				
Environmental Element	**Alternative A (No Action)**	**Alternative B**	**Alternative C2 (Preliminary Preferred)**	**Alternative C3**
		management plans, facilities, and related best management practices are installed and maintained to comply with the King County Surface Water Design Manual, and WSDOT's Highway Runoff Manual.		
		Construction (Short-Term) Impacts Alternative B would have greater impacts on vegetation communities, particularly forested and wetland habitats, than Alternatives C2 and C3. Exposed and/or compacted soils would be susceptible to colonization by invasive species. Vegetation removal would result in loss of wildlife habitat that provides protective cover, nesting areas, and food for animals and could displace and/or eliminate wildlife. Heavy equipment use would cause temporary audible and visual disturbance to wildlife. Alternative B would result in one new bridge crossing of Des Moines Creek and four new crossings of the East Fork of Des Moines Creek. Anadromous fish runs do not occur in the stream reaches that would be crossed. Alternative B does not alter any existing stream crossings and		

Table S-1 Summary of Major Environmental Impacts				
Environmental Element	**Alternative A (No Action)**	**Alternative B**	**Alternative C2 (Preliminary Preferred)**	**Alternative C3**
		does not involve in-water work. Construction activities could introduce a variety of pollutants and sediments into adjacent water resources. No impacts on threatened or endangered species are anticipated. **Mitigation Measures** Mitigation measures for construction impacts would be similar for all build alternatives. Construction activities would be scheduled to take into account timing recommendations from WDFW and other agencies to avoid disturbance to breeding wildlife in sensitive habitats, such as wetlands. Monitoring would be conducted during construction to ensure that mitigation measures are successfully implemented and that performance standards are achieved. All stream crossings would be spanned with bridges to minimize impacts on streams and fish habitat from the project. Construction activities would occur outside of stream channels, and the period of construction activity would be limited according to recommendations from WDFW, NMFS, and USFWS. Alternative B would require fish and water quality related design guidelines		

Table S-1 Summary of Major Environmental Impacts				
Environmental Element	**Alternative A (No Action)**	**Alternative B**	**Alternative C2 (Preliminary Preferred)**	**Alternative C3**
		and other forms of mitigation to comply with various federal, state, and local permit requirements.		
3.8 Land Use	**Operation (Long-Term) Impacts** 96 acres of the existing SR 509 right-of-way would remain in its current use, along with the existing I-5 corridor right-of-way, between South 216th Street and South 310th Street. Regional traffic congestion patterns would continue to worsen. Accessibility to the airport would remain the same. **Mitigation Measures** None. **Construction (Short-Term) Impacts** None. **Mitigation Measures** None.	**Operation (Long-Term) Impacts** Would require the greatest amount of new right-of-way acquisition (175-180 acres). This number does not include the existing/unutilized right-of-way for SR 509, I-5, or major arterials. 77 acres of the total would be vacant or undeveloped land (this is the most of all the build alternatives). Would require 0.5 acre of Des Moines Creek Park, and would avoid taking land from the Hillgrove Cemetery and the Federal Detention Center, but would take some land from the NW corner of the Alaska Airlines Gold Coast Center. **Mitigation Measures** WSDOT would coordinate with the cities of SeaTac and Des Moines to identify alternative property that could offset impacts associated with acquiring portions of Des Moines Creek Park. People and businesses	**Operation (Long-Term) Impacts** Would require the least amount of new right-of-way of all the build alternatives (94-100 acres). Would acquire the most land designated for Residential High Density uses (17 acres), but the least Residential Low Density land uses (30 acres). Would require the acquisition of 3 acres of Des Moines Creek Park, but would avoid the Hill-grove Cemetery, Alaska Airlines Gold Coast Center, and the Federal Detention Center. **Mitigation Measures** WSDOT would replace any lost parkland acreage through a negotiated land swap between WSDOT and the City of SeaTac. People and businesses displaced would be entitled to relocation assistance and payment programs. Permits and approvals would be acquired to ensure that the project is consistent with local	**Operation (Long-Term) Impacts** Would require 138-143 acres for new right-of-way. Would acquire the least amount of vacant or undeveloped land of all the build alternatives (28.7 acres). Would require 4 acres of Des Moines Creek Park. Would displace the Alaska Airlines Gold Coast Center, but avoid the Hillgrove Cemetery and the Federal Detention Center. **Mitigation Measures** WSDOT would replace any lost parkland acreage through a negotiated land swap between WSDOT and the City of SeaTac. People and businesses displaced would be entitled to relocation assistance and payment programs. Permits and approvals would be acquired to ensure that the

Table S-1 Summary of Major Environmental Impacts				
Environmental Element	**Alternative A (No Action)**	**Alternative B**	**Alternative C2 (Preliminary Preferred)**	**Alternative C3**
		displaced would be entitled to relocation assistance and payment programs. Permits and approvals would be acquired to ensure that the project is consistent with local comprehensive plans, zoning ordinances, and other regulations. **Construction (Short-Term) Impacts** Temporary traffic congestion, access, and parking restrictions would affect the quality and character of existing land uses. **Mitigation Measures** Access impacts would be mitigated through appropriate construction practices as mentioned in the transportation analyses.	comprehensive plans, zoning ordinances, and other regulations. **Construction (Short-Term) Impacts** Same as Alternative B. Could have less impacts than Alternative B because 80 fewer acres would have to be acquired. **Mitigation Measures** Same as Alternative B.	project is consistent with local comprehensive plans, zoning ordinances, and other regulations. **Construction (Short-Term) Impacts** Same as Alternative B. Could have less impacts than Alternative B because 40 fewer acres would have to be acquired. **Mitigation Measures** Same as Alternative B.
3.9 Relocation	**Operation (Long-Term) Impacts** None. **Mitigation Measures** None. **Construction (Short-Term)**	**Operation (Long-Term) Impacts** 19-24 businesses 106-114 single-family units 253-266 multifamily units 4 mobile homes (The residents of four existing mobile home parks will be relocated as part of the Port of Seattle Noise Mitigation Plan prior to and independent of construction of	**Operation (Long-Term) Impacts** 16-20 businesses 71-79 single-family units 175-187 multifamily units 4 mobile homes (The residents of four existing mobile home parks will be relocated as part of the Port of Seattle Noise Mitigation Plan prior to and independent of construction of	**Operation (Long-Term) Impacts** 12-17 businesses 111-114 single-family units 135-143 multifamily units 4 mobile homes (The residents of four existing mobile home parks will be relocated as part of the Port of Seattle Noise Mitigation Plan prior to and independent of construction of

Table S-1 Summary of Major Environmental Impacts				
Environmental Element	**Alternative A (No Action)**	**Alternative B**	**Alternative C2 (Preliminary Preferred)**	**Alternative C3**
	Impacts None. **Mitigation Measures** None.	the SR 509 extension) **Mitigation Measures** Displacees would be eligible for relocation assistance to find suitable and comparable relocation sites under the Uniform Relocation Assistance and Real Property Acquisition Act of 1970, as amended. Planned and approved housing exists in the project area. **Construction (Short-Term) Impacts** None. **Mitigation Measures** None.	the SR 509 extension) **Mitigation Measures** Same as Alternative B. **Construction (Short-Term) Impacts** None. **Mitigation Measures** None.	the SR 509 extension) **Mitigation Measures** Same as Alternative B. **Construction (Short-Term) Impacts** None. **Mitigation Measures** None.
3.10 Social	**Operation (Long-Term) Impacts** Community cohesion would be largely unaffected. The lack of access improvements would conflict with GMA concurrency requirements for proposed growth and development in the area. No impacts on recreational facilities.	**Operation (Long-Term) Impacts** Moderately severe impacts on Homestead Park community cohesion. Moderate impacts on Midway, Madrona and Grandview community cohesion. Would assist jurisdictions within the project area to direct development in accordance with their comprehensive planning. The Tyee Valley Golf Course	**Operation (Long-Term) Impacts** Moderately severe impacts on Mansion Hill community cohesion. Moderate impacts on Midway and Madrona neighborhood community cohesion. Same regional and community growth impacts as Alternative B. Same recreational impacts as Alternative B, except would	**Operation (Long-Term) Impacts** Moderately severe impacts on Mansion Hill and Homestead Park community cohesion. Moderate impacts on Midway neighborhood community cohesion. Same regional and community growth impacts as Alternative B. Same recreational impacts as Alternative B, except would

Table S-1 Summary of Major Environmental Impacts				
Environmental Element	**Alternative A (No Action)**	**Alternative B**	**Alternative C2 (Preliminary Preferred)**	**Alternative C3**
	No direct impacts on services and utilities. No impacts on pedestrian and bicyclist facilities. **Mitigation Measures** None. **Construction (Short-Term) Impacts** None. **Mitigation Measures** None.	would likely close. 0.5 acres of Des Moines Creek Park would be acquired. No direct impacts on Midway Park, Linda Heights Park, or Mark Twain School Playfield. School access would be more complicated for some students who walk to school because of street closures. One church would be displaced. Some utilities would need to be relocated. **Mitigation Measures** Construct a new access connection between South 208th and South 204th Streets to preserve access to remaining apartment complexes in the Madrona neighborhood. Investigate the feasibility and benefits of maintaining through access on key streets and installing pedestrian access across the roadway. Portions of the unused existing WSDOT right-of-way could be sold to local jurisdictions as recreational land. Extend school bus routes to include children whose school access would be disrupted.	acquire 2.9 acres of Des Moines Creek Park. Same service and utility impacts as Alternative B. **Mitigation Measures** Same community cohesion mitigation as Alternative B. In addition, WSDOT will investigate the feasibility of providing revised access to three homes near the intersection of South 211th Street and 32nd Avenue South that would lose access as a result of the alternative's current design. Portions of the unused existing WSDOT right-of-way could be sold to local jurisdictions as recreational land. An extension of Des Moines Creek Park Trail would be incorporated into alignment design. Same service and utility mitigation as Alternative B. **Construction (Short-Term) Impacts** Existing utilities may need to be relocated during construction. During construction of the	acquire 3.9 acres of Des Moines Creek Park. Same service and utility impacts as Alternative B. **Mitigation Measures** Same community cohesion mitigation as Alternative B. Same recreational mitigation as Alternative C2. Same service and utility mitigation as Alternative B. **Construction (Short-Term) Impacts** Existing utilities may need to be relocated during construction. During construction of the elevated structure in Des Moines Creek Park, the trailhead parking area and the northern end of Des Moines Creek Trail would likely need to be closed for safety reasons. **Mitigation Measures** WSDOT would work with local service providers to coordinate utility relocation efforts and to minimize service disruptions.

Table S-1 Summary of Major Environmental Impacts				
Environmental Element	**Alternative A (No Action)**	**Alternative B**	**Alternative C2 (Preliminary Preferred)**	**Alternative C3**
		Access plans would be developed for emergency services in areas where street access would be changed. **Construction (Short-Term) Impacts** Existing utilities may need to be relocated during construction. During construction of the bridges over Des Moines Creek, Des Moines Creek Trail would likely need to be closed for safety measures. **Mitigation Measures** WSDOT would work with local service providers to coordinate utility relocation efforts and minimize service disruptions. WSDOT would work closely with the City of SeaTac to minimize disruption to the facilities and, when unavoidable, work with the City to implement alternative routes/detours.	elevated structure in Des Moines Creek Park, the trailhead parking area and the northern end of Des Moines Creek Trail would likely need to be closed for safety reasons. **Mitigation Measures** If the trailhead parking area and trail (under Alternatives C2 and C3) need to be closed during construction for safety reasons. WSDOT would work closely with the City of SeaTac to minimize disruption to the facilities and, when unavoidable, work with the City to implement alternative routes/detours.	Same mitigation measures as Alternative B.
3.11 Economic	**Operation (Long-Term) Impacts** Traffic congestion on I-5, other north/south arterials, and some east/west arterials would likely	**Operation (Long-Term) Impacts** The movement of goods and people from I-5 to Sea-Tac Airport and other locations along	**Operation (Long-Term) Impacts** Same as Alternative B.	**Operation (Long-Term) Impacts** Same as Alternative B.

Table S-1 Summary of Major Environmental Impacts				
Environmental Element	**Alternative A (No Action)**	**Alternative B**	**Alternative C2 (Preliminary Preferred)**	**Alternative C3**
	continue to worsen, despite numerous roadway improvements. This would further impair the movement of goods and people within the cities of SeaTac and Des Moines and to Sea-Tac Airport. **Mitigation Measures** None. **Construction (Short-Term) Impacts** No businesses or residences would be displaced by right-of-way acquisition for the project, and there would be no resulting job losses or decreases in property or sales tax revenue. Benefits associated with construction related spending would not be realized. **Mitigation Measures** None.	the SR 509 corridor would be improved. Commercial vehicles and individual passengers traveling to and from Sea-Tac Airport would experience travel time savings due to the improved roadway. The fiscal impacts associated with the initial loss of property tax revenues would represent less than 1 percent of each jurisdiction's total tax revenues; therefore, the impact would not be considered substantial. The impacts on sales tax revenues are also not likely to be substantial. The initial tax impacts associated with displacements would likely be offset eventually by tax revenues associated with increased development of vacant land and redevelopment of existing buildings throughout the project area. **Mitigation Measures** None. **Construction (Short-Term) Impacts** Construction would result in a $715 million project and the	**Mitigation Measures** Same as Alternative B. **Construction (Short-Term) Impacts** Construction would result in a $690 million project and the associated positive impacts on employment and overall economic activity in the project area. Impacts on businesses might include temporarily increased congestion, noise, dust, and possibly interrupted or more difficult access. Temporary reduction in retail sales might result as customers avoid shopping in the construction area (this would be partially offset by sales tax revenues generated by construction spending in the region). Right-of-way acquisition would displace between 16 and 20 businesses. Depending on the option selected, the construction of the South Airport Link would be expected to displace between 0 and 4 businesses in the SeaTac	**Mitigation Measures** Same as Alternative B. **Construction (Short-Term) Impacts** Construction would result in a $695 million project and the associated positive impacts on employment and overall economic activity in the project area. Impacts on businesses might include temporarily increased congestion, noise, dust, and possibly interrupted or more difficult access. Temporary reduction in retail sales might result as customers avoid shopping in the construction area (this would be partially offset by sales tax revenues generated by construction spending in the region). Right-of-way acquisition would displace between 12 and 17 businesses. Depending on the option selected, the construction of the South Airport Link would be expected to displace between 0 and 4 businesses in the SeaTac

Table S-1 Summary of Major Environmental Impacts				
Environmental Element	**Alternative A (No Action)**	**Alternative B**	**Alternative C2 (Preliminary Preferred)**	**Alternative C3**
		associated positive impacts on employment and overall economic activity in the region. Impacts on businesses might include temporarily increased congestion, noise, dust, and possibly interrupted or more difficult access. Temporary reduction in retail sales might result as customers avoid shopping in the construction area (this would be partially offset by sales tax revenues generated by construction spending within the project area). Right-of-way acquisition would displace between 19 and 24 businesses. Depending on the option selected, the construction of the South Airport Link would be expected to displace between 0 and 4 businesses in the SeaTac city center. The I-5 improvements would displace 2 to 3 businesses. **Mitigation Measures** Install temporary signage to inform drivers that access to businesses during construction is temporarily changed or restricted. Require contractors to submit	city center. The I-5 improvements would displace 2 to 3 businesses. **Mitigation Measures** Same as Alternative B.	city center. The I-5 improvements would displace 2 to 3 businesses. **Mitigation Measures** Same as Alternative B.

Table S-1 Summary of Major Environmental Impacts				
Environmental Element	**Alternative A (No Action)**	**Alternative B**	**Alternative C2 (Preliminary Preferred)**	**Alternative C3**
		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. Inform businesses and tenants displaced by new right-of-way acquisition or other construction activities that they would be entitled to relocation assistance in accordance with the Uniform Relocation Assistance and Real Property Acquisition Act of 1970, as amended by RCW 8.26.		
3.12 Historic and Archaeological Resources	**Operation (Long-Term) Impacts** None. **Mitigation Measures** None. **Construction (Short-Term) Impacts** None. **Mitigation Measures**	**Operation (Long-Term) Impacts** No impacts would occur to known state or National Register listed or eligible resources. **Mitigation Measures** None. **Construction (Short-Term) Impacts** Six potentially historic buildings	**Operation (Long-Term) Impacts** Same as Alternative B. **Mitigation Measures** None. **Construction (Short-Term) Impacts** Five potentially historic buildings would be removed during	**Operation (Long-Term) Impacts** Same as Alternative B. **Mitigation Measures** None. **Construction (Short-Term) Impacts** Six potentially historic buildings would be removed during

Table S-1 Summary of Major Environmental Impacts				
Environmental Element	**Alternative A (No Action)**	**Alternative B**	**Alternative C2 (Preliminary Preferred)**	**Alternative C3**
	None.	would be removed during construction. **Mitigation Measures** WSDOT would consult with the tribes during construction in accordance with Section 106 of the National Historic Preservation Act of 1966. If required, archaeological monitoring will be undertaken during construction; in the event that potentially significant archaeological remains are found, specific late discovery procedures will be followed. If any of the buildings to be removed during construction are determined by OAHP to be NRHP-eligible, mitigation measures may include modifications to the project design to avoid or minimize impacts; review and approval by SHPO and local Landmarks Preservation Board of project design elements that may damage, alter, or obscure views of a historic resource/designated local landmark; or relocation of the historic resource.	construction. **Mitigation Measures** Same as Alternative B.	construction. **Mitigation Measures** Same as Alternative B.
3.13 Hazardous Waste	**Operation (Long-Term) Impacts** Increases potential for hazardous	**Operation (Long-Term) Impacts** Less potential for hazardous	**Operation (Long-Term) Impacts** Same as Alternative B.	**Operation (Long-Term) Impacts** Same as Alternative B.

Table S-1 Summary of Major Environmental Impacts				
Environmental Element	**Alternative A (No Action)**	**Alternative B**	**Alternative C2 (Preliminary Preferred)**	**Alternative C3**
	materials spills because of future increases in traffic congestion. **Mitigation Measures** None. **Construction (Short-Term) Impacts** No known or potentially contaminated sites would be affected. **Mitigation Measures** None.	materials spills associated with lower levels of traffic congestion. **Mitigation Measures** None. **Construction (Short-Term) Impacts** Thirty-six known or suspected contaminated sites could be affected. Four substantially contaminated sites could be affected. Potential soil and groundwater contaminants include petroleum hydrocarbons, solvents, and heavy metals. Construction of I-5 improvements could require excavation in or adjacent to the Midway Landfill. **Mitigation Measures** General mitigation includes erosion control, spill prevention and containment measures. Removal, and disposal of demolition debris, underground storage tanks, and contaminated soil would be conducted in accordance with regulatory requirements.	**Mitigation Measures** None. **Construction (Short-Term) Impacts** Forty known or suspected contaminated sites could be affected. The four substantially identified for alternative B could potentially be affected. Same impacts associated with the Midway Landfill as for Alternative B. **Mitigation Measures** Same as Alternative B.	**Mitigation Measures** None. **Construction (Short-Term) Impacts** Forty known or suspected contaminated sites could be affected. Six substantially contaminated sites could be affected, including the four sites identified for Alternatives B and C2. Same impacts associated with the Midway Landfill as for Alternative B. **Mitigation Measures** Same as Alternative B.

Table S-1 Summary of Major Environmental Impacts				
Environmental Element	**Alternative A (No Action)**	**Alternative B**	**Alternative C2 (Preliminary Preferred)**	**Alternative C3**
		Mitigation for construction in the vicinity of Midway landfill could include construction of retaining walls, odor control, and modification of the existing geomembrane and gas extraction system.		
3.14 Visual Quality	**Operation (Long-Term) Impacts** None. **Mitigation Measures** None. **Construction (Short-Term) Impacts** None. **Mitigation Measures** None.	**Operation (Long-Term) Impacts** Visual impacts on Lower Des Moines Creek, South 208th St. Draw, Mansion Hill, Midway Ridge, and Kent/Federal Way caused by clearing of vegetation, installation of noise walls, and construction of new lanes, ramps, or bridge structures. Changes would be visible to residents and recreational users. **Mitigation Measures** Incorporate aesthetic consid-erations into project design; minimize clearing and preserve stands of mature trees and natural vegetation; plant vegetation to preserve character, screen views, and blend the project with adjoining landscapes; consider wide-span bridge crossings to minimize view obstruction and interruption of visual continuity; employ principles of architectural design to enhance the appearance of	**Operation (Long-Term) Impacts** Visual impacts on Upper Des Moines Creek, South 208th St., Mansion Hill, Midway Ridge, and Kent/Federal Way caused by clearing of vegetation, installation of noise walls, and construction of new lanes, ramps, or bridge structures. Changes would be visible to residents and recreational users. **Mitigation Measures** Same as Alternative B. **Construction (Short-Term) Impacts** Same as Alternative B. **Mitigation Measures** Same as Alternative B.	**Operation (Long-Term) Impacts** Visual impacts on Upper Des Moines Creek, Mansion Hill, Midway Ridge, and Kent/Federal Way caused by clearing of vegetation, installation of noise walls, and construction of new lanes, ramps, or bridge structures. Changes would be visible to residents and recreational users. **Mitigation Measures** Same as Alternative B. **Construction (Short-Term) Impacts** Same as Alternative B. **Mitigation Measures** Same as Alternative B.

Table S-1 Summary of Major Environmental Impacts				
Environmental Element	**Alternative A (No Action)**	**Alternative B**	**Alternative C2 (Preliminary Preferred)**	**Alternative C3**
		project features and to promote visual corridor continuity; investigate opportunities to acquire sufficient right-of-way to provide space for plantings near retaining walls; and design interchanges as enhancements. **Construction (Short-Term) Impacts** Construction equipment, materials, and signage could be visible in staging areas and temporary lighting could be necessary for nighttime construction. **Mitigation Measures** Locate material and equipment storage in areas that are not prominent and shield roadway lighting so that light sources are not directly visible from residential areas.		

1. Purpose of and Need for Action

1. Purpose of and Need for Action

1.1 Purpose of the Action

The purpose of the proposed action is to improve regional highway connections with an extension of State Route (SR) 509 to serve future transportation needs in southwest King County and to enhance southern access to Seattle-Tacoma International (Sea-Tac) Airport.

1.2 Project History

The existing SR 509 corridor was adopted by the Washington State Transportation Commission in 1957 and authorized by the legislature in 1959 to accommodate a limited-access highway between Seattle and Tacoma. Part of its function was to be an interregional freeway of up to six lanes running parallel to Interstate 5 (I-5).

Design and construction proceeded from south Seattle to Burien in the 1960s. In the early 1970s, approximately 3.3 miles of right-of-way was purchased from Burien to SR 516 in the City of Des Moines. Because of rising costs, tightening federal and state highway construction funds, and opposition to continuing the highway, the Washington State Department of Transportation (WSDOT) abandoned the plans to continue construction of the route. In 1979, the state completed the last freeway segment from South 160th Street to South 188th Street.

In 1985, the City of Des Moines passed a resolution for WSDOT to terminate SR 509 at South 216th Street or northwards, and turn back the remaining unused right-of-way to the city. In 1986, the Port of Seattle recommended construction of a new south access road to Sea-Tac Airport. This proposal was determined by King County to be in conflict with the limited capacity of the county's road network in place at that time. A 28th/24th Avenue South study was initiated by King County and later taken over by the City of SeaTac.

In 1986, WSDOT requested that King County include an SR 509 analysis in the *Sea-Tac/Communities Plan Update* and associated environmental impact statement (EIS). During 1987 and 1988, King County, with WSDOT participation, developed the *Sea-Tac Area Update* and issued an SR 509 report recommending extension of the highway to join I-5 in the vicinity of South 210th/211th Street.

These events, together with the incorporation of the City of SeaTac in 1989, a transportation planning study for the City of Des Moines, the desire of the

Port of Seattle to explore a new airport south access route, and a public/ private committee study identifying the need for additional facilities in the area, resulted in a joint public/private SR 509/South Access Advisory Committee being formed in 1990 for the further study of intermodal projects in the area. This committee evolved into the current SR 509/South Access Road Executive and Steering Committees. The Executive Committee is a decision-making body composed of elected officials from the Cities of SeaTac and Des Moines, King County, Port of Seattle, 33rd Senate District, and 30th House of Representatives District, and the WSDOT Regional Administrator. The Steering Committee is composed of technical staff from the Cities of SeaTac, Des Moines, Burien, Kent, Federal Way and Normandy Park, King County, Port of Seattle, WSDOT, Federal Highway Administration (FHWA), and Federal Aviation Administration (FAA); the Steering Committee makes recommendations to the Executive Committee.

Between 1991 and 1995, the Steering Committee worked closely with a consultant team to screen corridor alternatives and oversee the environmental analysis. A Draft EIS (DEIS) evaluating environmental impacts at a corridor level was issued in 1995 (FHWA et al. 1995). Specifically, it documented potential impacts within a potential roadway corridors rather than within specific roadway alignments. In response to comments received on the DEIS, the decision was made to identify alternative roadway alignments to be evaluated in a project-level EIS. Since then the Executive Committee, Steering Committee, and other affected agencies have worked to identify the alternatives evaluated in this Revised DEIS. Chapter 2 includes a description of the alternatives selection process.

1.3 Need for Action

The SR 509 freeway terminates at South 188th Street/12th Place South, 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 on major roadways increases.

1.3.1 System Linkages

An important link in the state freeway system is missing within southwestern King County—a limited access connection between I-5 and the existing limited access portion of SR 509, which commences northbound at South 188th Street/12th Place South in Burien. Currently, the SR 509 corridor consists of a four-lane freeway north of Des Moines Memorial Drive/12th Place South, with a two- to four-lane arterial street south of that point. To the north, SR 509 has major connections to SR 99; to the south, it passes through the Cities of Normandy Park, Burien, and Des Moines, serving as a major connection to the regional system for residents. South of Des Moines, Marine

View Drive and 16th Avenue South were previously the signed SR 509 route. In 1992 the state transferred jurisdiction of these roads to the local agencies; the SR 509 route currently is discontinuous between SR 516 and Dash Point Road in Federal Way. South of SR 516, the SR 509 corridor is coincident with SR 99 until it connects with Dash Point Road.

The impact of this missing link is reflected in the heavy congestion on other freeways in the project vicinity, and the relatively low volume per hour per lane (vphpl) during the p.m. peak hour (between 4:30 p.m. and 5:50 p.m.) on SR 509 south of SR 518. In that section of roadway, the vphpl southbound is 1,150, but northbound it is only 500. In comparison, I-5 south of SR 518/ I-405 carries 2,060 vphpl southbound and 1,390 vphpl northbound. The underutilization of SR 509 is due primarily to its lack of a regional connection to and from the south.

A southern regional access route to Sea-Tac Airport from I-5 is also missing from the transportation system. Local access to Sea-Tac Airport from the south is only possible from the arterial street system at approximately South 182nd Street/SR 99. Local traffic can also access the North Access Expressway at South 170th Street. Currently, the primary regional access route from the south is I-5 via SR 518 and the North Access Expressway; this route requires vehicles to pass through the congested I-5/I-405 interchange and the Southcenter Hill portion of I-5.

1.3.2 Travel Demand and Capacity

The following discussion of travel demand and capacity first describes existing conditions and then discusses anticipated conditions of the project implemented.

Existing Conditions

The I-5/SR 99/SR 509 corridor is one of the most heavily traveled in the state. A number of local roadways and intersections are congested because of high volumes of vehicles accessing the region's major transportation routes and Sea-Tac Airport.

Traffic Volumes and Level of Service

Traffic volumes in the project vicinity vary widely, with average daily traffic volumes as high as 200,000 vehicles per day on I-5 north of I-405. Peak-hour volumes (when congestion is highest) are typically about 8 percent of daily volumes. The highest single hour of demand typically occurs during the p.m. peak hour. The p.m. peak-hour volumes in the project vicinity range as high as 16,000 vehicles per hour (vph) total (in both directions) on I-5 north of I-405. The p.m. peak-hour traffic volumes are summarized in Figure 1.3-1.

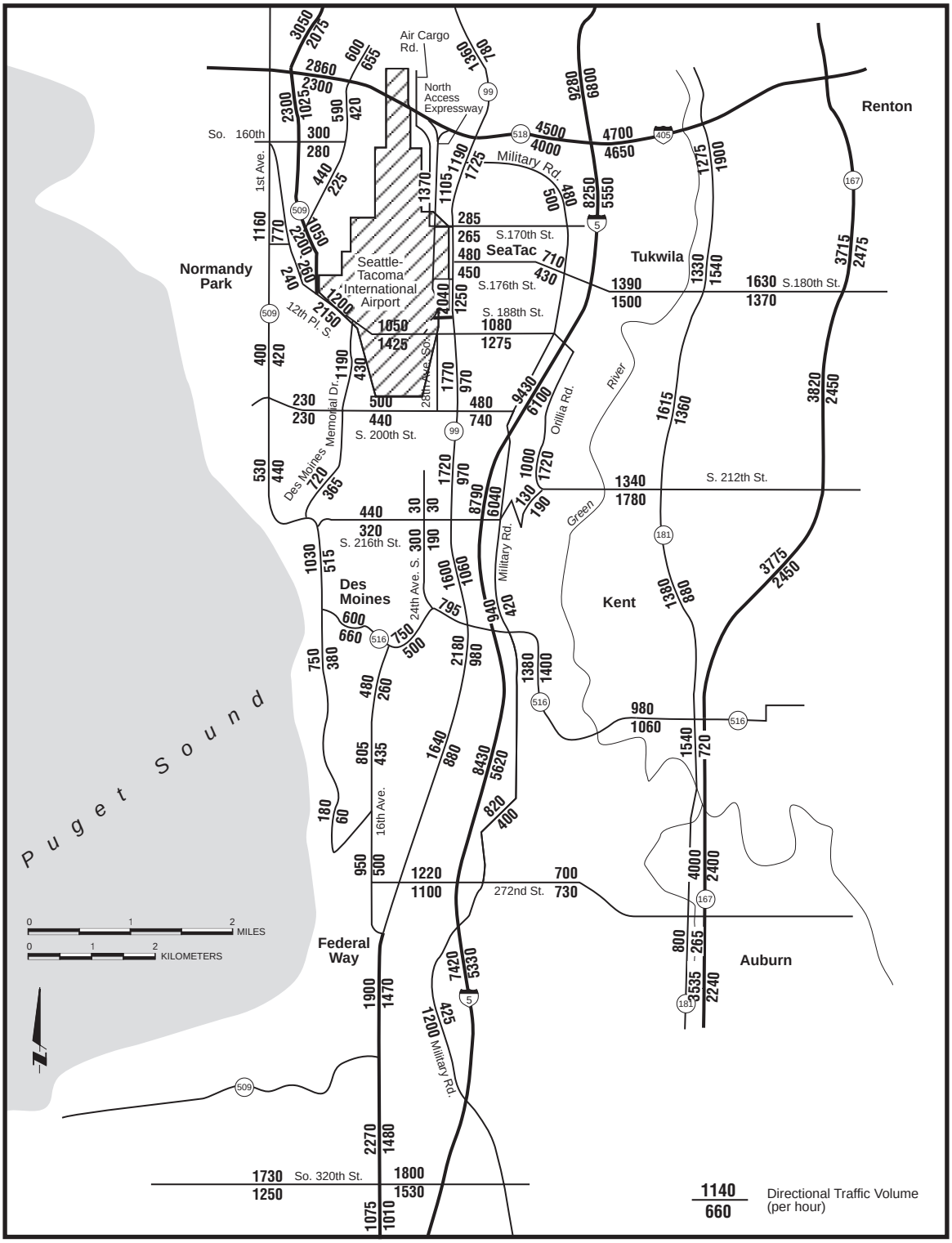


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FIGURE 1.3-1

Existing Traffic Volumes 1998 PM Peak Hour

SR 509: Corridor Completion/I-5/South Access Road
Environmental Impact Statement

On SR 509, the 1998 p.m. peak-hour volume (total both directions) was as high as 5,125 vph north of SR 518. Volumes decrease sharply south of SR 518, with a p.m. peak-hour volume of 3,325 vph (total both directions) at the south terminus of the freeway section. Between SR 516 and Des Moines Memorial Drive/12th Place South, traffic volumes are affected by the Cities of Normandy Park and Des Moines, with volumes (total both directions) ranging from 970 vph to 1,550 vph.

Level of service (LOS) is a qualitative description of the degree of comfort drivers experience as they travel a roadway. LOS grades range from LOS A, in which little or no delay is experienced, to LOS F, which denotes extreme congestion. WSDOT has established a LOS standard of D for peak-hour traffic operations on state highways.

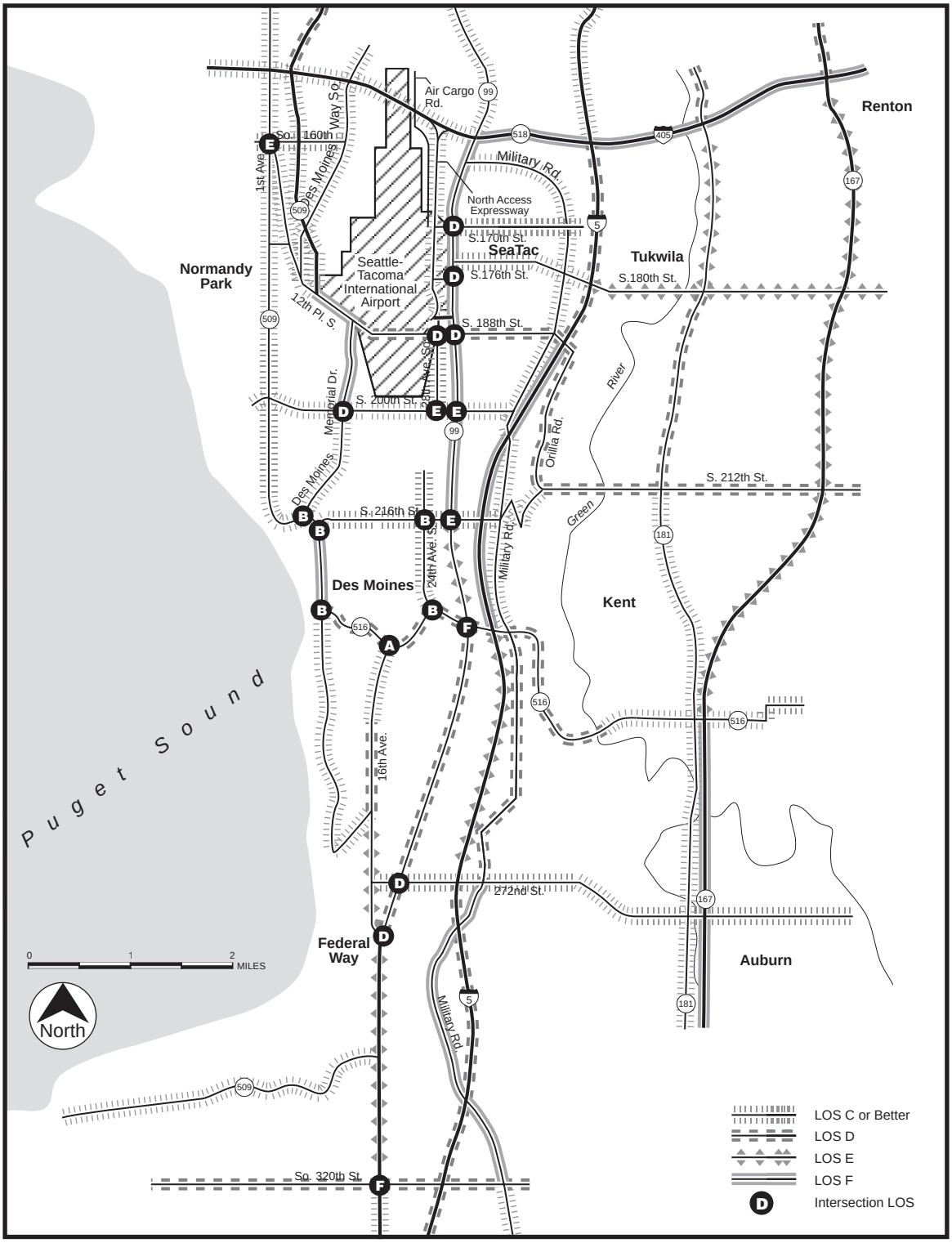
Currently, major transportation routes within the project vicinity are heavily congested during peak periods. Portions of the I-5, SR 99, and I-405 corridors are operating at LOS E or F. (LOS on SR 99 between South 177th Street and South 200th Street has improved since 1998, when traffic volume measurements were taken, due to roadway improvements.) Congestion is acute on the I-5 Southcenter Hill south of the intersection with I-405. The existing LOS are shown in Figure 1.3-2.

In the SR 509 corridor, the freeway segment operates at LOS C to D. Immediately south of the freeway terminus, the SR 509 corridor operates at LOS C or better to South 216th Street. Most traffic uses Des Moines Memorial Drive between the freeway and South 216th Street, rather than SR 509; as a result, portions of Des Moines Memorial Drive operate at LOS F. SR 509 operates at LOS F between South 216th Street and SR 516, where traffic volumes from SR 509 and Des Moines Memorial Drive merge.

Airport Traffic

Sea-Tac Airport is the single largest generator of vehicle trips in the project area. The airport handled 25 million annual passengers in 1997 and 1998 and serves as a regional center for air cargo.

In 1998, Sea-Tac Airport generated an annual average daily traffic volume of 66,000 vehicles. In August, the airport's busiest month, the average daily traffic volume is estimated at 84,000 vehicles, with 4,260 vph during the p.m. peak hour and 5,270 vph during the airport peak hour at midday (11 a.m. to 1 p.m.). This level of traffic volume impacts the adjacent roadway system, particularly at airport access points—the north access to and from SR 518 and along SR 99. Development supporting the airport such as hotels, rental car agencies, and offsite parking facilities also impacts circulation in the area.



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Note: Improvements made to SR 99 between South 170th Street and South 200th Street since 1999 have improved LOS within this roadway segment.

FIGURE 1.3-2

Existing Level of Service 1998 PM Peak Hour

Transit and High-Occupancy Vehicles

Transit service to the project area is provided by Metro and Sound Transit, which provide express and local service, transit centers, and park-and-ride lots. In addition to these services, taxis and private carriers serve the airport, and shuttle service is provided to the airport from hotels, car rental lots, and long-term offsite parking lots near Sea-Tac Airport.

The existing transit use within the vicinity of South 188th Street between approximately 1st Avenue South to I-5 is estimated at 17,400 person-trips per day. Transit mode split during the peak hours ranges from about 3 percent to 13 percent, with the higher mode splits for the cities of SeaTac, Renton, and Tukwila.

High-occupancy vehicle (HOV) facilities in the area consist primarily of HOV lanes on I-5, I-405, SR 167, and SR 99 from South 170th Street to

South 200th Street. Use of the HOV lanes varies during the p.m. peak hour from less than 200 vph to more than 1,000 vph. The highest use of all lanes is southbound on I-5 south of SR 518/I-405. Average peak-hour car occupancy is estimated at 1.15 to 1.24 persons per car, which means that approximately 80 to 90 percent of the vehicles have only one occupant.

Truck Travel

I-5 is the most heavily used truck route in the project area, with over 7,500 trucks per day per direction on Southcenter Hill measured in 1998. Other access-controlled highways (SR 167, SR 599, and SR 18) are more heavily used than parallel highways that have frequent intersections and traffic signals, such as SR 99 and SR 181.

Most trucks travel during daytime hours to meet the operating schedules of suppliers and receivers. Approximately 75 percent of all truck movement occurs between 6:00 a.m. and 6:00 p.m. During the a.m. peak period, trucks represent about 6 percent of the total traffic volume; during the p.m. peak period, trucks range from 4 percent to 7 percent of the total traffic volume. Although trucks represent a small portion of the total traffic, their effect on operations is much greater. Each truck (in terms of capacity) is equivalent to between 1.5 and 4.5 passenger vehicles, depending on the grade of the roadway (source: *Highway Capacity Manual*, Transportation Research Board [TRB] 1997, Table 3-4).

Future Travel Demand and Capacity

A comparison of the total travel demand for the project area is summarized in Table 1.3-1. Total peak-hour vehicle travel demand in the project area would increase by 35 percent without the project by the year 2020. This equals an approximate 1.2 percent growth rate per year from 1991 to 2020. (The

transportation analysis for the build alternatives relies on the travel demand model developed by The Transpo Group for forecasting future traffic volumes.)

Table 1.3-1

Vehicle Travel Demand Comparison[a] Year 2020

	1991	2020 (Without Project)	Percent Change
Total Trips[b]	128,500	173,600	35

[a] *p.m. peak hour.*
[b] *Total vehicle trips for all zones, including externals.*

A number of transportation improvements, including high-capacity transit (HCT) projects, HOV and other roadway improvements, and implementation of transportation demand management (TDM) strategies, are proposed in the project vicinity. When implemented, the transit projects are expected to reduce vehicle travel demand for work trips originating in or destined for the project area by up to 4 percent (and are accounted for in Table 1.3-1). Overall p.m. peak-hour travel demand, including through trips (trips which do not either originate or terminate in the project area), would be reduced by approximately 8.5 percent because of regional transit improvements. TDM programs could reduce trips by as much as 20 percent. Without the planned regional and local transit improvements, vehicle travel demand would increase even more, resulting in more congestion and lower travel speeds.

Traffic Volumes and Level of Service

Figure 1.3-3 shows the forecast 2020 peak-hour traffic volumes without the project. In the SR 509 corridor north of SR 518, year 2020 traffic volumes would increase by approximately 6 percent to over 5,400 vph (total both directions). In the freeway section south of SR 518, volumes would increase up to 35 percent to over 4,500 vph (total both directions). The arterial section of SR 509 from Des Moines Memorial Drive/12th Place South to SR 516 would experience traffic growth of about 11 percent. The freeway section of SR 509 south of SR 518 would continue to be underutilized, particularly in the northbound direction.

Figure 1.3-4 shows the associated LOS for the year 2020, based on the above travel demand assumptions without the SR 509 extension. Large parts of the I-5, SR 99, I-405, SR 518, SR 181, and SR 167 corridors, as well as some arterials feeding the corridors, would operate at LOS F. The SR 509 corridor would continue to be underutilized due to poor access to major routes to the south.

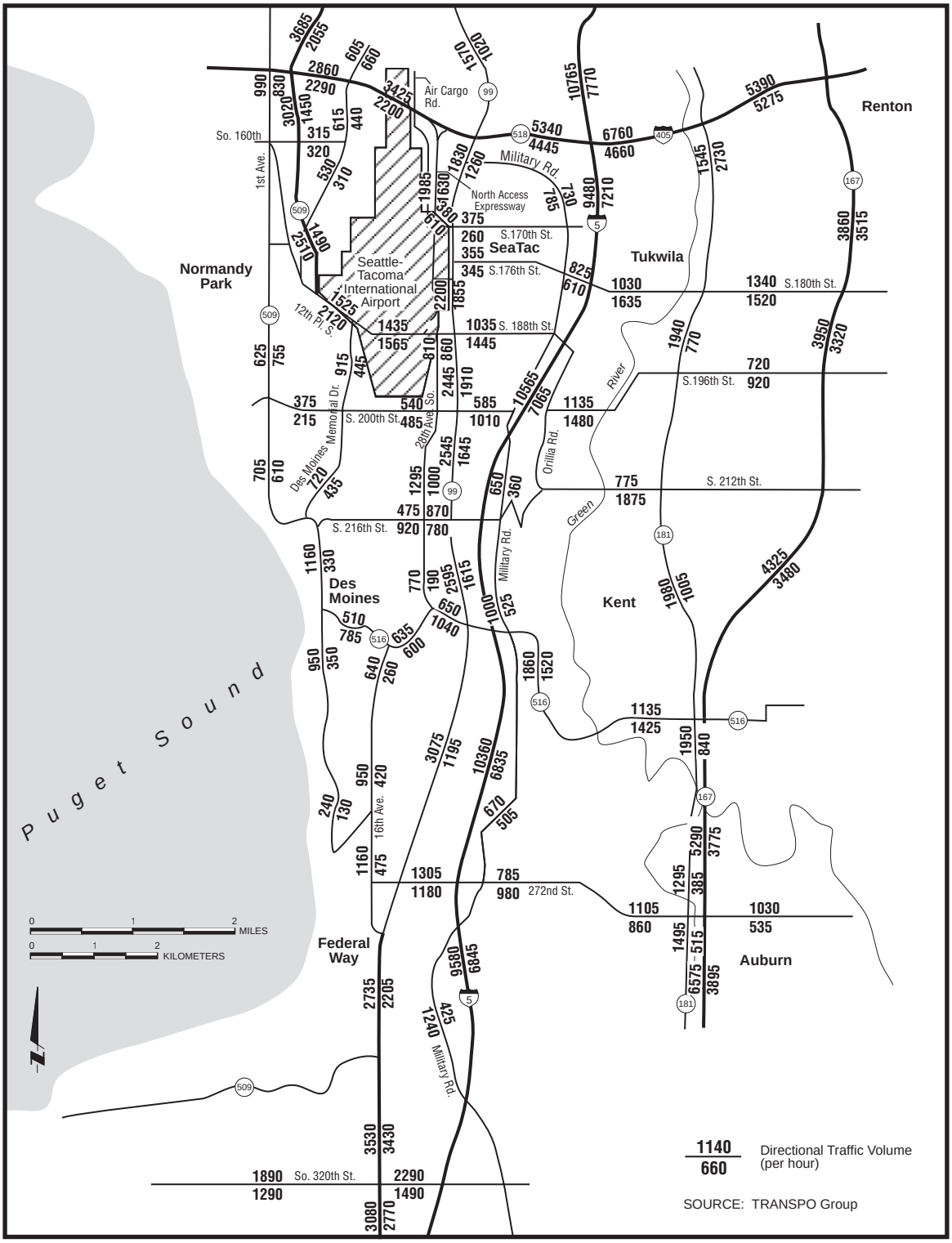

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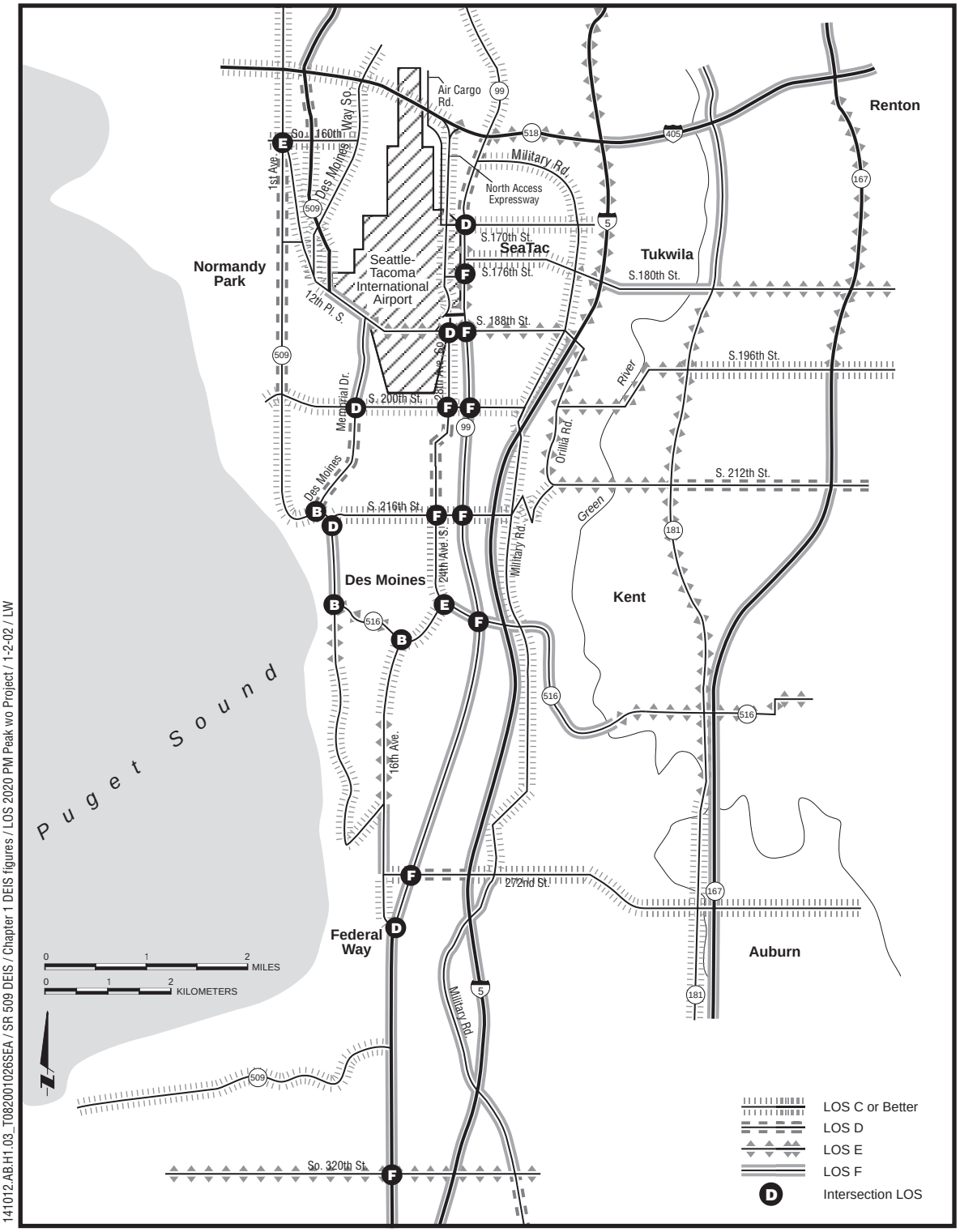
FIGURE 1.3-3

Traffic Volumes 2020 PM Peak Hour (Without Project)



141012.AB.H1.03_T082001026SEA / SR 509 DEIS / Chapter 1 DEIS figures / LOS 2020 PM Peak wo Project / 1-2-02 / LW

Note: Roadway level of service displayed is for travel direction with highest volume.

FIGURE 1.3-4

Level of Service 2020 PM Peak Hour (Without Project)

Airport Travel Demand

Travel demand to and from Sea-Tac Airport in 2020 is a reflection of the total number of passengers and the amount of air cargo passing through the airport. The airport would generate approximately 155,400 vehicle trips per day and 8,100 p.m. peak-hour trips in 2020, an increase of more than 70 percent over existing conditions.

Under current conditions, approximately 57 percent of the airport passenger terminal traffic accesses Sea-Tac Airport via the North Airport Expressway, 25 percent via South 182nd Street, and 18 percent via South 170th Street at Air Cargo Road. However, by 2010, based on the Airport Master Plan Update (adopted by Resolution 3212 [as amended] on August 1, 1996), approximately 60 percent of airport traffic is expected to access the passenger terminal via the North Airport Expressway, 20 percent from South 182nd Street, and 20 percent via South 170th Street. Because of the increased traffic to and from the south, traffic congestion at the airport entrances on SR 99 would increase substantially.

Transit and High-Occupancy Vehicles

Transit use would increase because of improved service (described below) and higher travel demand (described above). Despite the increased transit usage, congestion in the project vicinity would increase in the future.

Three major transit projects (Link Light Rail Transit System, Green River Valley Community Rail, and Sea-Tac Airport People Mover) expected to be in place by 2020, even without the project, would result in substantial improvement in transit service in the project area. Other transit-related service, local transit routes, transit flyer stops, HOV lanes, and park-and-ride lots also would be part of the overall transit program. In addition, new transit/carpool lanes are either planned, under construction, or recently completed for I-5, SR 99, SR 167, and SR 509.

The lanes would have higher usage in the future as more carpools are formed, and the number of carpools on I-5 would be expected to more than double by 2020. Travel demand by carpools traveling southbound on I-5 south of SR 518/I-405 could approach the theoretical capacity of the HOV lanes in the future.

TDM programs regionwide and specific to the project area would reduce peak-hour travel demand. Such strategies would result in higher average car occupancy, as well as higher transit mode splits. In 2020, the average car occupancy in the p.m. peak hour would range from 1.25 to 1.35 (an increase of approximately 9 percent over existing conditions), which is equivalent to 70 percent to 80 percent of the vehicles being single-occupant. Combined

with increases in transit mode split, the transportation system would carry substantially more people in 2020 than in 1998.

Truck Travel

Truck volumes on SR 509, SR 99, I-5, SR 181, and SR 167 are expected to increase from about 30,000 trucks per day in 1998 to 46,600 trucks per day in 2020 because of population and employment growth and economic development and prosperity in the project area. This represents a growth rate of approximately 2 percent per year to 2020. Truck traffic is expected to increase at a faster rate than passenger-vehicle traffic.

1.3.3 Modal Interrelationships

The proposed project is located at the confluence of the movement of goods and people in the King County area. South King County has the largest concentration of manufacturing and wholesale/distribution industries in Washington. Air freight and passenger travel primarily flow through Sea-Tac Airport. Commuters pass through the area during the a.m. and p.m. peak hours on their way to and from jobs in the commercial centers of Seattle, Bellevue, and elsewhere in the county. The movement of goods and people stretches the capacity of the existing transportation network as trucks, passenger cars, and HOVs compete with each other for roadway space.

Schedule reliability is one of the biggest concerns of the trucking industry. Traffic using I-5 is often delayed by accidents or major incidents that can make truck deliveries unreliable. In 1996, the section of I-5 between SR 599 and SR 516 experienced an average of 3 accidents per day and 1 major incident every 2 weeks. The time delays caused by accidents and congestion represent inefficiencies and costs for the trucking industry and the industries it serves.

As noted previously, in 1998 Sea-Tac Airport generated an annual average of 66,000 vehicles per day, which contributes to the inefficiencies of other modes.

1.4 Objectives of the Action

The objectives of the proposed SR 509 Corridor Completion/I-5/South Access Road Project improvements, as adopted by the Steering Committee, are as follows:

- Support local and regional comprehensive planning and development
    - Connect to existing and planned business centers (Aviation Business Center, Des Moines business parks, SeaTac Urban Center, and the City of Des Moines Pacific Ridge Neighborhood Improvement project)

- Serve the Port of Seattle's South Aviation Support Area (SASA)

- Maintain efficiency of existing roadways in the immediate vicinity of the airport terminals and parking garage
  - Extend these existing airport roadways south to connect to regional highway system

- Relieve local congestion
  - Relieve truck traffic on city streets
  - Serve peak-hour travel demands to and from major residential and commercial areas
  - Relieve congestion on South 188th Street, South 200th Street, SR 99, Military Road, Marine View Drive, SR 516, 16th Avenue South, and Des Moines Memorial Drive

- Serve harbor freight operations
  - Reduce travel times between harbor and freight destinations
  - Provide alternative routes, including direct route to Kent

- Improve regional mobility and safety
  - Serve Cross-Valley Connector traffic

- Be compatible with connections to HCT
  - Allow for full HOV connectivity
  - Support HCT and south corridor bus plans of local transit agencies

- Develop broad public and political support for the preferred alternative
  - Involve citizens in the identification and recommendation of a preferred alternative
  - Obtain approval of government councils and agencies

- Design project in an environmentally responsible manner
  - Avoid or minimize detrimental effects on environmentally sensitive areas
  - Mitigate environmental impacts where avoidance is not possible
  - Partner with other agencies to provide watershed-based mitigation solutions

- Provide cost-effective alternatives and solutions
    - Balance street system capacity with demand
    - Balance engineering, environmental, social, and economic issues or costs with benefits

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2. Alternatives

2. Alternatives

2.1 Project Termini

The northern terminus of the proposed SR 509 mainline under all build alternatives would be approximately 1,700 feet north of South 188th Street/12th Place South, where the existing SR 509 freeway ends. The intent of the SR 509: Corridor Completion/I-5/South Access Road Project is to connect the new roadway with the existing facility at its current terminus. The SR 509 mainline would connect with I-5 between approximately South 211th Street and South 214th Street, depending on the build alternative.

The northern terminus of the South Access Road under all build alternatives would generally be at the south end of the existing upper and lower terminal drives at Sea-Tac Airport. The South Access Road would connect with the SR 509 mainline between South 200th and South 209th streets, depending on the specific build alternative.

The southern terminus of the entire project would be where a southbound I-5 auxiliary lane would match with an auxiliary lane to be provided under the Sound Transit I-5 @ South 317th Street Direct Access Ramp project at approximately South 310th Street.

2.2 Alternatives Considered But Rejected

The National Environmental Policy Act (NEPA) and corresponding Council on Environmental Quality (CEQ) regulations require development and consideration of reasonable alternatives that represent a range of possibilities to arrive at a proposed action. The alternatives are the basis for the subsequent comparative analysis of environmental consequences. The build alternatives considered in this Revised DEIS represent different SR 509 extension and South Access Road alignments with different points of connection between SR 509 and the South Access Road and between SR 509 and I-5. All of the build alternatives address, in varying degrees, the purpose of and need for the action. These build alternatives are the result of an extensive screening process and reflect considerable public comment, traffic and environmental analyses, and design refinements. As required by NEPA, a No Action Alternative—in this case, one that assumes that neither the SR 509 extension nor the South Access Road would be built (although other planned local and regional transportation improvement projects could be implemented)—is also considered and analyzed in this Revised DEIS. It is evaluated so that the level of impacts from any of the build alternatives can be clearly distinguished from the level of impacts that would occur without the proposed action.

2.2.1 Development and Screening of Corridor Alternatives for Tier 1 DEIS

The SR 509/South Access Road Corridor Project Draft EIS and Section 4(f) Evaluation (1995 DEIS) (FHWA et al. 1995) was intended to be the first tier of a two-tiered environmental evaluation process. The first tier examined wide corridors (general pathways), within which a more detailed analysis (Tier 2) would be conducted to define specific road alignments.

A two-stage screening process was used to identify the alternatives to be analyzed in the Tier 1 DEIS (Figure 2.2-1). Stage 1 involved the identification of 11 corridor build alternatives, 9 of which had been developed in previous reports and studies. Fifteen environmental and construction evaluation criteria were used in their screening, ranging from wetland impacts to effects on other elements of the existing transportation system. These 11 alternatives, plus the No Action Alternative, were presented to the public at an open house on May 6, 1992, and to public agency representatives on May 7, 1992. Based on the input received and the results of a workshop with WSDOT representatives and the Steering Committee (composed of staff members and participating agencies) on May 13, 1992, the 11 alternatives were each assigned an overall ranking and the "best" six were presented to the public at an open house on June 1, 1992. This open house concluded the Stage 1 screening process.

During Stage 2, the remaining six action alternatives were defined graphically and evaluated qualitatively, using 15 more detailed criteria. As during Stage 1, qualitative observations of each alternative for each evaluation category and its criteria were formulated and an overall ranking was assigned to each alternative by category during a Steering Committee workshop conducted on July 1, 1992.

The Stage 2 screening process reduced the number of corridor alternatives to three:

- Alternative 1 (No Action)
- Corridor Alternative 2 (intersecting I-5 at South 210th Street)
- Corridor Alternative 3 (intersecting I-5 at SR 516)
- Corridor Alternative 4 (intersecting I-5 near South 272nd Street)

These alternatives were presented to the public at a NEPA Scoping Meeting on September 30, 1992, and to public agency representatives on October 1, 1992. These meetings concluded the Stage 2 screening process and initiated the preparation of the 1995 DEIS (FHWA et al. 1995).

CORRIDOR ALTERNATIVES FOR TIER 1 DRAFT EIS

PROJECT-LEVEL ALIGNMENTS FOR REVISED DEIS

1991 - 1995

1996 - 1997

1998 - 1999

1999 - 2001

NO ACTION → ALT A → ALT 1 → ALT 1 [1]

S 188TH CORRIDOR → ALT B

S 200TH CORRIDOR → ALT C

S 210TH CORRIDOR → ALT D-1

S 210TH CORRIDOR → ALT D-2 → ALT 2 → CONF 2-A → CONF 2-A(1)

CONF 2-A → CONF 2-A(2) → ALT 2 → ALT 2 [1] → 7/97 WHITE PAPER → ALT 2A

CONF 2-A → CONF 2-B

CONF 2-A → CONF 2-C → CONF 2-C1

CONF 2-A → CONF 2-D

ALT 2A → ALT 2A 01

ALT 2A → ALT 2A 02

ALT 2A → ALT 2A 03

ALT 2A → ALT 2A 04

ALT 2A → ALT 2A 05

ALT 2A → ALT 2A 06 → 9/97 WHITE PAPER → ALT 2A 016 → 3/98 WHITE PAPER → 5/98 WHITE PAPER → ALT B → 2/99 VE Study → ALT 2A 022

2/99 VE Study → ALT 2A 023

2/99 VE Study → ALT 2A 024

ALT 2A → ALT 2A 07

ALT 2A → ALT 2A 08

ALT 2A → ALT 2A 09

ALT 2A → ALT 2A 010

ALT 2A → ALT 2A 011

ALT 2A → ALT 2A 012

ALT 2A → ALT 2A 013 → 9/97 WHITE PAPER → ALT 2A 017 → 3/98 WHITE PAPER → 5/98 WHITE PAPER → ALT C → 2/99 VE Study → ALT 2A 018

2/99 VE Study → ALT 2A 019 → ALT 2A 019 REVISED → ALT C2 → ALT C2 → MINIMIZED C2 → ALT C2 [2]

2/99 VE Study → ALT 2A 020

2/99 VE Study → ALT 2A 021 → ALT 2A 025 → ALT 2A 025 REVISED → ALT 2A 026 → ALT C3 → ALT C3 → ALT C3 [2]

ALT 2A → ALT 2A 014

ALT 2A → ALT 2A 015

ALT 2B → ALT 2B 06

ALT 2B → ALT 2B 08

ALT A → ALT A [2]

ALT B → ALT B → ALT B [2]

ALT C1 → ALT C1

S 216TH CORRIDOR → ALT E

SR 516 CORRIDOR → ALT F → ALT F-1

ALT F → ALT F-2 → ALT 3 → CONF 3-A1 → CONF 3 → ALT 3 [1] → 7/97 WHITE PAPER → ALT 3A → 3/98 WHITE PAPER → 5/98 WHITE PAPER → ALT D → 2/99 VE Study → OPTION VE-D1

2/99 VE Study → OPTION VE-D2

ALT D → ALT D → ALT D

ALT 3 → CONF 3-A2

ALT 3 → CONF 3-B

16TH AVE S CORRIDOR → ALT G → ALT G-2

S 250TH CORRIDOR → ALT H-1

S 250TH CORRIDOR → ALT H-2

CONF 4-A1

CONF 4-A2 → ALT 4 → ALT 4 [1]

S 272ND CORRIDOR → ALT I → ALT I-2 → ALT 4

ALT I → ALT I-3

CONF 4-A3

CONF 4-A4

PORT OF TACOMA CORRIDOR → ALT J

Legend

[1] 1995 Tier 1 Draft EIS Alternatives

[2] Revised DEIS Alternatives

FIGURE 2.2-1

Development and Screening of SR 509 Corridor Completion/I-5/South Access Road Project Alternatives

Public and agency comments on the DEIS were received in writing and at a public hearing held on January 10, 1996. In reviewing the comments, the Steering Committee concluded that they could be more fully addressed if finer detail were developed. This led to a decision to prepare the second-tier environmental document, addressing specific project-level alignments, in more detail within a Revised DEIS, rather than preparing a Final Corridor EIS.

2.2.2 Development and Screening of Alternative Project-Level Alignments for the Revised DEIS

Subsequent to the publication of the corridor-level DEIS in December 1995, the alternatives were further evaluated. This reevaluation was initially directed by advice from the FHWA and was intended to ensure that the alternatives to be included in the project-level Revised DEIS were reasonable, avoided or minimized impacts as much as possible, and were not in some way fatally flawed. As a result of this process, corridor Alternative 4 was dropped from further consideration (because of a combination of substantial impacts to two Section 4(f) resources—Des Moines Creek Park and Zenith Park—and indication from the United States Army Corps of Engineers (USACOE) that the impacts to a large Category 1 wetland south of South 260th Street were so substantial that it was unlikely that the alternative would receive permit approval).

Refinement of Remaining Corridor Alternatives

Corridor Alternative 2

Corridor Alternative 2 was revised (referred to as Alternative 2A) to avoid or greatly minimize the impacts on Des Moines Creek Park. In the corridor Alternative 2, there was an interchange within the boundaries of Des Moines Creek Park. However, there were only minimal intrusions into the restricted Sea-Tac Airport Runway Protection Zone (RPZ) at the end of the airport's main runway (Runway 16L/34R). Because of comments received from the Department of Interior concerning the impacts on Des Moines Creek Park and the need to avoid or minimize those impacts, the SR 509 Executive Committee (composed of elected officials and WSDOT's northwest regional administrator) decided to develop options with no or minimal park impacts. To do this, portions of the roadway had to be aligned to the north and within the RPZ.

Initially, nine optional project-level alignments of corridor Alternative 2 were developed and evaluated. Each option was a sequential refinement of a previously conceived option and included different designs for both SR 509 and the South Access Road. The series of options were:

- Options 1, 2, and 7 envisioned that SR 509 and the South Access Road would intersect north of Des Moines Creek Park and South 200th Street and that the combined SR 509/South Access Road would then traverse in a southeasterly direction east of the park.

- Options 3, 4, 5, and 6 envisioned that SR 509 and the South Access Road would generally parallel each other on the west and east sides, respectively, of the park. SR 509 would cross through the park at its narrowest point in the vicinity of South 210th Street before eventually intersecting with the South Access Road east of the park.

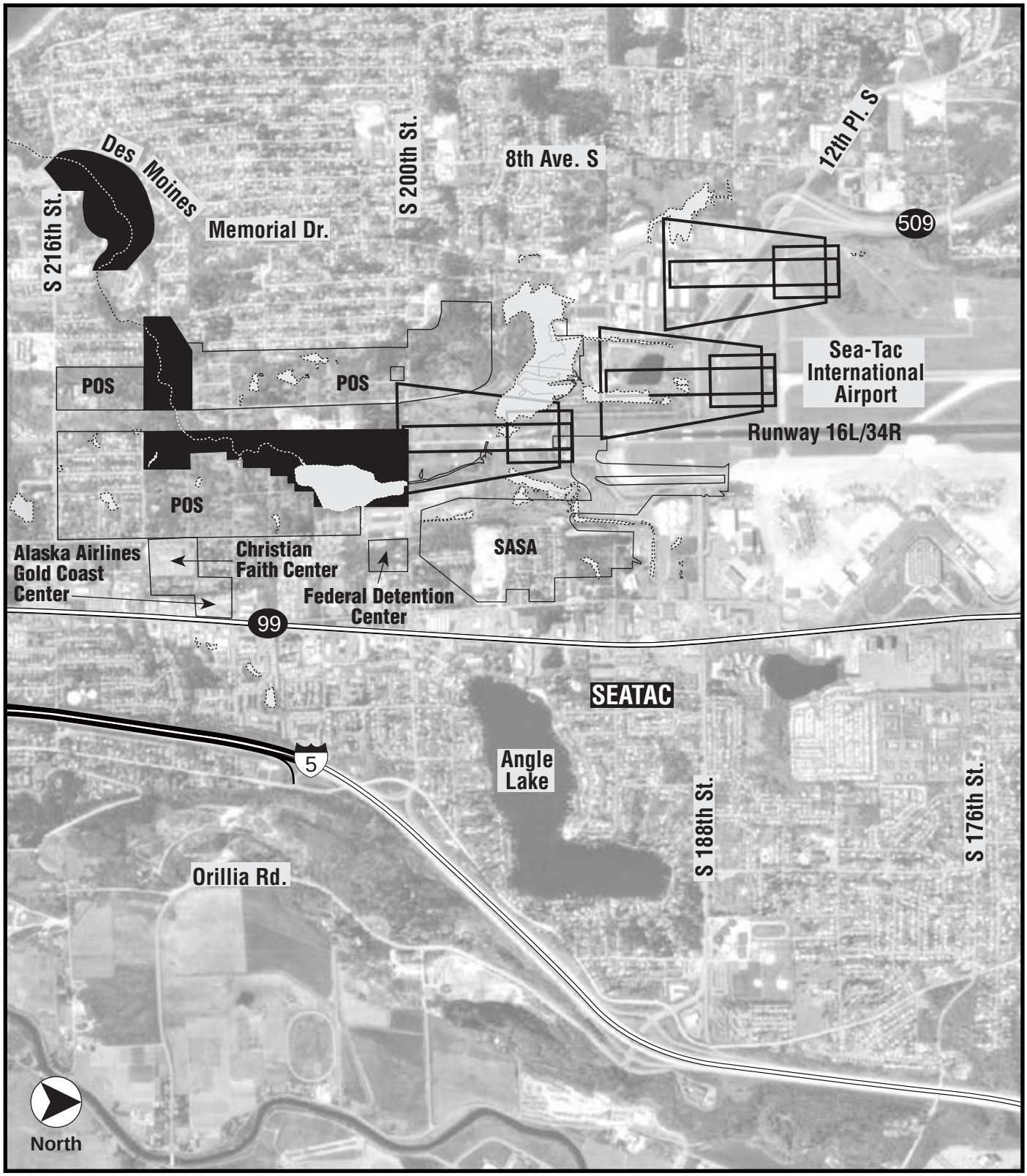
- Options 8 and 9 envisioned that the South Access Road would extend southwesterly to an interchange with SR 509 northwest of the park and that the combined roadway would extend southerly along the western boundary of the park before crossing through the park at its narrowest point in the vicinity of South 210th Street.

Each of these options was evaluated on the basis of specific environmental features and constraints (shown in Figure 2.2-2 or discussed in Chapter 3), including:

- Section 4(f) Property—Des Moines Creek Park
- Historic/archaeological resources
- Wetlands and streams
- Hazardous waste contaminated sites
- SASA
- Federal Detention Center (a facility for holding federal justice system detainees and inmates for a short time)
- FAA's Sea-Tac Airport RPZ
- Residences and businesses/potential displacements

As described in *White Paper: Evaluation of Alternative Alignments* (CH2M HILL July 1997), Options 6 and 8 were considered the most reasonable of the nine options because they minimized impacts relative to their predecessors and substantially minimized the corridor Alternative 2 impacts on Des Moines Creek Park. The other options were dropped from further consideration for a combination of reasons, including intrusions into the RPZ, impacts on residential neighborhoods, wetland impacts, impacts on the SASA, and poor traffic operations.

At the SR 509/South Access Road Executive Committee meeting on July 10, 1997, the committee directed that new design criteria be used to determine whether additional options could be developed to further minimize or avoid impacts. These criteria included a determination that the interchanges at South 200th Street with either SR 509 or the South Access Road were not necessary, nor was the accommodation of southbound traffic on the South Access Road to northbound SR 509. The committee also directed that, if



0 1/4 1/2 3/4 1 MILES

Legend

- Wetlands and Streams
- Runway Protection Zones
- Des Moines Creek Park
- **POS** Port of Seattle Redevelopment Area

FIGURE 2.2-2

Environmental Features

SR 509: Corridor Completion/I-5/South Access Road
Environmental Impact Statement

other feasible options could be identified, they should be evaluated and compared with Options 6 and 8 on the basis of an expanded list of environmental features and constraints that included:

- Port of Seattle-owned redevelopment areas
- Christian Faith Center
- Noise-sensitive residential receptors

Based on the new design criteria, six additional options were developed and evaluated. Continuing with the same numbering system used during the previous phase of alternative refinement, these options were numbered 10 through 15.

- Options 10, 11, and 12 were variations of the 1995 DEIS Alternative 2 in that SR 509 would extend southerly and cross through Des Moines Creek Park in the vicinity of South 204th Street, eventually intersecting with the South Access Road east of the park.

- Options 13, 14, and 15 envisioned that SR 509 would extend southeasterly north of South 200th Street, "thread the needle" between the northeast corner of the park, the southwest corner of the SASA, and the western boundary of the Federal Detention Center. The South Access Road would skirt the western boundary of SASA (similar to Option 6) and intersect SR 509 in the vicinity of South 200th Street.

As described in *White Paper: Evaluation of Alternative 2A Options* (CH2M HILL September 1997), Option 13 was perceived as the best of the six new options. The other options were determined to be flawed for a combination of reasons, including intrusions into the RPZ, complicated traffic movements, impacts on Des Moines Creek Park, and residential displacements.

Because of the addition of the Christian Faith Center to the list of environmental features and constraints to be considered, Option 6, which originally directly impacted the Center's administrative/education building (now the Alaska Airlines Gold Coast Center), was re-evaluated and a new Option 16 was developed. Option 16 envisioned that the SR 509 alignment would be moved roughly 500 feet north of Option 6, thus avoiding any direct impact on the Christian Faith Center's building. Option 16 also reflected a slight adjustment (from Option 6) to the alignment of the South Access Road to stay clear of the FAA Object-Free Area (OFA), another restricted area at the end of Runway 16L/34R.

At the Executive Committee meeting on September 17, 1997, Option 6 was dropped from further consideration in favor of Option 16. Option 8 was also dropped in favor of other, more feasible options. Option 13 was the Committee's preliminarily preferred Alternative 2A option, but the

Committee also requested that additional refinements be made. Finally, the Executive Committee directed that the refined Options 13 and 16, along with a revised version of corridor Alternative 3 (referred to as Alternative 3A), be presented to the public before final designation of a preliminary preferred option.

Refinements were made to Option 13 in four areas:

- The SR 509 alignment was shifted eastward in the vicinity of the Des Moines Creek Park to eliminate direct impacts on the park; however, impacts on the SASA increased.

- A half-diamond interchange between SR 509 and 28th/24th Avenue South was added to serve traffic movements from the City of SeaTac to and from the south on SR 509.

- The SR 509/South Access Road interchange was grade-separated from South 200th Street to provide for traffic movements to and from the airport on the South Access Road. Option 13 had an at-grade intersection at South 200th Street that required traffic to stop at a signalized intersection before continuing on to Sea-Tac Airport. By changing this connection to a grade-separated interchange, traffic could proceed from northbound I-5 to Sea-Tac Airport without encountering a traffic signal.

- The westerly SR 509/South 200th Street interchange, to serve traffic movements from the airport and the City of SeaTac to and from the north on SR 509, was moved farther west to avoid the RPZ and the Hillgrove Cemetery.

These refinements to Option 13 produced Option 17. By shifting the SR 509 alignment in the vicinity of South 200th Street and including a grade separation at that interchange, the SR 509 mainline was forced farther north before turning westerly through the RPZ.

Corridor Alternative 3

As with the corridor Alternative 2, the corridor Alternative 3 underwent a similar re-evaluation. Whereas the corridor alternative diverged from the existing SR 509 right-of-way in the vicinity of South 200th Street and traversed diagonally across Des Moines Creek Park, Alternative 3A, the project-level alternative, was intended to avoid impacts on the park by staying within the right-of-way until roughly South 214th Street before turning in a southeasterly direction. This refinement was very similar to the Section 4(f) Avoidance Alternative 3 DW analyzed in the DEIS. Alternative 3A also reflected modification in the alignment of the South Access Road. Whereas originally the South Access Road would extend generally southerly and intersect with SR 509 in the vicinity of South 205th Street, Alternative

3A envisioned that the roadway would extend southwesterly through the RPZ, pass under SR 509 north of South 200th Street, and eventually intersect with SR 509 in the vicinity of South 208th Street.

Alternative 3A was subsequently refined to avoid property purchased by the City of Des Moines for use as a "sports park" located in the area southwest of the intersection of South 216th Street and 24th Avenue South. The SR 509 alignment was extended farther south (to roughly South 220th Street) within the existing SR 509 right-of-way before turning southeasterly toward I-5.

Presentation of Refined Alternatives

Options 16 and 17 of Alternative 2A and the revised Alternative 3A were presented to the public at an open house on February 26, 1998. Based on the public input received, the Executive Committee, at its meeting on April 8, 1998, identified Option 17 (now redesignated as Alternative C) as the preliminary preferred alternative to be analyzed in the project-level Revised DEIS. This alternative was selected as the preliminary preferred alternative because, in comparison to the other alternatives, it had the fewest impacts on natural environmental features, had the potential of being considered a Section 4(f) avoidance alternative, left the greatest amount of Port of Seattle-owned redevelopment area untouched, and appeared to be the most direct route to the traveling public. The Executive Committee also recommended that Option 16 (redesignated Alternative B) and 3A Revised (redesignated Alternative D) be carried into the Revised DEIS, along with Alternative A (No Action).

FAA Opinion

On September 29, 1998, FAA transmitted its position on each of the three build alternatives regarding the RPZ. The FAA indicated that Alternative B was clearly outside the RPZ and was thus worthy of further consideration. FAA indicated that Alternative C could possibly be acceptable if a cover (tunnel) designed to protect the people under it from the errant landing of an aircraft were constructed where the roadway passed through the Extended OFA (XOFA), a subarea of the RPZ. FAA strongly encouraged that the road be located as far to the south end of the XOFA as feasibly possibly, suggesting that if the road were located in the southern one-third of the XOFA, FAA might accept such a proposal without the requirement for the cover. FAA indicated that Alternative D would traverse through the OFA, violating the FAA design standard of no roads in the OFA.

Value Engineering

With that guidance from FAA, WSDOT assembled a Value Engineering (VE) team in February 1999 comprised of WSDOT, FHWA, Port of Seattle, U.S. Department of Interior (National Park Service), and City of SeaTac and Des Moines staff. The intent of the VE team was to evaluate the Revised

DEIS alternatives and to determine if they could be further improved in terms of performance, cost, and minimization or avoidance of impacts. The VE team recognized the cost implications of the construction of a tunnel through the XOFA (estimated at an additional $12 million) and the associated safety concerns (trapping motorists in the tunnel during a car fire, or smoke and flames drawn into the tunnel by the ventilation system if an aircraft crash occurred near the portal). The VE team concluded that the Alternative C roadway alignment needed to be relocated farther south in the XOFA. By doing so, however, the road was forced into Des Moines Creek Park. Avoidance of the park was a critical design constraint that had shaped the development of all build alternatives to that point in the environmental review process, primarily because of the strength of Section 4(f) and its requirement to select an alternative that avoids impacts to parks if determined feasible and prudent. The VE team concluded that that constraint was unreasonable considering the complexity of the project area and that, by adhering to that constraint, other adverse impacts could result. The VE team recommended that new options to Alternative C be developed without that constraint.

As a result, three new options to Alternative B (22, 23, and 24), four new options to Alternative C (18, 19, 20, and 21), and one new option to Alternative D (Option VE-D1) were identified and qualitatively screened. On April 23, 1999, the Steering Committee approved Options 19, 21, and 23 to be further studied; the Committee also decided that two new options should be created and carried forward—Option 25 (a progression from Option 21 that would move the alignment farther south) and Option VE-D2 (a hybrid of the northern half of VE-D1 and the southern half of Alternative D). In May 1999, the Steering Committee conducted a structured decision-making process to determine whether any of the remaining VE options were superior to the original alternatives and should, therefore, be evaluated in the Revised DEIS instead. Each option was compared against its alternative of origin. For Alternatives B and D, it was concluded that the options did not offer enough of an advantage to warrant substitution of the originals. For Alternative C, Option 21 was dropped, but Options 19 and 25, along with the original alternative, which was a true Section 4(f) avoidance alternative, were recommended to be carried forward. The original Alternative C was then redesignated C1, Option 19 was redesignated C2, and Option 25 was redesignated C3.

Feasibility and Prudence of Alternatives C2 and C3

Both Alternatives C2 and C3 would directly impact Des Moines Creek Park as a result of the southern shift within the XOFA. Despite the impacts on the park, WSDOT considered both alternatives to be reasonable and prudent for analysis in the Revised DEIS because they would avoid or minimize the magnitude of social, economic, environmental, and cost impacts caused by Alternative C1, including the safety risks and costs associated with the tunnel

through the XOFA and the impacts to Class I wetlands and to SASA. On July 19, 1999, WSDOT met with Port of Seattle representatives and local officials with jurisdiction from the Cities of SeaTac and Des Moines (in other words, those who own, operate, and maintain Des Moines Creek Park). The consensus of that group was that, despite the impacts on the park, Alternatives C2 and C3 appeared feasible and prudent and should be included in the Revised DEIS, as long as proposed mitigation was implemented by WSDOT as part of the overall project. The proposed mitigation included the northward extension of the Des Moines Creek Trail to South 188th Street/12th Place South (where it could connect with other existing trails or other planned regional trail improvements) and the provision of replacement acreage from the existing and unused state right-of-way equaling the amount of impacted parkland. At a meeting on August 26, 1999, FHWA concurred that even though Alternative C1 was a true Section 4(f) avoidance alternative, it was probably not a prudent avoidance alternative. FHWA also concurred with the inclusion of the nonavoidance alternatives (AlternativesC2 and C3) in the Revised DEIS.

Public and Involved Agency Input

The five potential Revised DEIS alternatives—B, C1, C2, C3, and D—were presented to the public at an open house on October 27, 1999. An informal vote based on written comments received at, and subsequent to, the open house indicated that Alternative C2 was most preferred, closely followed by Alternatives C3 and D.

At its November 17, 1999, meeting, the Executive Committee adopted Alternative C2 as the new preliminary preferred alternative (as opposed to Alternative C in April 1998). In its adoption, the committee indicated that its preference was based on the facts that Alternative C2:

- would not require a tunnel through the XOFA
- would have the best geometric configuration
- would result in the least amount of new impervious surface area
- would be the least expensive

In January 2000, the NEPA/SEPA/404 Merger Agreement Signatory Agency Committee (SAC) concurred with the alternatives to be evaluated in the Revised DEIS.

Definition of I-5 Improvements

In January 2001, WSDOT assembled a second VE team to study the SR 509 southbound merge with I-5, traffic flow along I-5 south of that new interchange, and the need to rebuild the SR 5/SR 516 interchange. The VE team concluded that in addition to two SR 509 southbound collector/distributor (C/D) lanes from the SR 509/I-5 interchange to the

SR 516/I-5 interchange(applicable to Alternatives B, C1, C2, and C3), there needed to be not one but two additional southbound auxiliary lanes and one northbound auxiliary lane between SR 516 and South 272nd Street (all build alternatives), and that one additional southbound auxiliary lane would be required between South 272nd Street interchange and South 310th Street (all build alternatives). These improvements to the alternatives were intended to improve traffic operations along I-5, to minimize economic and social impacts along and adjacent to the I-5 corridor (especially within the Des Moines Pacific Ridge Neighborhood Improvement Plan limits), and to not preclude a future connection to the City of Kent's South 228th Street corridor extension. The southern terminus of the project was subsequently revised as noted in the *Project Termini* section earlier.

Elimination of Alternatives C1 and D

Based on further consultation and coordination between WSDOT and other project partners, local agencies, and resource permitting agencies, WSDOT concluded in a position paper titled *Screening of Alternatives C1 and D*, dated June 2001, that Alternatives C1 and D had clear conflicts with other essential regional projects important to the environment and economy, and would cause substantial impacts on water resources that the other build alternatives would avoid or lessen. Furthermore, WSDOT determined that given these conflicts and impacts, Alternatives C1 and D were not reasonable or permittable and should be eliminated from further evaluation in the Revised DEIS. The Executive Committee concurred with this recommendation on March 29, 2001. WSDOT's position was based on the following conclusions:

- Alternative C1 would impact almost 7 acres of a Class 1 wetland and its buffer area (approximately 5 acres under Alternative D). Both the USACOE and the Washington State Department of Ecology (regulatory agencies for Section 404 Wetlands and Section 401 Water Quality permits) expressed concerns about the impacts on this wetland and the resulting permitting difficulties.

- The wetland noted above is a critical component of the King County Des Moines Creek Basin Plan; the plan calls for the modification and use of portions of the wetland as a regional detention pond and water quality treatment facility. Alternatives C1 and D would reduce the wetland's intended capacity with little or no opportunity for expansion. As such, Alternatives C1 and D were not supported by any of the Des Moines Creek Basin Plan partnership agencies (King County, City of SeaTac, City of Des Moines, and Port of Seattle).

- Alternative C1 would cross the northern two-thirds of the XOFA and require an approximately 1,000-foot-long tunnel. In addition to the safety and cost issues associated with such a tunnel, any tunnel longer than 800

feet would require ventilation and fire control systems. The associated exhaust vents would be located on top of the tunnel; however, FAA indicated that surface structures such as vents would be prohibited within the XOFA.

- Alternative C1 would cross through a large portion of the Port's SASA and render the remaining portion of the area unusable to accommodate the intended aircraft and facilities. Because this area needs to be runway accessible and there are no other identified areas in the vicinity that meet this requirement, the Port opposed Alternative C1.

- Due to its longer length, Alternative D would create more new impervious surface area than any of the other alternatives. Minimizing impervious surface area has been emphasized by the Washington State Department of Ecology (Ecology) in terms of maintaining water quality standards, and by the U.S. National Marine Fisheries Service (NMFS) as being important in aiding salmon recovery. Because of the more stringent standards included with Ecology's 2001 *Stormwater Management Manual for the Puget Sound Basin*, efforts to minimize the amount of new impervious surface area have taken on added importance.

In September 2001, WSDOT received concurrence from the NEPA/SEPA/404 Merger Agreement SAC, approving Alternatives B, C2, and C3 for evaluation in the Revised DEIS (the SAC had previously concurred with Alternatives B, C1, C2, C3, and D in January 2000).

2.3 Alternatives Analyzed in the Revised DEIS

The SR 509: Corridor Completion/I-5/South Access Road Project includes improving regional highway connections with an extension of existing SR 509 to serve future transportation needs in southwest King County and to enhance southern access to Sea-Tac Airport. (The location of the project area is shown in Figure 2.3-1 and project area vicinity is shown in Figure 2.3-2.) The project includes extending the SR 509 freeway from South 188th Street/12th Place South to a connection with I-5 in the vicinity of South 210th Street; improving I-5 between South 210th and South 310th streets; improving southern access to and from Sea-Tac Airport by a new roadway (the South Access Road); and improving related local traffic circulation patterns.

As part of the EIS process to examine reasonable alternatives, as required by NEPA and the State Environmental Policy Act (SEPA), three build alternatives for the SR 509 mainline/I-5/South Access Road and a No Action Alternative are examined in this Revised DEIS. In addition, there are three design options for the 1,000-foot connection of the South Access Road to the airport terminal roadways.

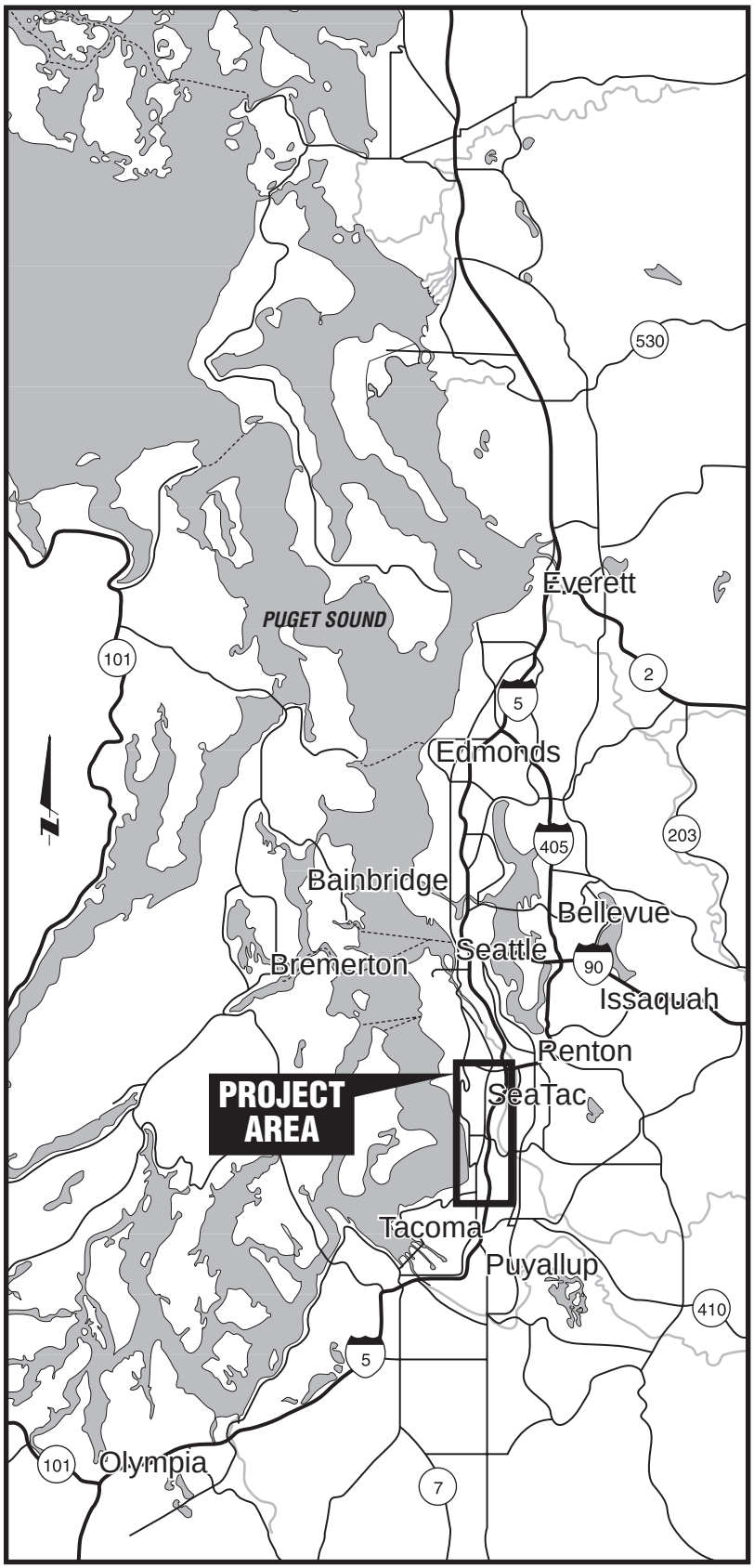
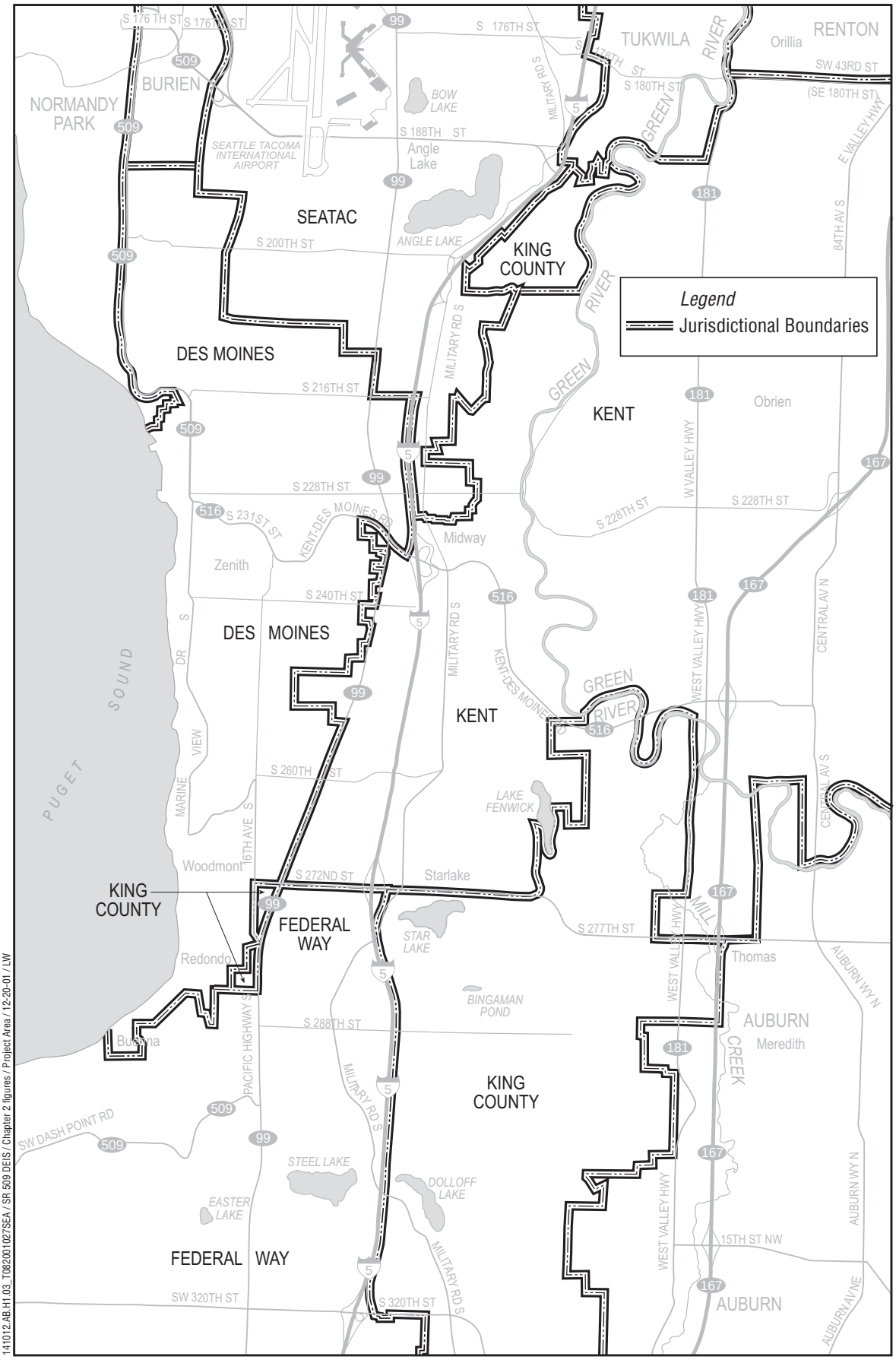


FIGURE 2.3-1

Project Area Location Map

SR 509: Corridor Completion/
I-5/South Access Road
Environmental Impact Statement



1410 12.AB.H1.03_T08200102 7SEA / SR 509 DEIS / Chapter 2 figures / Project Area / 12-20-01 / LW

0 1900 3800
Scale in Feet

North

FIGURE 2.3-2

Project Area

SR 509: Corridor Completion/I-5/South Access Road
Environmental Impact Statement

The following discussion first provides a description of the No Action Alternative, and then focuses on features of the project that are common to all the build alternatives, followed by an identification of features unique to each build alternative.

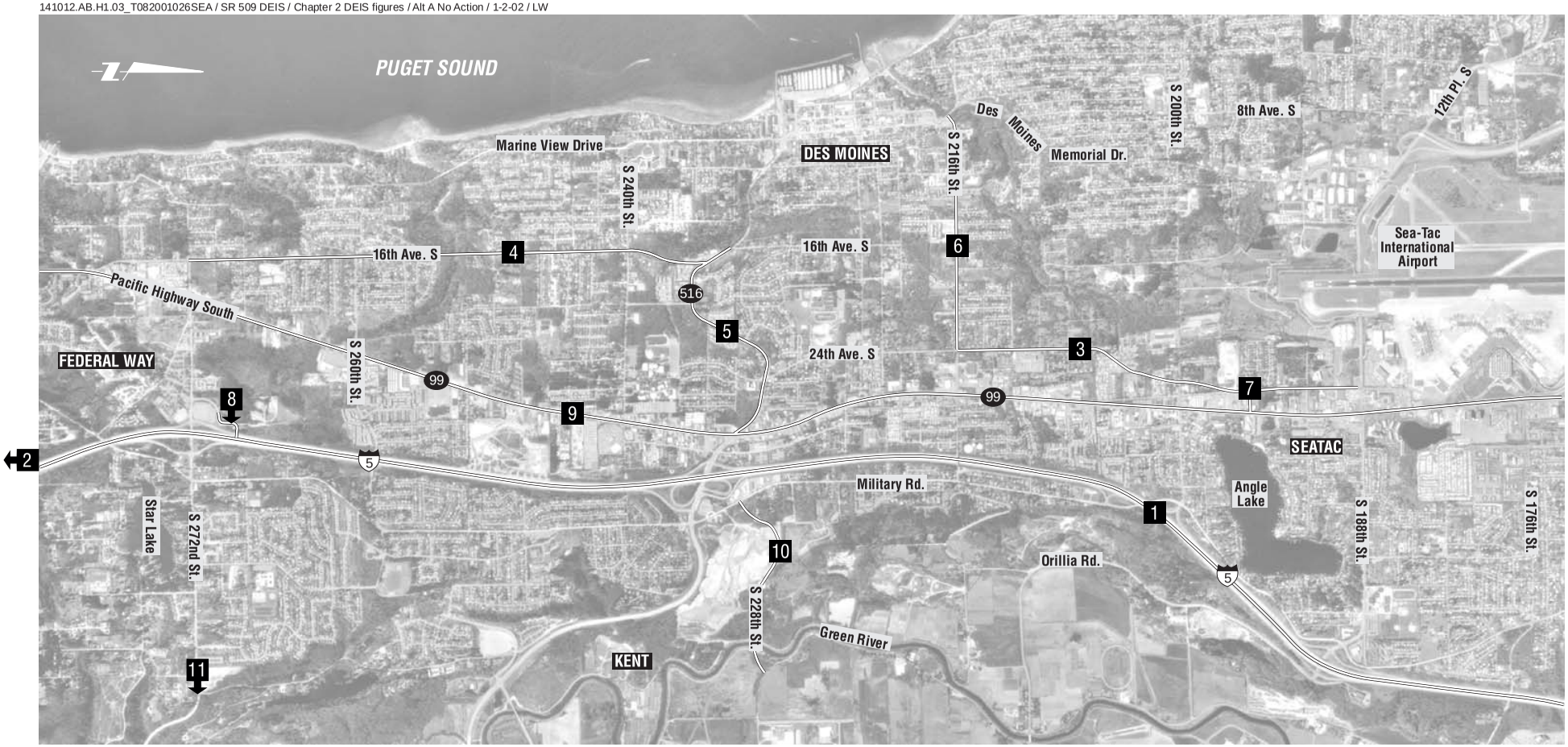
2.3.1 Alternative A (No Action)

The No Action Alternative (Figure 2.3-3) represents the baseline conditions assumed to exist in the future regardless of whether or not the proposed action is constructed. Inclusion of the No Action Alternative provides a "yardstick" against which to measure the potential effects of the various build alternatives. It also acknowledges that local jurisdictions, as well as the State of Washington, have the option not to go forward with the proposed project.

Under the No Action Alternatives, no new major construction activities described as the proposed project would occur. Short-term minor construction necessary for continued operation of existing roadway facilities would be accomplished, and minor safety improvements could be constructed as required. In addition, other funded or planned baseline transportation improvement projects within the project area (listed at the bottom of Figure 2.3-3) are assumed to be operational in the year 2020, as well as other projects such as development of the SASA, the third runway at Sea-Tac Airport, redevelopment within the Port of Seattle Noise Remedy Program area, the Des Moines Creek Basin Plan, the City of Des Moines Pacific Ridge Neighborhood Improvement project, the Des Moines Creek Basin Plan, and the City of SeaTac Central Business District (CBD) and Aviation Business Center projects. These projects have already been, or will be, subject to separate environmental reviews; analysis of their specific impacts is not included in this Revised DEIS; however, these projects are considered in the analysis of secondary and cumulative impacts in this Revised DEIS.

2.3.2 Features Common to All Build Alternatives

Each alternative for the SR 509 freeway extension would originate approximately 1,700 feet north of South 188th Street/12th Place South, where the existing SR 509 freeway terminates in a trumpet (T-shaped) interchange. Here, the existing interchange would be replaced with a diamond interchange, with SR 509 passing over the intersecting street. For approximately the first mile of the project, the build alternatives would stay mostly within existing WSDOT-owned SR 509 right-of-way; points of departure from the existing right-of-way would vary with each alternative. The southern terminus of the South Access Road would connect with the SR 509 freeway extension; the location and design of this connection would vary with each alternative. The northern terminus of the South Access Road would be approximately 1,000 feet north of South 188th Street. Improvements to I-5 would be the same for all build alternatives.



Legend

Baseline Projects by others

0 1/4 1/2 3/4 1 MILES

Baseline Projects Assumed for No Action Alternative.

1. I-5 HOV Lanes
2. I-5 @ S. 317th Street Direct Access Ramp
3. 28th/24th Avenue S. Arterial (Phase 1 completed – S. 188th to S. 204th Streets)
4. 16th Avenue S.
5. Kent-Des Moines (SR 516) Road
6. S. 216th Street
7. S. 195th Street
8. I-5 @ S. 272nd Street In-Line Station
9. Pacific Highway S./International Boulevard (SR 99) (Phases 1 and 2 completed – S. 170th to S. 200th Streets)
10. S. 228th Street
11. S. 272nd/S. 277th Street Corridor

FIGURE 2.3-3

Alternative A (No Action)

SR 509: Corridor Completion/I-5/South Access Road Environmental Impact Statement

SR 509 Mainline/South Access Road

The configuration of the SR 509 freeway extension would be six lanes: two general purpose travel lanes and an inside HOV lane in each direction. The South Access Road would consist of two general purpose lanes in each direction, for a total of four lanes. In general, rights-of-way would be at least 200 feet wide for the SR 509 freeway extension and at least 120 feet wide for the South Access Road. The width of right-of-way required would vary along the lengths of these facilities because of changing topography and adjacent land uses, and would be considerably greater in interchange areas. In some places, the right-of-way would be narrowed to avoid or minimize impacts on environmentally sensitive areas and other physical features.

Preliminary design features common to all build alternatives include the following:

- The SR 509 freeway extension would be designed to LOS D and a speed of 70 miles per hour (mph); the South Access Road would be designed to LOS D and a speed of 35to 45 mph.

- SR 509 and the South Access Road would be grade-separated from all streets classified as arterials.

- Interchange ramps, ramp terminals, and modifications to arterials within 300 feet of ramp terminals would be considered part of the proposed project and included within the proposed right-of-way. There would be interchanges at South 200th Street and 28th/24th Avenue South, but not at SR 99.

- The South Access Road would terminate at the SR 509 freeway extension in a “partial Y” interchange. This would provide a continuous flow of traffic between the two roadways in two directions (south and north) by use of a flyover ramp.

South Airport Link Design Options

The South Airport Link is the last 1,000 feet of roadway connecting the South Access Road to the existing airport roadways. There are three design options for the South Airport Link. At the south end, each design option would cross beneath South 188th Street and the southeast corner of Sea-Tac Airport via a tunnel. At the north end, the design options would maintain both southbound and northbound connections from the upper and lower terminal drives. They would also provide a southbound connection to a future "south bypass" lane for routing southbound traffic from the north without entering the terminal drive network.

Design Option H0

To fit into a narrow area between Sea-Tac Airport and two existing hotels, Air Cargo Road and the South Access Road would be "stacked" for more than half of the distance between South 188th Street and the airport parking garage via a tunnel that would be longer than the one for Design Options H2-A and H2-B (Figure 2.3-4). The extended tunnel would be designed to be compatible with the Link light rail extension to South 200th Street. An "S" curve would be created within the tunnel segment of the roadway to accommodate the necessary road widths and alignment. Currently, no vehicular access to the airport terminal drives would be provided from South 188th Street. The existing intersection at South 182nd Street and International Boulevard (SR 99) would be closed and local access provided at South 170th and South 200th Streets.

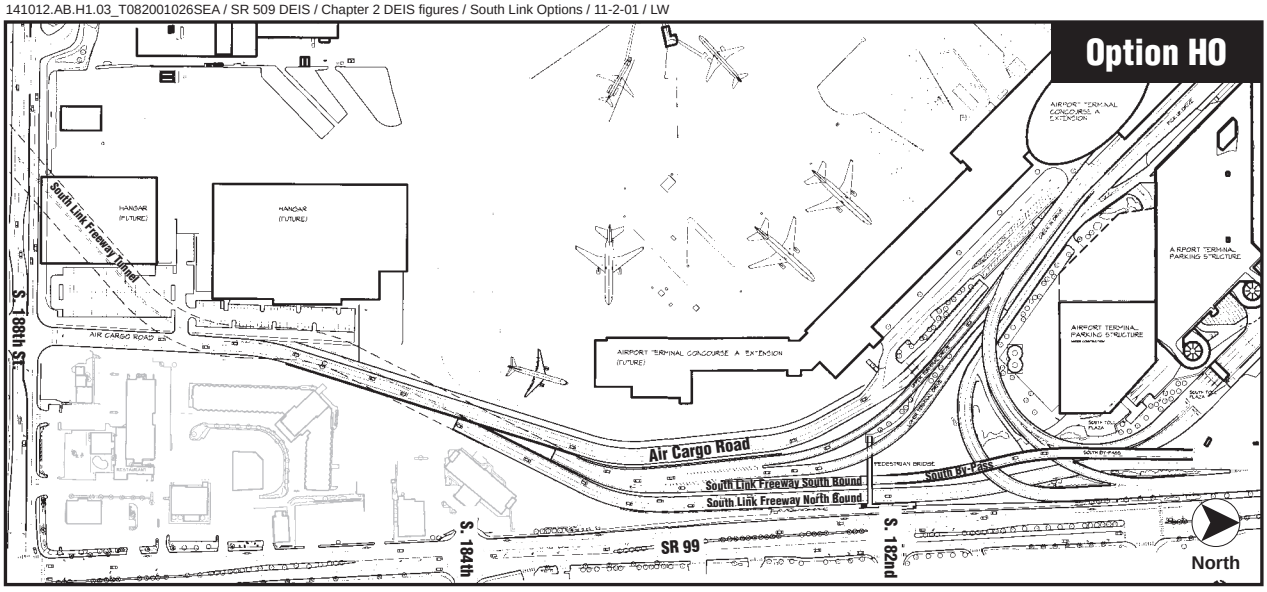
Design Option H2-A

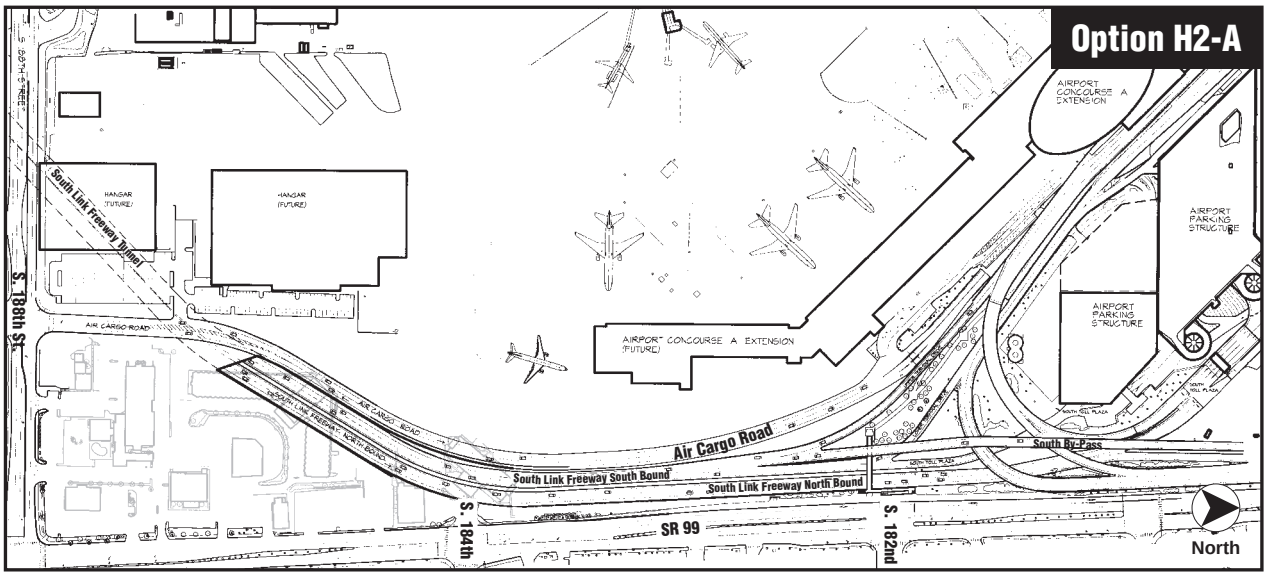
Under Design Option H2-A, Air Cargo Road and the southbound and northbound lanes of the South Airport Link would generally parallel each other and would be separated by medians (Figure 2.3-4). Air Cargo Road would run adjacent to the east edge of the airfield, followed to the east by the southbound and northbound lanes, respectively. The South Airport Link lanes would descend in elevation as they run from north to south, and Air Cargo Road would eventually cross over the top of them as they enter the tunnel. The tunnel entrance would be farther to the south than Design Option H0. Like Design Option H0, no vehicular access would be available for local traffic to replace the existing intersection at South 182nd Street.[1]

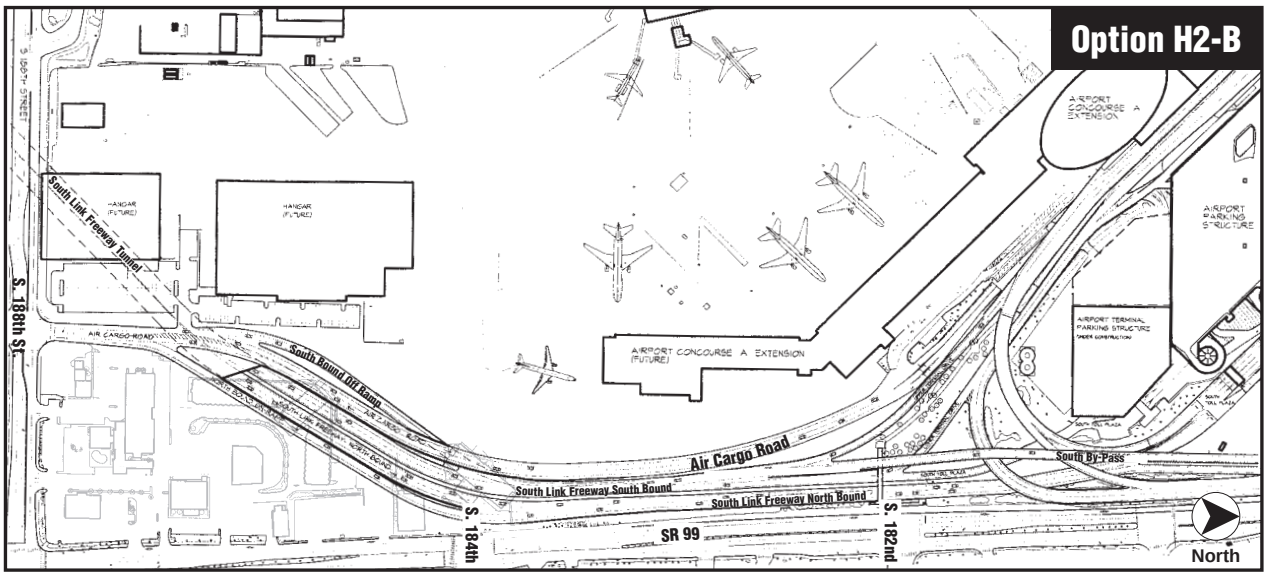
Design Option H2-B

Design Option H2-B would be essentially the same as Design Option H2-A, except that it would provide local access routes for northbound and southbound traffic at the intersection of South 188th Street and 28th Avenue South (Figure 2.3-4). Local ramps would merge in the northbound direction on the east side of the northbound lanes (northbound traffic from the intersection), and exit on the west side of the southbound lanes (southbound from the airport, the parking garage, or from the south bypass); they also would merge with Air Cargo Road. The local access ramps would require a slight shift in the overall alignment, infringing into adjacent areas more than Design Option H2-A. All other features would be the same as Design Option H2-A.

[1] The Port is considering local access options as part of other transportation assessments; however, for this analysis, access to the parking garage from the northbound expressway lanes was determined to be a fundamental requirement, and was only achievable at the expense of immediate local access.







0 100 200
Approx.
Scale in Feet

FIGURE 2.3-4
South Airport Link Design Options

SR 509: Corridor Completion/I-5/South Access Road
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I-5 Improvements

The SR 509 freeway extension would terminate at I-5 in a modified partial Y interchange, which would allow northbound I-5 traffic to continue north on SR 509 and southbound SR 509 traffic to continue south on I-5. In this configuration, the center HOV lanes of SR 509 would be grade-separated from the I-5 general purpose lanes, connecting directly with the interstate's center HOV lanes. SR 509 general purpose lanes would connect with new C/D lanes on either side of I-5, requiring additional grade separations (Figure 2.3-5).

Because of the close spacing of the proposed SR 509/I-5 interchange to existing I-5 interchanges, such as those at South 200th Street and SR 516, the project would necessitate a C/D system on I-5. On southbound I-5, two C/D lanes would extend from the convergence of SR 509 with I-5 to the SR 516 interchange (a distance that would vary among the build alternatives). From the SR 516 interchange to the South 272nd Street interchange, two new southbound auxiliary lanes would be constructed. Between South 272nd Street and approximately South 310th Street a new southbound auxiliary lane would be constructed to connect with the auxiliary lane to be provided by the Sound Transit I-5 @ South 317th Street Direct Access Ramp project. On northbound I-5, a new auxiliary lane would extend from South 272nd Street to the SR 516 interchange. Two northbound C/D lanes would start at the SR 516 interchange. Improvements would also be made to the on- and off-ramps at the SR 516 and South 272nd Street interchanges to alleviate conflicts between merging and exiting traffic. In addition, a South 228th Street extension and underpass would be constructed, providing a direct connection to northbound I-5 from South 228th Street and from southbound I-5 to South 228th Street.

The improvements to I-5 would cover approximately 6.7 miles.

2.3.3 Alternative B

Under Alternative B (Figure 2.3-6), SR 509 would extend southward from its existing terminus at South 188th Street/12th Place South and intersect with I-5 in the vicinity of South 210th Street. The SR 509 freeway extension would curve away from the existing WSDOT-owned right-of-way near South 196th Street, and continue south. The freeway extension and the South Access Road would generally parallel each other in a north-south orientation on the west and east sides of Des Moines Creek Park, respectively. SR 509 would pass beneath South 200th Street in a "tight" diamond interchange, which would minimize right-of-way width through the use of retaining walls to support the change in grade between interchange ramps and travel lanes. These retaining walls would help avoid or minimize impacts on surrounding land uses, including a residential area, Hillgrove Cemetery, and Port of Seattle-owned redevelopment land. Curving eastward near South 208th

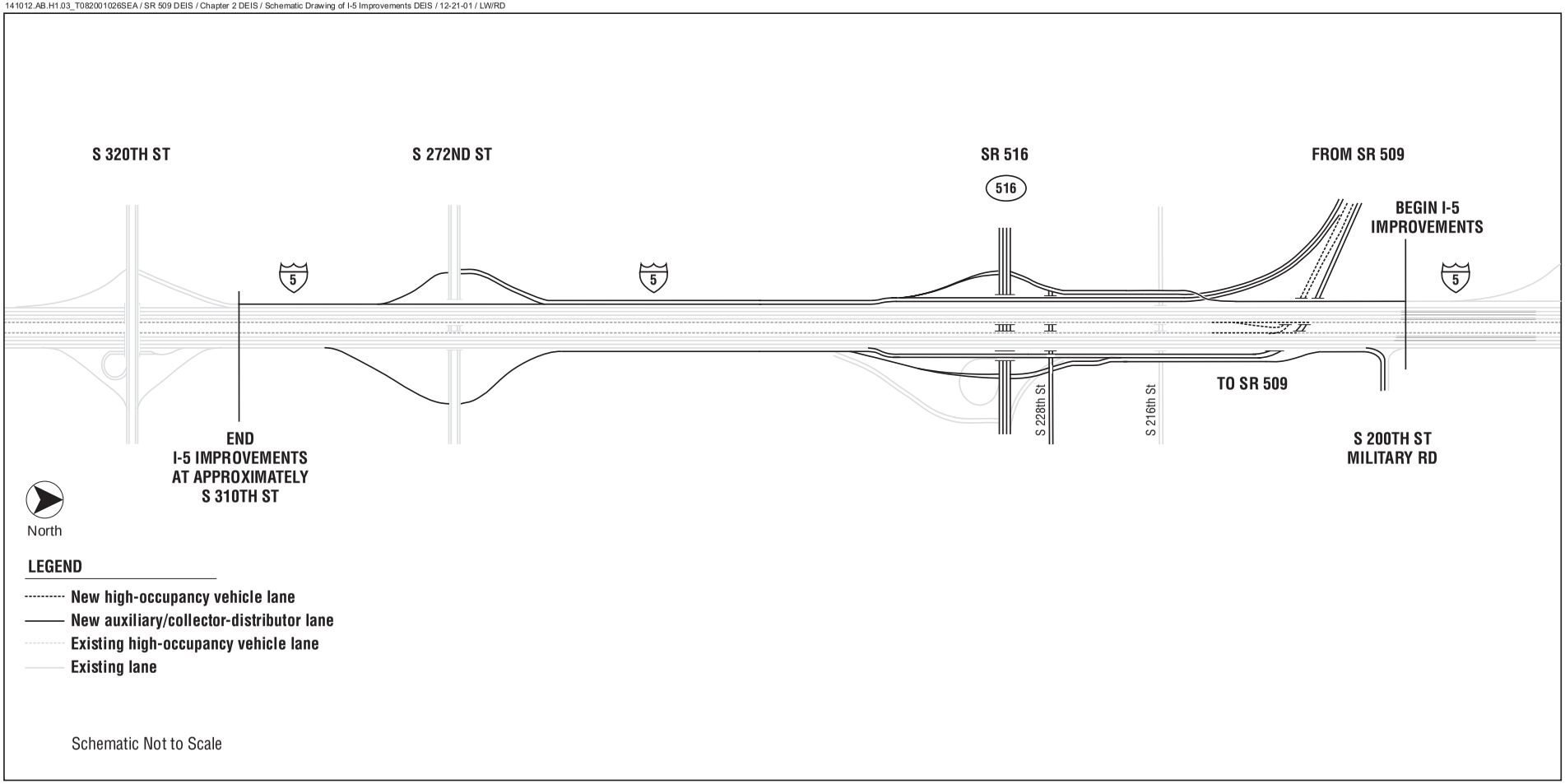
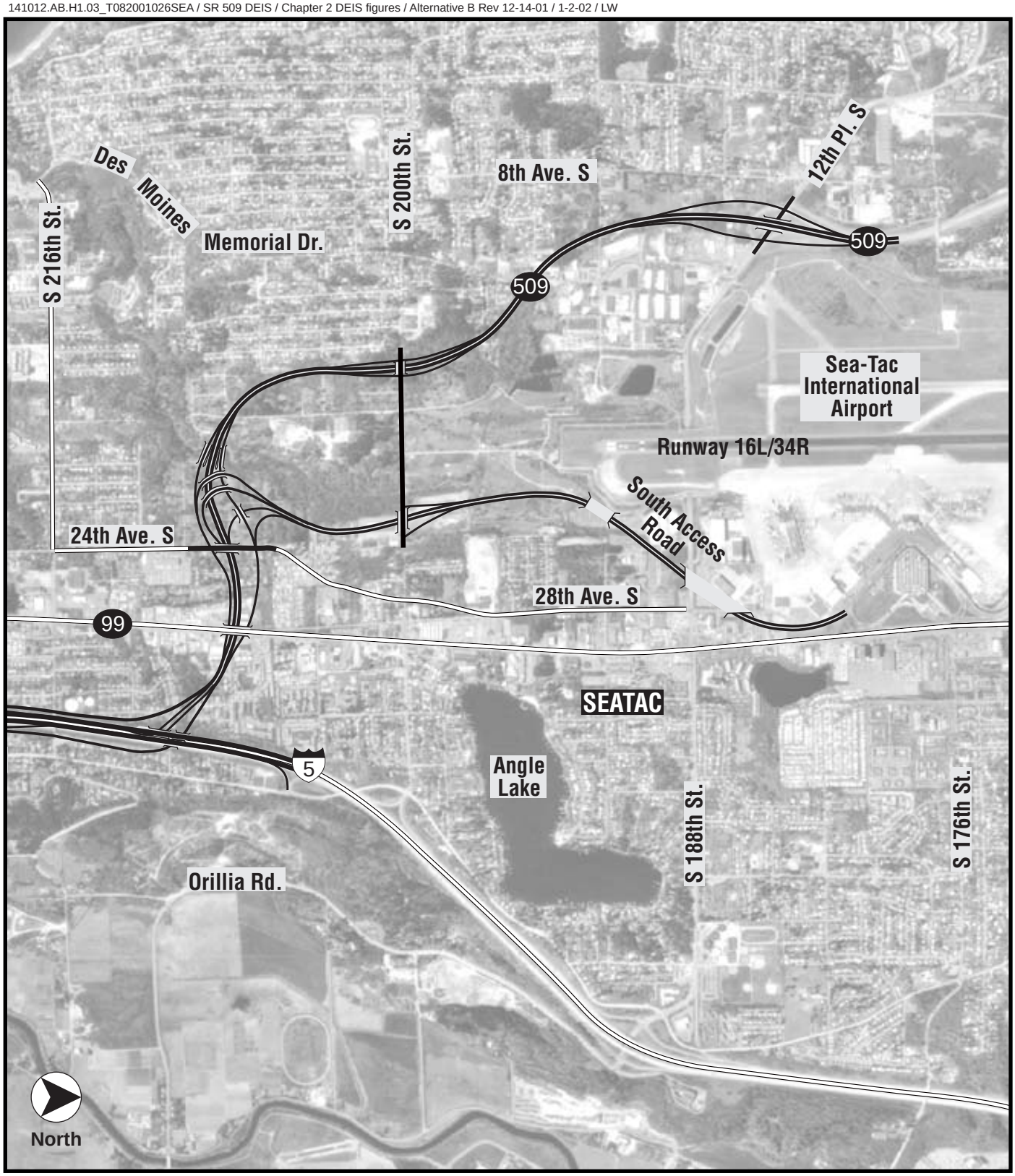


FIGURE 2.3-5

Schematic Drawing of I-5 Improvements

SR 509: Corridor Completion/I-5/South Access Road
Environmental Impact Statement



0 1/4 1/2 3/4 1 MILES

Legend

SR 509/South Access Improvements

FIGURE 2.3-6

Alternative B

SR 509: Corridor Completion/I-5/South Access Road Environmental Impact Statement

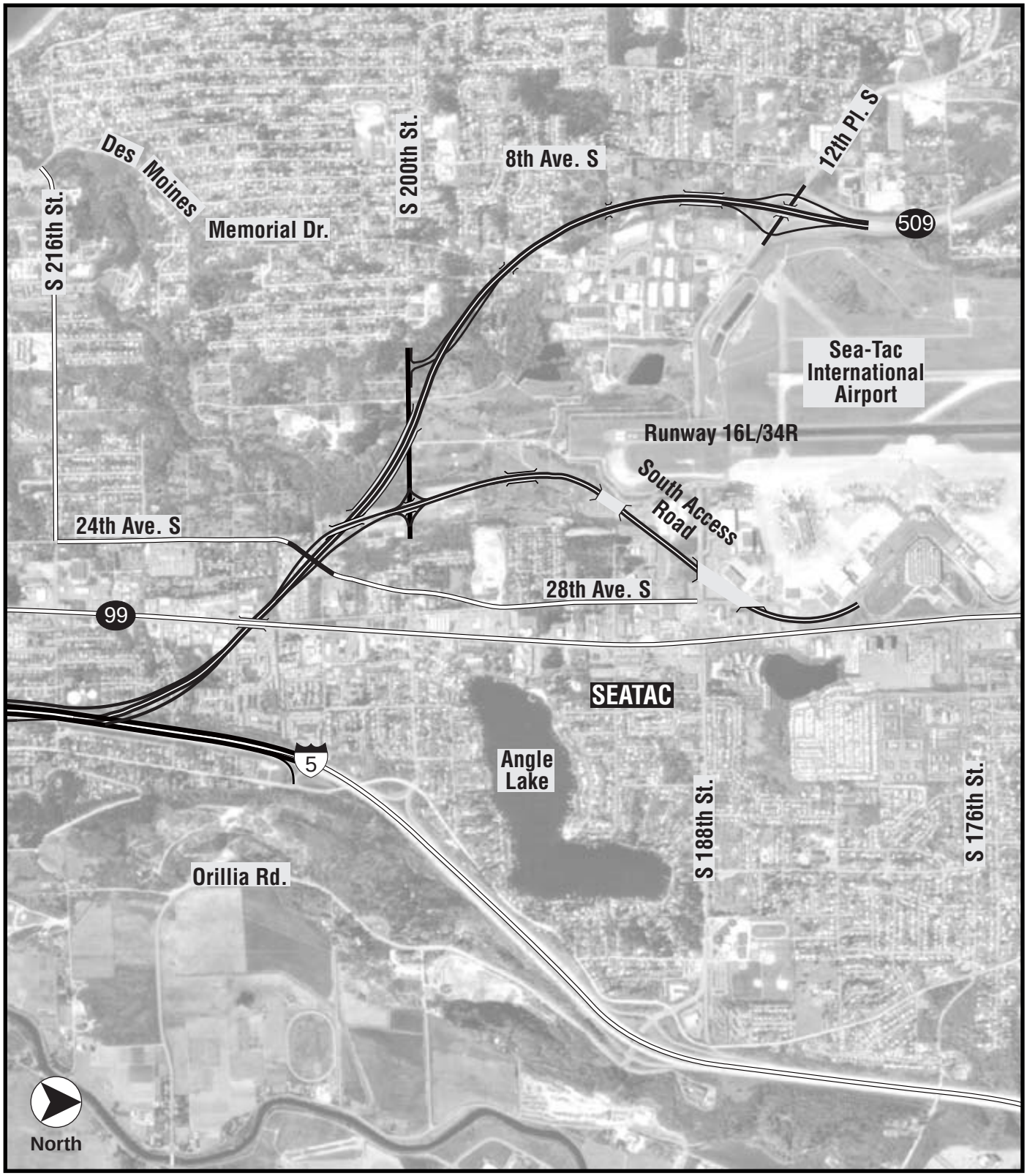
Street, the alignment would cross over Des Moines Creek on two separate bridges (to accommodate the SR 509 mainline and the ramps associated with the proposed intersection at 28th/24th Avenue South) and through Des Moines Creek Park at its narrowest point, thus minimizing impacts on that property.

The South Access Road would parallel the eastern edge of the FAA RPZ for Runway 16L/34R and extend along the western edge of the SASA. It would then pass beneath South 200th Street at a tight, partial diamond interchange, which would provide for movements to and from the north on the South Access Road. Continuing southward between Des Moines Creek Park to the west and the Federal Detention Center and existing mobile home parks to the east, the alignment would curve along the park's eastern boundary. Near the proposed intersection of 24th Avenue South and South 208th Street, the South Access Road would join with the proposed SR 509 extension at a partial Y interchange. This partial Y interchange would be interconnected with a full diamond interchange between SR 509 and 28th/24th Avenue South. East of the interchange area, the SR 509 alignment would form a slight arc to the north of the Alaska Airlines Gold Coast Center south of South 208th Street, and then curve southward to join with I-5.

Under Alternative B, the length of the SR 509 freeway extension (including the South Access Road) would be approximately 3.8 miles. The preliminary estimated cost for the development of Alternative B is $715 to $735 million in 2001 dollars. These cost estimates are based on preliminary design information, and may be revised during the final design and construction phases of the project. (These costs do not include the South Airport Link, the last 1,000 feet connecting the South Access Road to airport roadways.)

2.3.4 Alternative C2 (Preliminary Preferred)

Alternative C2 (Figure 2.3-7) would begin at the existing SR 509 terminus at South 188th Street/12th Place South. The alignment would follow the existing WSDOT right-of-way to just south of South 192nd Street. After travelling to the southeast, the alignment would cross through the existing WSDOT right-of-way slightly north of South 200th Street, passing through the southern one-third of the FAA XOFA, which would be far enough south of Runway 16L/34R to preclude the need for a tunnel. (If the alignment crossed through the northern two-thirds of the XOFA, the FAA would require the roadway to cross through the area in a tunnel.) At South 200th Street, the highway would be elevated to cross over the arterial, and would continue to be elevated on structure across the northeast corner of Des Moines Creek Park, thereby minimizing impacts on wetlands and the park. Continuing toward I-5, the SR 509 mainline would pass through existing mobile home parks and continue southeast, joining I-5 at approximately South 212th Street.



0 1/4 1/2 3/4 1 MILES

Legend

SR 509/South Access Improvements

FIGURE 2.3-7

Alternative C2 (Preliminary Preferred)

SR 509: Corridor Completion/I-5/South Access Road Environmental Impact Statement

The South Access Road would parallel the eastern edge of the FAA RPZ and Des Moines Creek Park. It would also be outside the SASA, precluding right-of-way acquisition of SASA property. The South Access Road interchange with SR 509 would be in the location of the existing mobile home parks. Access to and from 28th/24th Avenue South would be provided at this interchange.

Northbound and southbound access from South 200th Street to SR 509 would be divided and provided at two locations. A northbound SR 509 on-ramp and a southbound SR 509 off-ramp would be provided at South 200th Street along the west side of Des Moines Creek Park. A southbound on-ramp and northbound off-ramp would be provided at South 200th Street on the east side of Des Moines Creek Park.

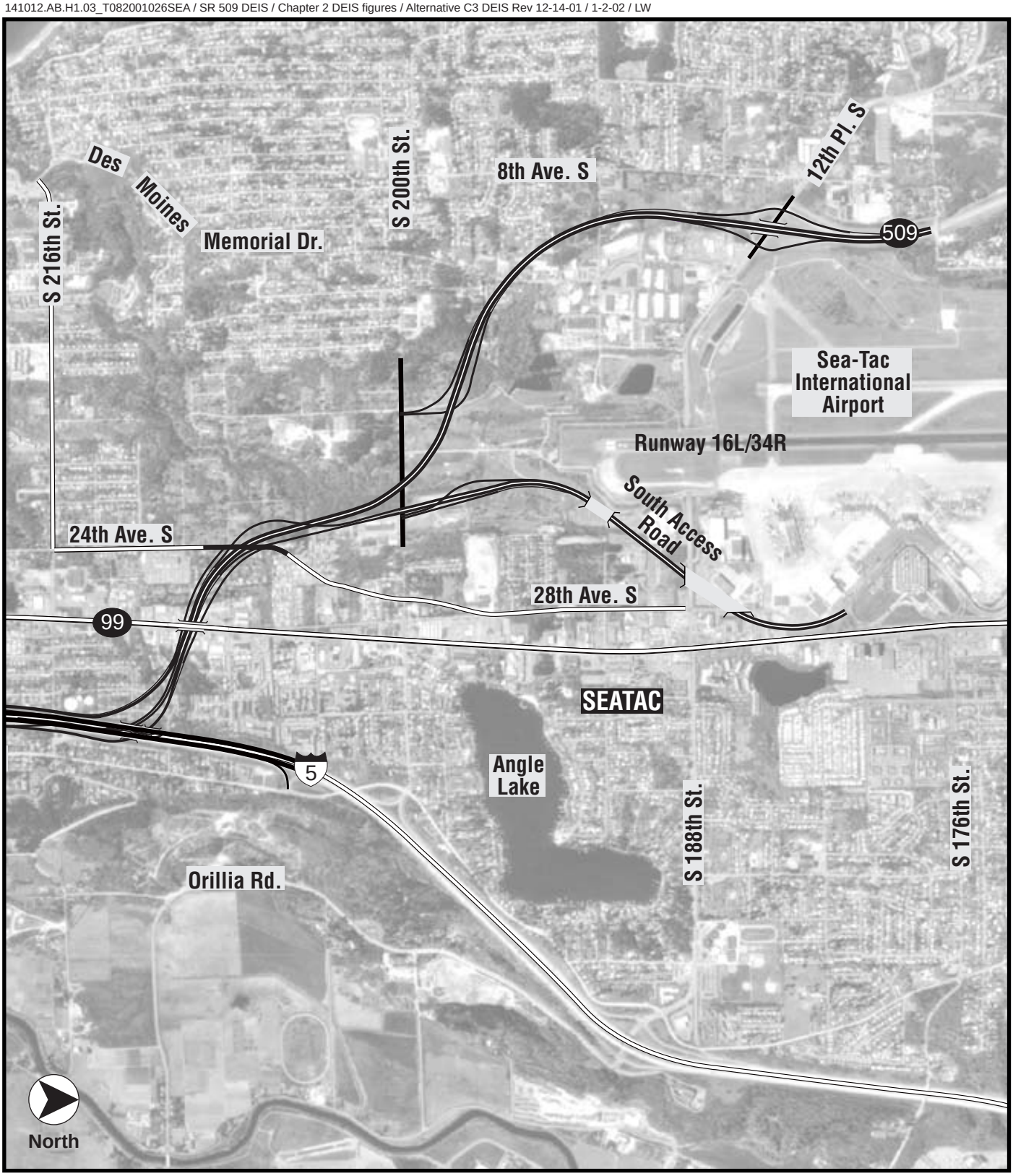
The length of Alternative C2, including the South Access Road, would be approximately 3.2 miles. The preliminary estimated cost for the development of Alternative C2 is approximately $690 to $710 million in 2001 dollars. These cost estimates are based on preliminary design information, and may be revised during the final design and construction phases of the project. These costs do not include the South Airport Link, the last 1,000 feet connecting the South Access Road to airport roadways.

2.3.5 Alternative C3

Under Alternative C3 (Figure 2.3-8), SR 509 would extend southward from its existing terminus at South 188th Street/12th Place South. The alignment would follow the existing WSDOT right-of-way to just south of South 192nd Street. Like Alternative C2, it would traverse the southern one-third of the FAA XOFA, thus precluding the need for a tunnel. Alternative C3 would encroach into the northeast corner of Des Moines Creek Park by crossing through the park on an elevated structure, which would minimize impacts on wetlands and the park. The alignment would continue west and south of existing mobile home parks, and cross through the Alaska Airlines Gold Coast Center south of South 208th Street. The alignment would join I-5 in the vicinity of South 212th Street.

From its northern terminus to South 200th Street, the South Access Road would pass to the east of the FAA RPZ and Des Moines Creek Park. Alternative C3 would intrude on the southeast corner of the SASA. The South Access Road would run parallel to the east side the SR 509 mainline until the vicinity of South 204th Street, where the southbound on-ramp would cross the mainline to the west, eventually joining the mainline in the vicinity of 28th/24th Avenue South.

Northbound and southbound access from South 200th Street to SR 509 would be divided and provided at two locations. A northbound SR 509 on-ramp and a southbound SR 509 off-ramp would be provided at South 200th Street



0 1/4 1/2 3/4 1 MILES

Legend

SR 509/South Access Improvements

FIGURE 2.3-8

Alternative C3

SR 509: Corridor Completion/I-5/South Access Road Environmental Impact Statement

along the west side of Des Moines Creek Park. A southbound on-ramp and northbound off-ramp would be provided at South 200th Street on the east side of Des Moines Creek Park.

Under Alternative C3, the length of the SR 509 freeway extension (including the South Access Road) would be approximately 3.5 miles. The preliminary estimated cost for the development of Alternative C3 is $695 to $715 million in 2001 dollars. These cost estimates are based on preliminary design information, and may be revised during the final design and construction phases of the project. These costs do not include the South Airport Link, the last 1,000 feet connecting the South Access Road to airport roadways.

2.3.6 Preliminary Preferred Alternative

At the same time that WSDOT requested the SAC's approval of the three alternatives for evaluation in the Revised DEIS, WSDOT also asked the SAC to concur with the selection of Alternative C2 as the "preliminary preferred alternative." WSDOT based this selection on the following factors:

- Because Alternative B would cross through the middle of Des Moines Creek Park (although at the narrowest point), the roadway would effectively divide the park; in addition, the enjoyment of the trail along the creek might be diminished by the visual intrusion of the roadway bridges over the trail, the loss of trees, and the resulting traffic noise. As a result, Alternative B was not well received by the Cities of SeaTac and Des Moines park directors (Alternatives C2 and C3 would cross the relatively unused northeast corner of the park, but the rest of the park would remain unaffected and contiguous).

- Alternative B would require acquisition of the greatest area of wetlands.

- Alternatives B and C3 would create more new impervious surface area than Alternative C2.

- Alternative B would impact the largest number of sensitive noise receptors (primarily residential units).

- Both Alternatives B and C3 would cause more single-family residential unit displacements than Alternative C2; on the other hand, Alternative C2 would have more multifamily unit displacements than the other alternatives (relocation of single-family units is considered more difficult and costly in the tight single-family housing market than the more expansive rental market in the SeaTac/Des Moines area).

- Alternative C3 would cross through the Alaska Airlines Gold Coast Center, possibly forcing the relocation of this facility to another city because of the lack of comparable alternative sites near the airport. The City of SeaTac indicated that it could not support an alternative that would have that great of a negative effect on the economic base of the community.

WSDOT conducted a review of Alternative C2 to determine whether impacts caused by Alternative C2 could be further minimized or completely avoided through additional design treatments. That design review effort resulted in a C2 alternative with preliminary minimization of impacts. Between the project's northern terminus and Des Moines Memorial Drive, the minimized C2 alignment was moved slightly to the east of the original Alternative C2 alignment to avoid impacts on new warehousing/light industrial development north of South 192nd Street. The minimized C2 alignment crossed the XOFA slightly south of the original Alternative C2 alignment, further minimizing FAA safety concerns. The minimized C2 roadway would be on an elevated structure along the entire alignment within Des Moines Creek Park, reducing the amount of parkland to be acquired and impacts on the wetlands within the park. To reduce the curvature of the C2 alignment, and thus increase the design speed, the minimized C2 alignment was moved slightly to the southwest in the area south of South 208th Street. These revisions were accepted by the Executive Committee and incorporated into the Alternative C2 design for evaluation in this Revised DEIS.

The SAC concurred with Alternative C2 as the preliminary preferred alternative in September 2001.

2.4 Traffic Analysis of Alternatives Analyzed in the Revised DEIS

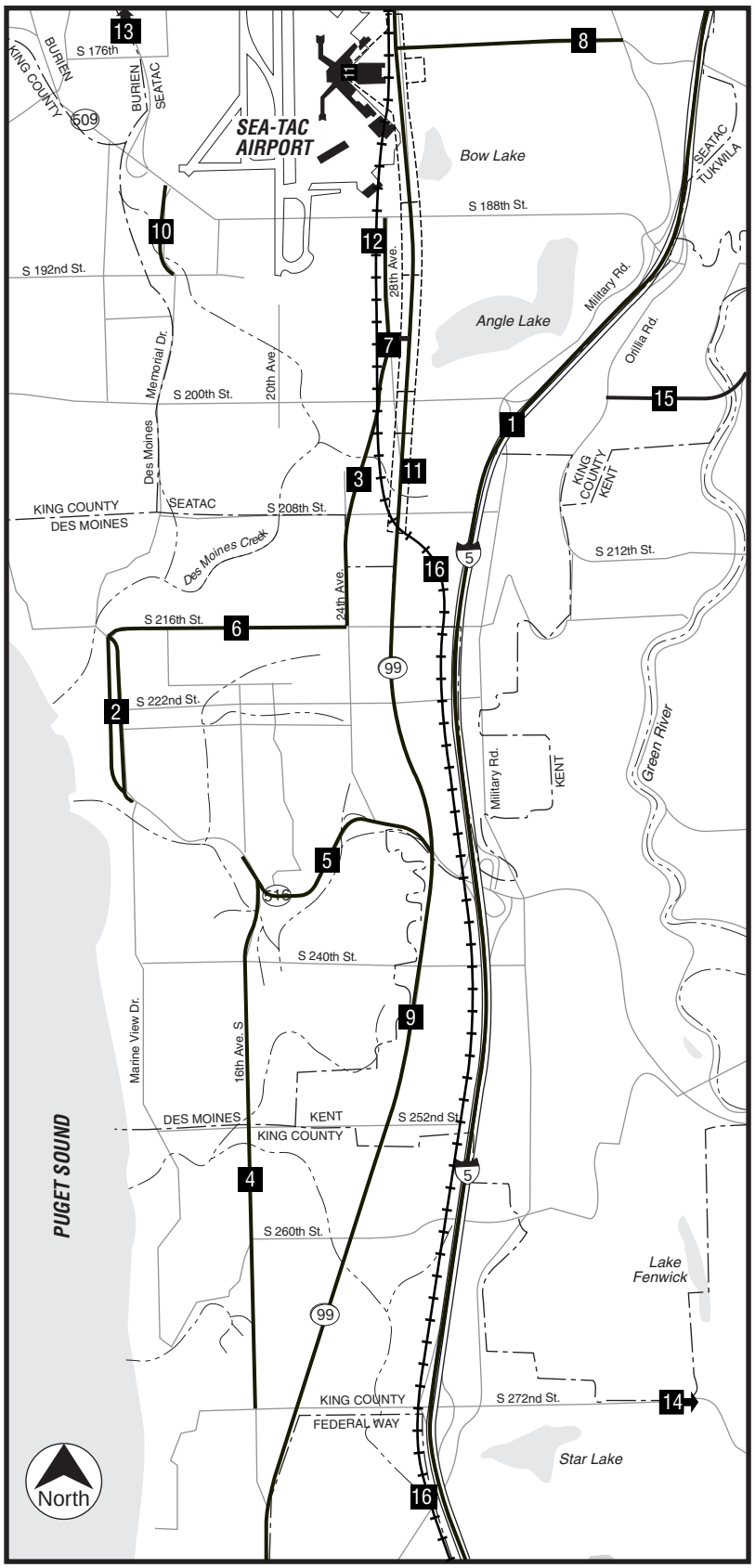
The traffic analysis for the SR 509: Corridor Completion/I-5/South Access Road Project examines extending SR 509 south to I-5; increasing regional capacity and relieving congestion on I-5 from its connection with the SR 509 extension to South 310th Street; and providing a new high-capacity, limited access connection to Sea-Tac Airport, known as the South Access Road. As mentioned previously, there are three design options—H0, H2-A, and H2-B—for the last 1,000 feet of the South Access Road, known as the South Airport Link. With respect to transportation system characteristics, Design Options H0 and H2-A are very similar, and have therefore been combined for the purpose of presenting the results of the traffic analysis. The area evaluated in the traffic analysis extends north to South 144th Street, west to Puget Sound, south to South 310th Street, and east to SR 167. This area includes all or part of the Cities of SeaTac, Normandy Park, Des Moines, Tukwila, Renton, Kent, Auburn, Federal Way and Burien, and portions of unincorporated King County.

2.4.1 Traffic Model

The traffic analysis for the build alternatives relies on a travel demand model for forecasting future traffic volumes. The model used in forecasting for the proposed project is based on information from the comprehensive plans for the Cities of SeaTac and Des Moines and numerous transportation plans and studies, as cited in the *SR 509/South Access Road EIS Discipline Report: Transportation* (CH2M HILL January 2002a). The forecast year used for this study is 2020. The traffic analysis looked at two areas: the traffic analysis area (roughly from north of SR 518 to south of South 310th Street and Puget Sound to east of SR 167) and the primary traffic study area (roughly from South 170th Street to south of South 272nd Street). The traffic analysis area captures project effects on the larger, regional network and the primary traffic study area addresses project effects on the local network.

The land use data for the traffic analysis area are based on regional forecasts by the Puget Sound Regional Council (PSRC), which have been modified to reflect local land use plans and information from meetings with local staff. Two land use scenarios were developed for 2020—one for the No Action Alternative and one for the build alternatives. This approach reflects the potential development that may not occur without improvements to SR 509, and complies with transportation service standards and Growth Management Act (GMA) regulations, which indicate that transportation and other public improvements needed to accommodate new development should occur concurrent with that development. Local jurisdictions do not currently have growth restrictions that require the proposed action to be built before growth in the area can proceed. The land use scenarios for the No Action Alternative and the build alternatives include the third runway at Sea-Tac Airport.

A base transportation network for the 2020 No Action Alternative was developed from the transportation plans for the transportation analysis area. The base year network includes a number of major transportation improvements. In addition to street/roadway improvements, the base year network includes construction of the first phase of the Sound Transit Link Light Rail system and commuter rail in the Green River valley. The transportation improvements included in the 2020 baseline transportation network are shown in Figure 2.4-1. Along with improved transit service, a variety of transportation system management (TSM) strategies are assumed to be implemented by employers in the traffic analysis area, including telecommuting, a compressed work week, parking pricing, and employer programs. These programs could reduce work trips by as much as 20 percent.



1. I-5 HOV Lanes
2. Marine View Drive/7th Ave S. Project (Completed)
3. 28th/24th Avenue S. Arterial (Phase 1 completed – S. 188th to S. 204th Streets)
4. 16th Avenue S.
5. Kent-Des Moines (SR 516) Road
6. S. 216th Street
7. S. 195th Street
8. S. 176th Street (Completed)
9. Pacific Highway S./International Boulevard (SR 99) (Phases 1 and 2 completed – S. 170th to S. 200th Streets)
10. Des Moines Memorial Drive (Completed)
11. Sea-Tac People Mover (Indefinitely on hold)
12. Sound Transit Project Link Light Rail Transit Route, Phase 1
13. 1st Avenue S. Bridge (Completed)
14. S. 272nd/S. 277th Street Corridor
15. Cross-Valley Connector Along S. 192nd/196th/200th Street Corridor (Completed)
16. Sound Transit future phase

FIGURE 2.4-1

Baseline Transportation Network Year 2020 Improvements

SR 509: Corridor Completion/
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141012.AB.H1.03_T082001026SEA / SR 509 DEIS / Chapter 2 DEIS figures / 2020 Improvements / 12-31-01 / LW

Without currently planned regional and local transit improvements, travel demand would increase, resulting in more congestion and lower travel speeds (particularly under the No Action Alternative). There would be a further shift of travel demand into other hours of the day, and impeded access and mobility throughout the day. If this were to occur, the traffic analysis area would need additional vehicle capacity. The analysis of the alternatives assumes that the proposed regional transit improvements would be built.

2.4.2 Vehicle Circulation

Street System

Improvements to the transportation system under the No Action Alternative would include the transit projects mentioned above and the planned capacity improvements to the system, as shown in Figure 2.4-1.

The build alternatives would also include the baseline improvements proposed under the No Action Alternative. Because the build alternatives would cut across several existing streets, grade separations would be provided for all streets with an arterial classification (principal, minor, or collector), as defined by the 1991 King County Functional Classification. Most other streets would be provided with a cul-de-sac or other suitable closure.

Each build alternative would provide improved access to Sea-Tac Airport and the SR 509 corridor for residents of the Green River valley (via SR 516), Federal Way, southern King County, and Pierce County.

Traffic Volumes

For the build alternatives, traffic volumes at the screenlines (imaginary lines that cross a number of key roadways to measure directional travel in broad corridors) would increase between approximately 1 percent to 23 percent compared to the No Action Alternative. The largest increases would occur at Screenline F (I-5) and Screenline C (South 188th Street), as shown in Table 2.4-1.

A summary of the existing and forecast traffic volumes at the screenlines is provided in Table 2.4-1. As expected, differences in the screenline traffic volumes among South Airport Link Design Options H0/H2-A and H2-B lessen the farther the screenline is from the South Access Road. Noticeable differences for the design options are noted in the vicinity of the airport—Screenline C (South 188th Street) and Screenline D (South 160th Street).

Table 2.4-1
Screenline Comparison of Traffic Volumes
2020 (p.m. peak hour)

Screenline	Existing (1998)	Alt. A (No Action)	Design Options H0/H2-A[a]			Design Option H2-B[a]		
			Alt. B	Alt. C2 (Prelim. Pref.)	Alt. C3	Alt. B	Alt. C2 (Prelim. Pref.	Alt. C3
A (S. 272nd St.)	17,950	23,300	24,020	24,100	24,160	24,020	24,100	24,160
B (SR 516)	21,200	26,470	29,030	29,090	29,180	29,030	29,110	29,170
C (S. 188th St.)	24,550	30,810	35,760	35,780	35,590	34,850	34,900	34,750
D (S. 160th St.)	28,250	33,550	36,650	36,590	36,610	36,590	36,480	36,480
E (S. 144th St.)	30,500	34,910	35,180	35,240	35,310	35,180	35,240	35,310
F (I-5)	25,100	30,340	37,180	37,570	37,350	37,300	37,540	37,350

[a]*Design Options H0/H2-A include South Access Road ramps to and from the north at South 200th Street. In Design Option H2-B, ramps are located at South 188th Street.*

Source: The Transpo Group and CH2M HILL.

In the SR 509 corridor, traffic volumes would increase substantially under the build alternatives because of the diversion of traffic from I-5 to the SR 509 freeway extension. In the existing SR 509 freeway sections, the total volumes in both directions would range from approximately 6,550 to 6,850 vph north of SR 518 and approximately 7,750 to 8,150 vph south of SR 518, depending on the alternative. In the proposed sections of SR 509, maximum total volumes in both directions would range from approximately 7,400 (Alternative C3) to 7,800 vph (Alternative C2). These traffic volumes do not substantially differ among the alternatives.

Traffic volumes on the South Access Road would differ depending on the South Airport Link design. Traffic volumes under Design Options H0/H2-A for any of the build alternatives would be higher than Design Option H2-B, ranging from approximately 2,130 to 2,700 vph. With Design Option H2-B, traffic volumes on the South Access Road would be approximately 1,780 vph under Alternative B, 1,930 vph under Alternative C2, and 1,965 vph for Alternative C3. Traffic volumes on the South Airport Link would be lowest with Design Option H2-B because of the direct connection to the airport roadway network north of South 188th Street.

Under all the build alternatives, the SR 509 freeway extension and new South Access Road would divert traffic from other north-south facilities, as shown by the lower traffic volumes on other corridors in the project area (roughly South 170th Street to south of South 272nd Street and east of SR 509, and Puget Sound to west of SR 181). At Screenline C (South 188th Street), volumes would decrease on I-5, SR 99, and First Avenue South.

One of the major benefits of the build alternatives, compared to the No Action Alternative, would be improved access and mobility in the middle of the day and at other off-peak hours.

Vehicle miles of travel (vmt) and vehicle hours of travel (vht) are measures of travel and congestion based on number of trips. Alternative A would have the lowest vmt of any of the alternatives because there would potentially be less development in the primary traffic study area and, therefore, less travel demand. Despite the increased vmt and vht for the build alternatives, average speed would remain generally the same as for the No Action Alternative. As shown in Table 2.4-2, Alternative B would have the highest vehicle hours and miles traveled, and the lowest speed (15.3 mph). Alternative C2 would have the lowest vht and the highest speed of the build alternatives.

Table 2.4-2
Comparison of Vehicle Miles of Travel and Vehicle Hours of Travel in the Project Area
2020 (p.m. peak hour)

	Design Options H0/H2-A[a]			Design Option H2-B[a]		
	VMT	VHT	Speed (mph)	VMT	VHT	Speed[c] (mph)
Alternative A (No Action)[b]	307,700	19,840	15.5	N/A	N/A	N/A
Alternative B	341,230	22,370	15.3	340,440	22,030	15.5
Alternative C2 (Preliminary Preferred)	339,060	21,540	15.7	338,705	21,475	15.8
Alternative C3	338,190	21,910	15.4	337,770	21,810	15.5

N/A = not applicable

[a] *Design Options H0/H2-A include South Access Road ramps to and from the north at South 200th Street. In Design Option H2-B, ramps are located at South 188th Street.*

[b] *The No Action Alternative does not reflect either Design Options H0/H2-A or H2-B,* but is considered the baseline.

[C] *Speed is calculated by dividing the total vmt by total vht in the project area.*

Level of Service

LOS is a qualitative description of the degree of comfort drivers experience as they travel along a corridor. LOS grades range from LOS A, in which little or no delay is experienced, to LOS F, which denotes extreme congestion. TRB Special Report 209, *1997 Highway Capacity Manual*, defines each LOS grade (see *SR 509/South Access Road EIS Discipline Report: Transportation* [CH2M HILL January 2002a]).

A three-tiered system of analysis was used to determine the LOS. In the first tier, an analysis of screenlines (imaginary lines that cross a number of key

roadways to measure directional travel in broad corridors) provided a regional perspective for the transportation analysis area. The screenline analysis provides a broad look at the system. The second tier was an analysis of each major corridor in the same area. This analysis provides a more detailed examination of changes in demand and operations. The third tier was an LOS analysis for 19 key intersections, which identified specific traffic bottlenecks. These roadway segments and intersections were selected for analysis because of their importance and because they would best reflect changes in travel demand and traffic operations due to implementation of the build alternatives. LOS was determined by comparing critical volumes to estimated capacity. Figure 2.4-2 provides a map of the locations of screenlines, corridors, and intersections used for this analysis. Figures 2.4-3 through 2.4-9 show the LOS for the No Action and the build alternatives under Design Options H0/H2-A and H2-B.

Screenlines

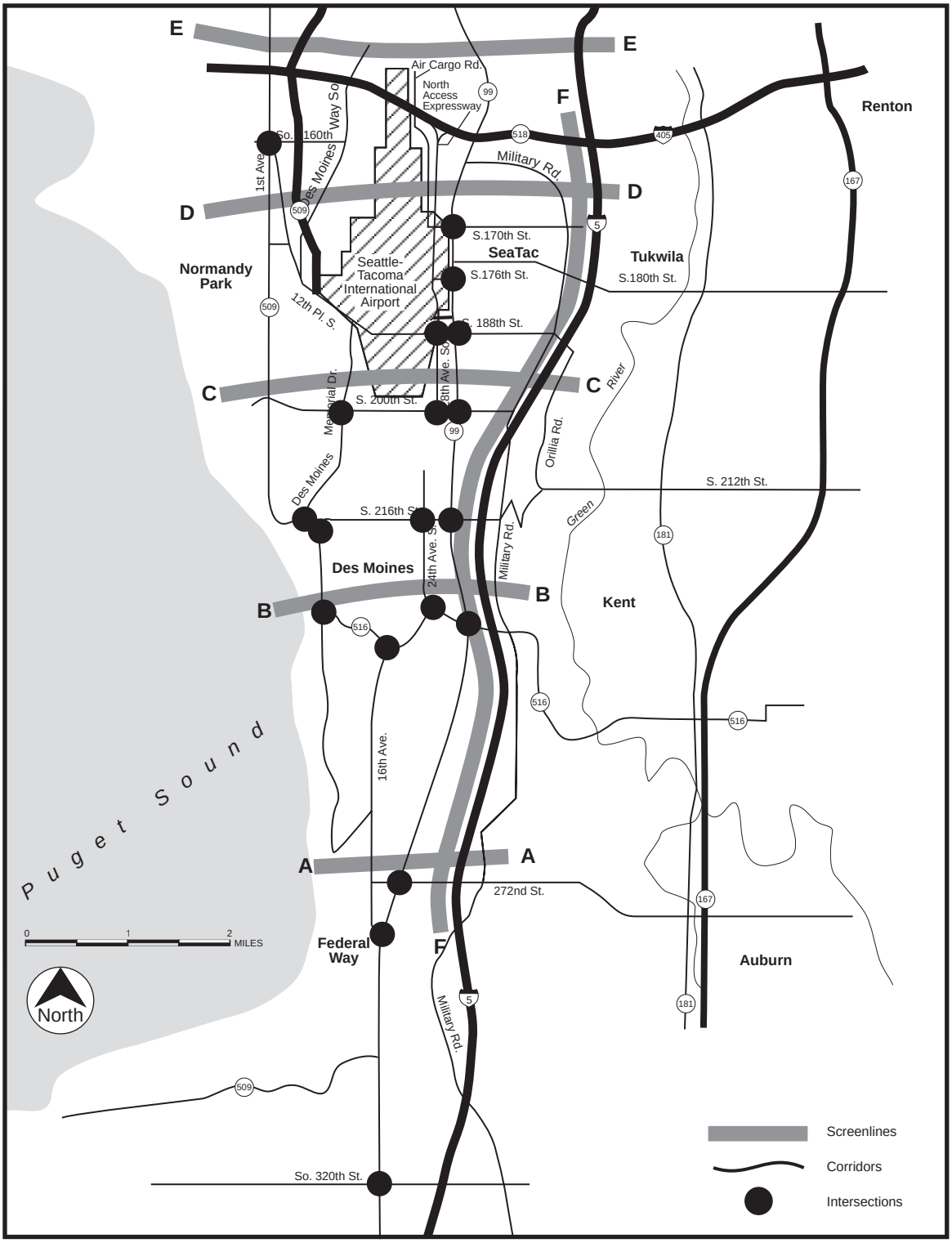
Under the build alternatives, increased capacity in the project area would provide general overall improvements in traffic operations, despite the overall increase in travel demand (Table 2.4-3). Screenline LOS would be essentially the same for all build alternatives. Screenline A (South 272nd Street) and possibly Screenline F (I-5) would operate at LOS F. The anticipated changes in LOS would be a substantial improvement over the No Action Alternative, and only slightly worse than existing conditions for a few screenlines. Portions of SR 509, SR 99, South 188th Street, and Marine View Drive would operate at LOS E or F. In general, the overall system would operate at LOS D/E.

Table 2.4-3
2020 Alternative Screenline Level of Service Summary

	Alternative A	Alternative B		Alternative C2		Alternative C3	
Screenline	**(No Action)**	**H0/H2-A**	**H2-B**	**H0/H2-A**	**H2-B**	**H0/H2-A**	**H2-B**
A (S. 272nd)	E	E/F	E/F	E/F	E/F	E/F	E/F
B (SR 516)	F	E	E	E	E	E	E
C (S. 188th)	F	D	D	D	D	D	D
D (S.160th)	D/E	E	E	E	E	E	E
E (S. 144th)	D	D	D	D	D	D	D
F (I-5)	F	E/F	E/F	F	F	E/F	E/F

[a]*Peak direction southbound for Screenlines A through E and westbound for Screenline F.*

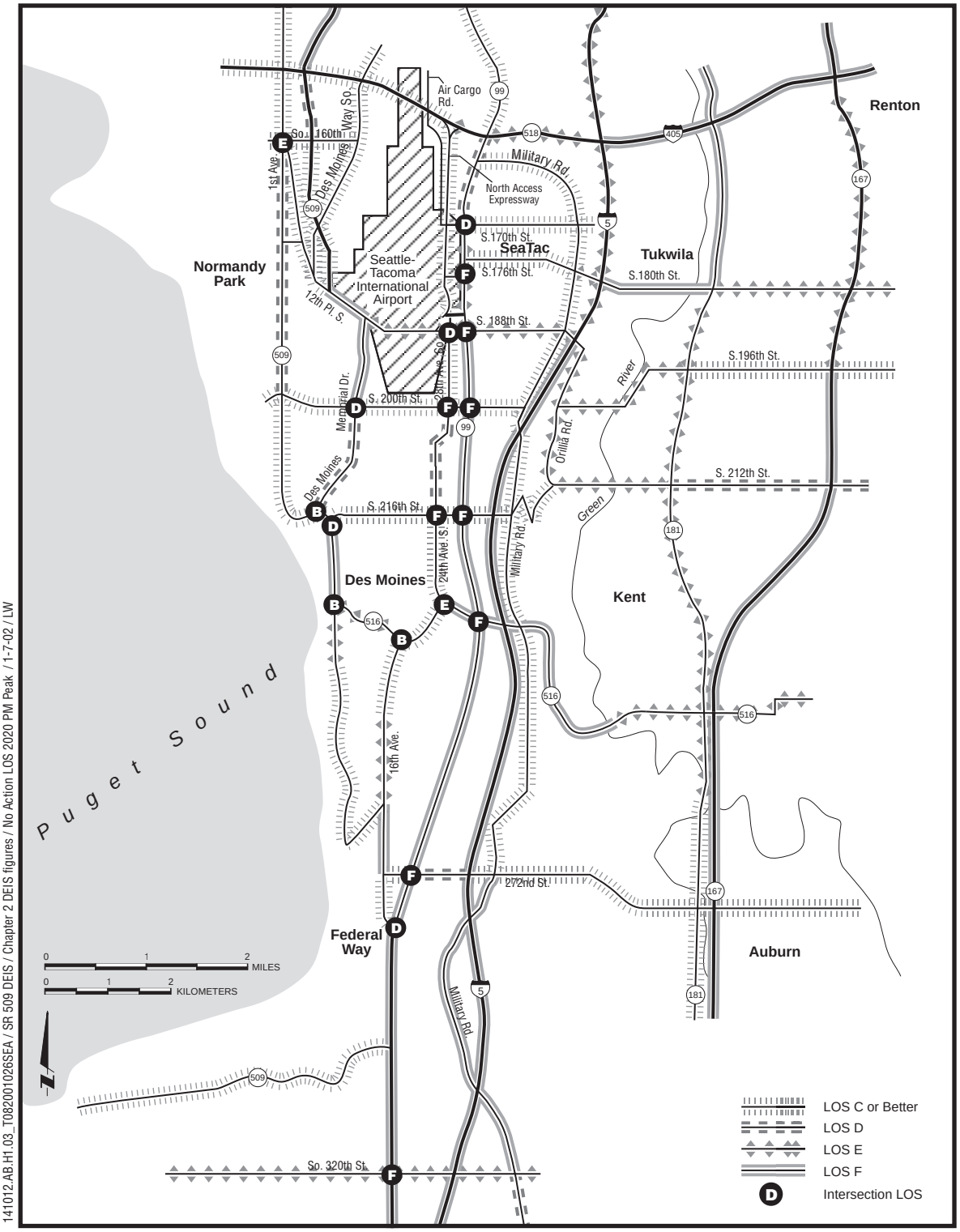
Source: The Transpo Group and CH2M HILL.



141012.AB.H1.03_T082001026SEA / SR 509 DEIS / Chapter 2 DEIS figures / Screenlines / 11-2-01 / LW

FIGURE 2.4-2

Screenlines and Intersections in Primary Traffic Study Area

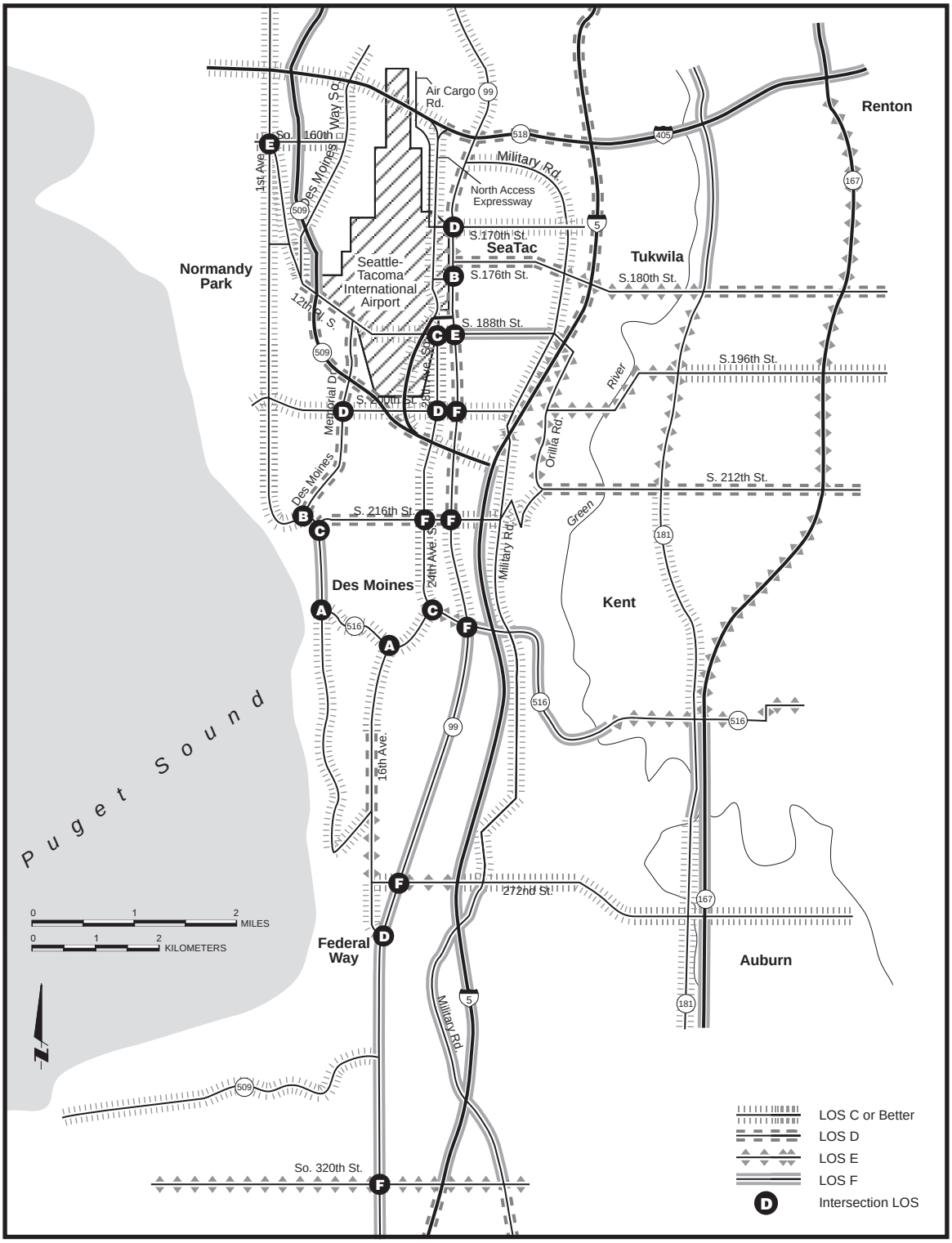


141012.AB.H1.03_T082001026SEA / SR 509 DEIS / Chapter 2 DEIS figures / No Action LOS 2020 PM Peak / 1-7-02 / LW

Note: Roadway level of service displayed is for travel direction with highest volume.

FIGURE 2.4-3

No Action Level of Service 2020 PM Peak Hour

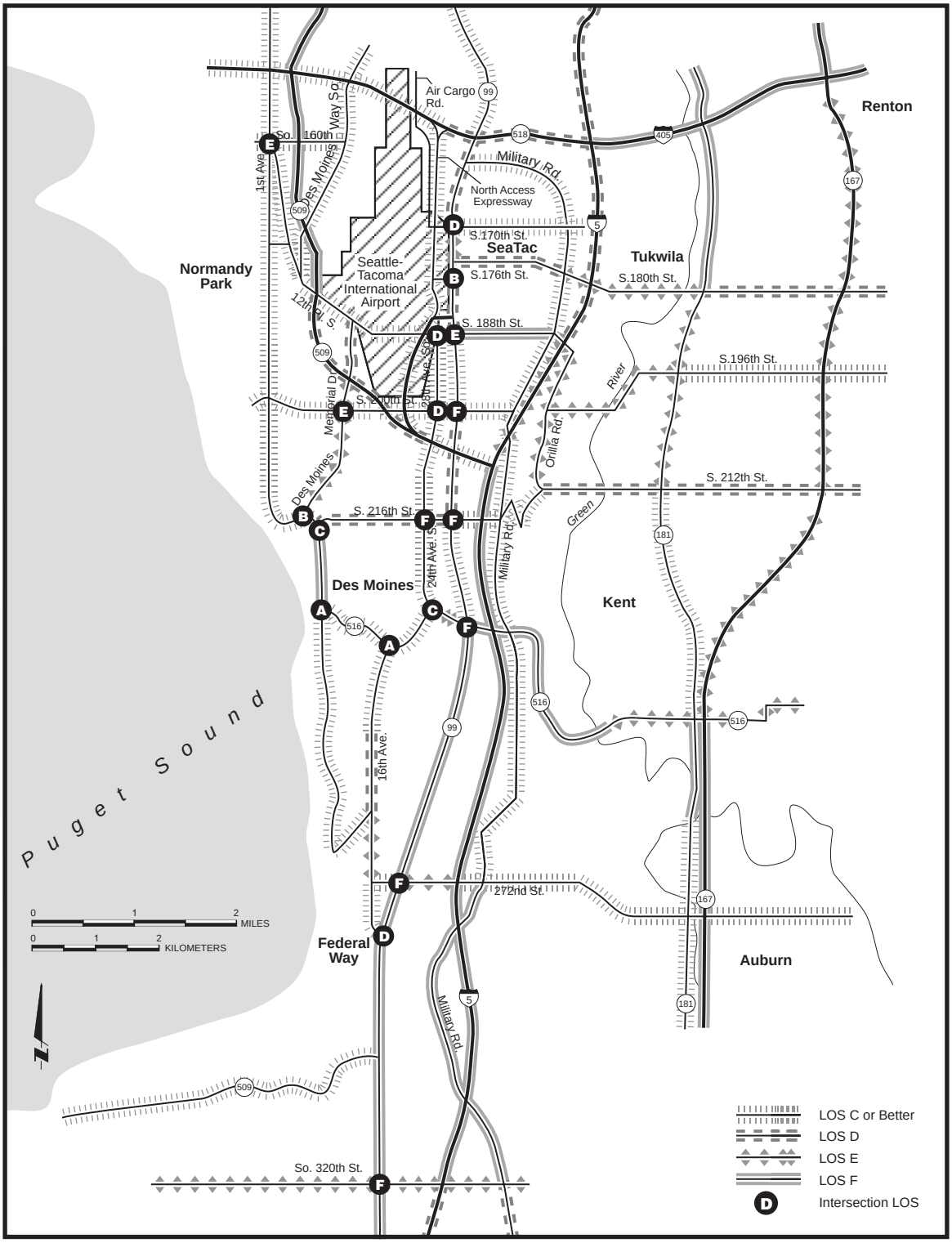


141012.AB.H1.03_T082001026SEA / SR 509 DEIS / Chapter 2 DEIS figures / AltBHO_H2A_2020 LOS 2.4-4 / 1-7-02 / LW

Note: Roadway level of service displayed is for travel direction with highest volume.

FIGURE 2.4-4

Alternative B – HO/H2-A Level of Service 2020 PM Peak Hour

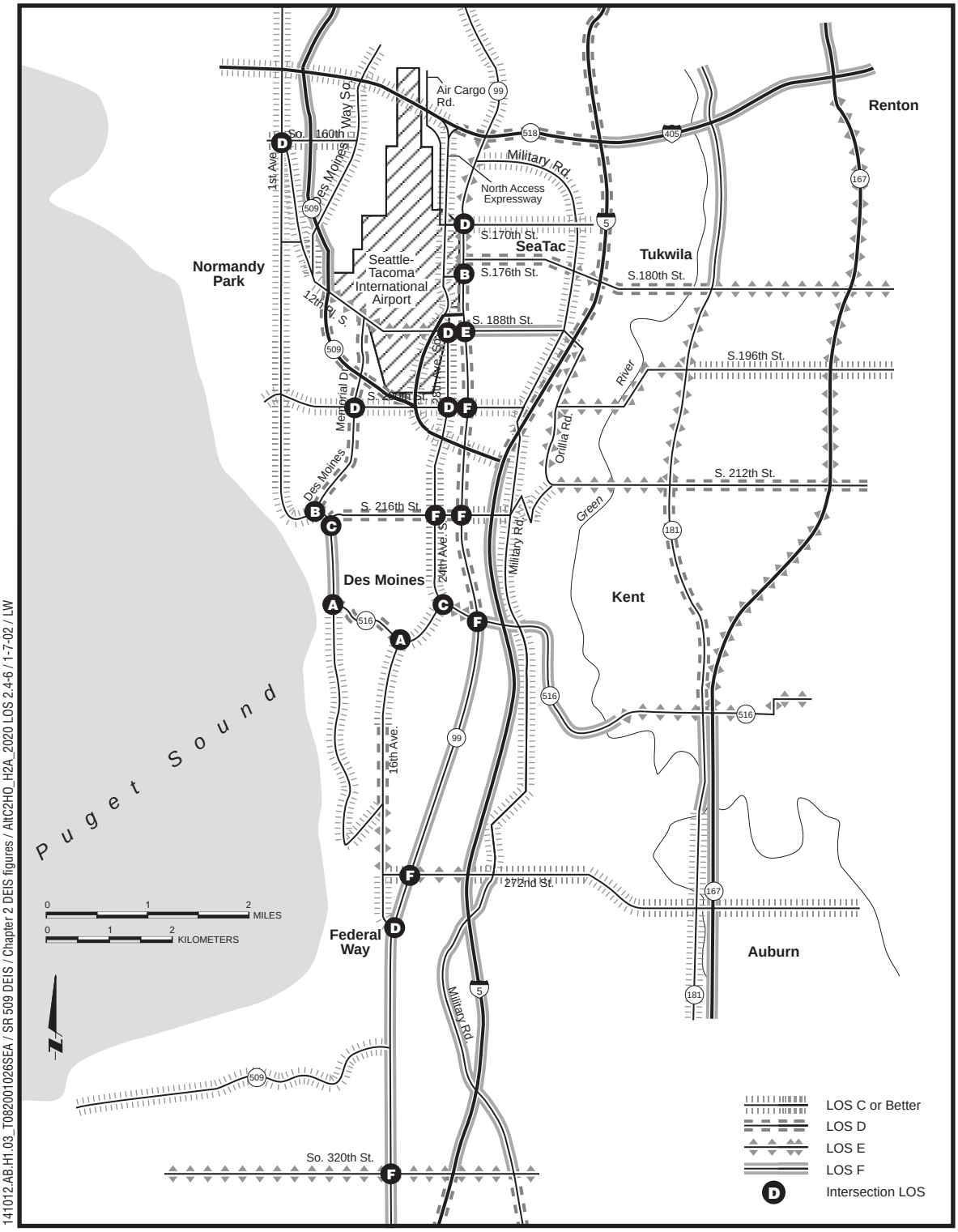


141012.AB.H1.03_T082001026SEA / SR 509 DEIS / Chapter 2 DEIS figures / AltBH2B_2020 LOS 2.4-5 / 1-7-02 / LW

Note: Roadway level of service displayed is for travel direction with highest volume.

FIGURE 2.4-5

Alternative B – H2-B Level of Service 2020 PM Peak Hour

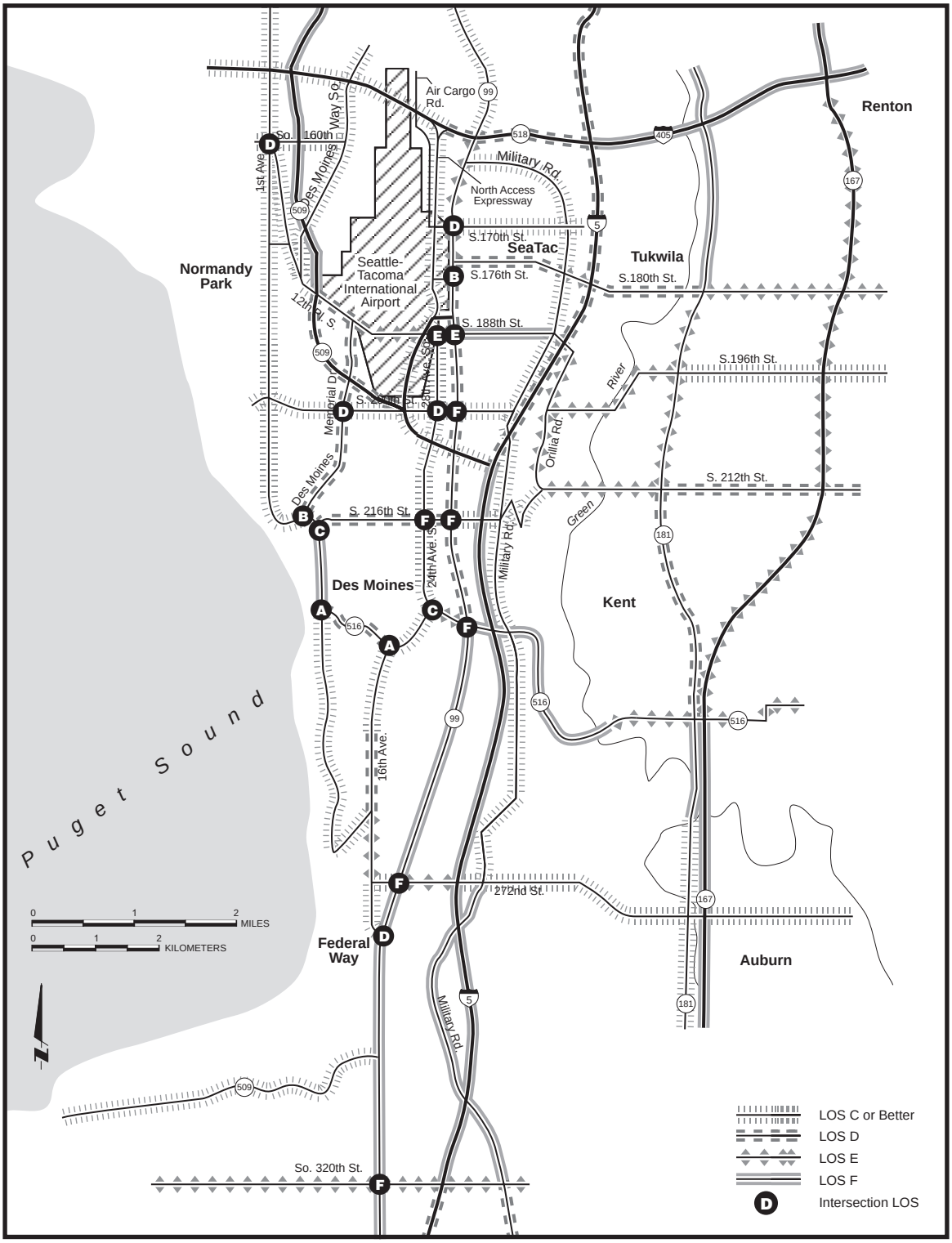


141012.AB.H1.03_T082001026SEA / SR 509 DEIS / Chapter 2 DEIS figures / AltC2HO_H2A_2020 LOS 2.4-6 / 1-7-02 / LW

Note: Roadway level of service displayed is for travel direction with highest volume.

FIGURE 2.4-6

Alternative C2 – HO/H2-A Level of Service 2020 PM Peak Hour

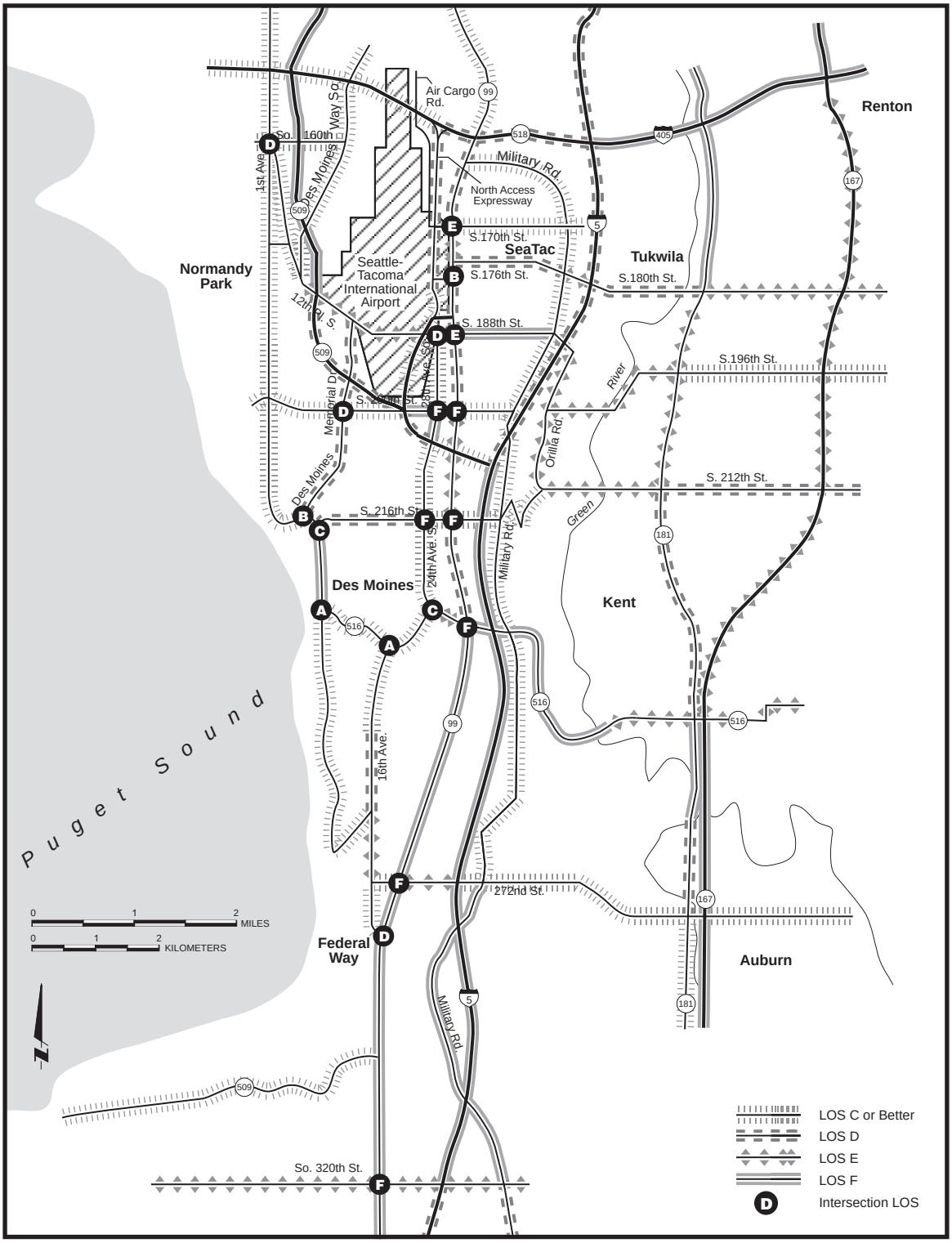


141012.AB.H1.03_T082001026SEA / SR 509 DEIS / Chapter 2 DEIS figures / AltC2H2B_2020 LOS 2.4-7 / 1-7-02 / LW

Note: Roadway level of service displayed is for travel direction with highest volume.

FIGURE 2.4-7

Alternative C2 – H2-B Level of Service 2020 PM Peak Hour

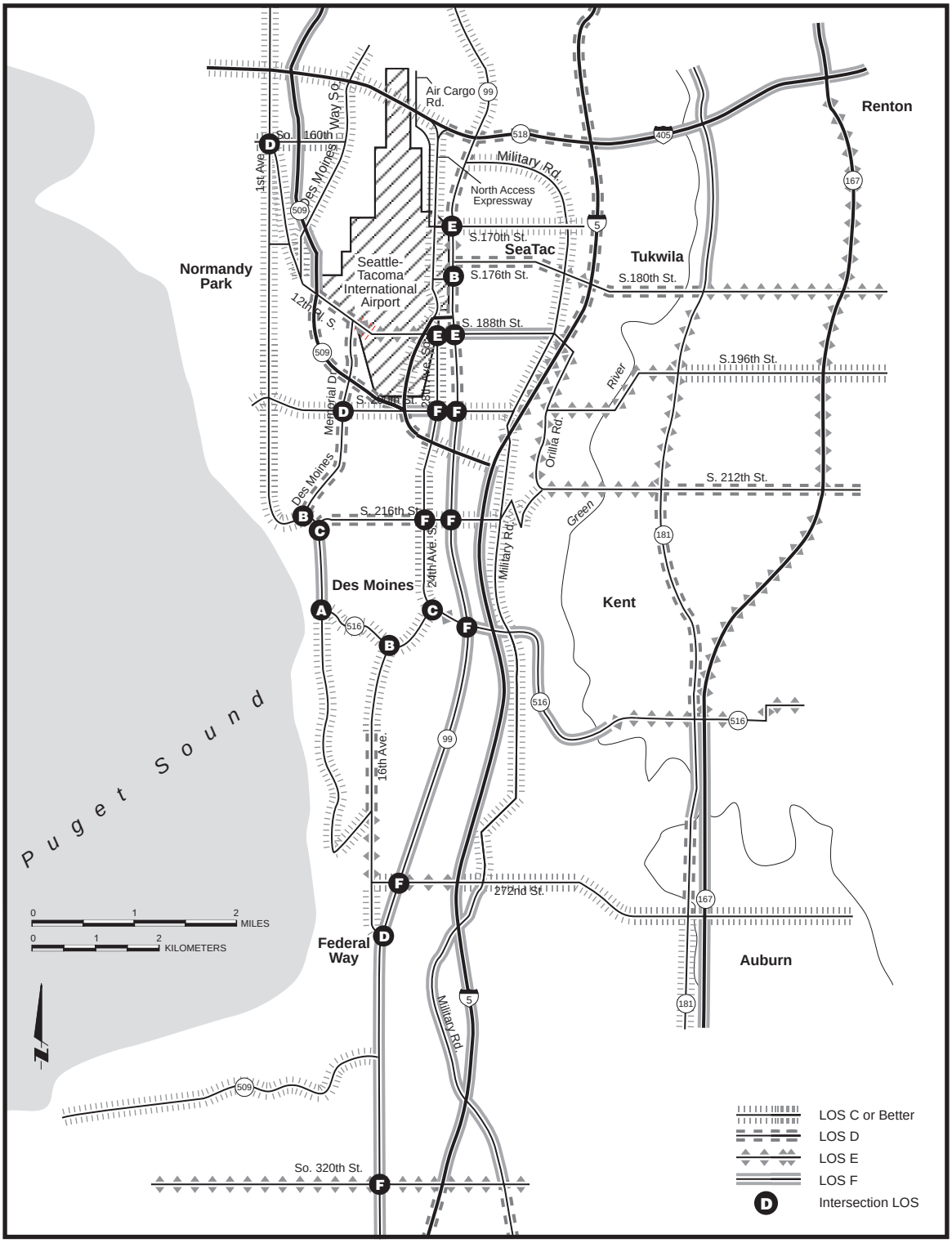


141012.AB.H1.03_T082001026SEA / SR 509 DEIS / Chapter 2 DEIS figures / AltC3HO_H2A_2020 LOS 2.4-8 / 1-7-02 / LW

Note: Roadway level of service displayed is for travel direction with highest volume.

FIGURE 2.4-8

Alternative C3 – HO/H2-A Level of Service 2020 PM Peak Hour



141012.AB.H1.03_T082001026SEA / SR 509 DEIS / Chapter 2 DEIS figures / AltC3_H2B_2020 LOS 2.4-9 / 1-7-02 / LW

Note: Roadway level of service displayed is for travel direction with highest volume.

FIGURE 2.4-9

Alternative C-3 – H2B Level of Service 2020 PM Peak Hour

Corridors

Corridor LOS would improve on some roadways with implementation of the build alternatives. The primary roadways that would improve are I-5 north of the proposed SR 518 connection, SR 99 between South 188th Street and SR 516, South 188th Street west of SR 99, Des Moines Memorial Drive north of South 200th Street, and SR 516 west of SR 99. The South Access Road would have a localized affect on LOS along South 188th Street between 28th Avenue South and SR 99. LOS would improve under Design Options H0/H2-A for all of the build alternatives, because local access would not be available at South 188th Street. LOS would not differ between Design Option H2-B and the No Action Alternative.

Intersections

Intersection LOS would be substantially better under the build alternatives than under the No Action Alternative; however, many locations in the transportation analysis area would still operate at LOS E to F during the p.m. peak hour, particularly in the SR 99 corridor. The western portion of the transportation analysis area would have improved operating conditions, particularly in the Des Moines Memorial Drive/Marine View Drive/SR 516 corridor. Access to Sea-Tac Airport would be improved, although high volumes of local traffic would continue to use the South 170th Street entrance off of SR 99 under Alternative C3. LOS would vary slightly among the alternatives, and would vary most at the 28th/24th Avenue South intersection with South 200th Street. Under Alternative B, this intersection would primarily operate at LOS D, LOS C or D under Alternative C2, depending on the South Airport Link design option (H0/H2-A or H2-B), and LOS F under Alternative C3.

2.4.3 Accidents and Safety

In general, roadways with lower levels of congestion have lower vehicles accident rates than roadways with higher levels of congestion. In 2020, traffic volumes along the local roadways within the vicinity of the proposed project would be expected to be lower as traffic would shift from the local roadways to the SR 509 freeway and South Access Road. For example, the build alternatives would reduce future traffic volumes along SR 99, which would in turn reduce the potential for accidents. The proposed SR 509 freeway extension and South Access Road would be limited access facilities with higher safety design standards that typically yield lower accident rates than at-grade roadways.

The findings above apply equally to nonmotorized modes of travel. Lower levels of congestion around bicycle and pedestrian facilities imply safer roadways, even if the facilities do not change in other ways.

2.4.4 Travel Time

All build alternatives would reduce overall traffic congestion in the project area and would increase the use of SR 509. The SR 509 freeway extension to I-5 would improve travel times in the p.m. peak period direction (southbound) from south Seattle to Federal Way by approximately 10 minutes.

2.4.5 Other Modes of Transportation

Transit and High-Occupancy Vehicles

The build alternatives would provide additional facilities for use by transit and other HOVs.

Enhancements for transit would be included in the design of the alternatives. These enhancements could include ramp metering with HOV queue bypass lanes and direct ramps for transit into the proposed HOV lanes. The general reduction in traffic congestion and the additional HOV lanes would reduce transit travel times, improve schedule reliability, and reduce transit operating costs. The improved transit operations could lead to increased ridership.

Although improved facilities for transit and carpools would be provided for under all the build alternatives, the transit mode split and average car occupancy are expected to be the same for all build alternatives, including the No Action Alternative. Because of the improved HOV connections in the transportation analysis area, carpools would split between the I-5 and SR 509 corridors, resulting in lower volumes of carpools on I-5. Overall, travel times for carpools would be reduced.

Pedestrian and Bicycles

As traffic is diverted onto the SR 509 freeway extension conflicts with pedestrians and bicyclists on arterial roadways would be reduced. The existing nonmotorized facilities in the City of SeaTac would be maintained under the build alternatives. Many of the bicycle facilities and pedestrian routes in Des Moines would intersect with the build alternatives; however, the proposed project would not preclude their continued use.

Under Alternatives C2 and C3, the proposed project has the potential to improve the regional trail system. Alternatives C2 and C3 would disrupt the Des Moines Creek Park trailhead. WSDOT has committed to extending the Des Moines Creek Trail from the park to South 188th Street under Alternative C2, and would be willing to make this commitment for Alternative C3. The extension of the Des Moines Creek Trail would be a primary component in facilitating a major regional trail connection between southwestern King County and the Burke Gilman Trail in the City of Seattle.

2.4.6 Movement of Goods and People

Trucks

The amount of truck traffic in the transportation analysis area is expected to increase by approximately 2 percent per year during the period from 1999 to 2020. Currently, 75 percent of all truck movements occur between 6 a.m. and 6 p.m. Increased congestion would increase truck travel times and operating costs, most severely during the off-peak period (9 a.m. to 3 p.m.) because of further spreading of the peak periods.

Truck access to the regional system would be improved under the build alternatives compared to the No Action Alternative. Lower levels of congestion would result in improved traffic operations. The SR 509 extension would provide an alternate truck route to the Ports of Seattle and Tacoma; truck travel times between the ports and their industrial areas would improve substantially compared to travel times under the No Action Alternative. The extension of SR 509 would reduce the travel distance between Seattle and Tacoma by approximately 1.2 miles, compared to using only I-5, and by approximately 1.7 miles compared to using SR 99 and I-5. (Additionally, the City of SeaTac, which is responsible for operation of SR 99, discourages its use as a truck route, and will not issue oversize or overload permits for SR 99.) Drivers traveling between Tacoma and Sea-Tac Airport would realize the largest reduction in travel distance. The build alternatives would reduce the travel distance by approximately 2.5 miles compared to the existing route along I-5 and South 188th Street.

Railroads

The Union Pacific and Burlington Northern Santa Fe Railroads have major rail lines that connect Seattle and Tacoma via the Green River valley. The tracks run north/south through the eastern part of the transportation analysis area near SR 181 (West Valley Road). There are no rail existing lines in the vicinity of the SR 509 corridor, so the build alternatives would have minimal, if any, impact on rail operations.

Air Travel

The Sea-Tac Airport Master Plan recently revised the air travel demand forecasts for the airport. Travel demand to Sea-Tac Airport in 2020 is a reflection of the total number of passengers and the amount of air cargo. The annual number of passengers forecast for 2020 is 44.6 million. The airport would generate approximately 155,400 vehicles per day and 8,100 p.m. peak-hour trips for 2020. This is an increase of more than 70 percent over existing conditions.

Under current conditions, approximately 57 percent of airport passengers travel to Sea-Tac Airport via the North Airport Expressway, 25 percent use

South 182nd Street, and 18 percent use South 170th Street at Air Cargo Road. However, by 2010, based on the Airport Master Plan Update, approximately 60 percent of airport vehicle traffic is expected to access the passenger terminal via the North Airport Expressway, 20 percent from South 182nd Street, and 20 percent via South 170th Street. Because of the increased traffic to the south, traffic congestion at the airport entrances on International Boulevard under the No Action Alternative would increase substantially.

Access to Sea-Tac Airport would be substantially improved under the build alternatives. Travel times to and from the south would be reduced and direct access to airport facilities would be provided for residents to the south. In general, overall travel time for travelers using the new roadways would be reduced by approximately 10 minutes, thus improving access for trips to Sea-Tac Airport.

2.4.7 Added Access Analysis

The *Draft SR 509/South Access Road Access Point Decision Report* (CH2M HILL January 2002b) was prepared as a formal request to FHWA for approval of the new SR 509 interchange with I-5. Even though the report focused on the information required for the access point decision, the analysis also provided general observations regarding the operation of I-5 with implementation of the project.[2] The analysis of the report is based on Alternative C2; no substantial differences would be expected under Alternatives B or C3 because there would be no substantial difference in volumes along I-5 among the alternatives.

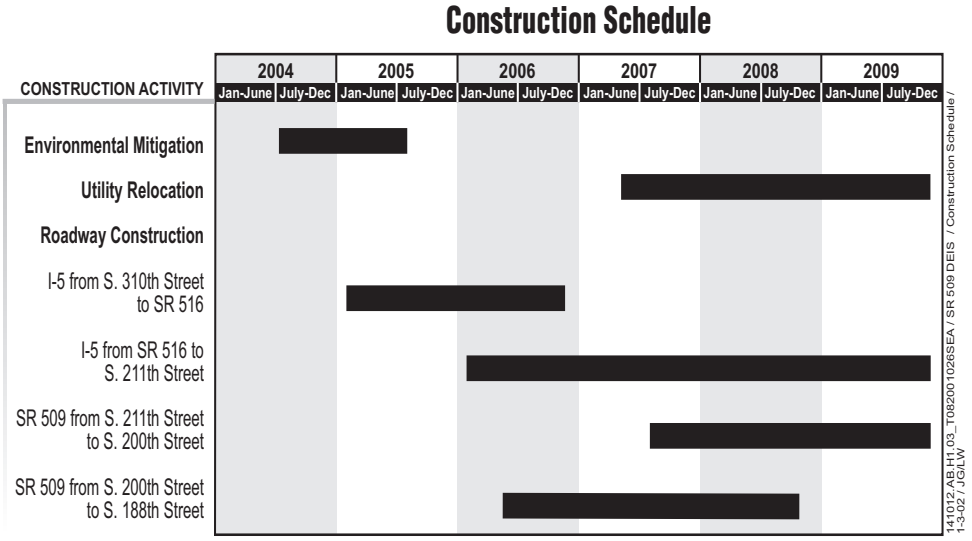
The access point decision analysis consistently shows that with the addition of the new SR 509 interchange, operations along I-5 would improve or maintain conditions found under the No Action Alternative. A portion of the I-5 mainline would operate at LOS F by 2020 under the No Action Alternative, but operations would improve to LOS E or better with the build alternatives. Operations would improve because added access to SR 509 would shift a substantial volume of traffic away from I-5 north of SR 516 and additional capacity would be added along the I-5 mainline. The additional capacity would be provided by the proposed auxiliary lanes, C/D lanes, and braided ramps near the SR 509/I-5 interchange with South 210th Street. The project would maintain or improve operations on all I-5 ramps compared to the No Action Alternative.

2.5 Anticipated Construction Schedule

If one of the build alternatives is selected, construction could begin in 2004. As shown in the generalized schedule, environmental mitigation would

[2] The analysis was performed using HCM methodologies, and was supplemented by the FREQ simulation model.

commence prior to the relocation of utilities and construction of the roadway. Roadway construction would be phased by freeway segment.



Note: Because the proposed project requires many activities, some of which depend on the availability of project funding, the actual construction sequence has not been identified in detail. This construction schedule provides the general phasing of project construction. It is not to be construed as the final project sequencing plan, which would be proposed by the contractor if a contractor is awarded.

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3. Affected Environment and Environmental Consequences

3. Affected Environment and Environmental Consequences

This chapter presents the elements of the environment that could be potentially affected by the SR 509: Corridor Completion/I-5/South Access Road Project. Each element includes sections entitled *Studies and Coordination*, which describes the assumptions, evaluation methods, and sources of information; *Affected Environment*, which describes existing conditions; *Environmental Impacts*, which describes the potential impacts of each alternative; *Mitigation Measures*; and *Construction Activity Impacts and Mitigation*. These latter two sections describe possible measures to avoid or minimize adverse impacts. Impacts are divided into the following categories—long-term operational impacts and short-term construction-related impacts. Secondary (indirect) and cumulative impacts and discussed for all elements in the final section of this chapter.

The material presented in this chapter is based on a series of technical discipline reports prepared by the WSDOT, which are referenced in Appendix B, and incorporated into this Revised DEIS by reference. Copies of these reports are available for review at FHWA and WSDOT.

Jim Leonard
Federal Highway Administration
711 South Capitol Way, Suite 501
Olympia, Washington 98501
Telephone (360) 753-9480

John White
WA State Dept of Transportation
6431 Corson Avenue South
Seattle, Washington 98018
Telephone (206) 768-5680

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3.1 Air Quality

3.1 Air Quality

3.1.1 Studies and Coordination

This section is based on the findings of the *Technical Memorandum: Air Quality Summary* (WSDOT October 4, 2001). The following discussion identifies various air quality standards, presents the results of the air quality analysis, demonstrates air quality conformity, and presents mitigation measures for temporary construction impacts. For this analysis, the project area is defined as the immediate vicinity of the proposed SR 509 and South Access Road alignments, and along the I-5 corridor from approximately South 210th Street to South 310th Street.

The U.S. Environmental Protection Agency (EPA), Washington State Department of Ecology (Ecology), and Puget Sound Clean Air Agency (PSCAA) regulate air quality in the project area. Under the Clean Air Act, EPA has established the National Ambient Air Quality Standards (NAAQS), which specify maximum concentrations for carbon monoxide (CO), particulate matter less than 10 micrometers in size (PM_{10}), particulate matter less than 2.5 micrometers in size ($PM_{2.5}$), ozone, sulfur dioxide (SO_2), lead, and nitrogen dioxide. The standards applicable to transportation projects are summarized in Table 3.1-1. The 8-hour average maximum CO concentration of 9 parts per million (ppm) is the standard most likely to be exceeded because of a new transportation project. Nonconformance with the NAAQS would jeopardize funding of a transportation project. Other pollutant standards of importance in the Puget Sound region include ozone and PM_{10}.

Nonattainment areas are geographical regions where air pollutant concentrations exceed the NAAQS for one or more pollutants. Air quality maintenance areas are regions that have recently attained compliance with the NAAQS and are working to maintain that status.

The primary source of CO is vehicular traffic. Industry, wood stoves, and slash burns are also sources of CO. In urban areas, motor vehicles are often the source of more than 90 percent of the CO emissions that cause ambient levels to exceed the NAAQS (U.S. EPA 1993). The effects of CO are usually localized, occurring near congested roadways and intersections during autumn and winter, and are associated with light winds and stable atmospheric conditions. CO concentrations in most areas have been decreasing over time because of more stringent federal emissions standards for new vehicles and the gradual replacement of older, more polluting vehicles.

Ozone is a pungent-smelling, colorless gas produced in the atmosphere when nitrogen oxides (NO_X) and volatile organic compounds (VOC) chemically react under sunlight. Ozone is not emitted directly, but is formed by a reaction between sunlight, NO_X, and hydrocarbons. Ozone is primarily a product of regional vehicular traffic, point source, and fugitive emissions of ozone precursors. In the Puget Sound area, the highest ozone concentrations occur from mid-May until mid-September, when urban emissions are trapped by temperature inversions followed by intense sunlight and high temperatures. Maximum ozone levels generally occur between noon and early evening at locations several miles downwind from the sources. Ozone is a pollutant of regional interest, but is not measured at the project level.

Table 3.1-1
Summary of Ambient Air Quality Standards

Pollutant	National Primary Standards	Washington State Standards	PSCAA Regional Standards
CO			
1-Hour Average (not to be exceeded more than once per year)	35 ppm	35 ppm	35 ppm
8-Hour Average (not to be exceeded more than once per year)	9 ppm	9 ppm	9 ppm
PM_{10}			
Annual Arithmetic Mean	50 µg/m^3	50 µg/m^3	50 µg/m^3
24-Hour Average Concentration (not to be exceeded more than once per year)	150 µg/m^3	150 µg/m^3	150 µg/m^3
$PM_{2.5}$			
Annual Arithmetic Mean	15 µg/m^3	--[b]	--[b]
24-Hour Average Concentration (not to be exceeded more than once per year)[a]	65 µg/m^3	--[b]	--[b]
Total Suspended Particulates			
Annual Arithmetic Mean	--[b]	60 µg/m^3	60 µg/m^3
24-Hour Average Concentration (not to be exceeded more than once per year)	--[b]	150 µg/m^3	150 µg/m^3
Ozone			
1-Hour Average (not to be exceeded more than once per year)	0.12 ppm	0.12 ppm	0.12 ppm
8-Hour Average (not to be exceeded more than once per year)	0.08 ppm	--[b]	--[b]

[a] The $PM_{2.5}$ standard has not yet been implemented by EPA.
[b] No applicable standards.
Sources: PSCAA Regulation 1 (1994); 40 CFR Part 50 (1997); WAC Chapters 173-470, 173-474, 173-175 (1987).
Annual standards never to be exceeded, short-term standards not to be exceeded more than once per year unless noted.
ppm = parts per million
µg/m^3 = micrograms per cubic meter

Ozone is a pungent-smelling, colorless gas produced in the atmosphere when nitrogen oxides (NO_X) and volatile organic compounds (VOC) chemically react under sunlight. Ozone is not emitted directly, but is formed by a reaction between sunlight, NO_X, and hydrocarbons. Ozone is primarily a product of regional vehicular traffic, point source, and fugitive emissions of ozone precursors. In the Puget Sound area, the highest ozone concentrations occur from mid-May until mid-September, when urban emissions are trapped by temperature inversions followed by intense sunlight and high temperatures. Maximum ozone levels generally occur between noon and early evening at locations several miles downwind from the sources. Ozone is a pollutant of regional interest, but is not measured at the project level.

Particulate matter includes small particles of dust, soot, and organic matter suspended in the atmosphere. Particles less than 100 micrometers in size are measured as total suspended particulates (TSP). PM_{10} is a component of TSP and $PM_{2.5}$ is a component of PM_{10} and TSP. $PM_{2.5}$ and PM_{10} can be inhaled deeply into the lungs, potentially leading to respiratory diseases and cancer. Particulate matter may carry absorbed toxic substances, and the particle itself may be inherently toxic. Particulate matter can affect visibility, plant growth, and building materials. Sources of particulates include motor vehicles, industrial boilers, wood stoves, open burning, and dust from roads, quarries, and construction activities. Most vehicular emissions are in the $PM_{2.5}$ size range, while road and construction dust is often in the larger PM_{10} range. Most fine particulate vehicle emissions result from diesel vehicles, which release fine particulates both directly, mostly as carbon compounds, and indirectly in the form of SO_2, a gas that reacts in the atmosphere with sulfate particulates. High $PM_{2.5}$ and PM_{10} concentrations occur in autumn and winter during periods of air stagnation and high use of wood for heat. In the Puget Sound region, fireplaces and wood stoves account for almost two-thirds of winter $PM_{2.5}$ emissions (PPCAA, 1999). The project is located within the Puget Sound region which has several PM_{10} Maintenance Areas. However, the project area is outside the Duwamish and Kent PM_{10} maintenance areas, so no design modification or mitigation would be required. The EPA has not implemented $PM_{2.5}$ standards yet.

In the1970s, exceedances of the CO and ozone emissions standards prompted EPA to declare portions of the central Puget Sound region as nonattainment areas. Measures taken by EPA and local agencies since then have resulted in the achievement of attainment status. The region now is designated to be CO and ozone maintenance areas that are managed under the provisions of air quality maintenance plans (AQMP) for these pollutants. Any regionally significant transportation project in the Puget Sound air quality maintenance areas must conform to the AQMPs. Conformity is demonstrated by showing that the proposed project would not cause or contribute to any new violation of any NAAQS, would not increase the frequency or severity of any existing violation of any NAAQS, or would not delay timely attainment of the

NAAQS. The proposed project is currently considered to be within the maintenance areas for ozone and CO.

Transportation conformity is a mechanism for ensuring that transportation activities, plans, programs, and projects are reviewed and evaluated for their impacts on air quality prior to funding or approval. The intent of transportation conformity is to ensure that new projects, programs, and plans do not impede an area from meeting and maintaining air quality standards. Specifically, regional transportation plans, improvement programs, and projects may not cause or contribute to new violations, exacerbate existing violations, or interfere with the timely attainment of air quality standards or the required interim emissions reduction towards attainment. Meeting conformity requirements takes the collective participation of all jurisdictions and agencies that implement transportation projects and programs in the Puget Sound region.

CO is the most likely pollutant to exceed the NAAQS for transportation projects. Local CO concentrations from vehicle traffic were predicted for the project design year (2020). CO concentrations in 2020 were modeled for each build alternative and the No Action Alternative at three intersections within the project area—South 188th Street and SR 509, South 200th Street and SR 509, and South 200th Street and the South Access Road (collectively referred to as the modeled intersections). Impact analysis included three additional design options for the South Airport Link—H0, H2-A, and H2-B—using MOBILE5a and CAL3QHC. The modeled intersections were selected based on future traffic volume, LOS, and impacts of the proposed SR 509 freeway extension on the existing city streets or arterials. Complete modeling methods were described in the Technical Memorandum: Air Quality Summary (WSDOT October 4, 2001), which references earlier air quality analysis and documents prepared at various times as the alternatives were developed.

Because ozone is a regional pollutant, ozone concentrations from vehicle emissions resulting from the construction of the proposed project are not modeled at a local level. The PSRC models conformity to the ozone standards. The proposed SR 509: Corridor Completion/I-5/South Access Road Project is included on the 2001 to 2004 project list of the Regional Transportation Improvement Plan (TIP) that has been determined to conform to the State Implementation Plan (SIP).

Concentrations of PM_{10} during construction were estimated from EPA AP-42 emission values. EPA has not yet recommended any models or procedures to accurately measure PM_{10} concentrations along individual roadways. The project area is outside the Duwamish and Kent PM_{10} maintenance areas; consequently, no mitigation or design modification is required, though discussion of construction dust impacts is discussed later in this section.

3.1.2 Affected Environment

The evaluation of existing air quality is based on ambient air quality data collected and published by Ecology and the PSCAA. The air quality monitoring stations closest to the project area are located between 1 and 5 miles away. According to the 1997 Air Quality Report from Ecology, a CO exceedance of the NAAQS at the Puget Sound location was recorded in 1995, and an ozone exceedance was recorded in 1994. Trends for both pollutants have continued downward for the last 10 years.

3.1.3 Environmental Impacts

Long-term effects on air quality in the project area would result primarily from vehicle emissions. Air quality would meet the NAAQS at all of the modeled intersections; therefore, the alternatives would conform to the CO maintenance plan on the local level. And, even though the build alternatives are outside the Puget Sound vehicle Inspection and Maintenance (I&M) Program area, stricter vehicle emissions standards for new cars and the gradual replacement of older, more polluting vehicles with newer, cleaner cars have helped improve air quality, resulting in a reduction of the average emissions per vehicle on the road. Decreasing vehicle emissions would offset increasing emissions stemming from growing traffic volumes and slower vehicle speeds.

CO concentrations in the project area were modeled for 2020 conditions. CO emission factors consistent with the 1998 Metropolitan Transportation Plan (MTP) update were used. The latest CO emission factors developed by PSRC for 2020 in the Puget Sound region are substantially lower than those used in this study; therefore, the analysis methodology is highly conservative and was not revised to incorporate the newer PSRC emission factors. These results include 1-hour and 8-hour average CO concentrations for each alternative. Current CO readings within the project area were not modeled because the existing roadways, which are used as alternate routes, are arterials; consequently, they are not comparable to the proposed multilane and limited access SR 509 freeway extension. CO concentrations for the year of opening, 2009, are expected to be lower than the results modeled for 2020 in this analysis because traffic volumes would be less in 2009 and highly conservative emission factors were used for the 2020 analysis.

Tables 3.1-2 and 3.1-3 summarize the maximum CO concentrations projected for 2020 traffic volumes predicted at the SR 509 intersection of South 188th Street and South 200th Street, as well as the intersection of South 200th Street and the South Access Road. Modeling assumptions and the methodology used for all alternatives were consistent to allow for comparisons among the alternatives. CO concentrations under each of the build alternatives were compared to the No Action Alternative values to determine the impact of the build alternatives. Traffic operations for

Alternatives C2 and C3 would be essentially the same; therefore, they were not modeled individually.

Table 3.1-2
Maximum 1-Hour Average CO Concentrations at Modeled Intersections in 2020

Modeled Intersections	Alternative A (No Action)	Alternative B	Alternative C2 (Preliminary Preferred)	Alternative C3
South 188th Street and SR 509	7.5 ppm	10.7 ppm	10.9 ppm [a]	10.9 ppm [a]
South 200th Street and SR 509	5.4 ppm	9.2 ppm	8.3 ppm	8.3 ppm
South 200th Street and South Access Road	5.6 ppm	6.9 ppm	10.7 ppm	10.7 ppm

[a] *Alternatives C2 and C3 at the South 188th Street intersection were not individually modeled because their emissions are not expected to differ substantially.*
Note: The 1-hour NAAQS for CO is 35 ppm.

As shown in Table 3.1-2, CO values would not exceed the 1-hour average NAAQS for the No Action Alternative or any of the build alternatives. Table 3.1-3 shows that modeled maximum 8-hour average CO concentrations would range from 3.8 to 7.6 ppm, which are within the standard.

Table 3.1-3
Maximum 8-Hour Average CO Concentrations at Modeled Intersections in 2020

Modeled Intersections	Alternative A (No Action)	Alternative B	Alternative C2 (Preliminary Preferred)	Alternative C3
South 188th Street and SR 509	5.3 ppm	7.5 ppm	7.6 ppm [a]	7.6 ppm [a]
South 200th Street and SR 509	3.8 ppm	6.4 ppm	5.8 ppm	5.8 ppm
South 200th Street and South Access Road	3.9 ppm	4.8 ppm	7.5 ppm	7.5 ppm

[a] *Alternatives C2 and C3 at the South 188th Street intersection were not individually modeled because their emissions are not expected to differ substantially.*
Note: The 8-hour NAAQS for CO is 9 ppm.

CO concentrations under 2020 conditions were modeled for the South Airport Link portion of the project area. Tables 3.1-4 and 3.1-5 summarize the maximum CO concentrations projected for 2020 traffic volumes predicted at the South 188th Street and 28th Avenue South intersection and at the South Airport Link 25 feet from the travel-way (the outside lane). These results include 1-hour and 8-hour average CO concentrations under Design Options H0, H2-A, and H2-B for each alternative. The No Action Alternative

was not modeled because there is currently no equivalent roadway at the location of the proposed South Access Road and South Airport Link.

Table 3.1-4
Maximum 1-Hour CO Concentrations Near the South Airport Link in 2020

Alternative/South Airport Link Design Option	South 188th Street and 28th Avenue South Intersection	South Airport Link (25 feet from travel-way)
B/H0 & B/H2-A	10.8 ppm	4.0 ppm
B/H2-B	11.4 ppm	4.2 ppm
C2/H0 & C2/H2-A	10.7 ppm	4.1 ppm
C2/H2-B	12.4 ppm	4.1 ppm
C3/H0 & C3/H2-A	10.7 ppm	4.1 ppm
C3/H2-B	12.4 ppm	4.1 ppm

Note: The 1-hour NAAQS for CO is 35 ppm.

As shown in Table 3.1-4, CO concentrations would not exceed the 1-hour average under any combination of design option and alternative. Modeled maximum 8-hour average CO concentrations values would range from 2.8 to 8.9 ppm, also falling within the standard (Table 3.1-5).

Table 3.1-5
Maximum 8-Hour CO Concentrations Near the South Airport Link in 2020

Alternative/South Airport Link Design Option	South 188th Street and 28th Avenue South Intersection	South Airport Link (25 feet from travel-way)
B/H0 & B/H2-A	7.6 ppm	2.8 ppm
B/H2-B	8.0 ppm	2.9 ppm
C2/H0 & C2/H2-A	7.5 ppm	2.9 ppm
C2/H2-B	8.9 ppm	2.9 ppm
C3/H0 & C3/H2-A	7.5 ppm	2.9 ppm
C3/H2-B	8.9 ppm	2.9 ppm

Note: The 8-hour NAAQS for CO is 9 ppm.

Alternative A (No Action)

The No Action Alternative would result in 25 to 30 percent lower 1-hour and 8-hour CO maximum concentrations than the build alternatives. Under the No Action Alternative, the maximum 8-hour average concentration predicted at South 188th Street and SR 509 would range from 5.3 to 7.5 ppm, depending on the alternative/design option.

Impacts Common to All Build Alternatives

The I-5 corridor would be improved to accommodate the flow of traffic to and from the SR 509 freeway extension. Improvements would include adding C/D lanes, auxiliary lanes and interchange ramp improvements. The I-5 corridor was not modeled because of its limited access and free-flow traffic volume; the I-5 lane additions also would occur within WSDOT right-of-way.

Alternative B

Under Alternative B, the maximum predicted 1-hour average CO concentrations would range between 6.9 and 10.7 ppm in 2020. None of the modeled intersections for the SR 509 freeway extension and the South Access Road were predicted to exceed the 1-hour NAAQS for CO of 35 ppm.

The maximum predicted 8-hour average CO concentrations would range between 4.8 and 7.5 ppm in 2020. None of the intersections were predicted to exceed the 8-hour average NAAQS for CO of 9 ppm.

Under Alternative B, South Airport Link Design Options H0 and H2-A would have 1-hour average CO concentrations of 10.8 ppm at the South 188th Street and 28th Avenue South intersection. The receptor located 25 feet from the travel-way was predicted at a maximum value of 4.0 ppm for 1-hour average CO concentrations. The 8-hour average CO concentrations were predicted to fall below the CO standard of 9 ppm at both locations as shown on Table 3.1-5.

For Design Option H2-B, 1-hour and 8-hour average CO concentrations were higher than those of Design Options H0 and H2-A. The 1-hour average CO concentrations at both locations were predicted to be well below the CO standard of 35 ppm. The 8-hour average CO concentrations were predicted to be below the CO standard of 9 ppm for both locations as shown on Table 3.1-5.

No design modifications would be required.

Alternative C2 (Preliminary Preferred)

Under Alternative C2, the maximum predicted 1-hour average CO concentrations would range between 8.3 and 10.9 ppm in 2020. None of the modeled intersections were predicted to exceed the 1-hour NAAQS of 35 ppm for CO.

The maximum predicted 8-hour average CO concentrations would range between 5.8 and 7.6 ppm in 2020. None of the modeled intersections were predicted to exceed the 8-hour average NAAQS of 9 ppm.

Under Alternative C2, Design Options H0 and H2-A were predicted to have 1-hour average CO concentrations at a maximum of 10.7 ppm at the South 188th Street and 28th Avenue South intersection. The 1-hour average CO concentrations at the receptor located 25 feet away from the travel-way were predicted at a maximum value of 4.1 ppm. The 8-hour average CO concentrations were predicted to be below the CO standard of 9 ppm at both locations.

For Design Option H2-B, 1-hour and 8-hour average CO concentrations were predicted to be 10 to 15 percent higher than the other design options. The 1-hour average CO concentrations at both locations were predicted to be well below the CO standard of 35 ppm. The 8-hour average CO concentrations were predicted to be below the CO standard of 9 ppm for both locations as shown on Table 3.1-5.

No design modifications would be required.

Alternative C3

In terms of factors affecting air quality, Alternative C3 is the same as Alternative C2, and would have identical air quality implications.

Like Alternative C2, no design modifications would be required.

3.1.4 Conformity Determination

FHWA and WSDOT projects must comply with project-level conformity criteria of the EPA Conformity Rule, and with WAC Chapter 173-420. The proposed project must be included in a conforming plan [the MTP and TIP by the regional metropolitan planning organization (MPO)]. The proposed project is included in the 2001 to 2004 Regional TIP as project WDOUM-6. Per 40 CFR Part 93. As discussed below, the proposed project must conform to the SIP by meeting several criteria.

- *The conformity determination must be based on the latest planning assumptions*. The project-level hot-spot analysis was completed using the Puget Sound Region MOBILE5a emission files used by PSRC for the MTP and TIP conformity determination at the time of the analysis. The proposed SR 509 extension and South Access Road are included in PSRC's current MTP and Regional TIP. The I-5 corridor improvements are not in the MTP and Regional TIP and would be documented in future updates prior to establishing conformity for this portion of the proposed project.

- *The conformity determination must be based on the latest emissions estimation model available*. Emissions to determine conformity to the MTP and TIP for the proposed SR 509 extension and South Access Road

were calculated using MOBILE5a, the emission model used to model conformity to the Puget Sound Air Quality Maintenance Plans. The I-5 corridor improvements are not in the MTP and Regional TIP and would be documented in future updates prior to establishing conformity for this portion of the proposed project.

- *The MPO must make the conformity determination according to the consultation procedures of this rule and the implementation plan revision required by Section 51.396.* The PSRC's MTP and TIP have been determined to conform to the SIP and have been accepted by EPA for the proposed SR 509 extension and South Access Road portions of this project. The I-5 corridor improvements are not in the MTP and Regional TIP and would be documented in future updates prior to establishing conformity for this portion of the proposed project.

- *There must be a current conforming plan and a current conforming TIP at the time of project approval.* The proposed SR 509 extension and South Access Road portions of the proposed project are included in the PSRC's current MTP and Regional TIP. The I-5 corridor improvements are not in the MTP and Regional TIP and would be documented in future updates prior to establishing conformity for this portion of the proposed project.

- *The project must come from a conforming transportation plan and program.* The proposed SR 509 extension and South Access Road portions of the proposed project are included in the PSRC's MTP and TIP. The I-5 corridor improvements are not in the MTP and Regional TIP and would be documented in future updates prior to establishing conformity for this portion of the proposed project.

- *The FHWA project must not cause or contribute to any new localized CO or PM_{10} violation in CO and PM_{10} nonattainment or maintenance areas.* The proposed SR 509: Corridor Completion/I-5/South Access Road project is located in a CO maintenance area. The proposed project would not create any new violations nor contribute to the frequency or severity of any existing CO violations. CO concentration values depend on the type of facility: limited access (freeway) or signalized. Because the proposed improvements to the I-5 corridor are on a limited-access facility, they would not be anticipated to create any violations to the NAAQS for CO. The project is not located within a PM_{10} nonattainment or maintenance area.

- *The FHWA project must comply with PM_{10} control measures in the applicable implementation plan.* The project area is not within a nonattainment or maintenance area for PM_{10}; therefore, no implementation plan is required.

The proposed SR 509 freeway extension and South Access Road portions of the proposed project are included in the PSRC's current MTP and Regional TIP. The entire project has been demonstrated to meet the local project level conformity requirements. The additional I-5 corridor portion of the proposed project would need to be incorporated into the MTP and Regional TIP. The impact of the proposed project on I-5 would include the addition of north and southbound C/D lanes north of SR 516, two additional southbound lanes from SR 516 to South 272nd Street, one additional lane southbound from South 272nd Street to South 310th Street, and one additional northbound lane from South 272nd Street to SR 516. Once the I-5 corridor improvements are included in the MTP and TIP, the proposed project would meet all requirements of 40 CFR Part 93 and WAC Chapter 173-420, and it would conform to the SIP.

3.1.5 Mitigation Measures

Because no project-level exceedances of the NAAQS are predicted, no operational design modifications would be needed.

3.1.6 Construction Activity Impacts and Mitigation

Construction Activity Impacts

Particulate emissions (in the form of fugitive dust during construction activities) are regulated by the PSCAA. The operator of a source of fugitive dust shall take reasonable precautions to prevent fugitive dust from becoming airborne and shall maintain and operate the source to minimize emissions. Construction impacts would be reduced by incorporating mitigation measures into the construction specifications for the proposed project per the Associated General Contractors (AGC) of Washington guidelines (*Guide To Handling Fugitive Dust From Construction Projects).*

Mitigation Measures

Possible mitigation measures to control PM_{10}, deposition of particulate matter, and emissions of CO and NO_x during construction are as follows:

- Spray exposed soil such as slopes, subgrades, and access roads with water or other dust palliatives to reduce emissions of PM_{10} and deposition of particulate matter.

- Gravel or pave access or haul roads to reduce particulate emissions.

- Cover trucks transporting materials, wet down materials in trucks, or provide adequate freeboard (space from the top of the material to the top of the truck) to reduce PM_{10} and deposition of particulates during transportation.

- Provide wheel washers to remove particulate matter that would otherwise be carried offsite by vehicles to decrease deposition of particulate matter on area roadways.

- Remove particulate matter deposited on paved public roads to reduce mud on area roadways.

- Schedule construction trucks to avoid peak travel times to reduce secondary air quality impacts caused by a reduction in traffic speeds while waiting for construction trucks.

- Place quarry spall aprons where trucks enter public roads to reduce mud track-out.

- Require devices compliant with federal emission-control rules on all construction equipment and transportation within the construction work area powered by gasoline or diesel fuel to reduce CO and NOx emissions in vehicular exhaust. Use relatively new, well-maintained equipment to reduce CO and NOx emissions.

- Plant vegetative cover as soon as possible after grading to reduce windblown particulates in the area.

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3.2 Noise

3.2.1 Studies and Coordination

This section is based on the findings of the *SR 509/South Access Road EIS Discipline Report: Noise* (Noise Discipline Report) (CH2M HILL July 2001), *SR 509/South Access Road EIS: South Airport Link* (August 2001), and *SR 509/South Access Road EIS: I-5 Improvements Report* (CH2M HILL October 2001). The discipline reports also contain noise measurement data from locations in the vicinity of each alternative and from the area along I-5 south of South 216th Street to south of South 272nd Street. The *SR 509/South Access Road EIS: I-5 Improvements Report* (CH2M HILL October 2001) provided an additional analysis of existing and future traffic noise conditions and a discussion of noise mitigation for areas along the I-5 corridor between South 216th and South 310th Streets. Upon final selection of the preferred alternative, a more extensive modeling analysis of the project area will be conducted. For the purpose of this analysis, the project area is defined as the immediate vicinity of the SR 509 and South Access Road alignments and along the I-5 corridor from the proposed SR 509 interchange and South 310th Street.

In July 1992, The Parry Group completed and published a Traffic Noise and Noise Barrier Analysis (Parry 1992) of I-5 between the Fife/54th Avenue East interchange and the Southcenter/I-405 interchanges. The analysis identified 28 receptors with sound levels at 60 to 76 dBA. The analysis also identified two berms constructed in the 1980s to abate highway traffic noise for residents near the South 272nd Street interchange, and recommended barriers at 10 locations in the I-5 corridor. Seven of the ten barriers recommended in Parry (1992) were located between South 216th Street and South 320th Street. At the time of this Revised DEIS, 6 of the 10 recommended barriers have been constructed.

Method of Analysis

Existing ambient sound levels were determined by measuring 38 sensitive receptor sites in the project area. Sound level measurements taken for the environmental documents for the third runway at Sea-Tac Airport and the I-5 HOV and truck climbing lane were also reviewed to determine ambient existing, as well as future, sound levels. A simplified version of the FHWA Noise Prediction Model Stamina 2.0, developed by Wayne C. Young of the Texas Department of Transportation, was used to generate noise contours at a level approaching the FHWA abatement criteria. These contours were plotted onto aerial photographs that were then used to count the number of sensitive receptors impacted by each alternative. Current noise-sensitive areas within

the Sea-Tac Airport Noise Remedy Program areas were not included in the counts because the homes within the areas covered by this program would either be relocated or acquired by the airport in the future. Because design data are not available to determine the feasibility and reasonableness of likely mitigation, an alternative method of screening the level of noise abatement within the project area was proposed by WSDOT and approved by FHWA.

In order to compare alternatives, a modified analytical approach was approved by FHWA before proceeding. Previous studies for this and other projects throughout the project area indicate that even short barriers would not be built when more than 100 lineal feet of barrier per household benefited is required. This reasonableness criterion was used for all the alternatives. As additional design data becomes available, all impacted neighborhoods will be analyzed and reasonable and feasible noise barriers will be recommended for construction in accordance with 23 CFR 772 and WSDOT Traffic Noise Analysis and Abatement Policy and Procedures.

Construction noise levels were estimated based on typical expected equipment noise levels provided by EPA.

Noise Regulations and Impact Criteria

State and local governments have primary responsibility to control noise sources and regulate levels of noise permitted in the environment. The federal government establishes noise source emission standards for products engaged in interstate commerce, such as individual automobiles and aircraft.

Applicable noise regulations and guidelines provide a basis for evaluating potential noise impacts. Noise regulations and guidelines specifying ambient indoor and outdoor sound levels are established by the FHWA, Ecology, and local jurisdictions.

Federal Highway Administration Noise Abatement Criteria

For federally funded highway projects, traffic noise impacts occur when predicted hourly traffic noise levels (L_{eq}[h]) approach or exceed the noise abatement criteria (NAC) established by the FHWA, or substantially exceed existing sound levels (U.S. Department of Transportation, 1982). “Approach” is defined by WSDOT as meaning within 1 dBA decibel. “Substantially exceed” is defined by WSDOT as an increase of 10 dBA or more over the existing level. The FHWA NAC for various land activity categories are presented in Table 3.2-1.

Table 3.2-1 FHWA Noise Abatement Criteria		
Active Category	**L_{eq} (h) (dBA)**	**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)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	--	Undeveloped lands.
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Source: U.S. Department of Transportation (1982).

State and Local Noise Regulations

The Cities of Kent and Federal Way regulate noise as a nuisance, but neither city has established property line standards specifying noise levels that cannot be exceeded at receiving properties. The Cities of Des Moines, Federal Way, Kent, and SeaTac do not have noise ordinances that apply to road construction or traffic noise; all defer to Ecology limits.

Ecology limits noise levels at property lines of neighboring properties (WAC Chapter 173-60). The maximum permissible noise levels depend on the land uses of both the source noise and receiving property. Ecology's property line noise regulations are presented in Table 3.2-2.

Table 3.2-2 Ecology Maximum Permissible Noise Levels (dBA)				
	Receiving Property			
	Residential			
Noise Source	**Day**	**Night***	**Commercial**	**Industrial**
Residential	55	45	57	60
Commercial	57	47	60	65
Industrial	60	50	65	70

* *Maximum permissible noise levels are reduced by 10 dBA for residential receiving property between 10 p.m. and 7 a.m.*
Source: WAC 173-60-040 (1989).

Sounds from motor vehicles on public roads are exempt from Ecology's property line regulations presented in Table 3.2-2, although the FHWA noise criteria still apply.

Construction noise from the proposed project would be exempt from regulations during daytime hours. However, project contractors and WSDOT crews would need to meet Ecology and local jurisdiction property line regulations during nighttime hours. Noise levels in Table 3.2-2 apply to construction equipment only at rural and residential receiving properties between 10 p.m. and 7 a.m. on weekdays and between 10 p.m. and 9 a.m. on weekends.

Coordination with Other Agencies and Groups

The TRANSPO Group, in cooperation with WSDOT, projected the future traffic volumes and speeds upon which this Revised DEIS is based. Modeled traffic is summarized in *SR 509/South Access Road EIS Discipline Report: Transportation* (CH2M HILL January 2002). Traffic noise levels for worst-case traffic conditions were predicted for each alternative using peak-hour volumes at various speed limits to calculate the distance to the 66-dBA contour. Heffron Transportation and K2 & Associates provided vehicle percentages. Actual traffic volumes used for this analysis were provided in the Noise Discipline Report (CH2M HILL July 2001).

The measurements taken for the Port of Seattle's third runway project and WSDOT's HOV and truck climbing lane projects were compared with those taken on this project for verification. These measurements were used to fill in missing data from adjustments made in the alignment as the proposed project alternatives evolved.

The methodology for noise analysis on this project was developed in close coordination with FHWA.

3.2.2 Affected Environment

Land Uses and Noise Sensitive Areas

The project area is mostly residential, but includes both commercial and light industrial uses. Sea-Tac Airport is the largest traffic generator in the project area (CH2M HILL January 2002). The existing land use along the I-5 corridor between South 216th Street and South 310th street is primarily residential. There are several small businesses mixed in the residential areas surrounding the I-5/SR 516 interchange.

A large portion of the project area is located within the Sea-Tac Airport Noise Remedy Program areas. The Port of Seattle has undertaken a series of noise mitigation programs in the area surrounding Sea-Tac Airport; these

include the Noise Acquisition and Relocation Program, under which the Port has purchased more than 1,360 homes, and the Neighborhood Reinforcement and Standard Insulation Programs to soundproof 10,000 additional homes (Port of Seattle 1991). Figure 3.2-1 shows the boundaries of the Noise Remedy Program areas, as well as the airport's annual average DNL (day-night average noise level) noise contours.

Many noise-sensitive receptors are located in the project area in the form of residences, apartment buildings, hospitals, libraries, parks, schools, retirement homes, and churches. Noise measurements were conducted at 38 representative receptor locations within the project area. Sensitive receptors evaluated in this Revised DEIS were chosen based on accessibility and proximity to major projects, as well as their ability to represent overall conditions in the project area.

Existing Noise Levels

Ambient sound levels were measured to describe the existing noise environment and to identify major noise sources in the project area. Ambient sound levels were measured at 38 receptor locations in the project area; Figure 3.2-2 shows these locations.

Receptors were selected along the proposed project alignments at locations that would likely be impacted by traffic noise. Sound levels for the 30 receptors located along I-5 are presented in Table 3.2-3. Average noise levels (L_{eq}) at these receptors and at the receptors located during the HOV and truck climbing lane noise analyses were dominated by traffic and ranged from 54 to 78 dBA. Substantial noise sources other than traffic are also noted in Table 3.2-3. An additional 8 measured receptors located in residential, commercial, industrial, and park areas near the proposed alignments for the build alternatives, where current traffic noise levels are minimal but the proposed project could create noise impacts (Table 3.2-3). In these areas, L_{eq} values ranged from 56 to 75 dBA. In most cases, the primary source of noise along the proposed alignments was aircraft operations.

The measured existing sound levels included all sounds that typically occur at each location. Noise measurements were taken only when unusual sounds did not occur; however, aircraft noise was included because it is common in the project area.

The dominant sources of noise in the project area are automobile and truck traffic and aircraft overflights. Aircraft noise was dominant at receptors nearest the airport or directly in the flight path. Roadway noise was dominant at receptors located along I-5. Traffic speeds ranged from 30 to 55 mph.

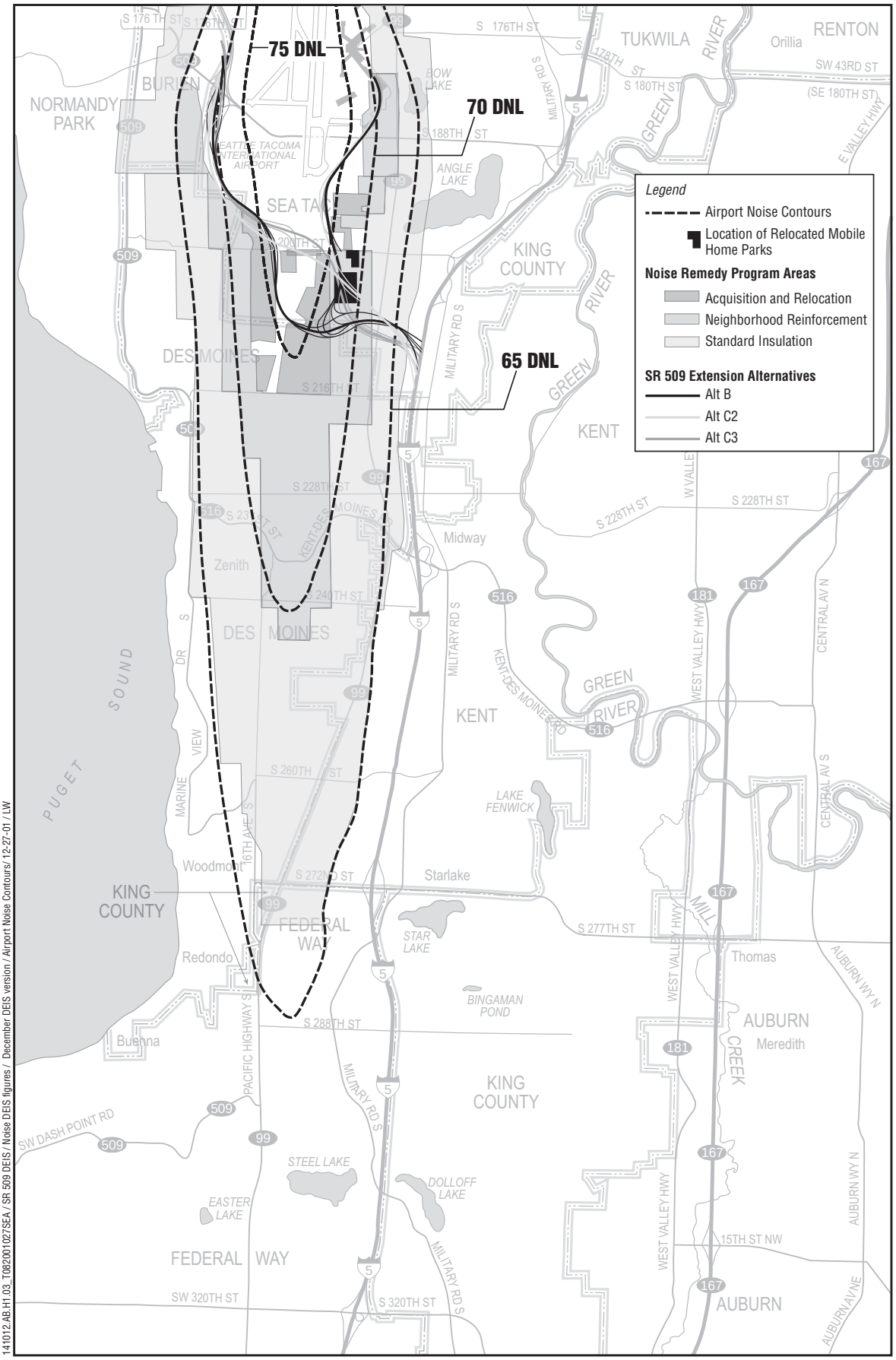

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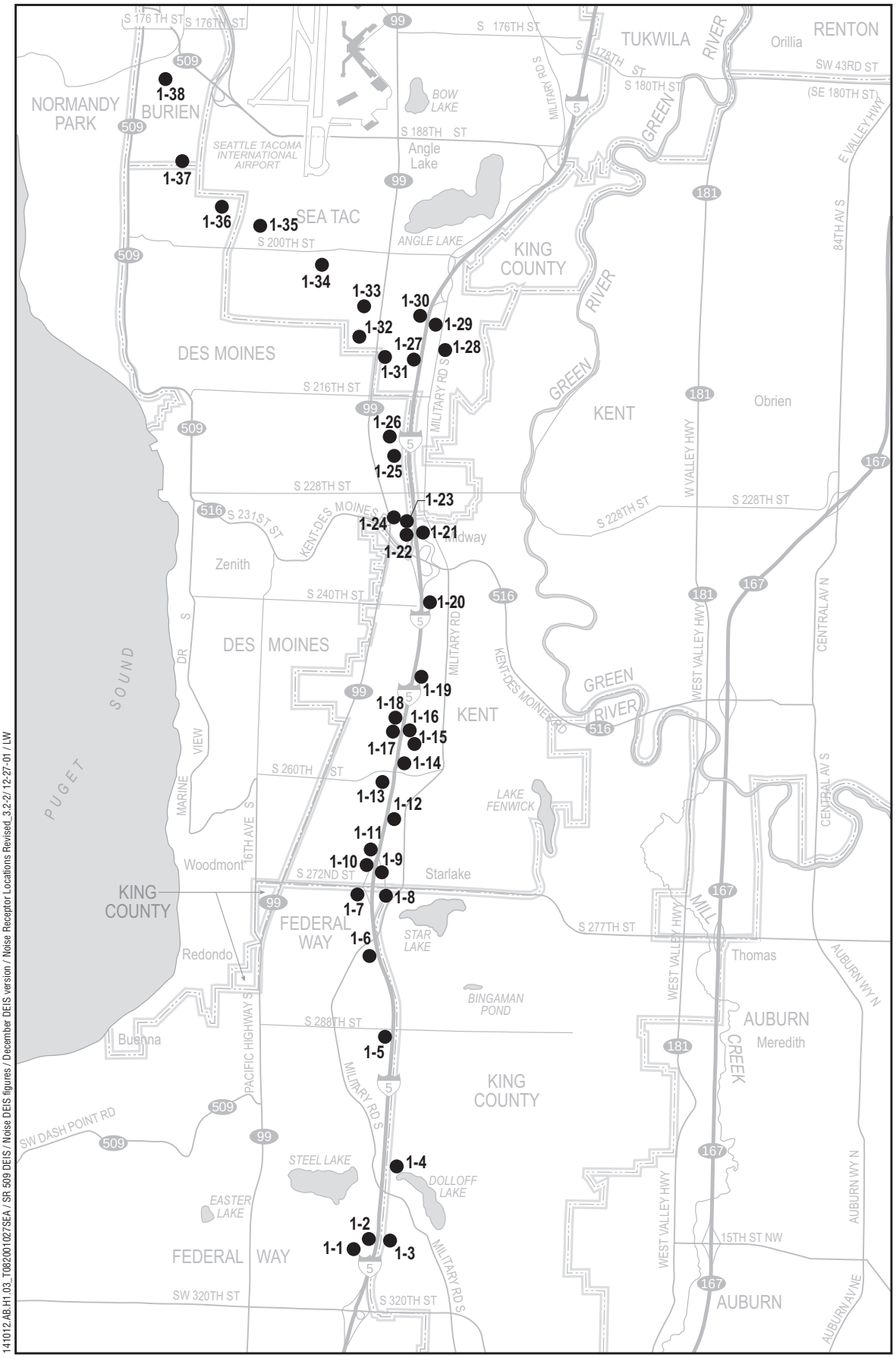
FIGURE 3.2-1

Airport Noise Contours and Port of Seattle Noise Remedy Program Areas

SR 509: Corridor Completion/I-5/South Access Road Environmental Impact Statement



141012.AB.H1.03_T08200102?SEA / SR 509 DEIS / Noise DEIS figures / December DEIS version / Noise Receptor Locations Revised_3.2-2/ 12-27-01 / LW

0 1900 3800
Scale in Feet

North

FIGURE 3.2-2

Noise Receptor Locations

SR 509: Corridor Completion/I-5/South Access Road
Environmental Impact Statement

Table 3.2-3
Noise Measurement Receptor Locations

Receptor Number	Location	Distance to I-5 (feet)	Date	Time	Measured A-Weighted Noise Level (dBA)			Comments
					L_{eq}	L_{max}	L_{min}	
1-1	Steel Lake Park	450	9/27/01	1:30 PM	60	72	51	
1-2	Steel Lake Court Apartments, back parking lot facing Southbound I-5	125	9/27/01	2:15 PM	75	71	79	Exceeds FHWA criterion
1-3	Corner of 32nd Ave/312th Street, facing Northbound I-5	525	9/27/01	2:40 PM	63	72	59	
1-4	Corner of South 304th Street/31st Avenue South, facing Northbound I-5	75	9/27/01	3:30 PM	72	66	85	Exceeds FHWA criterion
1-5	End of Sir Lancelot Court, facing Southbound I-5	115	9/27/01	12:50 PM	78	72	82	Exceeds FHWA criterion
1-6	Residence at 28138 29th Avenue South	220	6/28/94	9:40 AM	62	69	57	
1-7	Mark Twain Elementary	413	6/23/94	9:11 AM	67	85	55	Aircraft noise; exceeds FHWA criterion
1-8	Church at South 272nd Street and Military Road	440	6/28/94	8:58 AM	65	85	59	
1-9	Residence at 3004 South 271st Street	381	6/21/94	10:28 AM	69	81	62	Some aircraft noise; exceeds FHWA criterion
1-10	Residence at 26810 28th Avenue South	135	6/21/94	9:57 AM	68	86	58	Exceeds FHWA criterion
1-11	26818 28th Avenue South (backyard of residence facing Southbound I-5)	150	9/27/01	11:14 AM	73	78	67	Exceeds FHWA criterion
1-12	Residence at 3024 South 256th Street	285	6/21/94	11:20 AM	66	81	61	Approaches FHWA criterion
1-13	Royal Skies Apartments	289	6/21/94	2:42 PM	66	75	62	Approaches FHWA criterion
1-14	Residence at 25625 32nd Place South	259	6/30/94	5:18 PM	63	72	60	
1-15	Residence at 25410 33rd Place South	630	6/21/94	1:36 PM	63	81	47	Mostly aircraft noise
1-16	Residence at 25217 32nd Place South	538	6/21/94	12:00 PM	65	80	59	
1-17	Residence at 25344 31st Avenue South	171	6/21/94	3:20 PM	64	71	60	
1-18	Residence at 25317 31st Avenue South	289	6/21/94	3:53 PM	65	75	59	
1-19	Linda Heights Park, City of Kent	308	6/21/94	2:08 PM	69	78	62	Exceeds FHWA criterion
	Linda Heights Park, western edge, 20 feet south of bird nesting area	270	9/27/01	10:41 AM	71	74	66	Exceeds FHWA criterion
1-20	Residential area at South 35th Avenue and 240th Street South	220	6/30/94	5:55 PM	69	81	62	Exceeds FHWA criterion

Table 3.2-3
Noise Measurement Receptor Locations

Receptor Number	Location	Distance to I-5 (feet)	Date	Time	Measured A-Weighted Noise Level (dBA)			Comments
					L_{eq}	L_{max}	L_{min}	
1-21	Church at 22809 Military Road	89	6/21/94	4:40 PM	73	81	67	Exceeds FHWA criterion
1-22	Heritage Court Apartments	98	7/14/94	5:05 PM	69	83	63	Some aircraft noise; exceeds FHWA criterion
1-23	Apartment Complex, 3028 in grass facing Southbound I-5	100	9/27/01	10:00 AM	74	82	67	Exceeds FHWA criterion
1-24	Raintree Apartments	580	6/28/94	4:40 PM	54	68	46	Exceeds FHWA criterion
1-25	Apartment Building at 3059 South 224th Street	98	6/21/94	5:52 PM	74	82	67	Exceeds FHWA criterion
1-26	Midway Park at South 221st Street	600	6/21/94	6:20 PM	59	73	54	
	Midway Park near entry to substation	350	1/18/01	10:49 AM	70	76	66	Noise from I-5 and aircraft overflights
				2:10 PM	71	79	68	Exceeds FHWA criterion
1-27	Residence at 21240 32nd Avenue South	116	6/28/94	5:16 PM	65	75	61	Some aircraft noise
1-28	Residence at 21114 Military Road	620	6/30/94	4:42 PM	64	76	54	Some aircraft noise
1-29	Residence at 3409 South 209th Street	190	6/28/94	6:23 PM	69	81	61	Exceeds FHWA criterion
1-30	Sandpiper Apartments	160	6/28/94	5:46 PM	61	72	55	
1-31	Residence at 21415 29th Avenue South	NA	6/30/94	4:06 PM	68	89	41	Airplanes taking off; exceeds FHWA criterion
1-32	Residence at 20815 25th Avenue South	NA	6/30/94	3:02 PM	75	98	39	Very loud airplane noise; exceeds FHWA criterion
1-33	Town and Country Villa Mobile Home Park	NA	6/30/94	3:41 PM	69	92	39	Airplanes taking off; exceeds FHWA criterion
1-34	Des Moines Creek Park	NA	1/18/01	1:35 PM	71	88	46	Airplanes taking off
				3:09 PM	75	96	45	Exceeds FHWA criterion
1-35	Residence at 19509 13th Avenue South	NA	7/14/94	3:37 PM	74	93	39	Airplanes taking off; exceeds FHWA criterion
1-36	Residence at 1045 South 194th Street	NA	7/14/94	11:52 AM	63	83	46	Airplanes taking off
1-37	Residence at 860 South 192nd Street	NA	7/14/94	12:20 PM	70	89	46	Airplanes taking off; exceeds FHWA criterion
1-38	Woodside School	NA	7/14/94	11:13 AM	59	78	37	Some airplanes

NA = Not applicable; receptors are outside of the I-5 corridor.

Other sources of noise may include, but are not limited to, commercial activities, human voices in residences, children playing, and construction.

The highest traffic noise levels typically occurred during morning and evening rush hours. At the time of the Parry analysis in 1992, 28 receptors with sound levels at 60 to 76 dBA were identified. WSDOT estimated that nearly $3 million in noise barriers would have to be built to adequately mitigate the impacts associated with I-5 and the proposed HOV and truck climbing lane projects. Ten barrier systems were designed to supplement the two berms that were built in the 1980s to abate highway traffic noise for residents near the South 272nd Street interchange. Since then, 6 of the 10 recommended barriers have been constructed, reducing sound levels for adjacent residences by 7 to 10 dBA. The remaining four noise systems are awaiting construction funding.

Noise in Neighborhood Parks

Four parks could be adversely affected by increased noise levels due to the proposed project. These parks are Steel Lake Park, Linda Heights Park, Midway Park, and Des Moines Creek Park. Background noise levels were measured at representative locations within the four parks (1-1, 1-19, 1-26, and 1-34) near the proposed alternative alignments (Table 3.2-3).

Based on the results of these onsite noise level measurements and field observations, the following determinations were made:

- Currently, noise from I-5 is relatively low in Steel Lake Park. This is primarily due to the shielding provided by intervening residential structures located between the park and I-5. Current L_{eq} at the soccer field located next to 28th Avenue South, which represents the park area closest to I-5, are about 60 dBA. Such levels are below the WSDOT/FHWA NAC.

- Traffic on I-5 is the dominant source of noise at Linda Heights Park. Existing average background noise levels near the west side of the park are in the 70 dBA range. Such levels are above the WSDOT/FHWA NAC.

- Existing noise exposure in Midway Park is dominated by noise from traffic on I-5. Current L_{eq} in the middle of the park are about 70 dBA. Such levels are above the WSDOT/FHWA NAC.

- At the Des Moines Creek Park, aircraft departures from Sea-Tac Airport are the main sources of environmental noise. Measured noise levels in the park average 71 to 75 dBA during periods when jet aircraft departures occur. In fact, 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 70 dBA DNL.

3.2.3 Environmental Impacts

Noise from the proposed action would include short-term noise during road construction and long-term operational impacts from growth in traffic volumes and changes in traffic patterns on project area roadways. New construction and road sections that would be widened were analyzed for noise impacts. Noise modeling data for the projects, including the No Action Alternative, were used with aerial photographs to estimate the number of receptors that might be impacted in 2020 under each alternative.

Areas along the SR 509 freeway extension and north of SR 516 on both sides of I-5 contain residential parcels that could experience partial or full right-of-way acquisitions because of construction of the proposed project. If these parcels were to be acquired in total, the summary of noise impacts and proposed noise mitigation would be adjusted accordingly during the final design of the I-5 improvements.

Alternative A (No Action)

Under the No Action Alternative, traffic and noise levels would increase along the roadways because of development and transportation improvements in the project area that would increase traffic volumes. Under 2020 predicted traffic volumes, approximately 683 single-family residences would be within the 66 dBA contours (Table 3.2-4). Additionally, approximately 655 multifamily residential units, 1 school, 2 parks, 3 assisted care facilities, and 4 churches would experience similar effects, for a total of approximately 1,348 impacted receptors. When noise barriers planned by WSDOT are completed along I-5 as mitigation for previous projects, the number of impacted receptors will decrease. The number of receptors benefited by noise barriers will largely depend on the amount of right-of-way acquired for all the build alternatives.

The number of noise impacts under the No Action Alternative was determined by counting the number of sensitive receivers within a 66 dBA noise contour (developed using 2020 PM peak-hour traffic volumes) and assuming ideal noise propagation conditions. The same assumptions used to determine the existing impact contours were also used to determine impact contours under the No Action Alternative. Traffic volumes were taken from the results of the 2020 No Action Alternative travel demand traffic model provided by the TRANSPO Group. The number of impacts for the 2020 No Action Alternative was compared with the number of existing impacts, as well as the number of impacts in 2020 for the build alternatives.

Table 3.2-4 Estimated Number of Impacted Receptors by Alternative				
	2020 Alternative A (No Action)	**2020 Alternative B**	**2020 Alternative C2 (Preliminary Preferred)**	**2020 Alternative C3**
Traffic Noise 66 dBA or Greater				
Single-family residential	683	1,638	1,744	1,636
Multifamily residential	655	806	819	979
Schools	1	3	3	3
Libraries	0	0	0	0
Hospitals and retirement homes	3	3	3	3
Parks	2	3	3	3
Churches	4	5	6	6
Total Receptors Impacted	**1,348**	**2,458**	**2,578**	**2,390**

Note: A receptor is any single-family residence, housing unit on a multifamily parcel, school, hospital, retirement home, park, or library. The number of individuals exposed at each receptor location was not determined. Mobile homes within the Sea-Tac Airport 70-DNL contour and properties acquired by the Sea-Tac Airport Noise Remedy Program are excluded from the counts.

Under the No Action Alternative, the noise levels in 2020 would increase at locations near I-5 and decrease at locations away from I-5. This is a direct result of the 33 percent forecasted increases in traffic volumes on I-5 and a decrease in background noise levels.

Impacts Common to All Build Alternatives

Projected traffic volumes on I-5 for each of the build alternatives are very similar, and would result in the same distances to the 66 dBA contours. Therefore, noise impacts in areas along I-5 would be common to all three build alternatives. The impacts summarized in Table 3.2-4 include all areas within the 66 dBA contour for the proposed I-5 improvements, which are common to all build alternatives.

Under all build alternatives, traffic noise exposure in Linda Heights Park and Midway Park would increase by only 1 dBA relative to the No Action Alternative. Nevertheless, future traffic noise levels within these two parks exceed the WSDOT/FHWA NAC for all of the build alternatives.

Alternative B

Under Alternative B, traffic noise levels would increase in parts of the project area because of development and transportation improvements. The number of impacts under Alternative B was determined by counting the number of existing sensitive receivers within a 66 dBA noise contour (developed using 2020 PM peak-hour traffic volumes) and assuming ideal noise propagation conditions. Of the three build alternatives, Alternative B would impact the fewest additional receptors. Most of the additional sensitive receptors impacted by traffic noise under Alternative B are multifamily units located near the proposed SR 509/I-5 interchange.

In 2020, approximately 1,638 single-family residences would be impacted by noise levels of 66 dBA or greater (Table 3.2-4). Additionally, approximately 806 multifamily residences, 3 schools, 3 assisted care facilities, 3 parks, and 5 churches would be impacted by traffic noise, for a total of approximately 2,458 impacted receptors. The widening of South 200th Street between SR 509 and the new South Access Road would not impact any additional receptors because this location is within the Sea-Tac Airport Noise Remedy Program acquisition area.

Noise levels would increase slightly over 1 dBA relative to the No Action Alternative for receptors located along I-5 south of SR 509. This is the result of a 33 percent increase in traffic south of SR 509. Noise-sensitive receptors along I-5 north of SR 509 would experience a slight noise level decrease (less than 1 dBA) relative to the No Action Alternative, resulting from an approximately 16 percent decrease in traffic volumes north of the SR 509 interchange proposed in Alternative B.

Alternative B would introduce high traffic noise levels to certain portions of Des Moines Creek Park. Airport noise levels within the park area are currently high and are expected to remain high in the future. Aircraft noise exposure notwithstanding, the proposed project would be expected to substantially increase noise levels at certain locations within the park, including the south/southeast part of the park near the proposed SR/509/South Access Road interchange, the west part of the park along the east side of 15th Avenue South, and areas along the proposed SR 509/South Access Road on the east side of the park. However, the existing trailhead facilities and most of the existing main trail within the park would fall well outside the 66 dBA contour line.

Alternative C2 (Preliminary Preferred)

Under Alternative C2, traffic and noise levels would increase in portions of the project area because of development and transportation improvements. The number of noise impacts under Alternative C2 was determined by counting the number of existing sensitive receivers within a 66 dBA noise

contour (developed using 2020 PM peak-hour traffic volumes) and assuming ideal propagation conditions.

Using 2020 predicted traffic volumes, approximately 1,744 single-family residential parcels would be impacted by noise levels of 66 dBA and above (Table 3.2-4). Additionally, approximately 819 multifamily residential units, 3 schools, 3 hospitals/retirement homes, 3 parks, and 6 churches could experience similar effects, for a total of 2,578 impacted receptors. The widening of South 200th Street between SR 509 and the South Access Road would not impact any additional receptors because this location is within the Sea-Tac Airport Noise Remedy Program acquisition area.

Alternative C2 would introduce high traffic noise levels to certain portions of Des Moines Creek Park. Airport noise levels within the park are currently high and are expected to remain high in the future. Aircraft noise exposure notwithstanding, the proposed project would be expected to substantially increase noise levels at certain locations within the park. The section of Des Moines Creek Park that would be adversely affected by noise from project-related traffic would be the northeast part of the park near South 200th Street. The existing trailhead area and the northern part of the main trail would be subject to substantial traffic noise increases.

Alternative C3

Outside of areas in the vicinity of I-5 and SR 99, Alternative C3 would have approximately the same level of noise impacts on nearby noise-sensitive areas as Alternative C2. Using 2020 predicted traffic volumes, approximately 1,636 single-family residential parcels would be impacted by noise levels of 66 dBA and above (Table 3.2-4). Additionally, approximately 979 multifamily residential units, 3 schools, 3 hospitals/retirement homes, 3 parks, and 6 churches could experience similar effects, for a total of 2,390 impacted receptors.

The widening of South 200th Street between SR 509 and the South Access Road would not impact any additional receptors because this location is within the Sea-Tac Airport Noise Remedy Program acquisition and relocation area. The number of noise impacts under Alternative C3 was determined counting the number of existing sensitive receivers within a 66 dBA noise contour (developed using 2020 PM peak-hour traffic volumes) and assuming ideal propagation conditions.

Alternative C3 would introduce high traffic noise levels to certain portions of Des Moines Creek Park. Airport noise levels within the park are currently high and are expected to remain high in the future. Aircraft noise exposure notwithstanding, the proposed project would be expected to substantially increase noise levels at certain locations within the park. The section of Des Moines Creek Park that would be impacted by noise from project-related

traffic would be the east and northeast parts of the park along 24th Avenue South and near South 200th Street. The existing trailhead area and north part of the existing main trail within the park would be subject to substantial traffic noise level increases.

3.2.4 Mitigation Measures

The following noise abatement measures are likely to be incorporated into the selected alternative (if the No Action Alternative is not selected). Because the build alternatives would be constructed on a new alignment, the level of currently available design detail is limited. Therefore, the mitigation measures identified have been based on two assumptions: (1) a reasonable barrier is one that is not longer than 100 feet per household benefited; and (2) all barriers are feasible. Both of these assumptions were applied equally to all build alternatives. It is WSDOT policy to make final decisions on the construction of noise barriers after final horizontal and vertical alignments are determined and a detailed engineering analysis of the feasibility and reasonableness of noise abatement can be made. Only barriers that meet WSDOT criteria as accepted by FHWA would be constructed.

A variety of mitigation methods can be applied to projects to reduce noise impacts. Noise impacts from long-term operation of highways after projects have been constructed can be reduced by acquiring land as buffer zones, realigning the roadway, and constructing noise barriers (such as earth berms). The following mitigation measures could be incorporated into the design and operation of the proposed project.

Barriers

Complete visual shielding of all traffic noise sources with tall barriers could reduce long-term noise levels by as much as 20 dBA, but such shielding would be difficult to achieve. Noise barriers generally reduce traffic noise levels by 7 to 10 dBA, depending on barrier height and the distance that the sensitive receptor is located from the barrier. The effectiveness of a barrier would be determined by its height and length and by the topography of the project site. To be effective, the barrier must block the "line-of-sight" between the highest point of a noise source, such as a truck exhaust stack, and a receiver located within an outdoor area of frequent human use. A barrier must be long enough to prevent sounds from passing around the ends of the barrier, have no openings such as driveway connections, and be dense enough so that a substantial amount of noise energy would not pass through it. Buildings that are not sensitive to noise could also be used as barriers. Barriers are less effective at reducing noise levels at locations that are farther from the noise source or are elevated above ground level, such as the second floor of a building. Roadway noise barriers would not decrease aircraft noise; therefore, they would provide little or no benefit in areas where ambient noise is dominated by aircraft.

WSDOT evaluates many factors to determine whether barriers would be feasible and reasonable. The feasibility evaluation consists of engineering considerations, such as whether substantial noise reductions of 7 to 10 dBA can be achieved. The reasonableness evaluation considers factors such as the cost-effectiveness of the barriers and the concerns of the residents.

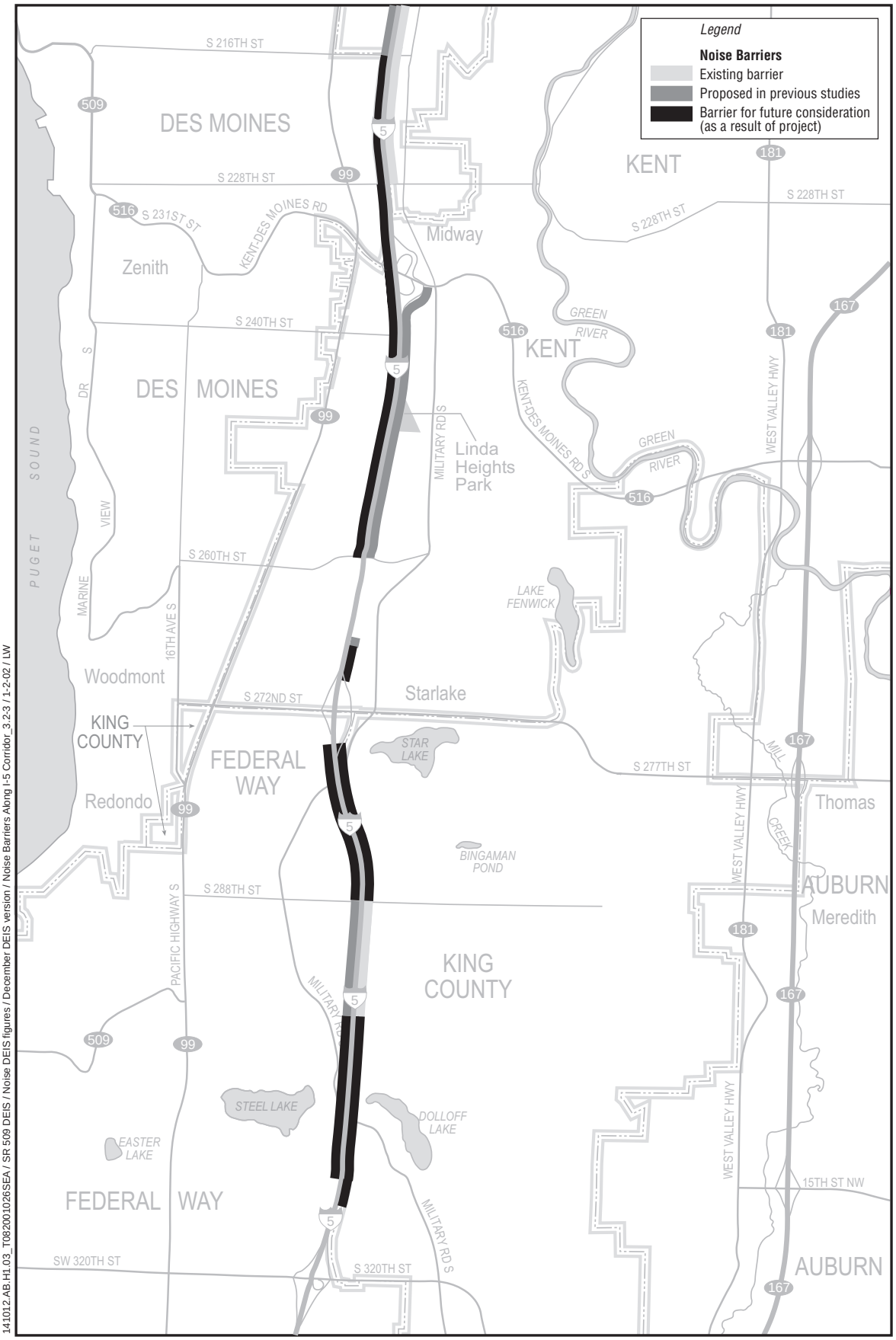
WSDOT is currently constructing or planning noise barriers along much of I-5 within the project area. Locations currently scheduled for barrier construction are along the east side of I-5 and are shown on Figure 3.2-3. The locations include the area from roughly South 259th Lane to South 255th Street; South 252nd Street to South 248th Street; South 244th Street to South 241st Street; north of SR 516 to South 228th Street; South 221st Street to South 216th Street; and South 216th Street to South 211th Street. Additional locations that are planned but not yet finalized for construction are from South 211th Street to south of Military Road on the east side of I-5, and on the west side of I-5 from about South 211th Street to South 216th Street; South 216th Street to South 219th Street; and South 224th Street to SR 516.

Areas for barrier mitigation were considered for each of the build alternatives. Aerial photographs and field verification were used to determine appropriate areas for barrier evaluation based on residential land use. Final designs would not be available until noise barrier locations are identified during final design of the selected alternative; therefore, only general areas were determined where residents would likely be impacted by traffic noise and could possibly benefit from noise barriers. These areas are shown in Figures 3.2-4 through 3.2-6. Near Sea-Tac Airport, where aircraft noise dominates, noise barriers would not be effective at reducing noise levels; therefore, noise barriers may not be appropriate in some of the areas outlined in Figures 3.2-3 through 3.2-6. Exact length, height, and location of noise barriers would be determined during the design phase for the selected alternative as more information becomes available.

Potential Barriers Common to All Build Alternatives

Within the I-5 corridor between South 216th Street and South 310th Street, several areas within the 66-dBA contour could require mitigation. These mitigation areas along I-5 would be common to all build alternatives. Seven barrier locations were identified for future consideration (Figure 3.2-3):

1. The residential area east of I-5 from South 310th Street to South 288th Street
2. The residential areas west of I-5 from South 310th Street to approximately 2,400 feet south of South 288th Street
3. The residential areas on both sides of I-5 from South 288th Street to South 272nd Street



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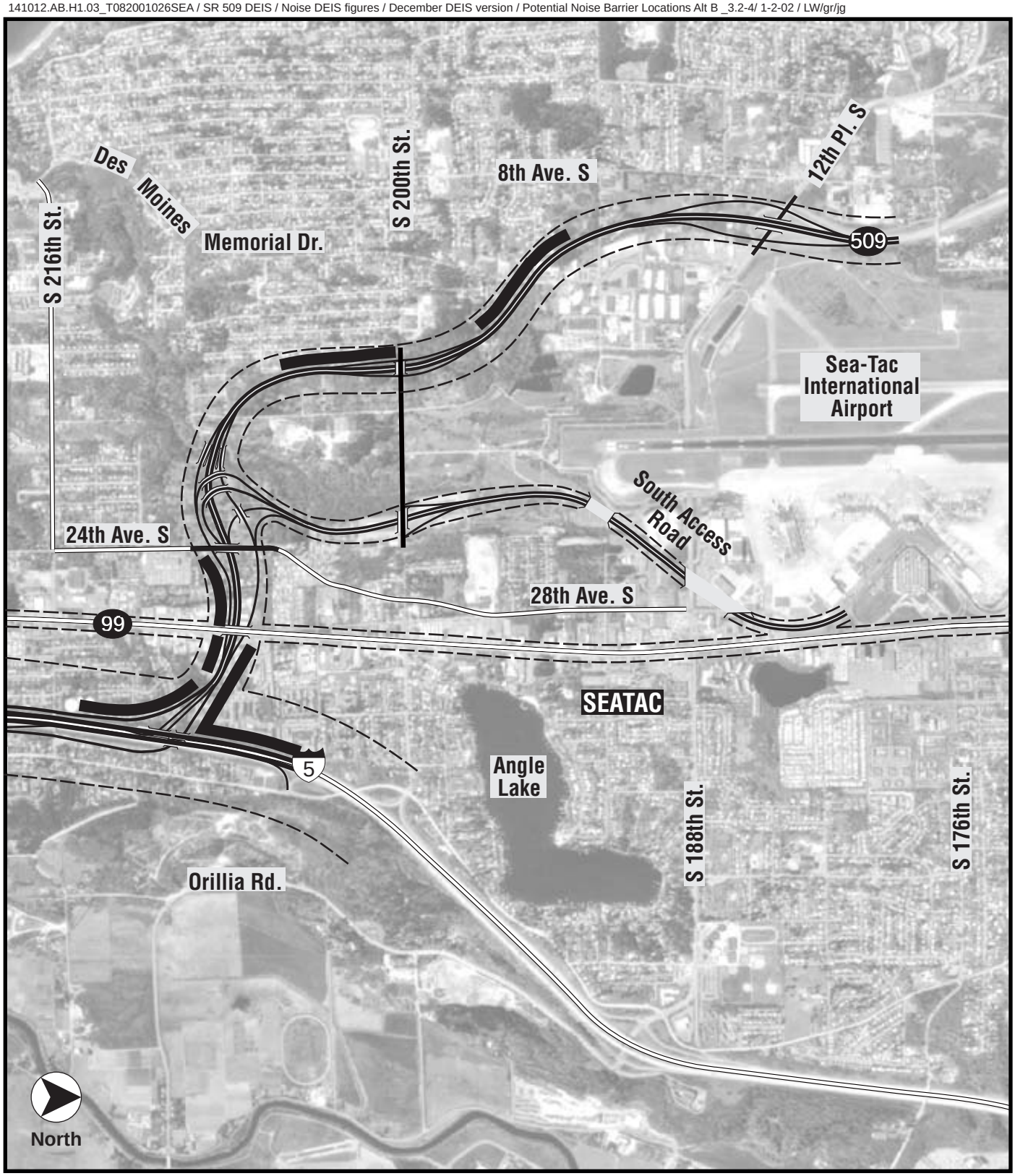
0 1900 3800
Scale in Feet

North

FIGURE 3.2-3

Potential and Constructed Noise Barrier Locations Along I-5 – All Alternatives



0 1/4 1/2 3/4 1 MILES

Legend

- SR 509/South Access Improvements
- Potential Noise Barriers
- 66 dBA Contour

FIGURE 3.2-4

Potential Noise Barrier Locations – Alternative B

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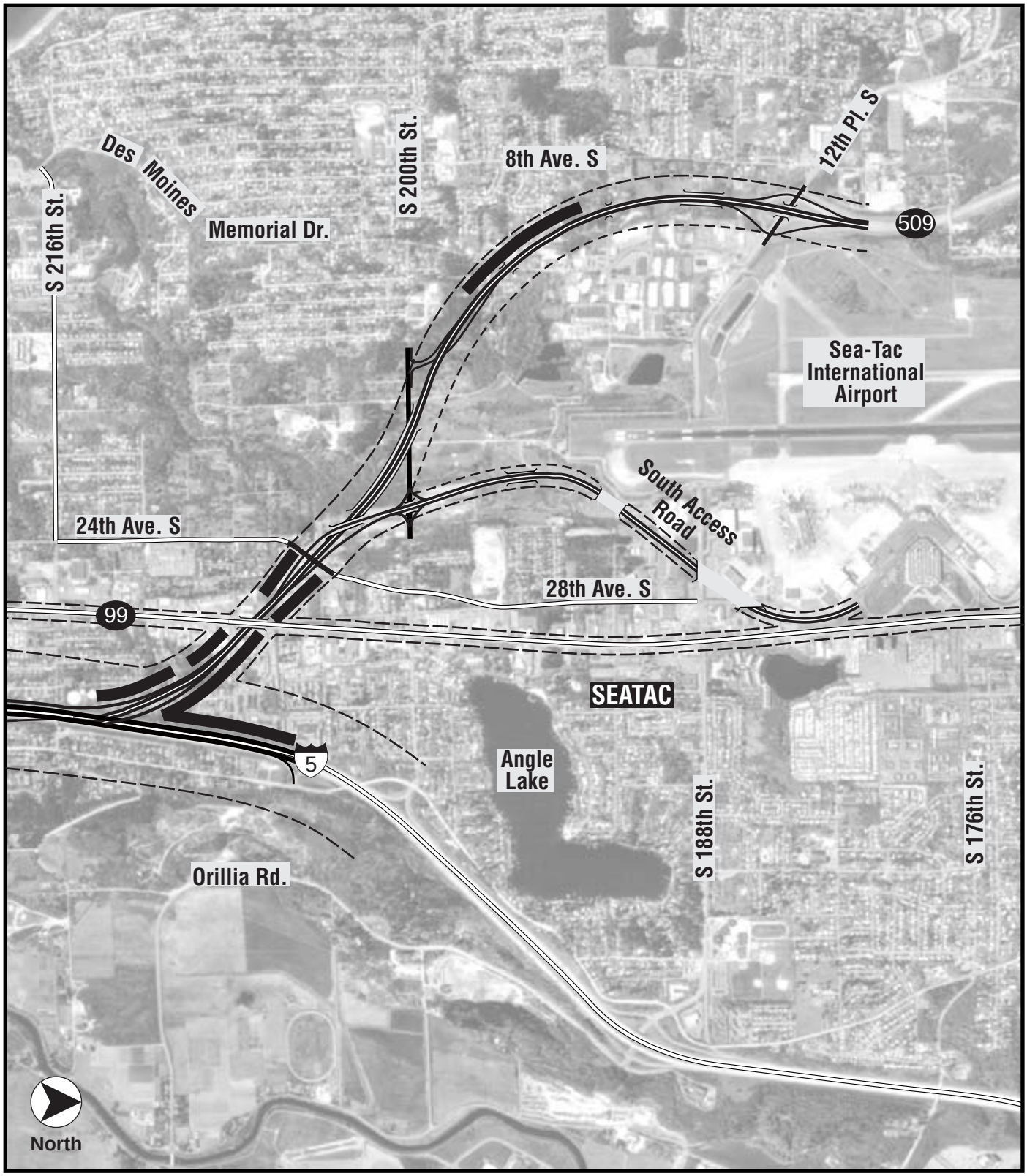

0 1/4 1/2 3/4 1 MILES

Legend

- SR 509/South Access Improvements
- Potential Noise Barriers
- 66 dBA Contour

FIGURE 3.2-5

Potential Noise Barrier Locations – Alternative C2 (Preliminary Preferred)

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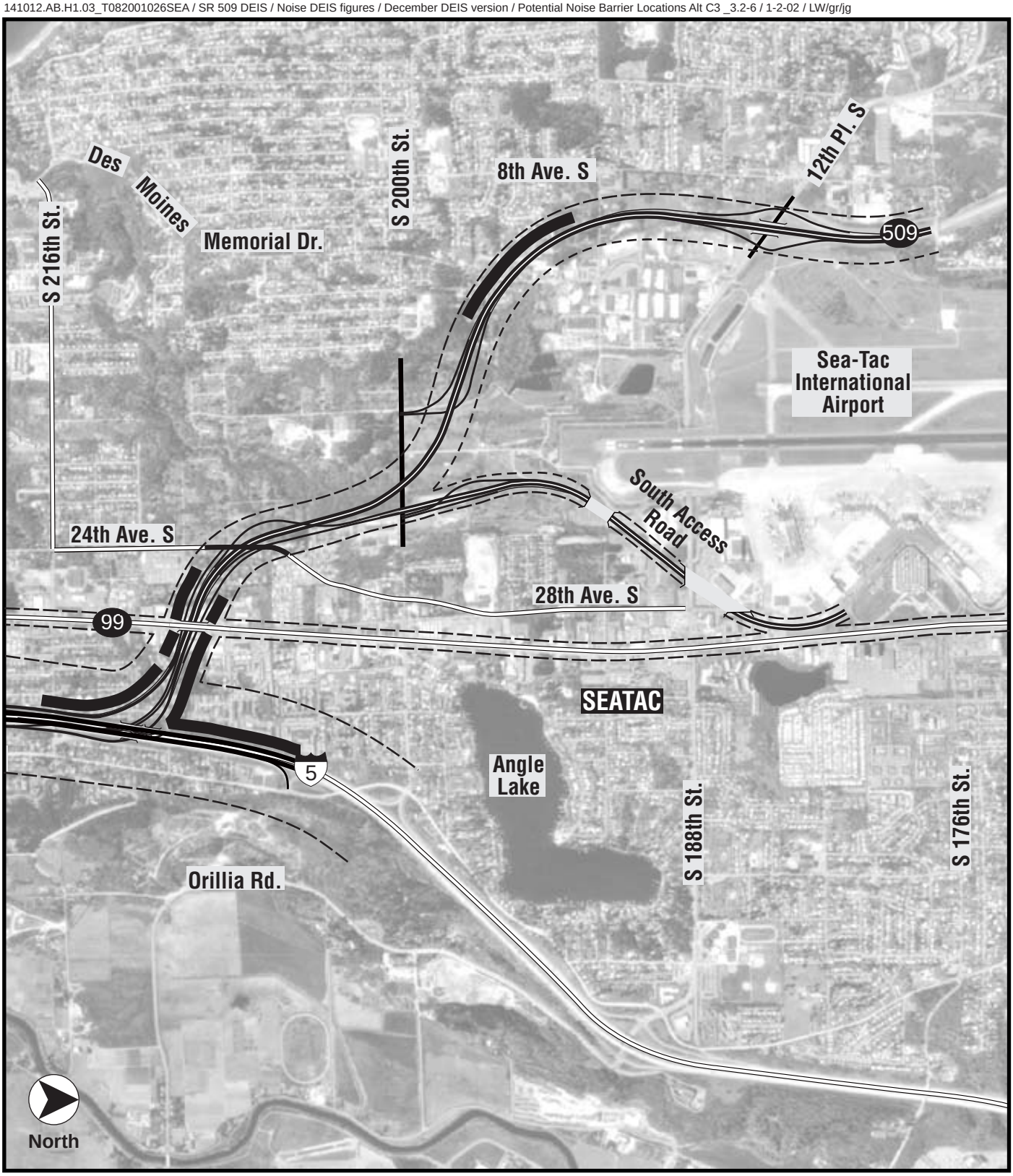

0 1/4 1/2 3/4 1 MILES

Legend

- SR 509/South Access Improvements
- Potential Noise Barriers
- 66 dBA Contour

FIGURE 3.2-6

Potential Noise Barrier Locations – Alternative C3

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4. The residential area on the east side of I-5 from South 272nd Street to South 268th Street
5. The residential area on the west side of I-5 from South 260th Street to South 228th Street
6. The residential area on the west side of I-5 from South 228th Street to South 216th Street

Alternative B

Seven additional potential barrier locations were identified (Figure 3.2-4):

1. Along the north side of SR 509 from I-5 to SR 99
2. Along the south side of SR 509 from I-5 to 32nd Lane South
3. Along the south side of SR 509 in the vicinity of 30th Avenue South
4. Along the south side of SR 509 from SR 99 to 24th Avenue South
5. Along the west side of SR 509 adjacent to 15th Avenue South from South 207th Street to South 200th Street
6. Along the west side of SR 509 from 196th Place to Des Moines Memorial Drive South
7. Along the west side of SR 509 from Des Moines Memorial Drive South to north of South 194th Street

Alternative C2 (Preliminary Preferred)

Six additional potential barrier locations were identified (Figure 3.2-5):

1. Along the north side of SR 509 from I-5 to SR 99
2. Along the south side of SR 509 from I-5 to 32nd Lane South
3. Along the south side of SR 509 in the vicinity of 30th Avenue South to South 208th Street
4. Along the southwest side of SR 509 from SR 99 to 26th Avenue South
5. Along the northeast side of SR 509 from 27th Place South to a point south of 24th Avenue South
6. Along the west side of SR 509 from 13th Avenue South to Des Moines Memorial Drive South

Alternative C3

Six additional potential barrier locations were identified (Figure 3.2-6):

1. Along the north side of SR 509 from I-5 to SR 99
2. Along the south side of SR 509 from I-5 to 32nd Lane South
3. Along the south side of SR 509 in the vicinity of 30th Avenue South
4. Along the southwest side of SR 509 from SR 99 to 26th Avenue South
5. Along the east side of SR 509 beginning from South 208th Street northward
6. Along the west side of SR 509 from 15th Avenue South to Des Moines Memorial Drive South

Other Possible Roadway Mitigation Measures

Noise impacts could also be reduced by land use controls throughout the project area. The Cities of Des Moines, Kent, Federal Way, and SeaTac and King County could implement land use plans and zoning that would restrict future land uses along SR 509 and I-5 to those compatible with roadway noise.

Public buildings could be insulated to reduce interior noise levels where it is determined that interior noise levels would approach or exceed FHWA's interior NAC of 52 dBA. Specific construction techniques could include acoustical doors and windows; insulation in walls, floors, and ceilings; and ventilation systems designed to preclude the need to open windows. Many of these activities have already been accomplished through the Sea-Tac Airport Noise Remedy Program for a number of public buildings and residences in the project area. Noise insulation would have no effect on exterior noise levels.

Retaining existing trees and vegetation and planting new vegetation along the selected alternative alignment would reduce noise annoyance psychologically by removing the noise source from view. To actually reduce noise levels, vegetation must completely block the line of sight between the observer and the source and be at least 15 feet tall. A dense line of trees with a depth of 100 feet would reduce noise by 5 dBA, in addition to the effect of distance (Barry and Reagan 1978).

3.2.5 Construction Activity Impacts and Mitigation

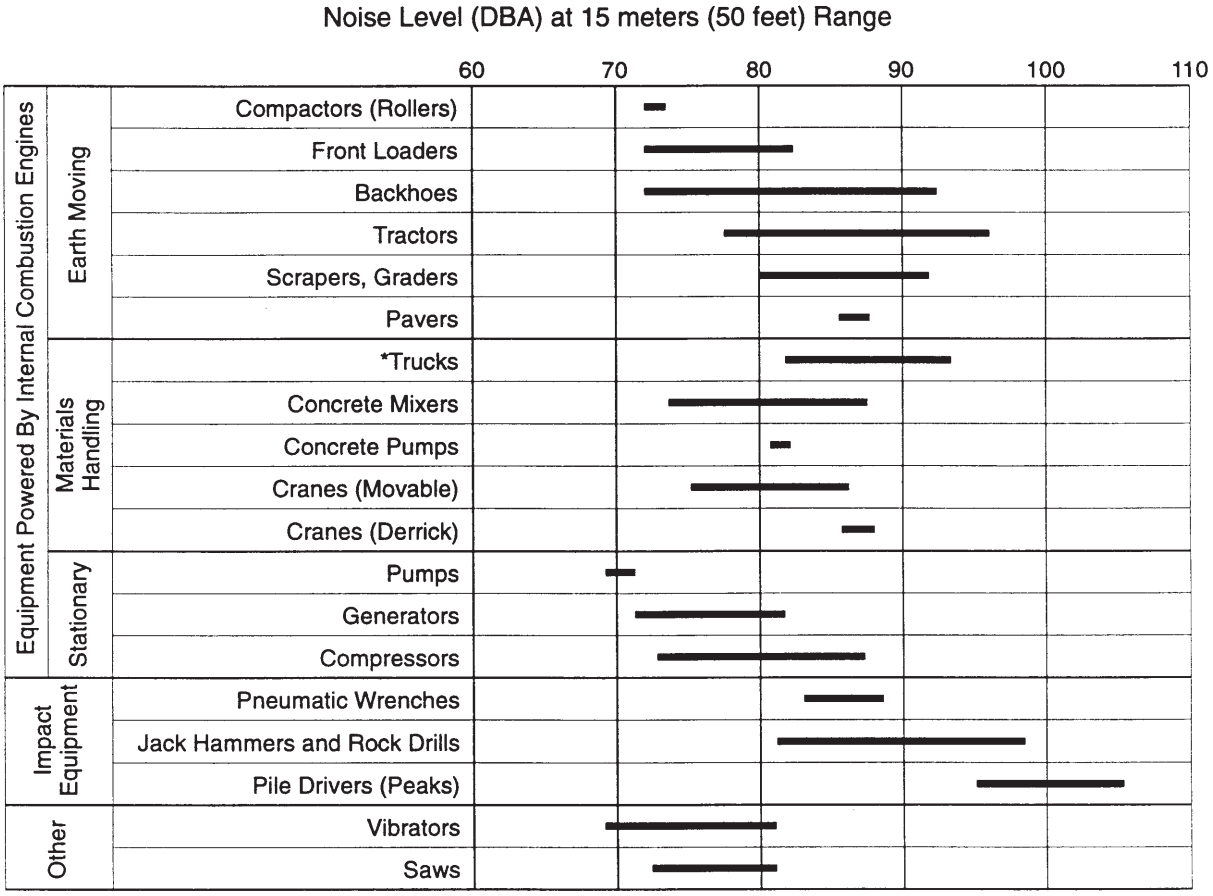
Construction Activity Impacts

Most typical highway construction activities would be common to all build alternatives. Roadways are usually constructed in several phases, each of which has its own mix of equipment and, consequently, its own noise characteristics. Roadway construction would involve clearing, cut-and-fill activities, pile driving, removing or reconditioning old roadways, bridge and wall construction, and paving.

The most prevalent noise source at construction sites is the internal combustion engine. Engine-powered equipment would include earth-moving equipment, vehicles, material-handling equipment, and stationary equipment. Mobile equipment operates in a cyclic fashion, while stationary equipment such as generators and compressors operates at fairly constant sound levels. Because trucks would be present during most phases of construction and would not be confined to the construction site, noise from trucks could affect more receptors. Other noise sources would include impact equipment and tools such as jackhammers. Impact tools could be pneumatically powered, hydraulic, or electric.

Construction noise would be short term in nature and limited to the length of the construction period. Construction noise effects would be temporary, intermittent, and depend on the type, amount, and location of construction activities. The construction methods used would determine the maximum noise levels of the construction equipment. The amount of construction activity would determine how often construction noise would occur throughout the day. The location of construction equipment relative to adjacent properties would determine any effects of distance in reducing construction noise levels.

Maximum noise levels of construction equipment under any of the build alternatives would be similar to the typical maximum construction equipment noise levels presented in Figure 3.2-7 at 50 feet from the equipment. Maximum noise levels from construction equipment would range from 69 to 106 dBA at 50 feet. Construction noise at residences farther away would experience a decrease at a rate of 6 dBA per doubling of distance from the source. Extrapolating from Figure 3.2-7, maximum noise levels at 200 feet would range from 57 to 94 dBA. The number of occurrences of the L_{max} would increase during construction, particularly during pile-driving activities. Because various equipment would be turned off, idling, or operating at full power at any time, average L_{eq} noise levels during the day would be less than the maximum noise levels presented in Figure 3.2-7.



* Current measurements indicate truck noise level of 78-90

NOTE: Based on limited available data samples.

SOURCE: U.S. Environmental Protection Agency, "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances," NTID 300.1, December 31 1971. Revised WSDOT District 1, February, 1991.

FIGURE 3.2-7

Construction Equipment Noise Ranges

Alternative A (No Action)

There would be no construction noise impacts under the No Action Alternative.

Alternative B

Alternative B, including the South Access Road, would require the construction of 3.8 miles of new roadway. This would only be slightly more new construction than under Alternatives C2 or C3; therefore, only slightly more area would be affected by construction noise.

Alternative C2 (Preliminary Preferred)

Alternative C2, including the South Access Road, would require the construction of 3.2 miles of new roadway. The number of receivers affected by construction noise would likely be lowest under this alternative.

Alternative C3

Alternative C3, including the South Access Road, would require the construction of 3.5 miles of new roadway. Alternative C3 would potentially expose a lower number of receivers to construction noise than Alternative B.

Mitigation Measures

Contractors are required to comply with all state and local regulations governing equipment source levels and noise resulting from the construction site activities during the life of the improvement. However, daytime construction activities are generally exempt from these limits. Construction noise can annoy people living and working in the area. Some simple and inexpensive techniques would be used to minimize the negative effects:

- Stationary noise sources would be placed as far from sensitive receivers as possible. Portable noise barriers, vehicles, and equipment or natural terrain features can be used between the noise source and sensitive receivers to provide shielding.

- Idling equipment would be turned off. Equipment operators would drive forward instead of backward whenever possible, lift instead of drag materials, and avoid scraping or banging activities to do work that can be accomplished by quieter hand methods.

- Work that does not need to be done at night would be confined to daytime hours. When work must be done at night, the contractor would complete the noisiest work as early as possible.

- Construction noise can be further reduced through the use of properly sized and maintained mufflers, engine intake silencers, ambient sensitive backup alarms, engine enclosures, noise blankets, and rubber linings.

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3.3 Energy

3.3 Energy

3.3.1 Studies and Coordination

The primary reference used to document existing transportation conditions was *SR 509/South Access Road EIS Discipline Report: Transportation* (CH2M HILL January 2002). The primary resource used to guide the analysis of potential energy impacts was *Fundamentals of Traffic Engineering*, 14th Edition (Homburger et al. 1996). *Highway Capacity Manual*, Transportation Research, Special Report 209, 1997. This section qualitatively assesses potential energy impacts resulting from the construction and operation of each of the project alternatives.

Consideration of roadway design principles was used to qualitatively compare and contrast the probable energy consumption of each of the alternatives. The estimated cost of construction (exclusive of right-of-way costs) was used to represent both the amount of energy used to manufacture construction materials and the amount of energy used to operate construction equipment and worker vehicles. Six factors were evaluated and combined based on Homburger et al. (1996) to represent the amount of energy consumed in the operation of each alternative. These factors are: (1) the length of each roadway alternative, (2) the roadway design speed, (3) the terrain traversed by the roadway, (4) the traffic flow, (5) the estimated number of street signals, and (6) the estimated annual average operation and maintenance costs for each of the alternatives.

Table 3.3-1 provides an estimated cost for each of the above factors. These costs were ranked between 1 and 5 based on the effect on energy consumption, with 1 representing the lowest energy consumption. For example, the design speed for Alternatives B, C2, and C3 would be 70 mph compared to posted speed limits of 25 to 35 mph of the existing roads or the No Action Alternative. This value is ranked 2 in Table 3.3-1 because vehicles running at 55 mph or higher generally consume more energy than vehicles traveling at 45 mph, and vehicles running less than 45 mph generally consume more energy than vehicles traveling at 45 mph. The fewer street signals under Alternatives B, C2, and C3 are ranked higher in Table 3.3-1 compared to the No Action Alternative because more energy is consumed with increasing numbers of street signals. The summation and ranking for the variables allow the project alternatives to be compared for the several operation factors.

3.3.2 Affected Environment

The project area is located within a populated urban area of western King County dominated by commercial and residential development. The area is

Table 3.3-1
Comparison of Energy Consumption by Project Alternative

A. Comparison of Values

	Construction	Operation-Use					Operation-O&M
	Cost [a] (millions)	Length	Design Speed	Terrain	Traffic Flow	Street Signals	O&M Cost/Year [b]
Alternative A (No Action)	0	NA[c]	25/35 mph[d]	rolling	poor	4+	0
Alternative B	$715 - $735	10.5 miles	70/60 mph[e]	rolling	good	0[f]	$295,000
Alternative C2 (Preliminary Preferred)	$690 - $710	9.9 miles	70/60 mph[e]	rolling	best	0[f]	$295,000
Alternative C3	$695 - $715	10.2 miles	70/60 mph[e]	rolling	good	0[f]	$295,000

B. Ranking of Values (1=Low, Less Energy)

	Construction	Operation-Use						Operation-O&M	Operation	Overall Ranking[g]
		Length	Design Speed	Terrain	Traffic Flow	Street Signals	Average			
Alternative A (No Action)	1	1	3[d]	5	5	5	3.8	1	2.4	1.7
Alternative B	4	3	2	2	2	2	2.2	3	2.6	3.3
Alternative C2 (Preliminary Preferred)	2	2	2	2	1	2	1.8	3	2.4	2.2
Alternative C3	3	3	2	2	2	2	2.2	3	2.6	2.8

[a] *Estimated construction costs (in 2000 dollars) provided by CH2M HILL on January 3, 2002. These cost estimates are preliminary and are subject to change during future design phases of the proposed project. Cost estimates do not include the 1,000 feet of the South Airport Link.*

[b] *Estimated operation and maintenance costs (in 2000 dollars) include annual expenditures for highway and bridge maintenance, utilities, and maintaining ramp terminal signals. Because the approximate length of each of the alternatives is about the same, the comparison is between the No Action Alternative and any of the build alternatives.*

[c] *NA - Not applicable because there are multiple routes to I-5 from the current terminus of SR 509.*

[d] *The posted speed limits of the rural streets south of Sea-Tac Airport are between 25 and 35 mph.*

[e] *The design speed of the SR 509 lanes is 70 mph; the design speed of the I-5 C/D lanes is 60 mph.*

[f] *There would be no signal lights to stop traffic; street signals would be at each interchange on- and off-ramp.*

[g] *Overall ranking is the average of construction and operation total values.*

served by a freeway (I-5) and principal arterials (SR 99, South 188th Street, South 192nd Street, and South 200th Street). Minor and collector arterials also provide east-west access across the project area. The Tyee Valley Golf Course, Sea-Tac Airport, and facilities associated with the airport, are the prominent features in the north part of the project area. The I-5 corridor, which accounts for approximately 6.7 miles of the project area, is the prominent feature in the southern part of the project area.

Traffic Circulation

The existing SR 509 corridor consists of a four-lane freeway north of Des Moines Memorial Drive/12th Place South and a five-lane arterial street (South 188th Street). To the north, SR 509 has major connections to SR 99 and passes through the City of Burien; to the south, it passes through the Cities of Normandy Park and Des Moines, serving as a major connection to the regional system for residents. South of Des Moines, the SR 509 route currently is discontinuous between SR 516 and Dash Point Road in Federal Way. South of SR 516, the SR 509 corridor is coincident with SR 99 until it connects with Dash Point Road. Because of the circuitous routing to the south and poor connections to regional traffic generators (e.g., Sea-Tac Airport), the freeway portion of the corridor is underused, particularly between Des Moines Memorial Drive/12th Place South and SR 518.

Access to Sea-Tac Airport from the south is available from the arterial street system at South 182nd Street/SR 99. Local traffic can also access the North Access Expressway at South 170th Street. The primary regional access route from the south is I-5 (via SR 518 and the North Airport Expressway).

Traffic Volumes

Traffic on SR 509 north of Des Moines Memorial Drive/12th Place South is highly directional during the p.m. peak hour (when congestion is highest), with approximately 70 percent of the traffic traveling southbound. Between this point and South 216th Street, approximately 55 percent of traffic travels southbound and 45 percent northbound. Although there is heavy congestion on other freeways in the project area, SR 509 south of SR 518 carries a relatively low vphpl during the p.m. peak hour; in that section of roadway, the vphpl southbound is 1,150, while northbound it is only 500. In comparison, I-5 south of SR 518/I-405 carries 2,060 vphpl southbound and 1,390 vphpl northbound. The underutilization of SR 509 is due primarily to its poor connection to and from the south.

Traffic to and from the Sea-Tac Airport passenger terminal uses three major access points: North Access Expressway, South 170th Street to access expressway ramps, and the south entrance at approximately South 182nd Street. The highest volumes (1998) are on North Access Expressway, with a two-way p.m. peak-hour volume of more than 2,475 vph. The other two

entrances have two-way p.m. peak-hour volumes of 1,220 and 1,130 vph, respectively. Trip distribution modeling for nonlocal traffic (i.e., traffic from outside the immediate influence area of Sea-Tac Airport) indicates that about 8 percent of the traffic is to or from the west, 18 percent to or from the east, 38 percent to or from the north, and 36 percent to or from the south. The Sea-Tac Airport peak hour generally does not coincide with commuter peak hours on adjacent roadways.

Level of Service

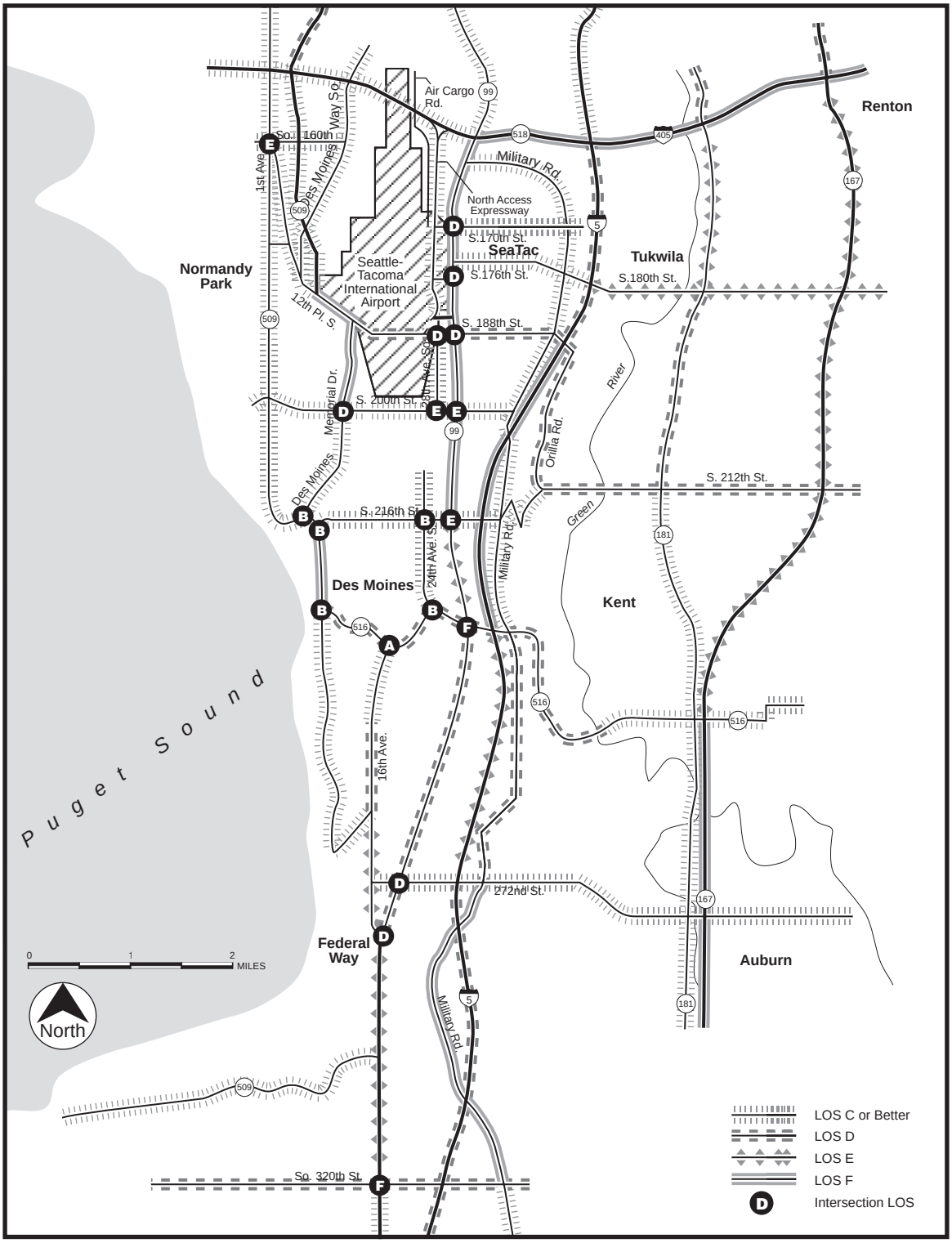
LOS is a qualitative description of the degree of comfort drivers experience as they travel along a corridor. LOS grades range from LOS A, in which little or no delay is experienced, to LOS F, which denotes extreme congestion. The TRB, in the *Highway Capacity Manual* (TRB 2000), provides definitions for each LOS grade.

Portions of the existing transportation system are highly congested during the p.m. peak hour. At the regional level, the I-5, SR 99, I-405, and SR 167 corridors are operating at LOS E or F. Portions of Des Moines Memorial Drive and SR 509 also are operating at LOS E and F. All of the signalized intersections along SR 99 operate at LOS D or worse. The intersections of First Avenue and South 160th Street and South 200th Street and 28th Avenue South operate at LOS E. The remaining intersections analyzed operate at LOS D or better (Figure 3.3-1).

In the SR 509 corridor, the freeway segment operates at LOS C to D. Immediately south of the freeway terminus, the SR 509 corridor operates at LOS C or better to South 216th Street. Most traffic uses Des Moines Memorial Drive between the freeway and South 216th Street rather than SR 509; as a result, portions of Des Moines Memorial Drive operate at LOS F. SR 509 operates at LOS F between South 216th Street and SR 516, where traffic volumes from SR 509 and Des Moines Memorial Drive merge. The arterial intersection at SR 509/SR 516 currently operates at LOS B.

Traffic on SR 509 through Des Moines has improved since 1992 as a result of completion of the Seventh Avenue South/Marine View Drive (SR 509) project, which added capacity in the corridor, and the additional work by WSDOT to improve the connections of First Avenue South and Des Moines Memorial Drive with Seventh Avenue South/Marine View Drive (SR 509) in the City's downtown business district.

All of these road conditions degrade travel efficiency within the project area. The primary arterials have many controlled (signaled) intersections and many direct access driveways. Stop-and-go travel conditions are common on the minor arterial and collectors. These conditions deteriorate the LOS of the primary arterials and tend to increase travel times and peak-hour congestion.



Note: Improvements made to SR 99 between South 170th Street and South 200th Street since 1999 have improved LOS within this roadway segment.

FIGURE 3.3-1

Existing Level of Service 1998 PM Peak Hour

Collectively, these conditions require more fuel consumption than under ideal conditions.

3.3.3 Environmental Impacts

Future use of the roadways under any of the project alternatives, including the No Action Alternative, would continue to result in the consumption of energy. A number of qualitative factors affects the consumption of energy. A first level of comparison is the number of miles traveled between two points. For example, if the distance traveled is substantially greater under one project alternative than another, then the consumption of energy for the same vehicle is greater for the longer route. Higher design speeds (above 55 mph) tend to increase energy consumption. Hilly terrain increases the consumption of energy. Uninterrupted travel would decrease energy consumption. And numerous traffic signals would increase energy consumption due to stop-and-go operation and idling. In addition, the annual cost of roadway maintenance is a quantitative measurement of the amount of energy consumed during operation. Table 3.3-1 compares the No Action Alternative and the build alternatives.

Alternative A (No Action)

Traffic flow would continue to be congested through the commercial and residential districts of project area. Vehicle speeds would be expected to remain between 25 to 35 mph. Actual speeds would vary due to the lack of controlled intersections and the high number of turning lanes along the east-west and north-south roadways. During periods of heavy use, traffic flow would likely be stop-and-go due to congestion.

Under the No Action Alternative, the length of the roadway system would not change, posted speed limits would remain between 25 and 35 mph, the terrain would remain rolling hills, traffic flow would be more congested given a projected 30 percent increase in the numbers of vehicles over the next 20 years, the existing street signal timing would remain, and the annual roadway maintenance costs would remain more or less the same as they are today. As described in Section 2.3.1 only minor construction and safety improvements of the local roads would occur under this alternative. Based on the comparative scheme, the total average rating for the No Action Alternative would be 1.7 points, the least of any of the build alternatives (see Table 3.3-1). Energy consumption during construction would be less than any of the build alternatives, however, energy consumption during operation would be higher.

Alternative B

Under Alternative B (including both the I-5 improvements and the South Access Road), a new 10.5-mile-long controlled roadway would be

constructed and operated. This alternative would have a design speed of 70 mph on a six-lane roadway traversing rolling terrain, good traffic flow, and no traffic signals except for the on- and off-ramps. Table 3.3-1 assigns a rating to these factors based on the values presented in the table and relative energy consumption. Annual roadway operation and maintenance costs are estimated to be $295,000. Based on relative ratings that represent energy consumption, Alternative B would be 3.3 points. According to this rating scheme, Alternative B would consume the most amount of energy of the build alternatives.

Alternative C2 (Preliminary Preferred)

Under Alternative C2 (including both the I-5 improvements and the South Access Road), a new 9.9-mile-long controlled roadway would be constructed and operated. The roadway would be a six-lane roadway and approximately six-tenths of a mile shorter than Alternative B. This Alternative would have a design speed of 70 mph traversing rolling terrain, and would have the best traffic flow of any of the alternatives, including the No Action Alternative. Annual operation and maintenance costs are estimated to be $295,000.

Based on the qualitative rating of these factors and their relationship to energy consumption, this alternative rating would be 2.2 points. Alternative C2 is anticipated to result in the lowest levels of energy consumption of the build alternatives and would provide the best traffic flow.

Alternative C3

Under Alternative C3 (including both the I-5 improvements and the South Access Road), a new 10.2-mile-long controlled roadway would be constructed and operated. The roadway would be a six-lane roadway and approximately two-tenths of a mile shorter than Alternative B. This alternative would have a design speed of 70 mph traversing rolling terrain, and would have good traffic flow compared to the other alternatives, including the No Action Alternative. Annual operation and maintenance costs are estimated to be $295,000.

Based on the qualitative rating of these factors and their relationship to energy consumption, this alternative rating would be 2.8 points. Alternative C3 is anticipated to result in the second lowest levels of energy consumption of the build alternatives and would provide good traffic flow.

3.3.4 Mitigation Measures

Once a roadway project has been constructed, few mitigation measures can be implemented to affect the consumption of energy resources. The physical characteristics of the roadway are set and the traffic signals and signs have been installed. The most effective measure to reduce the consumption of

energy would be to generally improve the energy efficiency (gas mileage) of the vehicles using the roadway system. This mitigation measure, however, is beyond the scope of this proposed project.

The operation of the build alternatives would not affect the availability of local or regional supplies of fuel. No additional supplies of energy would need to be developed to ensure long-term use of the proposed project, nor would the scope of the alternatives impact the production of energy. Lacking potential impacts resulting from the operation of any of the project alternatives in comparison to the availability, sources, and production of energy resources in the Pacific Northwest, no mitigation measures are proposed to address these issues.

3.3.5 Construction Activities and Mitigation

During the construction of transportation projects, energy consumption is typically quite high. The manufacture of building materials for road projects, as well as the materials themselves, consume energy resources. Workers typically drive to job sites in single-occupancy vehicles. Much of the construction equipment is motorized. The engines of backhoes, bulldozers, and cranes often idle for long periods each day. As a result, the amount of energy consumed in the construction of a transportation project is considerable.

Total construction cost is often used as a substitute value to compare energy consumption during the construction period. The cost of materials reflects the amount of energy consumed in the manufacture of the materials. The cost of labor is a measure of the number of workers commuting to the work site, as well as the amount of energy consumed operating the construction equipment. Some costs typically assigned to construction, however, do not directly correlate with the consumption of energy. For example, the acquisition of additional right-of-way does not consume energy. In addition, construction activities to relocate residences, businesses, and utilities consume energy, though these types of activities are typically excluded from construction cost estimates.

Table 3.3-1 presents a summary of cost estimates prepared for the proposed project. Dollar values and comparative ratings are displayed. The following paragraphs describe the construction cost estimates for the project alternatives as a measure to compare and contrast energy consumption.

Alternative A (No Action)

Under the No Action Alternative, only minor construction and safety improvements would be completed in the future. Expenditures during construction would be minimal and therefore, for comparison purposes, the

cost estimate has been set at zero. In comparison to the build alternatives, the No Action Alternative would consume the least amount of energy.

Alternative B

The total cost of constructing Alternative B is estimated to be $715 to $735 million. With the highest estimated construction costs, which in part is related to its longer length, this alternative would consume more energy to construct than the No Action Alternative or the other build alternatives.

Alternative C2 (Preliminary Preferred)

The total cost of constructing Alternative C2 is estimated to be $690 to $710 million (see Table 3.3-1). Based on the assumption that cost estimates can be used as a substitute value for energy consumption during construction, the cost estimates show that Alternative C2 would consume the least amount of energy to construct of any of the build alternatives and more than the No Action Alternative.

Alternative C3

The total cost of constructing Alternative C3 is estimated to be $695 to $715 million. Based on the assumption that cost estimates can be used as a substitute value for energy consumption during construction, the cost estimates show that Alternative C3 would consume about the same amount of energy to construct as Alternative C2 and more than the No Action Alternative.

Construction Mitigation

Major construction activities are proposed for each of the build alternatives. Only minor future construction is proposed for the No Action Alternative. Potential mitigation measures to reduce energy consumption during construction are briefly described below.

The magnitude of the construction activities proposed for the build alternatives would not affect the availability of local or regional supplies of fuel. No additional supplies of energy would need to be developed during construction, nor would the scope of the build alternatives impact the production of energy during the construction phase of the alternatives. Lacking potential impacts due to the relatively small scale of the project alternatives in comparison to the availability, sources, and production of energy resources in the Pacific Northwest, no mitigation measures are proposed to address these issues.

Alternative A (No Action)

No mitigation measures are necessary or proposed under the No Action Alternative to reduce energy consumption.

Alternative B

During construction, mitigation measures would be taken to reduce energy consumption. These mitigation measures could include the following: (1) 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, (2) limit the idling of construction equipment to the extent practical; (3) plan for the delivery of equipment and supplies during non-peak traffic periods to minimize disruptions to both traffic and construction activities, and (4) locate staging/laydown areas as close as possible to work sites to minimize travel distances.

Alternative C2 (Preliminary Preferred)

The mitigation measures suggested for Alternative B are equally appropriate to reduce construction-related energy consumption under Alternative C2.

Alternative C3

The mitigation measures suggested for Alternative B and C2 are equally appropriate to reduce construction-related energy consumption under Alternative C3.

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3.4 Geology and Soils

3.4 Geology and Soils

3.4.1 Studies and Coordination

Method of Analysis

This analysis is based on the findings of the *SR 509/South Access Road EIS Discipline Report: Geology and Soils* (CH2M HILL February 2000), *SR 509/South Access Road EIS: South Airport Link* (CH2M HILL August 2001), and *SR 509/South Access Road EIS: I-5 Improvements Report* (CH2M HILL October 2001). These discipline reports evaluated construction and operation impacts of the proposed project build alternatives and the No Action Alternative on geology and soils resources. For the purpose of this analysis, the project area is the area adjacent to the alignment the proposed SR 509 and South Access Road alternatives and the I-5 improvements. The evaluation included inventory and assessment of the geology, soils, topography, and unique physical features of the project area through review of geologic surveys, soil surveys, and topographic maps; sensitive areas maps for King County and the Cities of Des Moines and SeaTac; and previous technical studies, engineering reports, and borehole logs. A field reconnaissance of the project area was also performed. Areas subject to severe risk of erosion, landslide, and earthquake damage were identified. Based on this information, probable project impacts were assessed, including the effects of excavating, filling, stockpiling, paving, and draining on erosion and on steep and unstable slopes. Soils and geologic conditions that could constrain project design, construction, and operation were also identified.

Coordination with Agencies and Groups

The following agencies and groups were contacted during preparation of this Revised DEIS:

- U.S. Natural Resources Conservation Service, Renton, Washington, (formerly the Soil Conservation Service)
- WSDOT
- King County Department of Development and Environmental Services
- City of SeaTac
- City of Des Moines
- City of Kent

3.4.2 Affected Environment

Topography

The landscape of the project area was primarily formed by glacial and alluvial processes. It consists of a broad glacial plain that has been dissected by stream drainages and the Green River. The glacial uplands have gently rolling topography with slopes that generally range from nearly level to about 15 percent. Valleys and ravines occur along channels of the Des Moines, Massey, Miller, and McSorley creek drainages. Slopes along these drainages generally range from 15 to 40 percent; slopes greater than 40 percent occur in some areas. The Green River valley runs along the eastern edge of the project area and is marked by bluffs of up to 350 feet along its east valley wall. Elevation in the project area ranges from about 450 feet above mean sea level (msl) in the glacial uplands to about 40 feet above msl in the Green River valley.

Geology and Soils

The project area is located on the Des Moines Drift Plain. The drift plain consists of glacial sediments, nonglacial sediments, and recent alluvium. Most of the surface material in the project area was deposited during the Vashon glaciation, the last major glaciation. Deposits of the older Salmon Springs glaciation are exposed in some areas. The drift plain is underlain by Tertiary volcanic and sedimentary rock.

Soils mapped in the project area by the Soil Conservation Service (SCS) (1973) are shown in Figures 3.4-1 and 3.4-2. Alderwood and Everett soils occur on glacial uplands and terraces, and are the most common and abundant soils in the project area. Norma, Indianola, Kitsap, Bellingham, Seattle, and Tukwila soils occur less extensively.

Alderwood gravelly sandy loams are moderately well-drained soils that have a substratum of consolidated till at a depth of approximately 24 to 40 inches. Arents-Alderwood materials are Alderwood soils that have been substantially disturbed by urban development, but still have many features of undisturbed Alderwood soils. In both soils, surface horizons have moderately rapid permeability, but the till substratum is very slowly permeable, creating a high water table in winter. Erosion hazard is slight on slopes of 0 to 6 percent, slight to moderate on slopes of 6 to 15 percent, and severe to very severe on slopes greater than 15 percent. Slippage potential along the till contact is moderate to severe on slopes greater than 15 percent.

Everett gravelly sandy loams formed in glacial outwash. They are somewhat excessively drained soils that are underlain by very gravelly sand at a depth of 18 to 40 inches. Permeability is rapid. Erosion hazard is slight on slopes of 0 to 6 percent, slight to moderate on slopes of 6 to 15 percent, and severe to

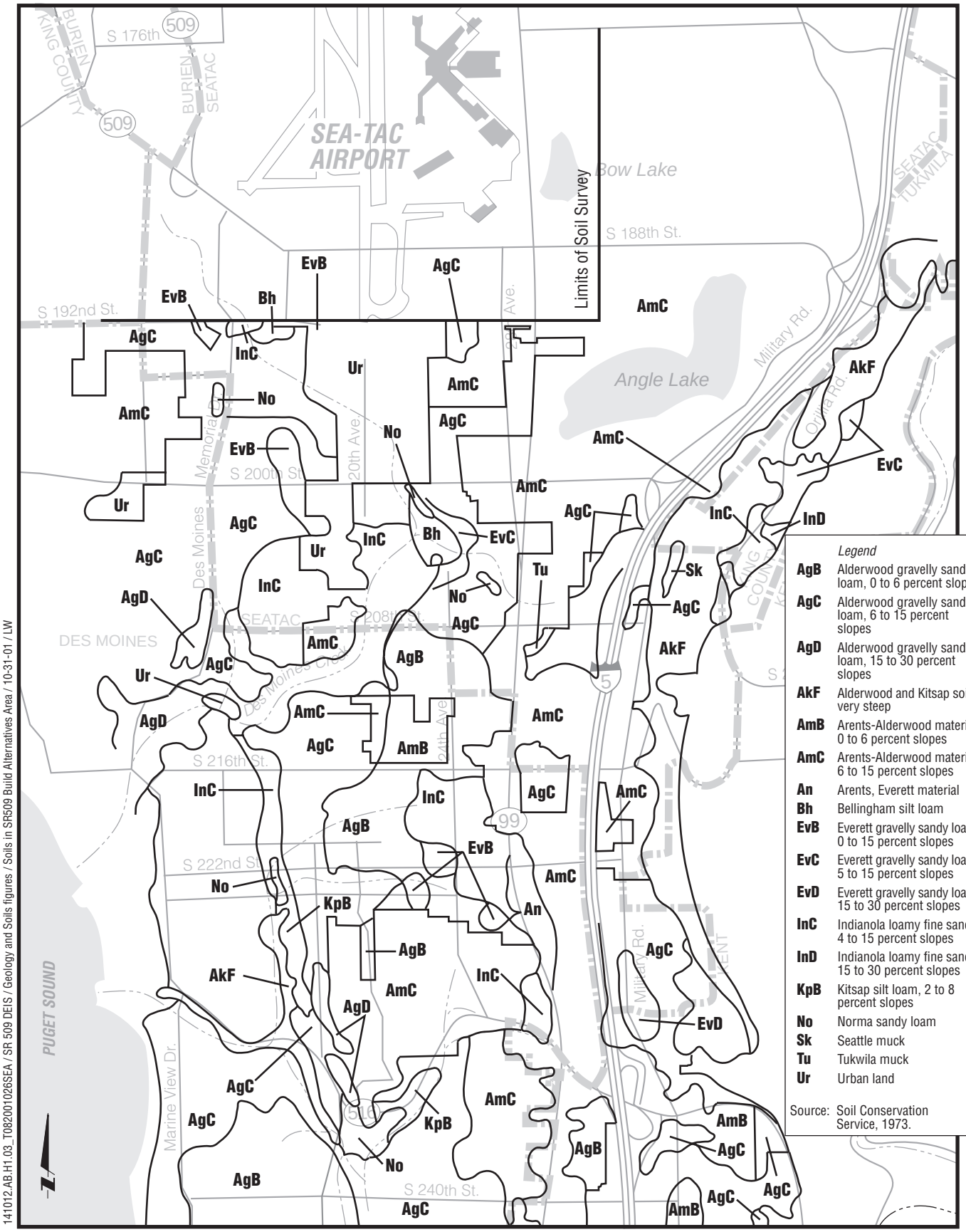

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FIGURE 3.4-1

Soils in the SR 509 Build Alternatives Area

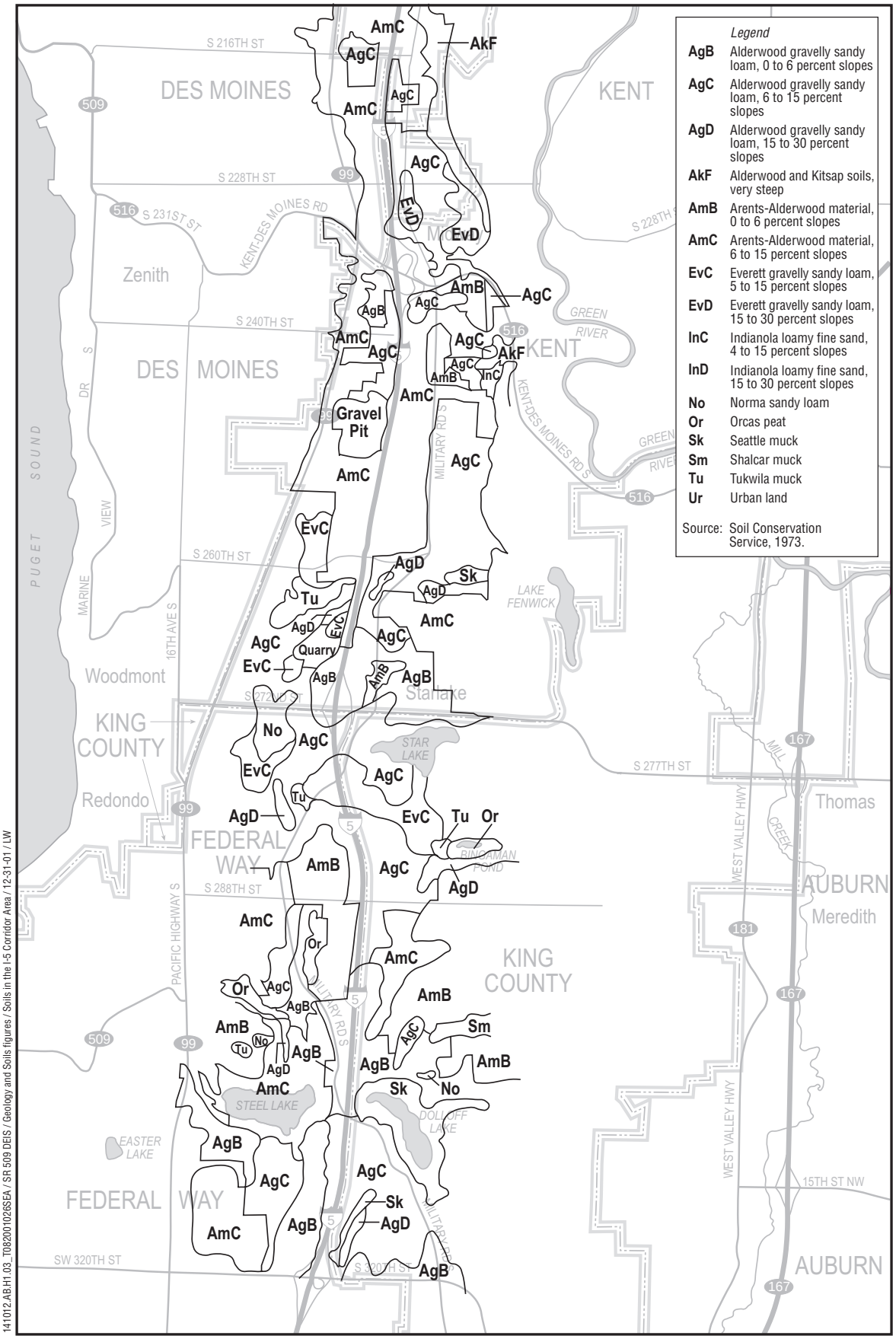

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FIGURE 3.4-2

Soils in the I-5 Corridor Area

very severe on slopes greater than 15 percent. Arents-Everett materials are Everett soils that have been disturbed by urban development, but have features similar to undisturbed Everett soils. They are level to gently sloping, and erosion hazard is slight.

Indianola loamy fine sands are somewhat excessively drained soils formed in sandy, stratified recessional outwash. Permeability is rapid. Slopes range from 4 to 15 percent, and erosion hazard is slight to moderate.

Kitsap silt loams are moderately well-drained soils that formed in glacial lake deposits and are found on terraces and strongly dissected terrace fronts. They have a substratum of platy, silty sediments at a depth of 18 to 40 inches. Permeability is moderate above the substratum and very slow within it. Water perches on top of the substratum in winter. Erosion hazard is slight to moderate on slopes of 2 to 8 percent, moderate to severe on slopes of 8 to 15 percent, and severe to very severe on slopes greater than 15 percent. Slippage potential along the substratum contact is moderate to severe on slopes greater than 8 percent.

Bellingham silt loams and Norma sandy loams are poorly drained soils formed in alluvium. Permeability is slow, slopes are less than 2 percent, and erosion hazard is slight. Bellingham soils occur in small depressions on glacial till plains. Norma soils occur in basins on glacial uplands and along stream channels. The water table is at or near the soil surface during the winter rainy season.

Seattle mucks and Tukwila mucks are poorly drained organic soils formed in depressions on till plains and in river and stream valleys. Permeability is moderate, and the high water table is at or near the surface during winter. Slopes are less than 1 percent, and there is little or no erosion hazard.

Site Seismicity

The project area lies within Seismic Zone 3 as defined in the Uniform Building Code (ICBO 1997). Zone 3 includes the Puget Sound region and represents an area of high seismic risk. Over the last 65 years, there have been 14 earthquakes of magnitude 5.0 and greater with epicenters in Washington. Seismicity in the region is a function of tectonic events and processes that occur as a result of collision between the Juan de Fuca plate and the North American plate. Geophysical investigations suggest that earthquakes may also occur from a network of faults beneath the Puget Sound basin. However, few active faults have been conclusively discovered because of the mid-crust depths of most of the earthquakes in the Puget Sound region and the thick overburden of geologically recent glacial and nonglacial sediments. No potentially active faults are mapped in the project area (Gower et al. 1985).

A seismic event may trigger slippage in areas susceptible to landslides or cause liquefaction in areas where relatively loose, fine-grained cohesionless soils occur below the water table. The following section discusses seismic hazards in the project area.

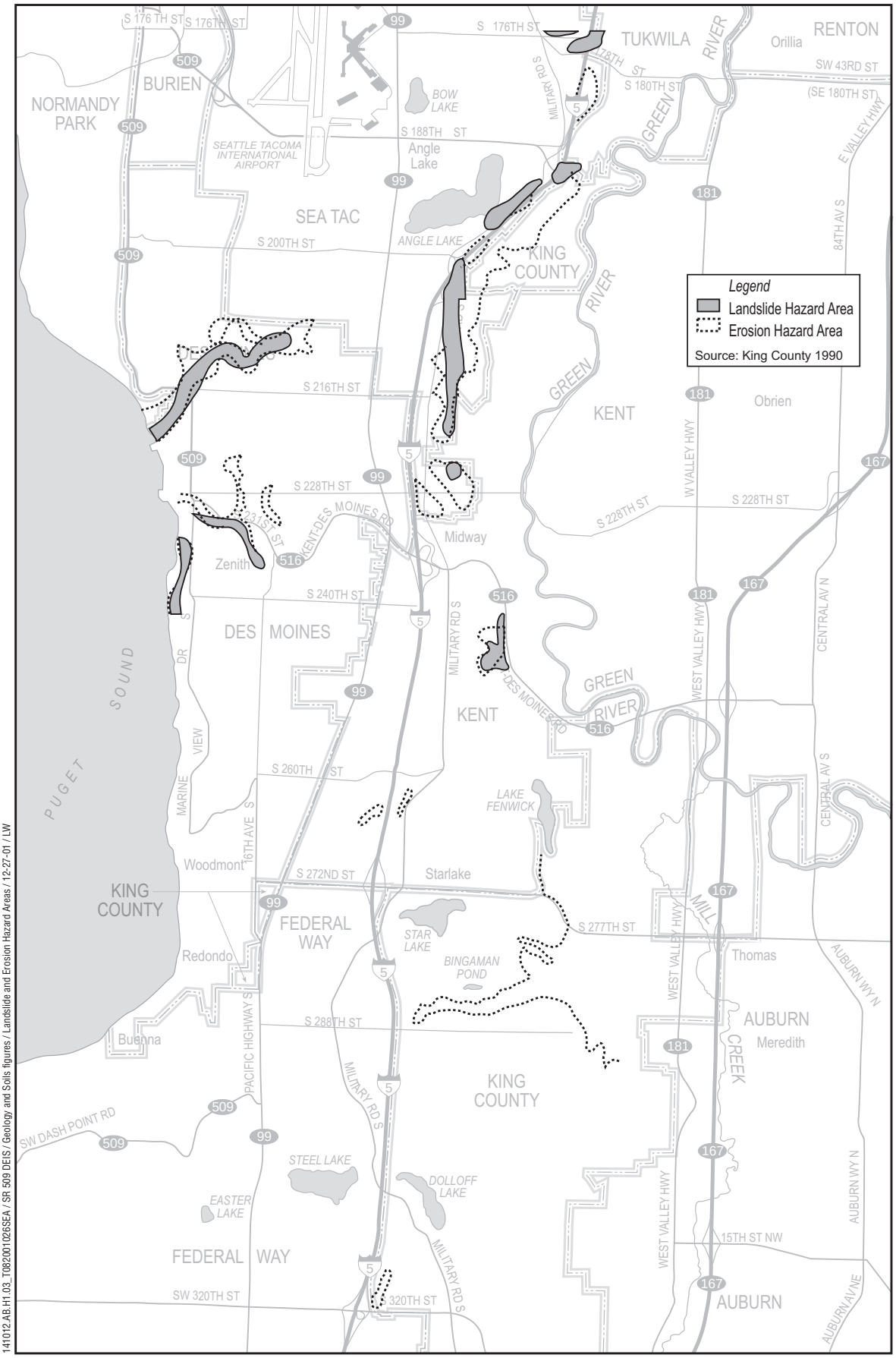
Sensitive Areas

Portions of the project area are designated as landslide, steep slope, erosion, and seismic hazard areas as defined in ordinances of King County (2001) and the Cities of Des Moines (2000), SeaTac (2001), Kent (2001), and Federal Way (2001). The intent of these ordinances is to regulate areas that have been identified as sensitive to help prevent and avoid activities that could have adverse impacts on property. Additional areas have been mapped as seismic hazard areas by Palmer et al. (1994, 1995).

Landslide hazard areas are sloping areas that are subject to a severe risk of landslide. They are defined as any area with a combination of slopes greater than 15 percent, impermeable soils, and springs or groundwater seepage. They are often associated with unconsolidated glacial deposits and alluvial fans. Steep slope hazard areas are landslide hazard areas on 40 percent or greater slopes. Erosion hazard areas are defined as areas of soils that are rated as having severe to very severe erosion hazard by the Natural Resources Conservation Service (SCS). They generally occur where slopes are greater than 15 percent. Landslide and erosion hazard areas identified within the project area are shown in Figure 3.4-3. These hazard areas occur along portions of the Green River and Des Moines Creek valley walls.

The proposed project is located within a seismic zone that represents an area susceptible to moderately high seismic activity. Seismic hazard areas are defined as areas subject to severe risk of earthquake damage as a result of seismically induced liquefaction. Liquefaction occurs when loose, saturated, and relatively cohesionless soil deposits temporarily lose strength because of earthquake shaking. Primary factors controlling the development of liquefaction include intensity and duration of strong ground motion, characteristics of subsurface soil, in situ stress conditions, and depth to groundwater. Potential effects of soil liquefaction include temporary loss of bearing capacity and lateral soil resistance, liquefaction-induced settlement, and lateral spreading.

Seismic hazard areas identified within the project area are shown in Figure 3.4-4. They generally occur in lacustrine deposits in the northern part of the project area, along a segment of Des Moines Creek, on the Green River floodplain, and in areas of fill.



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0 1900 3800
Scale in Feet

North

FIGURE 3.4-3

Landslide and Erosion Hazard Areas

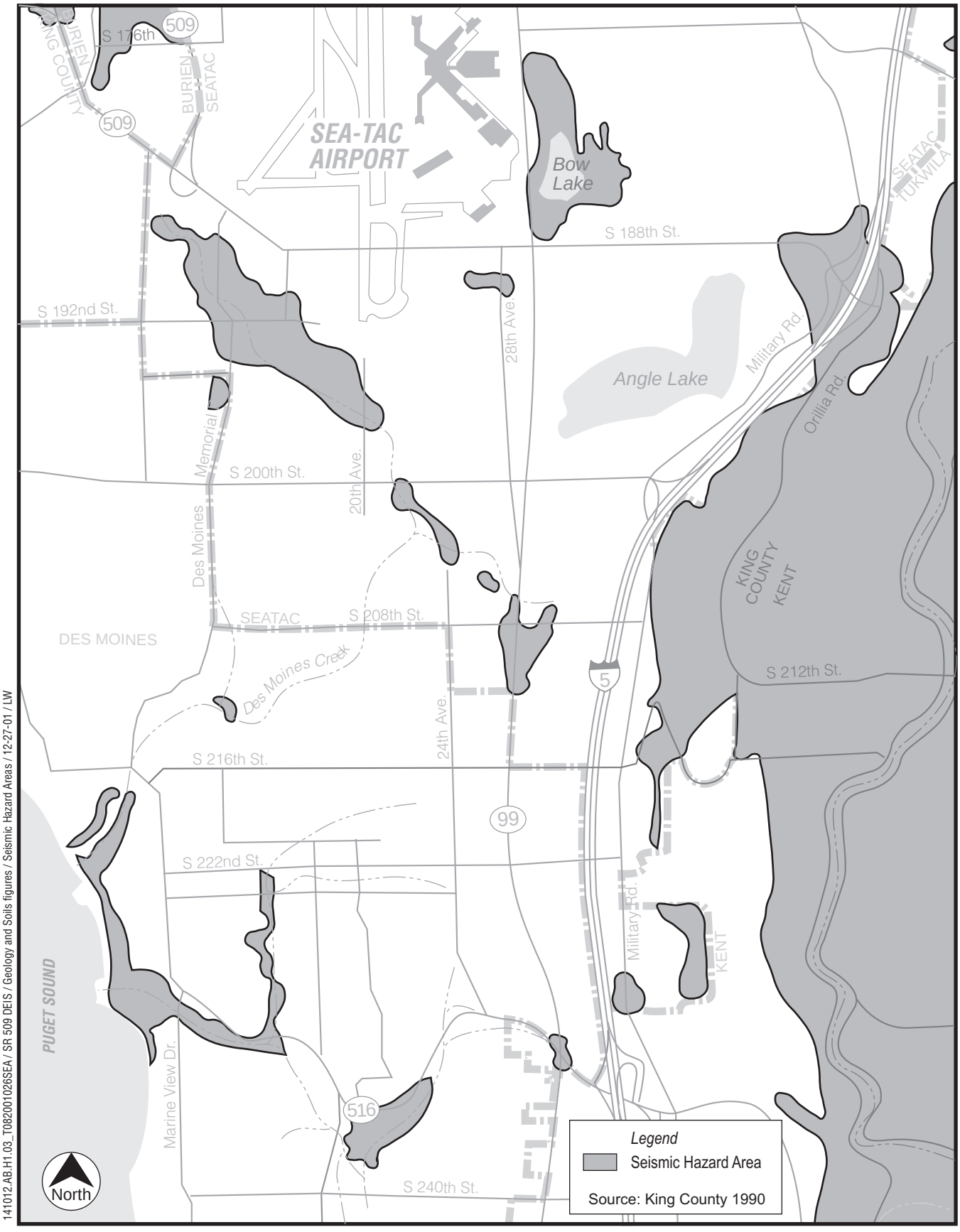

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FIGURE 3.4-4

Seismic Hazard Areas

3.4.3 Environmental Impacts

Alternative A (No Action)

The No Action Alternative would not result in any impacts on earth resources.

Impacts Common To All Build Alternatives

After construction, exposed soils would be either paved or revegetated. Little erosion and sedimentation would be expected after establishing vegetation. The amount of impervious surface would increase.

The project area is located within Seismic Zone 3, indicating the area is susceptible to moderately high seismic activity. This seismic zone includes the entire Puget Sound region. During a seismic event, the site would be subjected to ground motion. The potential for strong ground motion in the project area is considered no greater than for the Puget Sound in general. Moderate levels of earthquake shaking should be anticipated during the design life of the facility.

All of the build alternatives would cross seismic hazard areas. Liquefaction of soils in these areas during an earthquake could result in vertical and lateral displacements of structures, embankments, and paved areas. The liquefaction potential of all potential seismic hazard areas would be confirmed during the design stage of the preferred alternative. Design of structures to resist seismic forces and also secondary effects such as liquefaction might be required.

Alternative B

Alternative B would create about 4.2 million cubic yards (cy) of cut material and require about 3.5 million cy of fill material, including the I-5 improvements (Inca January 2000, CH2M HILL October 2001). This alternative would produce more cut material and would require more fill than Alternative C2, and more cut material but less fill material than Alternative C3. Consequently, the potential for erosion and sedimentation impacts for Alternative B would be the highest of the build alternatives.

Alternative B would cross five seismic hazard areas. The SR 509 extension would cross two seismic hazard areas: (1) near the intersection of SR 99 and South 208th Street where a bridge over SR 509 is proposed, and (2) north of South 192nd Street. A third seismic hazard area would be crossed by the South Access Road, south of South 200th Street. A fourth area would be crossed by the widened South 200th Street, west of the South Access Road. A fifth seismic hazard area would be crossed by SR 516 in the vicinity of SR 99 as part of the reconstructed I-5/SR 516 interchange. Liquefaction of soils in these areas during an earthquake could result in vertical and lateral

displacement of the bridge at the SR 99 crossing, as well as the embankments and paved roads at the other affected areas.

The South Access Road alignment would cross a small area mapped as Norma and Bellingham soils by the National Resources Conservation Service (formerly SCS). These soils could contain strata of compressible silty and organic material. Near the south end of the Alternative B SR 509 extension, the roadway would cross a small area of organic soil, Tukwila muck. Areas where these three soils occur might need to be excavated prior to roadway/ embankment construction. These unsuitable materials would be removed from the project area, unless deemed suitable for landscaped areas.

Alternative C2 (Preliminary Preferred)

Alternative C2 would create about 3.2 million cy of cut material and require about 1.2 million cy of fill material, including the I-5 improvements (Inca January 2000, CH2M HILL October 2001b). This alternative would produce the least amount of cut and fill material of all the build alternatives. The potential for erosion and sedimentation impacts for Alternative C2 would be the lowest of all the build alternatives.

Alternative C2 would cross five seismic hazard areas. These areas are: (1) near the intersection of SR 99 and South 208th Street where a bridge over SR 509 is proposed; (2) just northwest of the intersection of SR 99 and South 208th Street; (3) between South 204th Street and South 200th Street along the alignment; (4) north of South 200th Street near Des Moines Memorial Drive; and (5) west of Des Moines Memorial Drive between South 192nd Street and the existing SR 509 terminus. Liquefaction of soils in these areas during a seismic event could cause vertical and lateral displacements of soils under roadways, in embankment fill, and of the bridge footings at the SR 99 crossing.

Similar to Alternative B, small areas of the Norma sandy loam, Tukwila muck, and Bellingham silty loam are crossed by the alignment. These areas of potentially compressible soils might need to be excavated and replaced under roadways, embankments, and bridge footings.

Alternative C3

Construction of Alternative C3 would create about 3.8 million cy of cut material and require about 3.6 million cy of fill material, including the I-5 improvements (Inca January 2000, CH2M HILL October 2001b). This would be the more cut and fill material than for Alternative C2, and less cut material but more fill material than for Alternative B. The potential for erosion and sedimentation impacts for Alternative C3 would be higher than for Alternative C2, but less than Alternative B.

Alternative C3 would cross four seismic hazard areas. These areas are: (1) south of the intersection of SR 99 and South 208th Street where a bridge for SR 99 is proposed to go over SR 509; (2) between South 204th Street and South 200th Street along the alignment; (3) just south of Des Moines Memorial Drive between South 192nd Street and South 200th Street; and (4) west of Des Moines Memorial Drive between South 192nd Street and the existing SR 509 terminus. There is potential for liquefaction of soils in these areas during a seismic event. Liquefaction could cause vertical and lateral displacements of soils under roadways, embankment fills, and bridge footings at the SR 99 crossing.

Similar to Alternatives B and C2, small areas of the Norma sandy loam, Tukwila muck, and Bellingham silty loam are crossed by the alignment. These areas of potentially compressible soils might need to be excavated from under roadways, embankments, and bridge footings.

3.4.4 Mitigation Measures

A geotechnical investigation would be conducted as part of the design phase. Specific recommendations for liquefaction mitigation, subgrade preparation, roadway embankment, cut and fill, slope stability, foundation design, retaining structures, dewatering measures, and erosion control plans would be prepared prior to any construction. Suitable waste sites for unsuitable excavated soils would be identified prior to construction.

Structures would be designed to meet Seismic Zone 3 design requirements (ICBO 1997). Potential impacts of soil liquefaction could be mitigated by removing and replacing the loose materials with compacted fill materials. The need for removing and replacing would be evaluated on a case-by-case basis for the individual structural elements potentially impacted.

Retaining walls or other slope protection could be necessary where embankment fills need to be minimized. Where deep fills would be required, material should be selected from sources that allow construction of a compact base, yet afford fairly rapid drainage. Deep fill areas and retaining structures could require cross drainage.

3.4.5 Construction Activity Impacts and Mitigation

Construction Activity Impacts

Each of the build alternatives would require land clearing, grubbing and removing topsoil, cutting slopes, filling for roadway embankments, and paving roadways. Excavation and fill would result in minor topographic changes. Exposure of soils during excavation would increase the potential for erosion and downslope transport of sediment.

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 (2:1 or flatter) are not anticipated. Steepening slopes in areas of clean outwash, however, could increase the potential for soil erosion.

Prior to fill placement, overexcavation could be required in areas with soft organic or silt soils and areas with saturated soils. Existing fill that overlies native soil is likely of variable consistency and quality and also could require removal. The unsuitable soils would require removal from the project area, unless deemed suitable for landscaped areas.

Shallow groundwater is likely to be encountered in areas with poorly drained soils, areas adjacent to streams, wetland areas, and some areas underlain by till. Dewatering would be required for excavation below groundwater levels. Permanent drainage systems could be necessary in some areas to maintain the water table below the depth of excavation and to maintain stability of fill slopes and retaining structures.

Increased noise, dust, and traffic from hauling fill and excavated materials would be temporary impacts in the project vicinity. The magnitude of these impacts would depend on the location of borrow and waste sites, land uses along the haul routes, the duration of hauling operations, and construction phasing.

Mitigation Measures

A detailed erosion and sedimentation control plan would be required as part of the construction contract specifications. The plan would follow best management practices (BMPs). Drainageway protection and sediment retention would be approved by regulatory agencies prior to project construction (see Section 3.5, *Water Quality*). Additionally, construction activities would require a permit under the stormwater rules of the National Pollutant Discharge Elimination System (NPDES). Regular maintenance would be required for any permanent detention and sedimentation ponds constructed as part of the proposed project.

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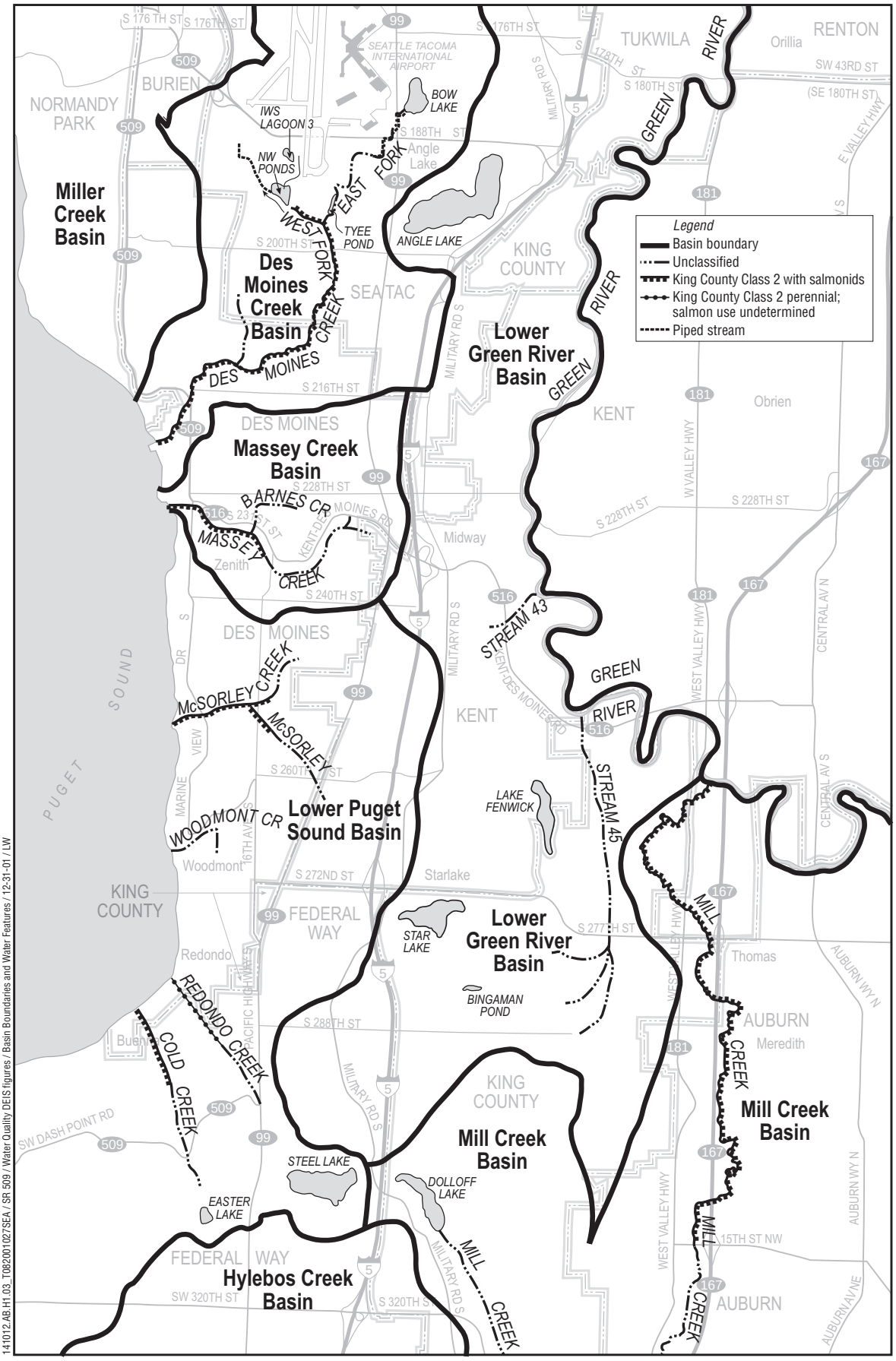
3.5 Water Quality

3.5.1 Studies and Coordination

This section is based on the findings of the *SR 509/South Access Road EIS Discipline Report: Water Quality* (CH2M HILL August 2000), *SR 509/South Access Road EIS: South Airport Link* (August 2001a), and *SR 509/South Access Road EIS: I-5 Improvements Report* (CH2M HILL October 2001). These discipline reports evaluated previous technical studies, engineering reports, basin plans, and topographic and natural resource maps to assess resources that could be affected by the proposed project. Identifying and evaluating potential impacts resulting from the proposed project alternatives also required coordinating with project consultants and representatives from natural resource management and regulatory agencies. The following agencies and jurisdictions were contacted during preparation of this Revised DEIS:

- U.S. EPA, Seattle Office, Region 10
- Washington State Department of Ecology (Ecology), Northwest Regional Office, Bellevue
- WSDOT
- King County Department of Natural Resources, Water and Land Resources Division
- King County Department of Metropolitan Services
- Highline Water Department
- City of Federal Way, Water and Sewer Department
- City of Des Moines, Public Works Department
- City of SeaTac, Public Works Department
- Port of Seattle

For this analysis, the project area includes all basins or watersheds potentially affected by this project (Figure 3.5-1). Information on drainage patterns, riparian land uses, riparian conditions, channel conditions, and hydrology in the project vicinity was augmented by field observations made during a jurisdictional wetland delineation and stream reconnaissance investigation. No water quality or flow data were collected.



0 1900 3800
Scale in Feet

North

1410I2.AB.H1.03_T082001027SEA / SR 509 / Water Quality DEIS figures / Basin Boundaries and Water Features / 12-31-01 / LW

FIGURE 3.5-1

Basin Boundaries and Water Features

Construction impacts on water quality were assessed by evaluating the proposed project alternatives' potential to increase erosion, sedimentation, stormwater, and other construction-related pollutants above existing conditions. Potential increases in construction-related erosion, sedimentation, stormwater, and pollutant loading are typically short term and generally decrease substantially after construction activities are completed. It was assumed that potential water quality impacts would be negligible in those basins that would not receive stormwater runoff from the proposed project. Therefore, potential construction impacts on surface water and groundwater quality were evaluated only for those water bodies expected to receive stormwater from construction sites.

Potential operational or long-term effects on surface waters were evaluated based on estimated average annual pollutant loads to receiving waters from the build alternatives. The FHWA design procedure (FHWA April 1990a, April 1990b), which has been adopted by WSDOT, was used to make the evaluation. The FHWA procedure is a probabilistic dilution model developed and applied in EPA's Nationwide Urban Runoff Program (NURP). The magnitude and frequency of occurrence of in-stream concentrations of a pollutant produced by stormwater runoff were computed as a basis for comparing the proposed alternatives. For each of the surface water basins affected by the proposed project alternatives, pollutant loadings were estimated for total suspended solids (TSS), chemical oxygen demand (COD), zinc, copper, nitrate/nitrite, total Kjeldahl nitrogen (TKN), and total phosphorus (TP). By examining each basin separately, impacts on surrounding resources could be assessed more precisely. The FHWA procedure was used to compare the compiled once-in-3-year concentration to the EPA acute criteria, to the recorded ambient (background) concentration, and to the Washington State Water Quality Standards for Class A waters.

The EPA's 3-year acute criteria were available only for toxic metals (zinc and copper). The stream ambient (background) concentrations in receiving streams were based on average pollutant concentrations from stormwater samples collected from December 1994 through July 1997 in Des Moines Creek, Massey Creek, and Barnes Creek (Herrera and Hall 1997). For each major receiving basin (Des Moines Creek Basin, Miller Creek Basin, Green River Basin, and Lower Puget Sound Basin) potentially affected by the build alternatives, probabilities of exceeding once-in-3-year target concentrations were computed. The same procedure was also used to document any cases where the Washington State Class A standards for toxic metals (zinc and copper) were exceeded.

Details on the FHWA procedure are documented in the water quality discipline report (CH2M HILL August 2000), and in the *SR 509/South Access Road EIS Discipline Report: South Airport Link* (CH2M HILL August 2001a). Treatment efficiencies of selected water quality treatment facilities were computed following median removal rates suggested in the

WSDOT Instructional Letter No. IL 4020.00, Enclosure C (WSDOT 1999) and in FHWA (1996) (Table 3.5-1).

Table 3.5-1
WSDOT Best Management Practices Effectiveness Rates

BMP*	Treatment Efficiency (%)			
	TSS	TKN	TP	Zinc
Wet Vault	23	5	5	5
Biofiltration Swale	72	25	28	67
Wet Pond	72	36	53	56
Vegetated Filter Strip	80	34	53	75

**WSDOT (1999).*

Wet ponds, bioswales, wet vaults, and some other innovative technologies, including treatment trains, have been considered for stormwater treatment. A description of technologies and some experimental BMPs being considered were presented in the *Stormwater Treatment Technical Memorandum* (CH2M HILL August 2001b).

Highway loadings were computed using the FHWA procedure (FHWA 1996).

3.5.2 Affected Environment

Basins and Resources

The proposed project would potentially affect the quality of water resources in five basins. These water resources include rivers, creeks, lakes, and groundwater.

Miller Creek Basin

Miller Creek Basin includes a drainage area of 5,200 acres and drains into Puget Sound. The Washington State Department of Fish and Wildlife (WDFW) identifies Miller Creek as stream 09.0371. The basin would be affected to an equal extent by each of the build alternatives; however, only a relatively small area of the basin would be disturbed, and there would likely be no substantial water quality impacts.

Des Moines Creek Basin

Des Moines Creek Basin includes a drainage area of 3,700 acres. Sea-Tac Airport in the northern portion of the basin occupies approximately 27 percent of the total basin area. The remainder of the basin is largely urbanized. Important resources in the basin include Des Moines Creek (King

County 1987) and associated wetlands. Bow Lake, Northwest Ponds (Wetland F), and Tyee Pond currently provide stormwater detention and treatment and are also near the build alternatives. Additional wetlands also are located within the Des Moines Creek Basin. Des Moines Creek, a King County Class 2 stream with salmonids, is the main drainage course in that basin.

Des Moines Creek generally flows south to southwest and empties into Puget Sound near South 222nd Street. WDFW identifies Des Moines Creek as stream 09.0377. Two major tributaries and two minor tributaries flow into Des Moines Creek. The major tributaries are known informally as the East Fork and West Fork. The East Fork, originating from Bow Lake, is a King County Class 3 stream in its lower reaches and unclassified in its upper reaches. Class 3 streams have intermittent flow and are not used by salmonids. The West Fork flows out of the Northwest Ponds complex at the western edge of the Tyee Valley Golf Course. The upper reaches of the West Fork are either designated Class 3 or are unclassified, while the lower reaches are Class 2. The two minor tributaries to Des Moines Creek are both unclassified.

Just upstream of the project area, near the Bow Lake outlet to the East Fork of Des Moines Creek, the corresponding flood frequency exceedance levels are 21, 29, and 35 cubic feet per second (cfs) (Des Moines Creek Basin Committee 1997). In general, impervious surfaces associated with development in the watershed have increased peak flows, resulting in downstream flooding in Des Moines Creek relative to predeveloped conditions. The higher peak flows, in turn, have led to problems with channel erosion and scouring of spawning gravel in downstream reaches of Des Moines Creek. The frequent flooding in the creek has also damaged public buildings and facilities in Des Moines Beach Park (Des Moines Creek Basin Committee 1997).

Lower Green River Basin

The Lower Green River Basin is a large basin that drains to the Duwamish River. Streams designated as 43 and 45 by USFW drain the basin north to Green River, which drains north to Puget Sound.

Stream 43 flows into the Green River at about river mile (RM) 20.0, and is located about 3,000 feet east of the project area. Stream 45 flows into the Green River at about RM 21.7, and is located more than 1 mile east of the project area. Star Lake is located about 1,000 feet east of the project area, and Lake Fenwick is located more than 1 mile east of the project area.

Lower Puget Sound Basin

Streams in the Lower Puget Sound Basin include McSorely Creek, Woodmont Creek, Redondo Creek, and Cold Creek, all draining to Puget

Sound. This basin would be impacted by stormwater runoff from the improvements along the I-5 corridor, located on the eastern boundary of the basin.

McSorley Creek is located within Saltwater State Park and flows into Puget Sound. Woodmont Creek flows directly into Puget Sound. The creek originates in a forested ravine more than 1 mile west of the project area. Woodmont Creek functions primarily as a stormwater conveyance channel with severe bank erosion (King County 1991). Redondo Creek flows directly into Puget Sound. Redondo Creek is located more than 1 mile west of the project area. Redondo Creek is one of the most severely incised channels in the basin, with heavy erosion associated with high flows and poor water quality resulting from nonpoint pollution from residential and commercial sources (King County 1991).

Cold Creek, located more than 1 mile west of the project area, flows into Puget Sound. Cold Creek has been piped and channeled in several locations. According to the *Lower Puget Sound Basin Plan* (King County 1991), Cold Creek drains from Easter Lake.

Mill Creek Basin

Water resources in the Mill Creek Basin include Mill Creek and Lake Dolloff. This basin would be impacted by stormwater runoff from the improvements along 4,000 feet of the I-5 corridor, located on the eastern boundary of the basin.

Mill Creek flows into the Green River at about RM 24.0. Lake Dolloff is located about 1,000 feet west of the project area. Mill Creek flows to the south from the outlet at the southeast end of Lake Dolloff, about 2,000 feet from the project area. Mill Creek drains first south, then north for about 8.4 miles into the Green River.

Groundwater

The project area has three aquifers, including a shallow aquifer, an intermediate aquifer, and a deep aquifer. The aquifers have been used historically as a source of groundwater for water supply. The shallow aquifer has been used for domestic, irrigation, and/or commercial purposes. The intermediate aquifer and the deep aquifer have been primarily used for municipal water supply. The largest municipal user is the Highline Well Field, which draws approximately 1.5 million gallons per day of water from the deep aquifer via the Angle Lake and Des Moines production wells. A new well, referred to as Tyee well, is currently being developed for municipal use. Two additional wells are located on Port of Seattle property: Well 2M, which is used for groundwater monitoring, and Well 1, which is not currently used for drinking water supply.

Surface Water

Des Moines Creek

Des Moines Creek is classified as a Class A (Port of Seattle April 1999) freshwater creek. Class A waters are usable for water supply, livestock watering, fish and wildlife, and recreation. Water quality standards for Class A waters are discussed relative to WAC Chapter 173-201A, *Water Quality Standards for Surface Waters of the State of Washington* (Table 3.5-2).

Water quality data collected in recent years indicate that elevated pollutant levels frequently occur in Des Moines Creek. In response to concerns over increased urbanization within the Des Moines Creek Basin, a multiagency watershed management team represented by Metro, King County, Port of Seattle, Ecology, and Trout Unlimited was established in 1986 to formulate a restoration plan for the creek. The team prepared a watershed management plan to control and maintain water quality and restore and maintain viable populations of salmon and trout. The recommended restoration plan is outlined in the *Des Moines Creek Restoration Project* (Herrera and Hall 1989). In the restoration plan, violations of water quality standards were reported for fecal coliform bacteria, metals, and turbidity.

In addition to water quality concerns associated with urban development, pollutants from operations at Sea-Tac Airport also are a concern (Des Moines Creek Basin Committee 1997). In general, water quality monitoring at the airport has shown runoff from the airport to be comparable to that of runoff from other urban land uses in the basin. However, there are industrial pollutants unique to airport operations that are collected and treated by the airport's Industrial Wastewater System (IWS). The IWS collects and processes drainage from areas in the airport that are more likely to contribute pollutants such as the aircraft servicing, loading, and de-icing locations. Effluent from the IWS is treated and then routed by pipeline along Des Moines Creek to just below the Midway Sewage Treatment Plant, where the IWS line joins the deep sewer outfall, which discharges to Puget Sound. Three fuel spills from the airport into Des Moines Creek between 1973 and 1986 resulted in mortality to fish and aquatic life (Parametrix 1994). Since these accidental spills, modifications to the IWS and inclusion of the Tyee Pond within the Regional Detention Facility make it unlikely that an impact of this nature would ever be repeated. Tyee Pond was designed to contain hydrocarbon spills and prevent them from reaching Des Moines Creek.

The airport's Storm Drain System (SDS) generally drains the runways, taxiways, and building roofs. Because these areas contribute relatively small pollutant loads, stormwater from the SDS discharges directly to Des Moines Creek in several locations along the perimeter of the airport. Monitoring conducted by the Port of Seattle indicates that stormwater from the airport is

Table 3.5-2
Washington State Department of Ecology Water Quality Standards for Class A Freshwaters and Lake Class

Parameter	Water Type	Standard*
Fecal coliform bacteria	Freshwater/ Lake	Shall not exceed a geometric mean of 100 colonies per 100 mL, and no more than 10% of samples used in calculating the geometric mean shall exceed 200 colonies per 100 mL.
Dissolved oxygen	Freshwater	Shall exceed 8.0 mg/L.
	Lake	No measurable decrease from natural conditions.
Total dissolved gas	Freshwater/ Lake	Shall not exceed 110% of saturation at any point of sample collection.
Temperature	Freshwater	Shall not exceed 18°C due to human activities. Incremental increases resulting from nonpoint source activities shall not exceed 2.8°C.
pH	Freshwater	Shall be in the range 6.5 to 8.5, with the human-caused variation within a range of less than 0.5 units.
	Lake	No measurable change from natural conditions.
Turbidity	Freshwater	Shall not exceed 5 NTU over background conditions when the background is 50 NTU or less, or have more than 10% increase in turbidity when background is more than 50 NTU.
	Lake	Shall not exceed 5 NTU over background conditions.
Toxic, radioactive, or deleterious material concentrations	Freshwater	Shall be below concentrations that may adversely affect characteristic water uses, cause acute or chronic conditions in the most sensitive aquatic biota, or adversely affect public health.

** Adapted from Water Quality Standards for Surface Waters of the State of Washington, WAC Chapter 173-201A, November 18, 1997. See this statute for complete language on water quality standards for these parameters and acute and chronic standard for toxic substances (e.g., metals, pesticides, and organics), which are not listed here.*
mL = milliliter
mg/L = milligrams per liter
°C = degree(s) Celsius
% = percent
NTU = nephelometric turbidity units

generally cleaner compared to similar urban runoff for TSS, biological oxygen demand (BOD), TP, total copper, total lead, total zinc, and oil and grease (Port of Seattle November 1996, June 1997, September 1997, November 1998). Chemicals associated with de-icing activities have also been detected in stormwater samples from the airport (Des Moines Creek Basin Committee 1997). For example, ammonia (from urea) in airport stormwater has been detected at concentrations that violate both chronic and

acute toxicity standards for aquatic life (Port of Seattle April 1996). However, because urea is no longer used as a de-icer at the airport, observed ammonia levels have been generally lower compared to other urban land uses (Port of Seattle 1999). Both the airport's IWS and SDS facilities are covered by an NPDES permit issued by Ecology. This permit regulates the discharges from both systems and is periodically reviewed and updated.

In 1997, the *Des Moines Creek Basin Plan* (Des Moines Creek Basin Committee 1997) was produced through a cooperative interjurisdictional effort undertaken by King County, the Cities of SeaTac and Des Moines, and the Port of Seattle. One of the primary goals of this basin plan was to develop a shared plan for addressing water quality and quantity issues. The specific water quality-related concerns that were identified in the *Des Moines Creek Basin Plan* are: Turbidity and suspended solids; high nutrient levels; water temperatures that frequently exceed optimal upper temperature limits for salmonid species; and low dissolved oxygen.

Average seasonal flow rates near the outlet of Des Moines Creek range from 1.3 cfs in July to 12.3 cfs in December. At the outlet of Des Moines Creek, flow exceedance levels for events with 2-, 5-, and 10-year recurrence intervals are estimated to be 171, 211, and 255 cfs, respectively. In general, impervious surfaces associated with development in the watershed have increased peak flows and downstream flooding in Des Moines Creek relative to predeveloped conditions. The higher peak flows have, in turn, led to problems with channel erosion and scouring of spawning gravel in downstream reaches of Des Moines Creek. The frequent flooding in the creek has also damaged public buildings and facilities in Des Moines Beach Park.

Lower Green River

The Lower Green River has been listed as a Class AA (extraordinary) freshwater creek (WAC 173-201A 1997). Class AA waters generally exceed the water quality requirements for all beneficial uses. The Lower Green River watershed is part of the Green River/Duwamish River watershed, and is located east of I-5 and the Sea-Tac Airport, including Angle Lake. United States Geological Survey (USGS), Ecology, and Metro have measured water quality at several locations on this watershed during the last decade. The focus of these studies was nutrients from precipitation and domestically applied fertilizers. Precipitation is estimated to contribute from 1 to 2 tons of nitrogen per square mile each year, and from 0.10 to 0.2 ton of phosphorus per square mile of the watershed each year (USGS 1995). Additionally, these studies estimated annual contribution of 1 ton per square mile per year of inorganic nitrogen. No additional water quality data have been collected for this project.

Streams of Lower Puget Sound Basin

No water quality data are available for McSorley Creek and Woodmont Creek. Redondo Creek and Cold Creek have been monitored by King County (1991). However, water quality standards in those creeks have not been exceeded since 1998 (Ecology 1998).

Mill Creek

King County and Ecology conducted water quality monitoring on the creek during 1993 and 1994. Water temperatures exceeded the Washington State standards upper temperature limits several times. Fecal coliform bacteria similarly exceeded the Washington State standards upper limits numerous times.

Clean Water Act Section 303(d) Waters

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 is 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 is listed as a 303(d) water because of exceedances for mercury, fecal coliforms, chromium, and temperature. Mill Creek is listed as a 303(d) water because of exceedances for temperature, dissolved oxygen, and fecal coliforms.

3.5.3 Environmental Impacts

Alternative A (No Action)

Under the No Action Alternative, adverse effects on water quality from the proposed project would not occur. However, other roadway construction and developments are planned and anticipated to occur over the next few years in the project vicinity. These activities would add impervious surfaces to the basins in the project area that could adversely affect the water quality of streams and wetlands.

Impacts Common to All Build Alternatives

Surface Water

Construction activities for each of the build alternatives would include clearing vegetation, regrading the existing ground surface, installing bridges at stream crossings, excavation for structures, staging and handling construction materials, and operating machinery. Removing vegetation would

decrease stormwater infiltration into the soil profile, expose mineral soils, and decrease evapotranspiration. Regrading the ground surface along the alternative alignments would disrupt upstream surface waters, including sheet flow and channelized flow. Sheet flow that currently flows across the project area from land upstream and adjacent to the roadway would be intercepted, conveyed, and discharged to a collection system.

Removing vegetation, intercepting sheet flow, and compacting soils would increase surface runoff volumes and rates. The increase in surface water flow rates and volumes could cause erosion and subsequent sedimentation in receiving channels. Increased surface water flow in the disturbed area would also have the potential to transport sediments downstream. Removing vegetation adjacent to streams could reduce shading and increase the temperature of water in the streams.

Highway operations would have the potential to affect surface water quantity and quality. The relative impact of a particular activity would depend to a large extent on its proximity to the receiving water bodies and the susceptibility of the water to the delivered pollutant. Specifically, Alternatives B, C2, and C3 would affect Des Moines Creek at one crossing of the main stem of Des Moines Creek, and four crossings of the East Fork of Des Moines Creek. No streams would be crossed by the I-5 improvements.

Stormwater runoff from the highway, accidental spills, sanding and de-icing, and vegetation controls are operational activities that have the potential to affect surface water. The maintenance of road and drainage structures would potentially impact surface water. The operational impacts are described below.

Water Quantity

The impervious highway surface and reduced soil infiltration capacity resulting from grading and landscaping in the remaining portion of the right-of-way would increase surface water runoff rates and volumes. Stormwater from the highway would be collected and conveyed to a management facility to attenuate peak flow rates. Nevertheless, total runoff volumes would most likely be higher compared with existing conditions, and the duration of flow for a given storm volume would be shorter.

Regrading along the proposed alternative alignments would change the course of offsite sheet flow. An interceptor ditch along the highway would collect offsite unconcentrated flow crossing the alignments and convey the water to a discharge outlet. Concentrating flows in this manner would have the potential to increase erosion in the receiving channel. Altering the existing path of unconcentrated flow also might decrease the water supply to dependent resources and groundwater.

Water Quality

Operation and maintenance of the build alternatives could degrade the quality of surface waters unless stormwater is effectively treated. Pollutants such as oil and grease, zinc, copper, wear from tires, vehicle particle flake, sediments, herbicides, and nutrients are commonly associated with highway stormwater runoff.

SR-509 Freeway Extension/South Access Road

Using the FHWA design procedure (FHWA April 1990a, April 1990b), the probabilities of exceeding ambient background concentrations and Washington State Class A standards are presented in Tables 3.5-3 and 3.5-4 for the proposed SR 509 freeway extension and South Access Road. These tables present concentrations without treatment by BMPs. Stormwater pollutant concentrations for all pollutants would exceed the 0.35% threshold, below which no stormwater treatment is required. Statistically, there would be no difference among the build alternatives, although Alternative C2 would have the lowest concentrations in the Miller Creek Basin and Alternative C3 the lowest concentrations in the Des Moines Creek Basin. The slight differences in concentrations would be due to different tributary watershed sizes and percentage of impervious surfaces on each watershed.

Using the WSDOT BMPs effectiveness rates (Table 3.5-1), the final pollutant concentrations after treatment at various BMPs are presented in Table 3.5-5. The last column of the table summarizes the concentration after treatment with biofiltration swales and wet ponds, the treatment train considered in the drainage design (CH2M HILL August 2001b). The thresholds recommended by the EPA, and Washington State Class A threshold for zinc are also included for comparison. To satisfy these thresholds, treatment using wet ponds with biofiltration swales, vegetated filter strips, or both would be necessary, as those facilities are the most efficient.

The average annual pollutant loadings from new roadway surfaces were computed for TSS, zinc, TKN, and TP using the FHWA procedure (FHWA 1996). The obtained annual loadings were then reduced assuming treatment efficiencies for biofiltration swales and wet ponds (Table 3.5-1) and compared with the annual pollutant loadings from the existing condition in Table 3.5-6. In general, the annual loadings after treatment would be higher than the annual loadings for existing conditions. The total loadings from Alternative C2 would be lower than the loadings from Alternatives B and C3 for all pollutants in both Des Moines Creek Basin and Miller Creek Basin. Average annual loading in both basins before treatment at stormwater facilities are also included for comparison in Table 3.5-6. TSS loading would be reduced over 10 times, zinc loading 7 times, TP 3 times, and TKN only 2 times.

Table 3.5-3
Stormwater Pollutant Concentrations from New Roadway Surfaces Relative to Background Concentrations

Basin/Parameter	Site Median Concentration (mg/L)[a]	Stream Background Concentration (mg/L)[b]	FHWA Model: Percent of Events Exceeding Once-in-3-Year Background Concentrations		
			Alternative B	Alternative C2 (Preliminary Preferred)	Alternative C3
Miller Creek Basin -SR-509 impact					
Total Suspended Solids	142.0	60.0	87	79	82
Zinc	0.329	0.023	99	98	99
Copper	0.054	0.005	98	96	97
Total Phosphorus	0.4	0.151	90	95	86
Nitrates and Nitrites	0.76	0.76	45	38	34
Des Moines Creek Basin -SR-509 impact					
Total Suspended Solids	142.0	58.7	17	17	70
Zinc	0.329	0.023	53	53	97
Copper	0.054	0.004	51	51	96
Total Phosphorous	0.4	0.151	20	20	75
Nitrates and Nitrites	0.76	0.652	3	3	29
Des Moines Creek Basin- I5 impact					
Total Suspended Solids	142	58.7	17	17	17
Zinc	0.329	0.023	53	53	53
Copper	0.054	0.004	51	51	51
Total Phosphorous	0.4	0.151	20	20	20
Nitrates and Nitrites	0.76	0.652	3	3	3
Lower Green River Basin - I5 impact					
Total Suspended Solids	142.0	7.9	67	67	67
Zinc	0.329	0.023	22	22	22
Copper	0.054	0.005	20	20	20
Total Phosphorus	0.4	0.031	54	54	54
Nitrates and Nitrites	0.76	0.366	1	1	1
Lower Puget Sound Basin (McSorley Creek) - I5 impact					
Total Suspended Solids	142.0	12.0	59	59	59
Zinc	0.329	0.023	98	98	98
Copper	0.054	0.005	98	98	98
Total Phosphorus	0.4	0.141	84	84	84

Table 3.5-3
Stormwater Pollutant Concentrations from New Roadway Surfaces Relative to Background Concentrations

Basin/Parameter	Site Median Concentration (mg/L)[a]	Stream Background Concentration (mg/L)[b]	FHWA Model: Percent of Events Exceeding Once-in-3-Year Background Concentrations		
			Alternative B	Alternative C2 (Preliminary Preferred)	Alternative C3
Nitrates and Nitrites	0.76	0.43	39	39	39
Mill Creek Basin - I5 impact					
Total Suspended Solids	142.0	12.0	87	87	87
Zinc	0.329	0.023	42	42	42
Copper	0.054	0.005	39	39	39
Total Phosphorus	0.4	0.141	15	15	15
Nitrates and Nitrites	0.76	0.43	6	6	6

Note: No treatment was considered in this table. All exceedance probabilities higher than 0.35% necessitate stormwater treatment.

[a] *Site median concentration values are the median site values from FHWA database (993 runoff events) for urban highways with average annual daily traffic (AADT) > 30,000 vehicles/day.*

[b] *Background concentrations in Des Moines and Miller basins are based on the average of 15 stormwater samples in Des Moines Creek, four locations in Massey Creek Basin (Herrera, 1997). Background concentrations of zinc and copper in all basins were estimated from these measurements. Stream background concentrations for Miller Creek (for all pollutants except for zinc and copper) were estimated as arithmetic averages from samples in Des Moines Creek and Massey Creek Basins. Stream concentrations for the Lower Green River Basin were estimated from the water quality samples collected by Department of Ecology at Station 09A090 on Green River at Kent. Stream concentrations for the Mill Creek Basin were estimated from the water quality samples collected by Department of Ecology at Station 09E070 on Mill Creek at Orillia.*

Table 3.5-4
Stormwater Pollutant Concentrations from New Roadway Surfaces Compared to Washington State Class A Standards

Basin/Parameter	Site Median Concentration (mg/L)a	WA Class A Standard (mg/L)b	FHWA Model: Percent of Events Exceeding State Standards Once Every 3 Years		
			Alternative B	Alternative C2 (Preliminary Preferred)	Alternative C3
Miller Creek Basin - SR-509 impact					
Zinc	0.329	0.064	84	72	76
Copper	0.054	0.00885	89	79	82
Des Moines Creek Basin - SR-509 impact					
Zinc	0.329	0.064	70	70	61
Copper	0.054	0.00885	78	78	70
Des Moines Creek Basin - I-5 impact					
Zinc	0.329	0.064	13	13	13
Copper	0.054	0.00885	17	17	17
Lower Green River Basin- I5 impact					
Zinc	0.329	0.064	3	3	3
Copper	0.054	0.00885	5	5	5
Lower Puget Sound Basin (McSorley Creek) - I5 impact					
Zinc	0.329	0.064	73	73	73
Copper	0.054	0.00885	80	80	80
Mill Creek Basin - I5 impact					
Zinc	0.329	0.064	8	8	8
Copper	0.054	0.00885	12	12	12

Note: No treatment was considered in this table. All exceedance probabilities higher than 0.35% require stormwater treatment. Hardness of 50 ppm (1996) was measured for stormwater samples; hardness of 80 ppm was measured for baseflow samples.

[a] *Site median concentration values are the median site values from the FHWA database (993 runoff events) for urban highways with average annual daily traffic > 30,000 vehicles/day.*

[b] *These thresholds were computed using hardness of 50 ppm.*

Table 3.5-5
Pollutant Removal Using Various BMPs for Selected Parameters

Basin/Parameter	Site Median Concentration (mg/L)[b]	Background Concentration (mg/L)[c]	EPA Acute Criteria (mg/L)[d]	WA State Standard (stormflow; baseflow) (mg/L)[e]	Concentration After BMP Treatment (mg/L)[a]				Biofiltration Swale and Wet Pond train
					Wet Vault	Biofiltration Swale	Wet Pond	Vegetated Filter Strip	
Des Moines Creek Basin									
Total Suspended Solids	142.00	58.70			109.34	39.76	39.76	28.40	11.13
Zinc	0.33	0.02	0.18	0.064; 0.095	0.31	0.11	0.14	0.08	0.05
Total Phosphorus	0.40	0.15			0.38	0.29	0.19	0.19	0.14
Total Kjeldahl Nitrogen	1.83	---			1.74	1.37	1.17	1.21	0.88
Miller Creek Basin									
Total Suspended Solids	142.00	60.00			109.34	39.76	39.76	28.40	11.13
Zinc	0.33	0.02	0.18	0.064; 0.095	0.31	0.11	0.14	0.08	0.05
Total Phosphorus	0.40	0.15			0.38	0.29	0.19	0.19	0.14
Total Kjeldahl Nitrogen	1.83	---			1.74	1.37	1.17	1.21	0.88
Lower Green River Basin									
Total Suspended Solids	142.00	7.9			109.34	39.76	39.76	28.40	11.13
Zinc	0.33	0.023	0.18	0.064; 0.095	0.31	0.11	0.14	0.08	0.05
Total Phosphorus	0.40	0.031			0.38	0.29	0.19	0.19	0.14
Total Kjeldahl Nitrogen	1.83	---			1.74	1.37	1.17	1.21	0.88
Lower Puget Sound Basin									
Total Suspended Solids	142.00	12.0			109.34	39.76	39.76	28.40	11.13
Zinc	0.33	0.023	0.18	0.064; 0.095	0.31	0.11	0.14	0.08	0.05
Total Phosphorus	0.40	0.141			0.38	0.29	0.19	0.19	0.14
Total Kjeldahl Nitrogen	1.83	---			1.74	1.37	1.17	1.21	0.88
Mill Creek Basin									
Total Suspended Solids	142.00	12.0			109.34	39.76	39.76	28.40	11.13
Zinc	0.33	0.023	0.18	0.064; 0.095	0.31	0.11	0.14	0.08	0.05
Total Phosphorus	0.40	0.141			0.38	0.29	0.19	0.19	0.14
Total Kjeldahl Nitrogen	1.83	---			1.74	1.37	1.17	1.21	0.88

Note: Hardness of 50 ppm was measured for stormwater samples: hardness of 80 ppm was measured for baseflow samples.

[a] *See Table 3.5-1 for BMP treatment efficiencies.*

[b] *FHWA (1996). Site median concentration values are the median site values from the FHWA database (993 runoff events) for urban highways with average annual daily traffic >30,000 vehicles/day.*

[c] *Stream background concentrations for the Miller Creek and Green River Basins (for all pollutants except zinc and copper) were estimated as arithmetic averages from samples in Des Moines Creek and Massey Creek Basins. Stream concentrations for the Lower Puget Sound and Mill Creek Basins were estimated as arithmentic averages form samples in Mill Creek Basin. Stream concentrations for the Lower Green River Basin were estimated from the water quality samples from Green River in Kent at 212th Street.*

[d] *National Urban Runoff Program (NURP) conducted by EPA.*

[e] *Source: WAC Chapter 173-201A (stormflow hardness = 50 ppm, baseflow hardness = 80 ppm).*

Table 3.5-6
Total Pollutant Loading From New Roadway Surfaces from SR 509/South Access Road Alternatives [kg/year]

Pollutant	Alternative	Annual Mass Loading Before Treatment		Annual Mass Loading After Treatment at Bioswale and Wet Pond	
		Des Moines Creek	Miller Creek	Des Moines Creek	Miller Creek
Total Suspended Solids	Alternative B	55,937	4,295	4,385	337
	Alternative C2	41,518	1,267	3,255	99
	Alternative C3	43,808	1,297	3,435	102
Zinc	Alternative B	130	9.5	19	1.4
	Alternative C2	96	2.8	14	0.4
	Alternative C3	101	2.9	15	0.4
Total Kjeldahl Nitrogen	Alternative B	721	52.6	346	25.2
	Alternative C2	535	15.5	257	7.4
	Alternative C3	565	16.9	271	8.1
Total Phosphorus	Alternative B	130	9.5	44	3.2
	Alternative C2	96	2.8	32	0.9
	Alternative C3	101	2.9	34	1.0

Note: Annual mass loadings for each alternative were computed using the FHWA procedure (FHWA, 1996). Pollutant loadings were then reduced assuming treatment efficiencies from Table 3.5-1.

I-5 Improvements

The proposed I-5 improvements would create approximately 37 acres of new impervious surface. Approximately 1.3 acres would be located in the Miller Creek Basin, 10.3 acres in the McSorley Creek sub-basin of the Lower Puget Sound Basin, 23.3 acre in the Lower Green River Basin, and 2.1 acres in the Des Moines Creek Basin. Runoff from the new impervious surfaces has the potential to adversely affect water quality; however, no streams would be crossed by the proposed I-5 improvements.

Drainage design and layout of stormwater treatment facilities is detailed in the *I-5 Corridor Improvements Drainage Facilities Concepts Technical Memorandum* (CH2M HILL November 2001). Stormwater generated from all new surfaces would affect Des Moines Creek Basin, Lower Green River Basin, Lower Puget Sound Basin (mostly McSorley Creek), and Mill Creek Basin. Stormwater would be treated by biofiltration swale, wet pond, or biofiltration swale-wet pond treatment train.

Assessment of stormwater pollutant concentrations from new roadway surfaces is presented in Table 3.5-3 relative to background concentrations, and in Table 3.5-4 relative to Washington State Class A-standards. Without treatment, the greatest potential impact would be in the Lower Puget Sound Basin, where almost 100 percent of rainfall events would generate pollutants that would exceed the threshold criteria for zinc and copper. TSS loadings would be exceeded most of the times in the Mill Creek Basin (87 percent). In general, pollutant concentrations from I-5 improvements in Des Moines Creek Basin would be several times less than the impact from the SR 509 improvements in the same basin.

The average annual loading from new roadway surfaces were computed for TSS, zinc, TKN, and TP using the FHWA procedure (FHWA 1996). The obtained loadings were reduced for stormwater facilities specified in the drainage design report (CH2M HILL November 2001), using treatment efficiencies from Table 3.5-1. These loadings were then compared with the pollutant loadings before the treatment (Table 3.5-7). The highest removal efficiency would be achieved in the Des Moines Creek and Mill Creek basins for all pollutants. The removal of TSS pollutants would be the most efficient (56 to 72 percent). The removal of TKN pollutants would be the least efficient (24 to 36 percent), especially in the Lower Green River Basin (24 percent).

South Airport Link

This 1,000-foot segment of the proposed South Access Road would impact only the East Fork of Des Moines Creek. For design options H0, H2-A, and H2-B, bioswales in combination with wet vaults are proposed for stormwater treatment. Stormwater pollutant concentrations, expressed as exceedance

Table 3.5-7
Total Pollutant Loading from New Roadway Surfaces for I-5 improvements

Pollutant	Basin impacted by I-5	Annual Mass Loading Before Treatment [kg/year]	Annual Mass Loading After Treatment [kg/year]	Overal efficiency [percent]
TSS	Des Moines	4,342	1,216	72
	Lower Green River	54,632	24,010	56
	Lower Puget Sound	25,585	9,320	64
	Mill Creek	4,284	1,199	72
Zinc	Des Moines	10	4	56
	Lower Green River	127	74	42
	Lower Puget Sound	59	30	50
	Mill Creek	10	4	59
TKN	Des Moines	56	36	36
	Lower Green River	704	538	24
	Lower Puget Sound	330	237	28
	Mill Creek	55	37	33
TP	Des Moines	12	6	53
	Lower Green River	154	105	32
	Lower Puget Sound	72	44	39
	Mill Creek	12	7	46

Note: Annual mass loadings for each alternative were computed using the FHWA procedure (FHWA, 1996). Pollutant loadings were then reduced assuming efficiency of treatment facilities from Table 3.5-1. No treatment was applied for the pollutant loading for the existing conditions.

probabilities, would be highest at vault 1 for design option H0, and at vault 2 for design options H2-A and H2-B. Stormwater pollutant concentrations would be higher for design options H2-A and H2-B than for design option H0 for all constituents (Tables 3.5-8 and 3.5-9). These tables present concentrations without treatment by BMPs.

Design option H0 would have the lowest number of runoff flows exceeding the once-in-3-year threshold of 0.3 percent to 0.4 percent. Design option H2-B would have the highest number of runoff events exceeding the once-in-3-year threshold of 0.3 percent to 0.4 percent.

Without treatment, the background concentration of all pollutants would be exceeded numerous times for flows draining to vaults 1, 2, and 3 (Table 3.5-8), and Washington State water quality standards for the same pollutants would also be exceeded (Table 3.5-9). Pollutant concentrations after treatment at several BMPs, including biofiltration swales and wet vaults (as recommended in the stormwater plan), were included for comparison (Table 3.5-10). The results show that use of vegetated filter strip could improve treatment efficiencies. The results for annual pollutant loading for the three South Link design options after treatment at bioswales followed by wet vaults are presented in Table 3.5-11. TSS and zinc loading would be reduced 3 to 4 times after treatment, while TP and TKN would be reduced only 1 to 2 times.

Groundwater

Infiltrated stormwater pollutants from new impervious surfaces could cause potential adverse impacts on groundwater quality. However, this potential would be low if standard BMPs are implemented. The Angle Lake Well and other wells in the study area are within the South King County Groundwater Management Area (GWMA). Although there is no aquifer protection plan for the Angle Lake Well, the protection plan of the wellhead area is in a 5-year development phase and is not yet finalized (Johnson pers. comm. 2000). Whenever the BMPs become available, they will be incorporated into the protection plan.

Accidental Spills

The volume of hazardous materials (such as petroleum products) that would be transported through and delivered within the project area is determined predominantly by the local demand for such materials. Each of the build alternatives would provide a transportation corridor designed under current regulatory safety standards, which would result in a lower frequency of accidents compared with existing roads designed to earlier standards. Thus, the risk of accident-related spills would be expected to be lower under any of the build alternatives compared to the No Action Alternative because the new roadway would improve the overall safety of the road system.

Table 3.5-8
Stormwater Pollutant Concentrations
for South Airport Link Options Relative to Background Concentrations

Option/Parameter	Site Median Concentration (mg/L)[a]	Stream Background Concentration (mg/L)[b]	Percent of Events Exceeding Once-in-3-Year Stream Background Concentrations		
			Runoff Draining to Vault 1	Runoff Draining to Vault 2	Runoff Draining to Vault 3
Option H0					
Total Suspended Solids	142	58.7	26	14	4
Zinc	0.329	0.023	68	48	19
Copper	0.054	0.004	66	45	17
Total Phosphorus	0.4	0.151	30	16	5
Nitrates and Nitrites	0.76	0.652	11	5	0.3
Option H2-A					
Total Suspended Solids	142	58.7	26	29	4
Zinc	0.329	0.023	68	72	19
Copper	0.054	0.004	65	69	18
Total Phosphorus	0.4	0.151	30	33	5
Nitrates and Nitrites	0.76	0.652	11	12	0.3
Option H2-B					
Total Suspended Solids	142	58.7	28	35	4
Zinc	0.329	0.023	70	78	20
Copper	0.054	0.004	68	76	18
Total Phosphorus	0.4	0.151	32	40	5
Nitrates and Nitrites	0.76	0.652	12	16	1

Note: No treatment was considered in this table. All exceedance probabilities higher than 0.35% require stormwater treatment.

[a] *Site median concentration values are the median site values from the FHWA database (993 runoff events) for urban highways with average annual daily traffic >30,000 vehicles/day.*

[b] *Background concentrations are based on the average of 15 stormwater samples collected from 2 locations in Des Moines Creek and 4 locations in Massey Creek Basin (Herrera and Hall, 1997).*

Table 3.5-9
Stormwater Pollutant Concentrations for South Airport Link Options Relative to Washington Class A Standards

Option/Parameter	Site Median Concentration (mg/L)[a]	WA Class A Standard (mg/L)[b]	Percent of Events Exceeding Once-in-Three-Year Stream Background Concentrations		
			Runoff Draining to Vault 1	Runoff Draining to Vault 2	Runoff Draining to Vault 3
Option H0					
Zinc	0.329	0.064	20	10	3
Copper	0.054	0.00885	26	14	4
Option H2-A					
Zinc	0.329	0.064	20	22	3
Copper	0.054	0.00885	26	28	4
Option H2-B					
Zinc	0.329	0.064	21	27	3
Copper	0.054	0.00885	27	35	18

Note: No treatment was considered in this table. All exceedance probabilities higher than 0.35% require stormwater treatment. Hardness of 50 ppm was measured for stormwater samples; hardness of 80 ppm was measured for baseflow samples.

[a] *FHWA (1996). Site median concentration values are the median site values from the FHWA database (993 runoff events) for urban highways with average annual daily traffic >30,000 vehicles/day.*

[b] *WAC Chapter 173-201A. These thresholds were computed using hardness of 50 ppm.*

Table 3.5-10
Pollutant Removal Using Various BMPs for Selected Parameters for South Airport Link Design Options

Option/Parameter	Site Median Concentration (mg/L)[b]	Background Concentration (mg/L)[c]	EPA Acute Criteria (mg/L)[d]	WA State Standard (stormflow; baseflow) (mg/L)[e]	Concentration After BMP Treatment (mg/L)[a]			
					Biofiltration Swale	Biofiltration Swale and Wet Vault	Wet Pond	Vegetated Filter Strip
Option H0, H2A, H2B								
Total Suspended Solids	142.000	58.700	--	--	39.76	30.62	39.76	28.40
Zinc	0.329	0.023	0.18	0.064; 0.095	0.11	0.10	0.14	0.08
Total Phosphorus	0.400	0.151	--	--	0.29	0.27	0.19	0.19
Total Kjeldahl Nitrogen	1.830	--	--	--	1.37	1.30	1.17	1.21

Note: Hardness of 50 ppm was measured for stormwater samples; hardness of 80 ppm was measured at baseflow samples.

[a] *See Table 3.5-1 for BMP treatment efficiencies. The analysis is limited only to the parameters defined in Table 3.5-1.*

[b] *FHWA (1996). Site median concentration values are the median site values from the FHWA database (993 runoff events) for urban highways with average annual daily traffic >30,000 vehicles/day.*

[c] *Background concentrations are based on the average of 15 stormwater samples collected from 2 locations in Des Moines Creek and 4 locations in Massey Creek Basin (Herrera & Hall, 1997).*

[d] *FHWA (April 1990a).*

[e] *WAC 173-201A (stormflow hardness = 50 ppm, baseflow hardness = 80 ppm).*

-- = No criteria/rules available.

Table 3.5-11

Total Pollutant Loading From New Roadway Surfaces for South Airport Link Design Options

Pollutant	Option	Annual Mass Loading Existing Conditions	Annual Mass Loading After Wet Vault and Bioswale [kg/year]*
Total Suspended Solids	Option H0	3,626	778
	Option H2-A	4,599	1,007
	Option H2-B	5,002	1,135
Zinc	Option H0	8	3
	Option H2-A	11	3
	Option H2-B	12	4
Total Kjeldahl Nitrogen	Option H0	47	33
	Option H2-A	59	43
	Option H2-B	64	48
Total Phosphorus	Option H0	8	6
	Option H2-A	11	7
	Option H2-B	12	8

Note: Annual mass loadings were computed using the FHWA procedure (FHWA 1996). Pollutant loadings were then reduced assuming treatment efficiency from Table 3.5-1. No treatment was applied for pollutant loading for existing conditions.

The Tyee wetland/stormwater pond was designed to control stormwater flow and allow temporary shut down of flow to Des Moines Creek in the event of a pollutant spill further upstream. Where the pond could not be avoided, each of the build alternatives would span the pond with a bridge. Because no fill or bridge supports would be placed within the pond, there would be no reduction in pond storage volume, and, therefore, no effect on its stormwater control function.

Vegetation Management

Vegetation would be managed through implementation of Integrated Vegetation Management (IVM) within WSDOT's *Roadside Classification Plan* (RCP) (WSDOT 1996). The IVM promotes use of native vegetation, implementation of the visual quality policy, and reduced use of fertilizers, pesticides, and other chemical controls. The visual quality policy promotes environmentally beneficial landscaping, including use of water-efficient and runoff-reduction practices and construction with minimum impact on habitat. However, even with the most conservative use, some amounts of landscaping chemicals or herbicides would be expected to enter the receiving surface water bodies during storm events.

Alternative B

Under Alternative B, the SR 509 freeway extension and South Access Road (Figure 3.5-2) would create 89.5 acres of new impervious surface in Des Moines Creek and Miller Creek Basins. Total new impervious surface area for Alternative B, including the I-5 improvements, would be 126.5 acres. The SR 509 alignment of Alternative B would necessitate one stream channel crossing over a Class 2 reach of Des Moines Creek near the intersection of South 208th Street and 18th Avenue South. The alignment of the South Access Road would cross the channelized and piped upper reaches of the East Fork tributary to Des Moines Creek at four locations, which are either Class 3 or unclassified.

Runoff from Alternative B would have the greatest number of storm events exceeding the once-in-3-year threshold of 0.35 percent (Table 3.5-3). Without treatment, the potential to exceed Washington State standards for zinc and copper in Des Moines Creek Basin and Miller Creek Basin would be the highest of the build alternatives (Table 3.5-4). With the proposed stormwater treatment, loadings of each pollutant evaluated would be the highest of the build alternatives (Table 3.5-6). Annual TSS loading would range from nearly 4,300 kg (Miller Creek Basin) to 337 kg (Des Moines Creek Basin).

Potential impacts associated with the proposed South Airport Link design options and I-5 improvements are described under Impacts Common to All Build Alternatives.

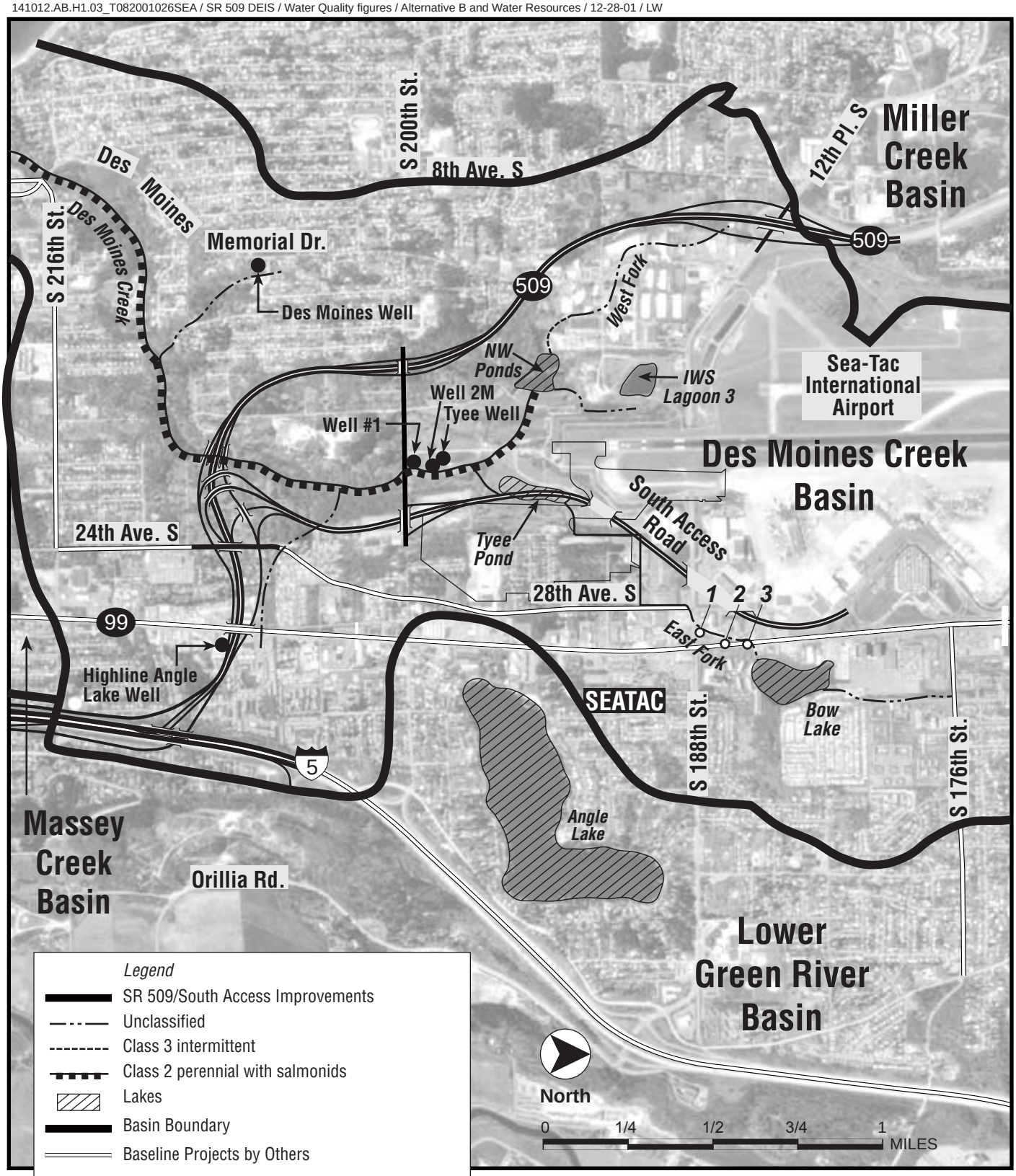


FIGURE 3.5-2

Water Resources and Basin Boundaries – Alternative B

Alternative C2 (Preliminary Preferred)

Under Alternative C2 (Figure 3.5-3), the proposed SR 509 freeway extension and South Access Road would create 76 acres of new impervious surface in Des Moines Creek and Miller Creek Basins. Total new impervious surface area for Alternative C2, including the I-5 improvements, would be 113 acres. Water quality impacts from construction and operation would be the highest in areas where the roadway alignment would cross Des Moines Creek and at four crossings of the East Fork of Des Moines Creek.

Runoff from Alternative C2 would yield exceedance probabilities that are similar to Alternatives B in Des Moines Creek Basin, but lower than Alternative B in Miller Creek Basin (Table 3.5-3). Without treatment, the potential to exceed Washington State standards for zinc and copper in Des Moines Creek Basin would be the same as Alternative B (Table 3.5-4). However, they would not exceed the once-in-3-year standard in Miller Creek Basin.

With the proposed stormwater treatment, pollutant loadings would be lowest of the build alternatives for each pollutant evaluated. Annual TSS loading would range from 3,255 kg (Des Moines Creek Basin) to 99 kg (Miller Creek Basin), which would be 36 percent lower than Alternative B and 6 percent lower than Alternative C3 (Table 3.5-6).

Potential impacts associated with the proposed South Airport Link design options and I-5 improvements are described under Impacts Common to All Build Alternatives.

Alternative C3

Under Alternative C3 (Figure 3.5-4), the proposed SR 509 freeway extension and South Access Road would create 76.5 acres of new impervious surface in Des Moines Creek and Miller Creek Basins. Total new impervious surface area for Alternative C3, including I-5 improvements, would be 113.5 acres. Potential water quality impacts from construction and operation would be the highest in areas where the roadway alignment would cross Des Moines Creek and the East Fork of Des Moines Creek. The number and locations of stream crossings would be the same as Alternative C2.

Exceedance probabilities of background concentrations in Miller and Des Moines Creek would be approximately the same as Alternative C2, but lower than Alternative B (Tables 3.5-3 and 3.5-4). With the proposed stormwater treatment, pollutant loadings would be similar to Alternative C2 and lower than Alternative B for each pollutant evaluated (Table 3.5-6). Annual TSS loadings would range from 3,435 kg (Des Moines Creek Basin) to 102 kg (Miller Creek Basin), which would be 6 percent higher than Alternative C2 and 24 percent lower than Alternative B.

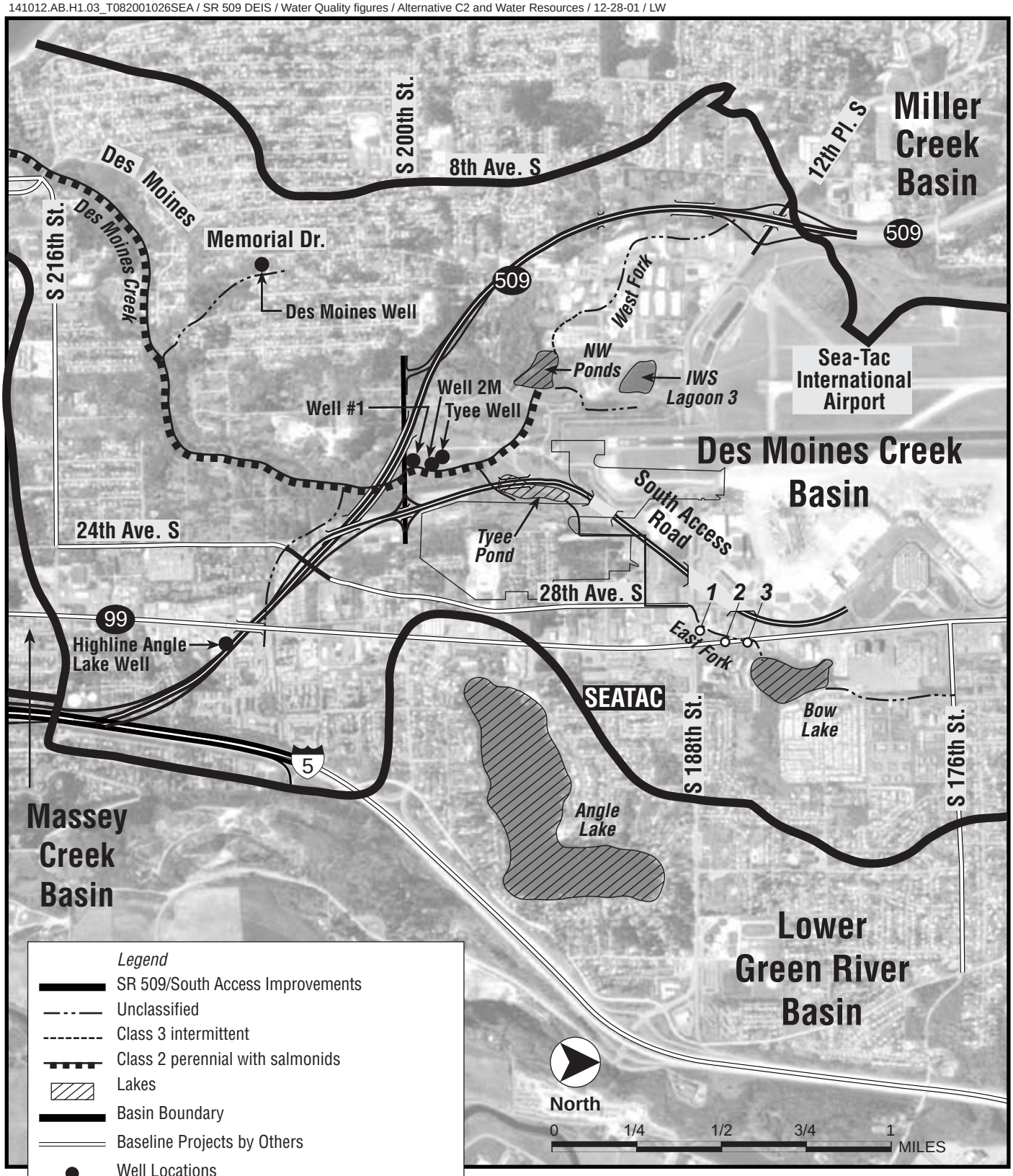


FIGURE 3.5-3

Water Resources and Basin Boundaries – Alternative C2 (Preliminary Preferred)

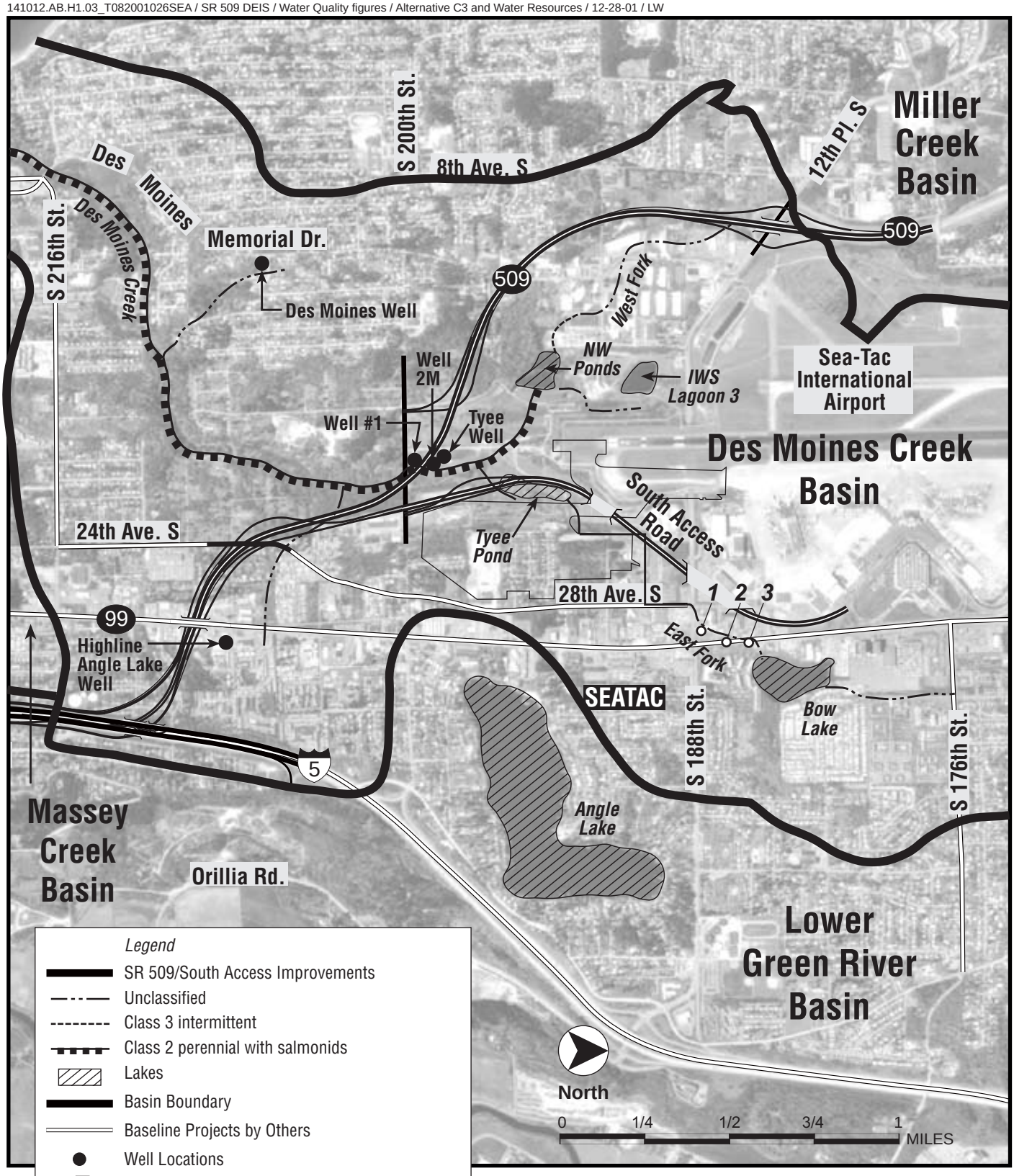


FIGURE 3.5-4

Water Resources and Basin Boundaries – Alternative C3

Potential impacts associated with the proposed South Airport Link design options and I-5 improvements are described under Impacts Common to All Build Alternatives.

3.5.4 Mitigation Measures

Project Design Mitigation Measures

Mitigation has been incorporated into the design of the build alternatives to reduce potential water quality impacts. Each of the alternatives incorporates King County's detention and water quality treatment criteria according to the King County basic water quality menu in the *Surface Water Design Manual* (King County 1998), as well as WSDOT Endangered Species Act (ESA) stormwater effects guidelines (WSDOT 1999). In addition, to increase the effectiveness of onsite surface water management, stormwater from the roadways would be managed separately from upstream surface water intercepted by the highway. Whenever possible, the build alternative alignments have been selected to avoid or reduce impacts on sensitive resource areas.

WSDOT would maintain stormwater management facilities for the proposed project, except for facilities at the South Access Road, which would be maintained by the Port of Seattle. WSDOT's maintenance measures would follow RCP (WSDOT 1996) and the *Regional Road Maintenance Endangered Species Act Program Guidelines* (NMFS 2001). The IVM would promote use of native vegetation and reduced use of fertilizers, pesticides, and other controls. The visual quality policy would assume environmentally beneficial landscaping, use of water-efficient and runoff-reduction practices, and construction with minimal impact on habitat.

One of the goals of the *Des Moines Creek Basin Plan* (Des Moines Creek Basin Committee 1997) is to address elevated temperatures in Des Moines Creek. As part of the proposed project, trees and shrubs would be planted around detention ponds and along stream banks adjacent to the proposed alignment to provide shade and help lower stream temperatures.

As project design is further developed, opportunities to address stormwater issues using a watershed approach would be sought. This approach would focus on treating stormwater at the subwatershed level, emphasizing infiltration techniques and restoration of natural hydrological functions where practicable. A subwatershed scale analysis of existing soil types, geology, and land use cover, interfaced with the existing Des Moines Creek Basin Plan, would be used to identify such opportunities.

Operation Mitigation Measures

Operation mitigation measures would include operation and maintenance of stormwater management systems, implementation of an accidental spill response plan, and discriminate use of de-icing materials and herbicides for vegetation management within the highway right-of-way.

Stormwater Treatment Outfalls

Outfalls from proposed stormwater treatment facilities would be designed to dissipate the energy of the discharged water to prevent streambed scouring. Where practical, outfalls would be designed to improve fish habitat in the stream by including an alcove of low-velocity water. Such an alcove would provide refuge during high flows to overwintering juvenile and migrating adult salmonids (King County 1998).

Stormwater Management

Potential measures to mitigate operational impacts on water resources would include implementing design specifications from a number of existing plans and regulations, including WSDOT's NPDES permit for stormwater runoff. WSDOT has a Municipal NPDES permit that regulates and defines methods to manage, control, and treat runoff from highways and associated shoulders within the project area. Through the NPDES permit process, WSDOT is required to provide water quantity control and water quality treatment for all new and existing impervious surfaces to avoid or effectively mitigate impacts on water resources (WSDOT 1997). The proposed design criteria for the collection, detention, and treatment of stormwater will be according to the King County *Surface Water Design Manual* (King County 1998) and the WSDOT *Highway Runoff Manual* (WSDOT 1995). In cases where both manuals list design criteria, the more stringent design criteria will be used.

In general, standards and methods specified in the King County *Surface Water Design Manual* would be applied for designing stormwater BMPs. However, FAA design standards for airports place 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 (FAA 1997). Project elements constructed by the Port on its property (e.g., South Airport Link) would be included under the airport's NPDES permit and appropriate controls and conditions for those facilities would be developed in conjunction with that permit.

Proposed stormwater treatment for the SR 509 freeway extension and the I-5 improvements primarily include vegetated bioswales, wet ponds, and detention ponds. A detailed description of the proposed stormwater treatment is provided in the *Stormwater Treatment Technical Memorandum for the SR 509/South Access Road* (CH2M HILL August 2001b) and in the *I-5 Corridor*

Improvements Drainage Facilities Concepts Technical Memorandum (CH2M HILL November 2001).

Vehicle access to stormwater and water quality treatment structures would be provided to allow I&M. The maintenance of all structures would be conducted according to the Stormwater Site Plan (SSP) prepared per WSDOT's *Highway Runoff Manual* (WSDOT 1995), WSDOT's RCP (WSDOT 1996), and King County's *Surface Water Design Manual* (King County 1998).

The outlets of facilities and interceptor swales would be designed to adequately dissipate the energy of discharged water before it reaches the receiving stream. Depending on the flow rates from the facility and the configuration of the system, this could be accomplished with a variety of structures, including rock pads, gabion outfalls, dispersion trenches, or level spreaders (King County 1998).

Accidental Spills Mitigation

To help control the spread of accidental spills during highway operation, the flow-control structures at stormwater detention facility outlets would be equipped with baffles and a spill-control separator to retain buoyant materials (lighter than water) such as petroleum products. Spilled liquids collected by the drainage system would thereby be detained in the stormwater detention facility until cleanup is complete.

Vegetation-Control Mitigation

Herbicide sprays to control vegetation would be applied only in dry weather under zero or mild wind conditions. In addition, spraying would be done only by a licensed sprayer. Precautions would be taken when spraying near sensitive water resources. Records would be maintained to keep track of the date, location, type, and amount of herbicides applied. Additional applicable guidelines for vegetation management, as outlined in WSDOT's RCP (WSDOT 1996), would be followed.

Bare or thinly vegetated ground surface areas within the right-of-way could be minimized, particularly on slopes. Where possible, grass vegetation could be used between the edge of pavement and roadside ditches and in earth-lined ditches to reduce erosion and encourage biofiltration of stormwater.

3.5.5 Construction Activity Impacts and Mitigation

Construction Impacts

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 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 (1) accidental release of these substances, (2) leaking storage containers, or (3) construction equipment maintenance. The potential for construction impacts would be low because of the short period of construction and implementation of BMPs.

Construction might affect the wellhead protection area of the Angle Lake Well. The Angle Lake Well and other wells in the project area are within the South King County GWMA. However, management strategies to protect the wellhead area are in a 5-year development phase and are not yet finalized (Johnson pers. comm. 2000). Whenever the BMPs become available, they will be incorporated into the protection plan. In the meantime, BMPs outlined in the King County *Surface Water Design Manual* (King County 1998) and WSDOT's *Highway Runoff Manual* (WSDOT 1995) would be used.

Mitigation Measures

Local, state, and federal government permit requirements would be implemented to mitigate potential construction impacts on surface and groundwater resources for all build alternatives. Stormwater, grading, and water quality-related permits required for the proposed project could include Hydraulic Project Approval (HPA), NPDES Permits for Construction and Operation of Sites Disturbing More Than 5 Acres, NPDES Permits For Construction Activity for Sites Greater than 1 Acre (Phase II of the NPDES Stormwater Program [U.S. EPA December 1999]), and local clearing, grading, and other permits.

To fulfill requirements of the construction NPDES permit, an SSP would need to be developed. The SSP would include measures for controlling erosion and sedimentation and preventing discharge of pollutants contained in stormwater to water bodies during construction and operation. The SSP would also include provisions for implementation of BMPs to protect groundwater and public drinking water supply, and measures to protect water and sewer lines, and construction monitoring. In developing the SSP, detailed data collection and analysis of local site conditions would be conducted. This would incorporate a thorough soils assessment, including jar tests, to determine potential for erosion and persistent water turbidity. Other site specific information on drainage, topography, ground cover, rainfall records, existing encumbrances, and water table elevation would be used in developing a Temporary Erosion and Sediment Control (TESC) plan.

The TESC plan is a required component of the SSP. In developing the TESC plan, appropriate construction BMPs would be selected for each of the particular types of anticipated construction activities. Implementing effective BMPs at construction sites, such as minimizing exposed soil surfaces and controlling erosion and sedimentation, would prevent or reduce potential impacts on surface water and groundwater quality. The King County *Surface Water Design Manual* (King County 1998) and WSDOT's *Highway Runoff Manual* (WSDOT 1995) would be used for BMP selection and design criteria. BMPs for the types of construction activities anticipated typically include the following:

- Phasing construction to minimize the amount of earth exposed at any one time to erosive forces
- Designing construction entrances, exits, and parking areas to reduce tracking of sediment onto public roads
- Using vegetative erosion-control practices (seeding, mulching, soil conditioning with polymers, flocculants, sod stabilization, vegetative buffer strips, and protection of trees with construction fences)
- Implementing erosion-control practices (mulching, erosion-control blankets, and application of soil tackifiers)
- Implementing sediment-control practices (straw bales, silt fences, check dams, sediment traps, sedimentation basins, and flocculation methods)
- Controlling erosion of stockpiled materials (e.g., diverting upslope water around stockpiles, covering stockpiles, and placing silt fences around stockpiles)
- Preserving the permeability of pervious areas within the project construction site to the greatest extent practical
- Performing routine I&M of erosion and sediment control BMPs.

If construction takes place during the wet season (October 1 through April 30), exposed soils would be subjected to additional controls specified in King County's erosion and sedimentation control standards (King County 1998).

A Spill Prevention Control and Countermeasures (SPCC) plan would be adopted as a construction planning element of the proposed project to reduce accident-related water quality impacts (Wilson pers. comm. 1999). The plan would specify the responsibilities of those involved during accidental spills.

SEA/3-05 water qual.doc/020220066

3.6 Wetlands

3.6.1 Studies and Coordination

This section is based on the finding of the *SR 509/South Access Road EIS Discipline Report: Wetlands* (Wetland Discipline Report) (CH2M HILL August 2000b), *SR 509/South Access Road EIS: South Airport Link* (August 2001), and *SR 509/South Access Road EIS: I-5 Improvements Report* (CH2M HILL October 2001). These discipline reports contain detailed descriptions of methods, results of the field investigation, and an evaluation of the characteristics and functions of wetlands identified in the project area.

The identification of wetlands along the SR509: Corridor Completion/ I-5/South Access Road Project is based on methods presented in the 1987 USACOE *Wetland Delineation Manual* (Manual) (USACOE 1987), and the 1997 *Washington State Wetland Identification and Delineation Manual* (WIDM) (Ecology 1997). Two levels of investigation were conducted for the evaluation of the wetlands within the project area: (1) a review and analysis of site-specific literature and data, and (2) site-specific field investigations to determine the presence and extent of wetlands. For this investigation, the wetlands within 100 feet of the proposed project alignments were identified. The methods used in the field investigation are described in the *SR 509/South Access Road EIS Discipline Report: Wetlands* (Wetland Discipline Report) (CH2M HILL August 2000b).

Existing information was reviewed to identify documented wetlands or site characteristics that would indicate wetlands within the project area. The following documents were reviewed to gather preliminary information about the vegetation, soils, and hydrology of the area:

- *National Wetland Inventory, Des Moines and Poverty Bay, Washington Quadrangles* (U.S. Fish and Wildlife Service [USFWS] 1987)
- *King County Sensitive Areas Map Folio* (King County 1990a)
- *King County Wetland Inventory* (King County 1990b)
- *Soil Survey of King County Area, Washington* (SCS 1973)
- Color aerial photographs, 1994 and 1997 (scale 1:24,000)
- *Wetland Delineation Report, Master Plan Update Improvements Seattle-Tacoma International Airport* (Parametrix 1999a)

- *Wetland Functional Assessment and Impact Analysis, Master Plan Update Improvements Seattle-Tacoma International Airport* (Parametrix 1999b)

Following the field investigations, these documents were reviewed again to determine the connection between wetlands and surface water features outside the project area.

Coordination was initiated with the following local agencies and groups of the NEPA/SEPA/Section 404 Merger SAC:

- Port of Seattle, Sea-Tac Airport
- King County, Department of Natural Resources
- City of Des Moines, Department of Community Development
- City of SeaTac, Department of Planning and Community Development

3.6.2 Affected Environment

The proposed project would extend south of Sea-Tac Airport from 12th Place South/South 188th Street and the airport south terminal drives in the City of SeaTac to as far south as South 310th Street in the City of Federal Way. Segments of the build alternatives would extend through the Des Moines Creek, Miller Creek, Lower Puget Sound, Lower Green River, and Mill Creek watersheds. The project area is characterized as urbanlands, residential, and open green space.

The project area is located on glacial highlands that drain to the Green River Valley and Puget Sound. Topography is gently undulating to hilly, with ravines along riparian corridors. Soils within a large portion of the project area consist of excessively drained to moderately well-drained soils that have developed in glacial outwash and till. In many areas, dense slightly permeable glacial till occurs at a depth of 20 to 40 inches. Soil map units in the project area are described in Section 3.4, *Geology and Soils.*

The build alternatives would cross Des Moines Creek. Des Moines Creek has been classified by King County as a Class 2 stream with salmonids (King County 1990a).

The build alternatives, including the I-5 improvements, directly affect 32 wetlands or wetland buffers (Table 3.6-1, Figures 3.6-1 through 3.6-4). Two wetlands (Wetlands A and 9) occur along the mainstem of Des Moines Creek. Three wetlands (Wetlands D, F, and G) have surface water connections to drainages that flow into Des Moines Creek. Twenty-one wetlands (Wetlands B, H, K, M, N, S, 1, 2, 5, 6, 7, 8, 15, 16, 17, 18, 19, 20, 21, 22, and 23) are isolated slope or depression systems. Two wetlands (Wetlands I-13 and I-19) are associated with McSorley Creek. One wetland (I-7) consists of cut-slope seeps within the Mill Creek watershed. Three

Table 3.6-1
Summary of Wetland Characteristics

Wetland and Watershed	Size (acres)	USFWS Classification	Hydrologic Connection	Ecology Rating	Local Rating	Ecology Buffer Size (feet)*
Des Moines Creek Basin						
A	16.0	PFO/PSS	Riparian along Des Moines Creek	2	1[a]	100
B	6.6	PFO/PSS/PEM	Depressional	2	1[a]	100
D	4.9	PFO/PSS/PEM	Riparian, East Fork of Des Moines Creek	2	2[a]	100
F	28.8	PFO/PSS/PEM/ POW	Headwater of East Fork of Des Moines Creek	2	1[a]	100
G	7.9	PSS/PEM	Riparian along Des Moines Creek	2	2[a]	100
H	0.09	POW/PEM	Isolated Depression	4	3[a]	25
K	0.09	PEM	Isolated Depression	3	3[a]	50
M	0.1	PSS	Isolated Depression	3	3[a]	50
N	0.1	PSS	Isolated Depression	3	3[a]	50
S	0.5	PEM	Isolated Slope	4	3[a]	25
1	0.02	PFO	Isolated Slope	3	3[a]	50
2	0.7	PFO	Isolated Depression	3	3[a]	50
5	0.9	PFO/PSS	Isolated Depression	3	3[a]	50
6	0.03	PFO/PSS	Isolated Depression	3	3[a]	50
7	0.6	PFO/PSS	Isolated Depression	3	3[a]	50
8	0.08	PFO/PSS	Isolated Depression	3	3[a]	50
9	0.07	PSS/Stream	Riparian along Des Moines Creek	2	SW[b]	100
15	0.2	PFO	Isolated Depression	3	3[a]	50
16	0.04	PFO	Isolated Depression	3	3[a]	50
17	0.06	PFO	Isolated Depression	3	3[a]	50
18	0.9	PEM	Isolated Slope	4	3[a]	25
19	0.5	PFO/PSS	Isolated Slope	3	3[a]	50
20	0.3	PFO/PSS	Isolated Depression	4	3[a]	25
21	0.2	PEM	Isolated Depression	3	IW[b]	50
22	0.01	Ditch	Isolated Depression	4	IW[b]	25
23	0.01	PEM	Isolated Slope	4	3[a]	25
Mill Creek Watershed						
I-7	0.06	PEM	Cut slope discharge to I-5 drainage system	3	3[c]	50
Lower Green River Watershed						
I-10	0.05	PEM/PSS	Isolated culvert connection with I-5 drainage system	3	3[c]	50
I-11	0.2	PFO/PSS	Isolated culvert connection with I-5 drainage system	3	3[c]	50
I-12	0.3	PEM/PSS	Isolated depression	3	3[c]	50
Lower Puget Sound Watershed						
I-13	0.2	PFO	Riparian system along McSorley Creek or tributary	3	3[c]	50
I-19	78.5	PFO	Riparian system along McSorley Creek or tributary	1	1[d]	200

** Lower range of Ecology (1998) recommended buffer width*

SW = significant wetland

IW = important wetland

PFO = palustrine forested

PSS = palustrine scrub-shrub

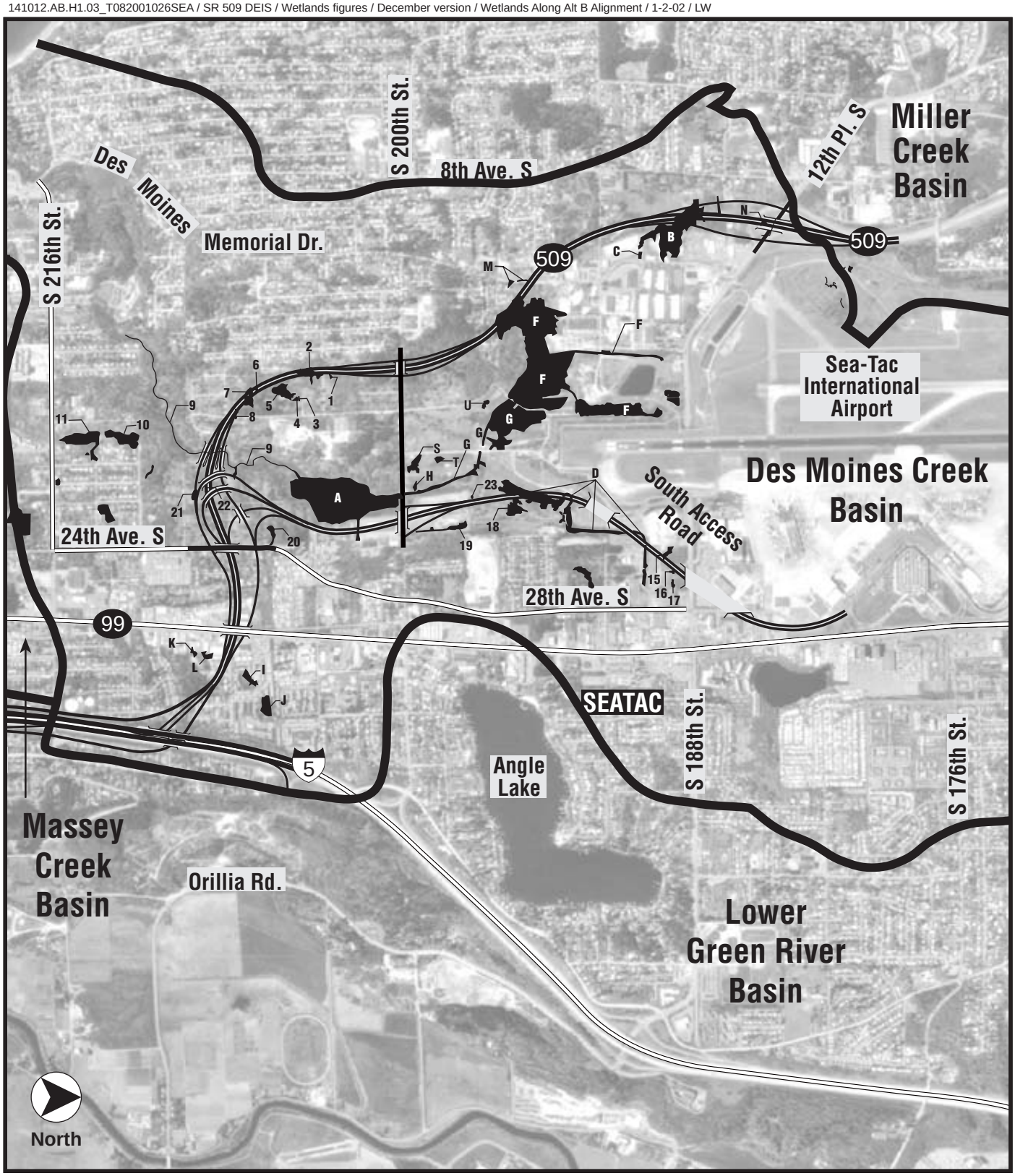
PEM = palustrine emergent

[a] *Using City of SeaTac Environmentally Sensitive Areas Ordinance (1994)*

[b] *Using City of Des Moines Environmentally Sensitive Areas Ordinance (1997)*

[c] *Using City of Federal Way Environmentally Sensitive Areas Ordinance Chapter 22.12 (2001)*

[d] *Using City of Kent Wetlands Management Ordinance Chapter 11.04 (2000)*



0 1/4 1/2 3/4 1 MILES

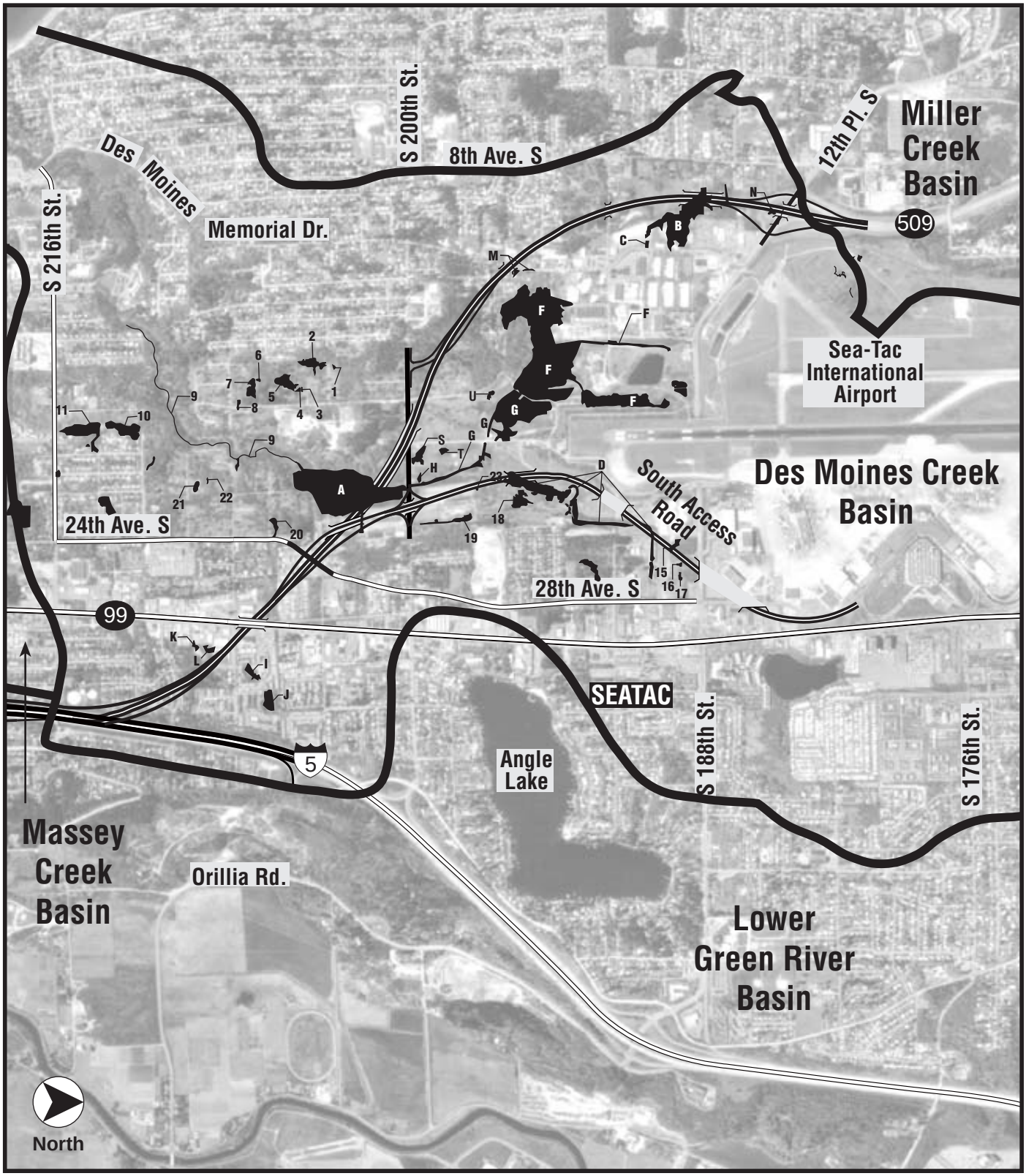
Legend

- SR 509/South Access Improvements
- Baseline Projects by Others
- Wetlands
- Basin Boundary

FIGURE 3.6-1

Wetlands Along Alternative B Alignment

SR 509: Corridor Completion/I-5/South Access Road Environmental Impact Statement



0 1/4 1/2 3/4 1 MILES

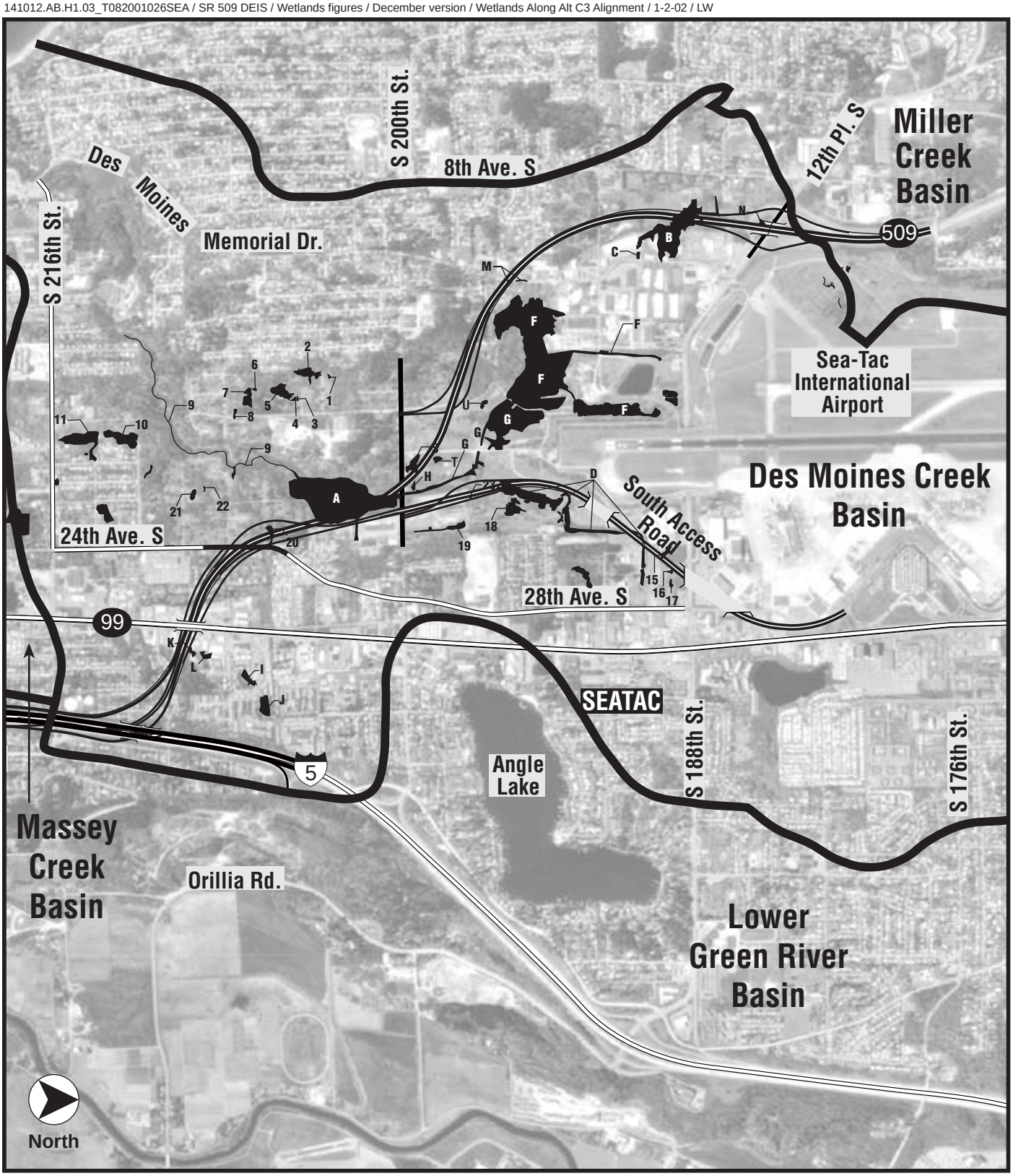
Legend

- SR 509/South Access Improvements
- Baseline Projects by Others
- Wetlands
- Basin Boundary

FIGURE 3.6-2

Wetlands Along Alternative C2 Alignment (Preliminary Preferred)

SR 509: Corridor Completion/I-5/South Access Road Environmental Impact Statement



0 1/4 1/2 3/4 1 MILES

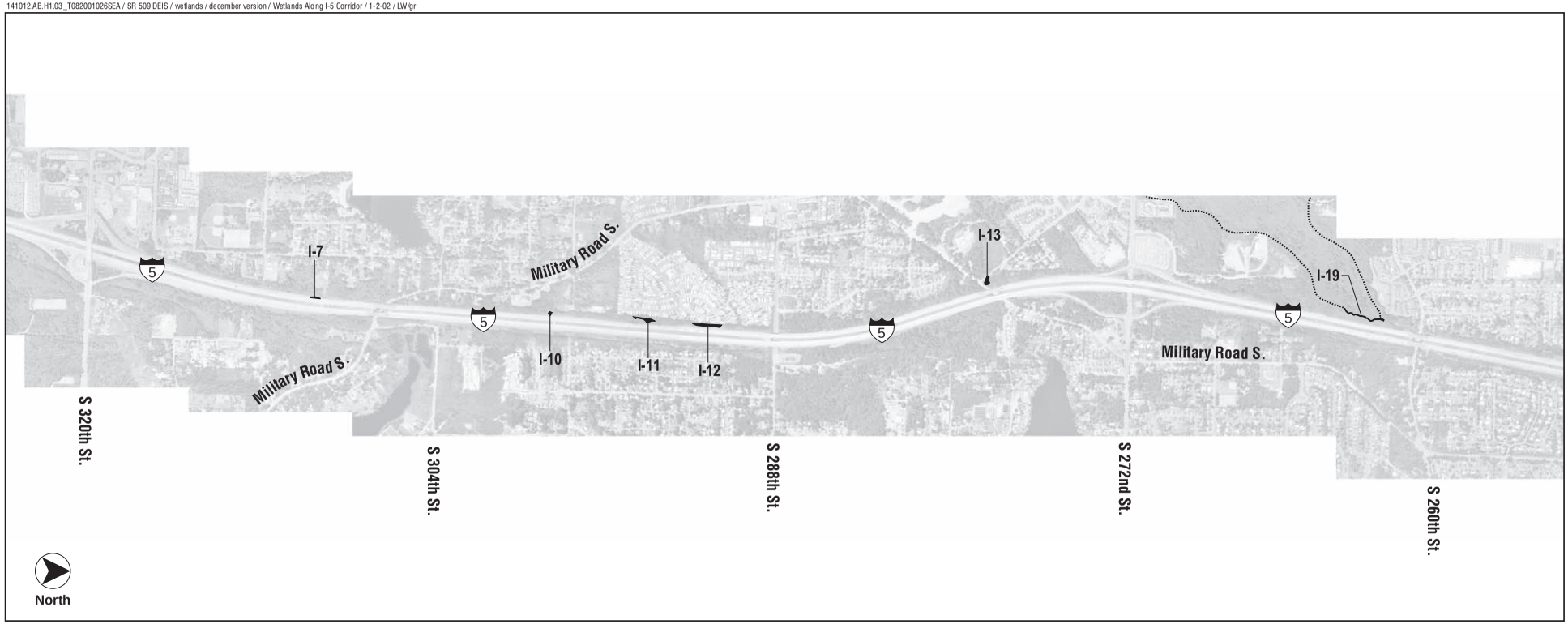
Legend

- SR 509/South Access Improvements
- Baseline Projects by Others
- Wetlands
- Basin Boundary

FIGURE 3.6-3

Wetlands Along Alternative C3 Alignment

SR 509: Corridor Completion/I-5/South Access Road Environmental Impact Statement



Legend

Field Survey Boundary

Estimated Boundary

Reference: *King County Wetland Inventory, 1990.*

FIGURE 3.6-4

Wetlands Along I-5

SR 509: Corridor Completion/I-5/South Access Road Environmental Impact Statement

wetlands (Wetlands I-10, I-11, and I-12,) are isolated or culverted depression systems. No wetlands were identified along the South Airport Link segment of the build alternatives. Table 3.6-1 shows the wetland size; USFWS classification; hydrologic connection; classification in accordance with the Washington State Wetlands Rating System for Western Washington (Ecology 1993); City of SeaTac, City of Des Moines, City of Federal Way, or City of Kent Wetland Rating; buffer size; and primary wetland function(s). Common and scientific names for plant species observed in these wetlands are provided in Table 3.6-2. Table 3.6-3 provides a summary of generalized values for major wetland functions. The semi-quantitative method developed by Cooke (1997) was used to develop the qualitative assessment of wetland functions.

Wetlands were rated using the Washington State Wetlands Rating System for Western Washington (Ecology 1993) along with the City of SeaTac Environmentally Sensitive Areas Ordinance (1994), the City of Des Moines Environmentally Sensitive Areas Ordinance (1997), King County Environmentally Sensitive Areas Ordinance Chapter 21A.24 (2001), the City of Federal Way Environmentally Sensitive Areas Ordinance Chapter 22.12 (2001), and the City of Kent Wetlands Management Ordinance Chapter 11.04 (2000).

Information described for Wetlands 1, 2, 5, 6, 7, 8, 9, 15, 16, 17, 18, 19, 20, 21, 22, and 23 was obtained during a reconnaissance visit and/or the *Wetland Delineation Report for Master Plan Update Improvements, Seattle-Tacoma International Airport* (Parametrix 1999a).

Wetland A

Wetland A is a 16-acre Category 2 riparian wetland along Des Moines Creek (Ecology 1993). Only the portion of this wetland that could potentially be affected by the proposed alternatives was delineated. Wetland A extends south from South 200th Street along the Des Moines Creek corridor and connects to Wetland 9. Wetland A contains PFO and PSS habitat. Wetland vegetation is dominated by red alder, vine maple, Himalayan blackberry, salmonberry, wild lily-of-the-valley, and lady fern. Subdominant vegetation includes red elderberry, skunk cabbage, and slough sedge. Soils are black muck. The wetland hydrologic indicators are saturated soil and inundation. Soils not saturated or inundated were assumed to have wetland hydrology based on the presence of oxidized rhizospheres in the rooting zone, wetland drainage patterns, low soil chroma, and soil mottling.

Table 3.6-2
List of Observed Plant Species in Wetlands

Common Name	Scientific Name	Wetland Indicator Status[a]
Trees		
vine maple	*Acer circinatum*	FAC-
big-leaf maple	*Acer macrophyllum*	FACU
red alder	*Alnus rubra*	FAC
Oregon ash	*Fraxinus latifolia*	FACW
black cottonwood	*Populus balsamifera ssp. Trichocarpa*	FAC
Lombardy poplar	*Populus nigra*	NI
Quaking aspen	*Populus tremuloides*	FAC+
Douglas fir	*Pseudotsuga menziesii*	FACU
cascara	*Rhamnus purshiana*	FAC-
mountain ash	*Sorbus scopulina*	FACU
western red-cedar	*Thuja plicata*	FAC
Western hemlock	*Tsuga heterophylla*	FACU-
Shrubs		
redstem dogwood	*Cornus sericea = C. stolonifera*	FACW
Scotch broom	*Cytisus scoparius*	UPL
pacific crabapple	*Malus fusca*	FACW
Indian plum	*Oemleria cerasiformis*	FACU
Evergreen blackberry	*Rubus laciniatus*	FACU+
Himalayan blackberry	*Rubus procerus = R. discolor*	FACU
salmonberry	*Rubus spectabilis*	FAC+
Trailing blackberry	*Rubus ursinus*	FACU
willow	*Salix sp.*	NI
Pacific willow	*Salix lucida var. lasiandra*	FACW+
Scouler willow	*Salix scouleriana*	FAC
Sitka willow	*Salix sitchensis*	FACW
red elderberry	*Sambucus racemosa*	FACU
Douglas spirea	*Spiraea douglasii*	FACW
Grasses and Forbs		
colonial bentgrass	*Agrostis capillaris = A. tenuis*	FAC
redtop	*Agrostis gigantea = A. alba var. alba*	FAC
lady fern	*Athyrium filix-femina*	FAC
slough sedge	*Carex obnupta*	OBL
Canada thistle	*Cirsium arvense*	OBL
orchardgrass	*Dactylis glomerata*	FACU
Watson willowherb	*Epilobium ciliatum = E. watsonii*	FACW-
Fireweed	*Epilobium anagallidifolium*	FACU-

Table 3.6-2 (continued)
List of Observed Plant Species in Wetlands

Common Name	Scientific Name	Wetland Indicator Status[a]
field horsetail	*Equisetum arvense*	FAC
giant horsetail	*Equisetum telmateia*	FACW
tall fescue	*Festuca arundinacea*	FAC-
bedstraw	*Galium sp.*	NI
Tall mannagrass	*Glyceria elata*	FACW+
common velvetgrass	*Holcus lanatus*	FAC
Creeping velvetgrass	*Holcus mollis*	FACU
Western St. John's wort	*Hypericum perforatum*	NI
tapertip rush	*Juncus acuminatus*	OBL
Daggerleaf rush	*Juncus ensifolius*	FACW
soft rush	*Juncus effusus*	FACW
duckweed	*Lemna minor*	OBL
birdsfoot trefoil	*Lotus corniculatus*	FAC
skunk cabbage	*Lysichiton americanum*	OBL
purple loosestrife	*Lythrum salicaria*	FACW+
wild lily-of-the-valley	*Maianthemum dilatatum*	FAC
Water parsley	*Oenanthe sarmentosa*	OBL
reed canarygrass	*Phalaris arundinacea*	FACW
waterpepper	*Polygonum hydropiper*	OBL
Japanese knotweed	*Polygonum cuspidatum*	FACU
Sword fern	*Polysticum munitum*	FACU
Bracken fern	*Pteridium aquilinum*	FACU
creeping buttercup	*Ranunculus repens*	FACW
true water cress	*Rorippa nasturtium-aquaticum*	OBL
curly dock	*Rumex crispus*	FAC+
small-fruited bulrush	*Scirpus microcarpus*	OBL
softstem bulrush	*Scirpus tabernaemontanii = S. validus*	OBL
bittersweet nightshade	*Solanum dulcamara*	FAC+
white clover	*Trifolium repens*	FAC
clover	*Trifolium sp.*	NI
common cattail	*Typha latifolia*	OBL
American brooklime	*Veronica americana*	OBL

[a] *Reed (1988, 1993) separates vascular plants into the following basic groups according to their "wetland indicator status" based on each species' frequency of occurrence in wetlands: Obligate wetland plants (OBL) occur almost always in wetlands (estimated probability >99%) under natural conditions. Facultative wetland plants (FACW) occur almost always in wetlands (estimated probability 67-99%), but occasionally are found in nonwetlands. Facultative plants (FAC) are equally likely to occur in wetlands or nonwetlands (estimated probability 34-66%). Faculative upland plants (FACU) usually occur in nonwetlands (estimated probability 67-99%), but occasionally are found in wetlands (estimated probability 1-33%). Obligate upland plants (UPL) occur almost always in nonwetlands under natural conditions (estimated probability >99%). No Indicator plants (NI) are not assigned an indicator status by Reed.*

Table 3.6-3
Wetland Functions

Wetland	Flood/ Stormwater Control	Base Flow/ Groundwater Support	Erosion/ Shoreline Protection	Water Quality Improvement	Natural Biological Support	Habitat Functions	Recreation
A	M	M	M/L	M	M	M	M
B	M	M	M/L	M	M	M/L	L
D	M/H	M/H	M/L	M	M	M	M
F	H	H	M	M/H	H	M/H	M
G	M	M	M	M	M/L	M/L	M/L
H	M	M	M/L	M/L	L	L	M/L
K	M/L	M/L	NA	M	L	L	L
M	M	M/L	NA	M/L	M/L	M/L	L
N	M	M/L	M/L	M	L	L	L
S	M/L	M/L	NA	M	L	L	M
1	M/L	M/L	NA	M	M/L	M/L	L
2	M/L	M/L	NA	M	M/L	M	L
5	M/L	M/L	NA	M	M/L	M	L
6	M/L	M/L	NA	M	M/L	M/L	L
7	M/L	M/L	NA	M	M/L	M/L	L
8	M/L	M/L	NA	M	M/L	M/L	L
9	M/L	M/L	M/L	M/L	M	M	M
15	M/L	L	NA	M	L	L	L
16	M/L	L	NA	M	L	L	L
17	M/L	L	NA	M	L	L	L
18	L	M/L	NA	M	L	L	M
19	L	M/L	NA	M	M/L	M/L	L
20	M/L	M/L	NA	M	M/L	M/L	L
21	M/L	M/L	NA	M	L	M/L	L
22	M/L	M/L	NA	M	L	M/L	L
23	L	M/L	NA	M	L	L	M/L
I-7	M/L	M	NA	M	M/L	L	L
I-10	M	M	NA	M/H	L	L	L
I-11	M	M	NA	M/H	M/L	M	L
I-12	M	M/L	NA	M/H	L	L	L
I-13	M	M	M	M/H	M	M/L	M/L
I-19	M	M	M	M/H	M	M/H	M/H

L = low

M/L = moderately low

M = moderate

M/H = moderately high

H = high

NA = Not Applicable

Wetland B

Wetland B is a 6.6-acre Category 2 wetland system in the northwest portion of the project area (Ecology 1993). Wetland B is west of Des Moines Memorial Drive, north of South 192nd Street, and south of the existing terminus of SR 509. It was not possible to determine the hydrologic connections for Wetland B because surface flow enters a culvert and discharges at an unknown location.

This wetland contains PFO, PSS, and PEM habitat. Wetland vegetation is dominated by red alder, Himalayan blackberry, and Scouler willow. Subdominant vegetation includes mountain ash, western red-cedar, Watson willowherb, American brooklime, orchardgrass, reed canarygrass, field horsetail, and giant horsetail. Soils are very dark brown sandy loam, dusky red loamy sand with strong brown mottles, and very dark gray sandy loam. The wetland hydrologic indicators are saturated soil and inundation, oxidized rhizospheres, wetland drainage patterns, low soil chroma, and soil mottling.

Wetland D

Wetland D is a 4.9-acre Category 2 wetland and stream system associated with the east fork (Tyee Fork) of Des Moines Creek (Ecology 1993). Wetland D extends northeast from the Tyee Valley Golf Course toward Bow Lake. The wetland/stream includes culvert crossings for both the golf course and airport parking. The southern portion of the wetland (2.9 acres) was modified in the late 1980s as a stormwater detention pond for the east fork of Des Moines Creek. At this time, the wetland is being considered a jurisdictional wetland. Outflow from the pond is diverted into a culvert to the south, which in turn discharges into the middle of Wetland G.

This wetland contains PFO, PSS, and PEM habitat and includes approximately 3,250 feet of the east fork of Des Moines Creek. Wetland vegetation is dominated by red alder, Sitka willow, birdsfoot trefoil, white clover, colonial bentgrass, tall fescue, soft rush, common velvetgrass, small-fruited bulrush, and true watercress. Subdominant vegetation includes Himalayan blackberry, bittersweet nightshade, curly dock, tapertip rush, softstem bulrush, and redtop. Soils include black muck, dark greenish gray sand, very dark brown sandy loam with dark yellowish brown mottles, and dark grayish brown loamy sand with dark yellowish brown mottles. The wetland hydrologic indicators are saturated soil and inundation. The hydrology in wetland areas was inferred based on wetland drainage patterns, drift lines, oxidized rhizospheres, low soil chroma, and soil mottling.

Wetland F

Wetland F is a 28.8-acre Category 2 wetland system associated with the western fork of Des Moines Creek (Ecology 1993). This wetland has been referred to as the “Northwest Ponds” and serves as a portion of the

headwaters of Des Moines Creek. Wetland F extends north from the Tyee Valley Golf Course and west toward Des Moines Memorial Drive. This wetland's outflow is connected to Wetland G through a 54-inch culvert.

This wetland contains PFO, PSS, PEM, and POW habitat. Forested areas are dominated by red alder and creeping buttercup. Scrub-shrub vegetation is dominated by Pacific willow, purple loosestrife, and waterpepper. Emergent areas are dominated by creeping buttercup, giant horsetail, bittersweet nightshade, and maintained golf course grass. Other subdominant vegetation includes Himalayan blackberry, soft rush, small-fruited bulrush, reed canarygrass, common cattail, Scouler willow, cascara, Indian plum, salmonberry, red elderberry, Douglas spirea, lady fern, and sword fern. Soils include black muck, peat, and organic loam. The wetland hydrologic indicators are saturated soil and inundation, wetland drainage patterns, and low soil chroma. A culvert that enters the wetland from the northwest contributes to wetland hydrology.

Wetland G

Wetland G is a 7.9-acre Category 2 wetland and stream system associated with Des Moines Creek (Ecology 1993). Wetland G extends south from the outflow of Wetland F to South 200th Street. This wetland/stream system has areas flowing through culverts.

This wetland contains PSS and PEM habitat and includes approximately 2,100 feet of Des Moines Creek. Wetland vegetation is dominated by Pacific willow and red alder in the scrub-shrub community. Wetland areas on the golf course fairways are dominated by mowed grasses. The delineation was based largely on hydric soil conditions. Soils include black muck. The wetland hydrologic indicators are saturated soil, inundation, oxidized rhizospheres, wetland drainage patterns, low soil chroma, and soil mottling.

Wetland H

Wetland H is a 0.09-acre Category 4 wetland that functions as a pond for the Tyee Valley Golf Course (Ecology 1993). Wetland H is just north of South 200th Street. It is adjacent to, but hydrologically isolated from, Des Moines Creek.

This wetland contains POW and a fringe of PEM habitat. Wetland vegetation is dominated by mowed grasses, soft rush, and reed canarygrass. Soils include black muck. The wetland hydrologic indicators are saturated soil and inundation.

Wetland K

Wetland K is a 0.09-acre Category 3 wetland (Ecology 1993) located south of South 208th Street, adjacent to Wetland L, and near a sanitary sewer lift

station. It was not possible to determine the hydrologic connections for Wetland K. The wetland is isolated by fill, and all inflows and outflows are in culverts. It is likely connected to Des Moines Creek through the area's stormwater system. A chainlink fence around the wetland minimizes human intrusions.

The wetland contains PEM habitat. Wetland vegetation is dominated by colonial bentgrass and reed canarygrass. Subdominant vegetation includes black cottonwood and creeping buttercup. Soils include very dark grayish brown sandy loam with yellowish brown mottles. The wetland hydrologic indicators are saturated soil, inundation, and wetland drainage patterns.

Wetland M

Wetland M is a 0.1-acre Category 3 wetland (Ecology 1993) located north of South 192nd Street and west of Des Moines Memorial Drive. The wetland is mostly a section of an old ditch. The southern end was filled sometime in the past, and the northern end enters a culvert crossing under South 192nd Street. It was not possible to determine the hydrologic connections for Wetland M. It is likely connected to Wetland F and Des Moines Creek through the area's stormwater system.

The wetland contains PSS habitat. Wetland vegetation is dominated by Scouler willow, red alder, and creeping buttercup. Subdominant vegetation includes Himalayan blackberry, giant horsetail, and Japanese knotweed. Soils include black sandy muck. The wetland hydrologic indicators are saturated soil and inundation, wetland drainage patterns, and low soil chroma.

Wetland N

Wetland N is a 0.1-acre Category 3 wetland (Ecology 1993) located within the half cloverleaf at the terminus of SR 509 at South 188th Street. The wetland is a depression and ditch surrounded by roads, and it flows into the roadway drainage system to the south. It was not possible to determine the hydrologic connections for Wetland N. It is likely connected to Wetland F and Des Moines Creek through the area's stormwater system.

Wetland N contains PSS habitat. Wetland vegetation is dominated by red alder, Douglas spirea, and grasses. Subdominant vegetation includes soft rush and pacific crabapple. Soils include gray loamy sand. The wetland hydrologic indicators are saturated soil and inundation, surface-scoured areas, wetland drainage patterns, and low soil chroma.

Wetland S

Wetland S is a 0.5-acre Category 4 wetland (Ecology 1993) located west of Des Moines Creek and north of South 200th Street within the Tyee Valley Golf Course. It is immediately west of Wetland H. The wetland is a seep on a

gentle slope. The water from this wetland appears to enter the golf course drainage system. The wetland contains PEM habitat. Wetland vegetation is dominated by grasses planted for the golf course fairways. Soils include very dark gray gravelly sandy loam. The wetland hydrologic indicator is saturated soil.

Wetland 1

Wetland 1 is a 0.02-acre Category 3 wetland system (Ecology 1993) in the western portion of the project area. Wetland 1 is west of 18th Avenue South and south of South 200th Street. This wetland contains PFO habitat with a shrub understory. Wetland vegetation is dominated by red alder, Himalayan blackberry, salmonberry, and giant horsetail. Hydric soils and wetland hydrology have been identified within the delineated wetland boundary.

Wetland 2

Wetland 2 is a 0.7-acre Category 3 wetland system (Ecology 1993) in the western portion of the project area. Wetland 2 is west of 18th Avenue South, south of South 200th Street, and south of Wetland 1. This wetland contains PFO habitat and a shrub understory. Wetland vegetation is dominated by red alder, black cottonwood, willows, redstem dogwood, Himalayan blackberry, lady fern, and reed canarygrass. Soils consist of black loam over very dark gray gravelly sandy loam. Saturation and inundation have been observed during the growing season. The western boundary of the wetland is a seep zone, and water generally flows to a depression. An intermittent swale extends out of the wetland to the southeast.

Wetland 5

Wetland 5 is a 0.9-acre Category 3 wetland system (Ecology 1993) in the western portion of the project area. Wetland 5 is west of 18th Avenue South and south of South 200th Street. This wetland contains PFO habitat and a PSS understory. Wetland vegetation includes western red-cedar, red alder, willows, Douglas spirea, creeping buttercup, and bittersweet nightshade. Soils consist of black peaty muck over gray loam. Standing water has been observed on the site.

Wetland 6

Wetland 6 is a 0.03-acre Category 3 wetland system (Ecology 1993) in the western portion of the project area. Wetland 6 is west of 18th Avenue South, south of South 200th Street, and south of Wetland 5. This wetland contains PSS and PFO habitat. Wetland vegetation is dominated by red alder, Himalayan blackberry, salmonberry, and Douglas spirea. Hydric soils and wetland hydrology have been identified within the delineated wetland boundary.

Wetland 7

Wetland 7 is a 0.5-acre Category 3 wetland system (Ecology 1993) in the western portion of the project area. Wetland 7 is west of 18th Avenue South, south of South 200th Street, and south of Wetland 6. This wetland contains PSS and PFO habitat. Wetland vegetation is dominated by red alder over Himalayan blackberry. Hydric soils and wetland hydrology have been identified within the delineated wetland boundary.

Wetland 8

Wetland 8 is a 0.08-acre Category 3 wetland system (Ecology 1993) in the western portion of the project area. Wetland 8 is west of 18th Avenue South, south of South 200th Street, and south of Wetland 7. This wetland contains PSS habitat with overhanging forest trees (PFO). Wetland vegetation is dominated by red alder, Oregon ash, willows, creeping buttercup, and bedstraw. Hydric soils and wetland hydrology have been identified within the delineated wetland boundary.

Wetland 9

Wetland 9 is an 0.07-acre Category 2 wetland around Des Moines Creek (Ecology 1993). Wetland 9 is downstream from Wetland A and includes the Des Moines Creek channel and associated riparian wetlands. The PSS habitat is dominated by red alder, vine maple, Himalayan blackberry, and salmonberry.

Wetland 15

Wetland 15 is a 0.2-acre Category 3 wetland (Ecology 1993) located south of South 188th Street and west of 28th Avenue South. The wetland is separated from a roadside ditch by a berm. No outlets or surface water inflows are identified for this wetland. The wetland contains PFO habitat. Wetland vegetation is dominated by black cottonwood, Scouler's willow, and red alder saplings. Soils include black gravelly sandy loam over gray gravelly sandy loam. The wetland hydrologic indicators are saturated soil and surface water inundation.

Wetland 16

Wetland 16 is a 0.04-acre Category 3 wetland (Ecology 1993) located south of South 188th Street and west of 28th Avenue South. The wetland is highly disturbed and might have been created through past land use. No outlets or surface water inflows were identified for this wetland. The wetland contains PFO habitat. Wetland vegetation is dominated by black cottonwood, red alder, and Himalayan blackberry. Soils include black gravelly sandy loam over gray gravelly sandy loam. The wetland hydrologic indicators are saturated soil and surface water inundation.

Wetland 17

Wetland 17 is a 0.06-acre Category 3 wetland (Ecology 1993) located south of South 188th Street and west of 28th Avenue South. The wetland is highly disturbed and might have been created through past land use. No outlets or surface water inflows were identified for this wetland. The wetland contains PFO habitat. Wetland vegetation is dominated by black cottonwood, red alder, and Himalayan blackberry. Soils include black gravelly sandy loam over gray gravelly sandy loam. The wetland hydrologic indicators are saturated soil and surface water inundation.

Wetland 18

Wetland 18 is a 0.9-acre Category 4 wetland (Ecology 1993) located east of Wetland D (Tyee Pond) within the Tyee Valley Golf Course. The wetland is a large seep area on a slope. Surface water from this wetland does not connect with Wetland D. The wetland contains PEM habitat. Wetland vegetation is dominated by grasses planted for the golf course fairways. Soils include very dark gray to gray gravelly sandy loam with mottling. The wetland hydrologic indicator is saturated soil.

Wetland 19

Wetland 19 is a 0.5-acre Category 3 wetland (Ecology 1993) located north of South 200th Street and east of Des Moines Creek. The wetland occurs on a slope and includes a ditch. The water from this wetland flows into the drainage system at 200th Street. The wetland contains PFO and PSS habitat. Wetland vegetation is dominated by salmonberry. Soils include black mucky loam. The wetland hydrologic indicators are saturated soil, watermarks, and wetland drainage patterns.

Wetland 20

Wetland 20 is a 0.3-acre Category 4 wetland (Ecology 1993) located between 24th Avenue South and Des Moines Creek near South 208th Street. The wetland is a small depression and receives runoff from development to the east. The wetland contains PFO and PSS habitat. Wetland vegetation is dominated by red alder, black cottonwood, salmonberry, Himalayan blackberry, and Douglas spirea. Soils include very dark gray clay loam under a deep organic surface layer. The wetland hydrologic indicators are saturated soil, water-stained leaves, watermarks, and wetland drainage patterns.

Wetland 21

Wetland 21 is a 0.2-acre Category 3 wetland (Ecology 1993) located between Des Moines Creek and 24th Avenue South and south of Wetland A. The wetland is a previously farmed area. It was not possible to determine the hydrologic connections for Wetland 21. The wetland contains PEM habitat.

Wetland vegetation is dominated by reed canarygrass. Soils include reddish gray gravelly sandy loam with mottles. The wetland hydrologic indicators are inundation, saturated soil, watermarks, and wetland drainage patterns.

Wetland 22

Wetland 22 is a 0.01-acre Category 4 wetland located near Wetland 21 (Ecology 1993). The wetland contains PEM habitat. Wetland vegetation is dominated by reed canarygrass. Hydric soil conditions and wetland hydrologic characteristics were observed in the wetland.

Wetland 23

Wetland 23 is a 0.01-acre Category 4 wetland (Ecology 1993) located east of Wetland G and south of Wetland D (Tyee Pond) within the Tyee Valley Golf Course. The wetland is a small seep area on a slope. The water from this wetland does not connect with other wetlands. The wetland contains PEM habitat. Wetland vegetation is dominated by grasses planted for the golf course fairways. Soils include very dark gray to gray gravelly sandy loam with mottling. The wetland hydrologic indicator is saturated soil.

Wetland I-7

Wetland I-7 is a 0.06-acre Category 3 cut-slope seep wetland along the I-5 roadcut (Ecology 1993). This wetland is located along the western side of I-5, north of South 310th Street. The water from this wetland enters a ditch that empties into the I-5 stormwater drainage system. A previously surveyed wetland delineation for Wetland I-7 (WSDOT 1997) represents the conditions observed during the 2001 field investigation.

This PEM wetland is in the Mill Creek watershed. Wetland vegetation is dominated by soft rush, colonial bentgrass, redtop, creeping velvetgrass, and field horsetail. Subdominant vegetation includes trailing blackberry, tapertip rush, daggerleaf rush, and reed canarygrass. Soils include grayish brown to very dark grayish brown gravelly loam surface soil over a greenish gray and black sandy loam. The wetland hydrologic indicators are saturated soil and wetland drainage patterns.

Wetland I-10

Wetland I-10 is a 0.05-acre Category 3 (Ecology 1993) depression located between I-5 and Military Road north of South 304th Street and south of South 288th Street. There is a culvert in the western portion of the wetland that extends to the east. A previous surveyed wetland delineation for Wetland I-10 represents the conditions observed during the 2001 field investigation.

This wetland is located in the Lower Green River watershed, and contains a PEM and a PSS portion. The vegetation is dominated by salmonberry,

Scouler willow, and reed canarygrass. Subdominant vegetation includes evergreen blackberry. Soils are very dark gray to dark brown sandy and gravelly loam. The wetland hydrologic indicators are saturated soil, wetland drainage patterns, and low soil chroma.

Wetland I-11

Wetland I-11 is a 0.2-acre Category 3 (Ecology 1993) depression located between I-5 and Military Road north of South 304th Street and south of South 288th Street. There is a culvert in the western portion of the wetland that extends to the east. The entire wetland was delineated in the field.

This PFO and PSS wetland is located in the Lower Green River watershed. Wetland vegetation is dominated by quaking aspen, Douglas spirea, slough sedge, and tall mannagrass. Subdominant vegetation includes Himalaya blackberry, Pacific willow, and Scouler willow. Soils are black organic loam. The wetland hydrologic indicators are saturated soil and wetland drainage patterns.

Wetland I-12

Wetland I-12 is a 0.3-acre Category 3 (Ecology 1993) isolated depression located between I-5 and Military Road, north of South 304th Street and south of South 288th Street. No outflow channel or culverts were observed during the field visit. The entire wetland was delineated in the field.

The wetland contains PEM and PSS habitats and is located in the Lower Green River watershed. Wetland vegetation is dominated by Douglas spirea and reed canarygrass. Subdominant vegetation includes trailing blackberry and bracken fern. Soils are black to very dark grayish brown loam with areas of peat. The wetland hydrologic indicators are wetland drainage patterns, low soil chroma, organic soils, and depressional topography.

Wetland I-13

Wetland I-13 is a 0.2-acre Category 3 (Ecology 1993) wetland associated with the headwaters of McSorley Creek and is located between I-5 and Star Lake Road north of Military Road. A culvert discharges into the eastern end of the wetland, and surface water flows to the west. Only a portion of the wetland was delineated in the field.

Wetland I-13 contains PFO habitat and is located in the Lower Puget Sound watershed. Wetland vegetation is dominated by red alder, black cottonwood, Himalaya blackberry, Douglas spirea, and redtop. Subdominant vegetation includes Pacific willow and giant horsetail. Soils are dark gray loam. The wetland hydrologic indicators are saturated soil, low soil chroma, and depressional topography.

Wetland I-19

Wetland I-19 is a 78.5-acre Category 1 (Ecology 1993) wetland associated with McSorley Creek located west of I-5 and south of South 159th Street. Surface water flows to the southwest. The eastern portion of the wetland was flagged in the field.

The wetland is a PFO system in the Lower Puget Sound watershed. Wetland vegetation is dominated by red alder, salmonberry, lady fern, and field horsetail. Subdominant vegetation includes western red-cedar and water parsley. Soils include black organic loams over greenish gray sandy gravelly loam and peat. The wetland hydrologic indicators are inundation, saturated soil, water-stained leaves, and wetland drainage patterns.

3.6.3 Environmental Impacts

This section describes potential long-term environmental impacts on wetlands and wetland buffers from construction and operation of the SR 509: Corridor Completion/I-5/South Access Road Project. Permanent construction impacts are direct effects on wetlands through filling, dredging, or altering hydrology. Operation impacts are impacts resulting from the ongoing use of the roadway after construction.

Alternative A (No Action)

With this alternative, no direct impacts on wetlands would occur as a result of construction.

Impacts Common to All Build Alternatives

The primary direct effect from project construction would be the permanent fill or dredge (from cut and fill slopes) of wetlands and their buffer areas. Some wetlands would be cleared, graded, and filled, while in other cases wetland buffers would be affected. Table 3.6-4 lists wetland impacts and wetland buffer impacts.

Wetland functions that would be reduced as a result of construction include flood water detention and retention, flood flow desynchronization, groundwater recharge and discharge, and water quality improvement. Vegetated wetland and adjacent upland areas that currently allow infiltration of rainwater would be replaced by impervious road surfaces. Biological and wildlife support would be affected by reduced production and disruption of connections among habitats (Table 3.6-3). Placement and sizing of culverts, bridges, berms, and other structures that direct the flow of surface water could alter wetland hydrology by diverting, restricting, or increasing the flow

Table 3.6-4
Summary of Potential Direct Impacts from Build Alternatives

Wetland and Watershed	USFWS Classification	Wetland Rating*	Size (acres)	Potential Direct Impact (acres)					
				Wetlands			Buffers		
				Alternative B	Alternative C2 (Preliminary Preferred)	Alternative C3	Alternative B	Alternative C2 (Preliminary Preferred)	Alternative C3
Des Moines Creek Basin									
A	PFO/PSS	2/1[a]	16.0	0.04	0.01	0.01	1.2	2.4	5.1
B	PFO/PSS/PEM	2/1[a]	6.6	2.9	0.01	2.7	4.0	3.7	1.9
D	PFO/PSS/PEM	2/2[a]	4.9	1.5	0	1.5	5.7	3.9	8.1
F	PFO/PSS/PEM/POW	2/1[a]	28.8	1.5	0	0	2.5	0.5	0.4
G	PSS/PEM	2/2[a]	7.9	0	0	0.08	0	0.1	0.7
H	POW/PEM	4/3[a]	0.09	0	0	0.09	0	0	0.2
K	PEM	3/3[a]	0.09	0	0	0.01	0	0	0
M	PSS	3/3[a]	0.1	0	0.03	0.1	0.04	0.9	1.2
N	PSS	3/3[a]	0.1	0.1	0.1	0.1	0.6	0.6	0.6
S	PEM	4/3[a]	0.5	0	0	0.5	0	0	0
1	PFO	3/3[a]	0.02	0.02	0	0	0.4	0	0
2	PFO	3/3[a]	0.7	0.7	0	0	1.5	0	0
5	PFO/PSS	3/3[a]	0.9	0	0	0	0.5	0	0
6	PFO/PSS	3/3[a]	0.03	0.01	0	0	0.4	0	0
7	PFO/PSS	3/3[a]	0.5	0.5	0	0	0.7	0	0
8	PFO/PSS	3/3[a]	0.08	0.07	0	0	0.5	0	0
9	PSS, Stream	2/SW[b]	0.07	0.04	0	0	0.1	0	0
15	PFO	3/3[a]	0.2	0	0	0	0.2	0	0.3
16	PFO	3/3[a]	0.04	0.04	0.04	0.04	0.5	0	0.5
17	PFO	3/3[a]	0.06	0	0	0	0.3	0	0.4
18	PEM	4/3[a]	0.9	0.08	0	0	0.3	0	0
19	PFO/PSS	3/3[a]	0.5	0	0	0	1.2	0	0
20	PFO/PSS	4/3[a]	0.3	0	0	0.3	0	0	0.5
21	PEM	3/IW[b]	0.2	0.2	0	0	0.6	0	0
22	Ditch	4/IW[b]	0.01	0.01	0	0	0.4	0	0
23	PEM	4/3[a]	0.01	0	0.01	0.01	0.05	0.1	0.1

Table 3.6-4
Summary of Potential Direct Impacts from Build Alternatives

Wetland and Watershed	USFWS Classification	Wetland Rating*	Size (acres)	Potential Direct Impact (acres)					
				Wetlands			Buffers		
				Alternative B	Alternative C2 (Preliminary Preferred)	Alternative C3	Alternative B	Alternative C2 (Preliminary Preferred)	Alternative C3
Basin Total			69.6	7.7	0.2	5.4	21.6	12.3	19.9
Mill Creek Watershed									
I-7	PEM	3/3[c]	0.06	0	0	0	0.05	0.05	0.05
Lower Green River Watershed									
I-10	PEM/PSS	3/3[c]	0.05	0	0	0	0.03	0.03	0.03
I-11	PFO/PSS	3/3[c]	0.2	0	0	0	0.04	0.04	0.04
I-12	PEM/PSS	3/3[c]	0.3	0	0	0	0.1	0.1	0.1
Basin Total			0.5	0	0	0	0.2	0.2	0.2
Lower Puget Sound Watershed									
I-13	PFO	3/3[c]	0.2	0	0	0	0.06	0.06	0.06
I-19	PFO	1/1[d]	78.5	0	0	0	1.3	1.3	1.3
Basin Total			78.7	0	0	0	1.4	1.4	1.4
Grand Total			148.7	7.7	0.2	5.4	23.3	13.9	21.5

NA= not available
SW = significant wetland
IW = important wetland
** 2/1[a] = Ecology(2)/local ordinance rating (1)*
[a] *Using City of SeaTac Environmentally Sensitive Areas Ordinance (1994)*
[b] *Using City of Des Moines Environmentally Sensitive Areas Ordinance (1997)*
[c] *Using City of Federal Way Environmentally Sensitive Areas Ordinance Chapter 22.12 (2001)*
[d] *Using City of Kent Wetlands Management Ordinance Chapter 11.04 (2000)*

of water in adjacent wetlands. The type and magnitude of construction impacts would depend on final designs, including stormwater management systems, for each build alternative. Additional discussion of stormwater and water quality issues is included in Section 3.5, *Water Quality*.

Pollutants such as petroleum products, heavy metals, and sediments that are carried into wetlands by stormwater running off highways could negatively affect wetland functions. Plant stress, habitat degradation, and loss of flood storage capacity could result from the influx of such pollutants. Noise and visual disturbance from traffic on roads passing through and next to wetlands could disrupt breeding, nesting, and feeding of many types of wildlife.

Under each of the build alternatives, increases in roadway and other impervious surfaces could change hydrologic function in the wetlands and streams.

Alternative B

The total area of direct wetland impact from Alternative B, including the I-5 improvements, would be 7.7 acres, which would be the highest of all the build alternatives. This includes impacts on 6.0 acres of Category 2 wetlands, 1.6 acres of Category 3 wetlands, and 0.1 acre of Category 4 wetlands. Areas of PFO, PSS, and PEM habitat would be affected. No direct wetland impacts would occur in Category 1 wetlands. There would be a total of 23.3 acres of buffer impacts with Alternative B (Table 3.6-4), the highest of the build alternatives.

The SR 509 freeway extension and South Access Road portion of Alternative B would directly affect 7.7 acres of wetland and 21.6 acres of wetland buffer. Direct impacts would occur in Wetlands A, B, D, F, N, 1, 2, 6, 7, 8, 9, 16, 18, 21, and 22 (see Figures 3.6-1 and 3.6-4). No direct impacts would occur in Wetlands M, 5, 17, 15 19, and 23, but portions of their buffers would be affected.

There would be no direct wetland impacts along the I-5 corridor. Approximately 1.6 acres of wetland buffer along Wetlands I-7, I-10, I-11, I-12, I-13, and I-19 could, however, be affected (Table 3.6-4).

Alternative C2 (Preliminary Preferred)

The total area of direct wetland impact from Alternative C2, including the I-5 improvements, would be approximately 0.2 acre. This includes impacts on 0.2 acre of Category 3 wetlands and 0.01 acre of Category 4 wetlands. Areas of PFO, PSS, and PEM habitat would be affected. Impacts on Wetlands A and B include 0.02 acre for bridge support footings. No direct wetland impacts would occur in Category 1 wetlands. There would be a total of 13.9 acres of buffer impacts associated with this alternative (see Table 3.6-4).

The direct wetland and buffer impacts would be the lowest of all the build alternatives.

The SR 509 freeway extension and South Access Road portion of Alternative C2 would directly affect 0.2 acre of wetland and 12.3 acres of wetland buffer. Direct impacts would occur in Wetlands A, B, M, N, 16, and 23 (Figures 3.6-2 and 3.6-4). Bridges would be constructed across Wetlands A, B, and D. Approximately 0.9 acre of Wetland A, 1.2 acres of Wetland B, and 0.6 acre of Wetland D would lie under the bridge decks and could be affected by shading. Direct impacts in these wetlands would be limited to potential placement of bridge support piers. No direct impacts would occur in Wetlands D, F, and G, but portions of their buffers would be affected.

Impacts along the I-5 corridor would be the same as for Alternative B (Table 3.6-4).

Alternative C3

The total area of direct wetland impact from Alternative C3, including the I-5 improvements, would be 5.4 acres, which would be higher than Alternative C2, but lower than Alternative B. This would include impacts on 4.2 acres of Category 2 wetlands, 0.3 acre of Category 3 wetlands, and 0.9 acre of Category 4 wetlands. Areas of PFO, PSS, and PEM habitat would be affected. No direct wetland impacts would occur in Category 1 wetlands. There would be a total of 21.5 acres of buffer impacts associated with this alternative (Table 3.6-4), which would be lower than Alternative B but higher than Alternative C2.

The SR 509 freeway extension and South Access Road portion of Alternative C3 would directly affect 5.4 acres of wetland and 19.9 acres of wetland buffer. Direct impacts would occur in Wetlands A, B, D, G, H, K, M, N, S, 16, 20, and 23 (Figures 3.6-3 and 3.6-4). A bridge would be constructed across Wetland A. Approximately 3.3 acres of the wetland would lie under the bridge deck and could be affected by shading. Direct impacts in Wetland A would be limited to potential placement of bridge support piers. No direct impacts would occur in Wetlands F, 15, and 17, but portions of their buffers would be affected.

Impacts along the I-5 corridor would be the same as for Alternative B (Table 3.6-4).

3.6.4 Mitigation Measures

Wetlands are recognized as an important and valuable natural resource, and their protection is a matter of public interest. The federal government and the State of Washington have a “no net loss” policy concerning wetlands. Environmental Sensitive Areas Ordinances of the City of SeaTac (1994), the

City of Des Moines (1997), the City of Federal Way City (2001), the City of Kent (2000), and King County (2001) were implemented to protect wetlands and mitigate unavoidable impacts. One goal of these policies is to achieve no overall loss of wetland acreage or function through mitigation of wetland impacts that results from regulated activities. Mitigation includes (in order of preference) avoidance, minimization, rectification, reduction, compensation, and monitoring.

As part of agency coordination for Alternative C2, the Preliminary Preferred Alternative, WSDOT has committed to avoiding all Category 1 wetlands and spanning all Category 2 wetlands with bridges to minimize impacts. In addition, the South Access Road would span the Tyee wetland/stormwater pond with a bridge to eliminate any direct impacts. If Alternative B or C3 is selected as the Preferred Alternative, similar design features to avoid and/or minimize wetland impacts would be evaluated.

Where direct impacts on wetlands cannot be avoided, compensation for impacts may be accomplished through wetland enhancement, restoration, or creation. Wetland impacts would be mitigated by the creation of new wetlands or enhancement of existing wetlands. Requirements include creation and/or restoration at minimum 1:1 mitigation ratio. Additional mitigation is required to satisfy Ecology's wetland mitigation guidelines. Shading impacts at bridge crossings could be mitigated by planting native shade-tolerant species.

An assessment of local and Ecology mitigation ratios indicates that Ecology's ratio requires more mitigation (Ecology 1998) than is required by the ordinances of SeaTac (1994), Des Moines (1997), Federal Way (2001), Kent (2000), or King County (2001). Table 3.6-5 shows preliminary estimates for areas of wetland mitigation required using mitigation ratios from Ecology (1998). A wetland mitigation plan is being prepared that will provide a detailed description of wetland mitigation for the proposed project.

In addition, any wetland enhancement, restoration, or creation projects would need to adhere to guidance presented in the FAA advisory circular (FAA 1997) regarding wildlife attractions on or near airports. This circular discourages the placement of wetland mitigation projects that could attract certain wildlife in areas where air traffic is present. This would likely require that certain wetland functions restricted by the FAA be mitigated at one or more mitigation sites outside the FAA 10,000-foot restricted zone.

3.6.5 Construction Activity Impacts and Mitigation

Potential temporary impacts resulting from construction of any of the build alternatives include clearing, grading, excavation, and filling. Types of construction include temporary access roads along vertical wall structures or bridge piers during construction. These activities would expose erodible soils,

Table 3.6-5
Preliminary Mitigation Requirements for Wetland Impacts Based on Ecology (1998)

Wetland and Watershed	USFWS Classification	Ecology Rating	Mitigation Ratio	Recommended Mitigation by Vegetation Community Type (acres)											
				Alternative B				Alternative C2 (Preliminary Preferred)				Alternative C3			
				Total	PFO	PSS	PEM	Total	PFO	PSS	PEM	Total	PFO	PSS	PEM
Des Moines Creek Basin															
A	PFO/PSS	2	3:1	0.1	0.1			0.03	0.03			0.03	0.03		
B	PFO/PSS/PEM	2	3:1	8.7	8.7			0.03	0.03			8.0	8.0		
D	PFO/PSS/PEM	2	2:1	3.1		3.1						3.0		3.0	
F	PFO/PSS/PEM/ POW	2	3:1	4.4	4.4										
G	PSS/PEM	2	2:1									0.2		0.2	
H	POW/PEM	4	1.25:1									0.1			0.1
K	PEM	3	2:1									0.02			0.02
M	PSS	3	2:1					0.06		0.06		0.2		0.2	
N	PSS	3	2:1	0.2		0.2		0.2		0.2		0.2		0.2	
S	PEM	4	1.25:1									0.7			0.7
1	PFO	3	3:1	0.07	0.07										
2	PFO	3	3:1	2.2	2.2										
5	PFO/PSS	3	3:1												
6	PFO/PSS	3	3:1	0.04	0.04										
7	PFO/PSS	3	3:1	1.5	1.5										
8	PFO/PSS	3	3:1	0.2	0.2										
9	PSS, Stream	2	2:1	0.08		0.08									
15	PFO	3	3:1												
16	PFO	3	3:1	0.1	0.1			0.1	0.1			0.1	0.1		
17	PFO	3	1.25:1												
18	PEM	4	1.25:1	0.1			0.1								
19	PFO/PSS	3	3:1	0.01	0.01										
20	PSS	4	1.25:1									0.3		0.3	
21	PEM	3	2:1	0.4			0.4								
22	Ditch	4	1.25:1	0.01			0.01								
23	PEM	4	1.25:1					0.01			0.01	0.01			0.01
Basin Total				21.1	17.2	3.4	0.5	0.5	0.2	0.3	0.01	12.9	8.1	4.0	0.8
Mill Creek Watershed															
I5-7	PEM	3	2:1	0	0	0	0	0	0	0	0	0	0	0	0
Lower Green River Watershed															
I-10	PEM/PSS	3	2:1												
I-11	PFO/PSS	3	3:1												
I-12	PEM/PSS	3	2:1												
Basin Total				0	0	0	0	0	0	0	0	0	0	0	0
Lower Puget Sound Watershed															
I-13	PFO	3	3:1												
I-19	PFO	1	6:1												
Basin Total				0	0	0	0	0	0	0	0	0	0	0	0
Grand Total				21.1	17.2	3.4	0.5	0.5	0.2	0.3	0.0	22.7	18.3	4.0	1.1

Ecology (1998) = How Ecology Regulates Wetlands. Publication No. 97-112.

Minimum mitigation ratio for creation or restoration:

Category 1 = 6:1

Category 2 or 3--PFO = 3:1

Category 2 or 3--PSS or PEM = 2:1

Category 4 = 1.25:1

increasing the potential for erosion and sediment transport to wetlands. Sedimentation could degrade water quality by increasing turbidity, suspended solids, and pollutants. Sediment deposition in wetlands could reduce floodwater storage capacity, change water depth and flow patterns, and block water inflow or outflow paths. Large volumes of sediment could kill trees by cutting off oxygen to their roots and could bury the eggs of aquatic organisms.

Wetland water quality could be adversely affected during construction as a result of onsite storage and use of fuel and lubricants for construction equipment. Pollutants from an accidental spill could be carried to adjacent wetlands by surface water runoff, degrading both water quality and wildlife habitat.

Adherence to BMPs and local environmental protection policies would 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 would be prepared and implemented to avoid or minimize construction impacts on wetlands and streams. Settling ponds, containment berms, silt fences, sediment traps, seeding of exposed slopes, and other measures would be implemented as appropriate. Areas of short-term construction impacts would be restored by replanting with native trees and shrubs upon completion of construction activities.

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3.7 Vegetation, Wildlife, Fish, and Threatened and Endangered Species

3.7 Vegetation, Wildlife, Fish, and Threatened and Endangered Species

3.7.1 Studies and Coordination

This section is based on previous reports, including the *SR 509/South Access Road EIS Discipline Report: Vegetation, Wildlife, and Fisheries* (CH2M HILL March 2000), the *SR 509/South Access Road EIS Discipline Report: South Airport Link* (CH2M HILL August 2001), the *SR 509/South Access Road EIS: I-5 Improvements Report* (CH2M HILL October 2001).

To identify and evaluate vegetation, wildlife, fish, and associated habitats within the project area, information was gathered from a variety of sources. USFWS, NMFS, and the WDFW were contacted to provide information on federal and state threatened, endangered, proposed, and candidate species that may occur in or near the project area. The Washington State Department of Natural Resources (WDNR) Natural Heritage Program (NHP) was consulted regarding priority habitats and sensitive plant and wildlife species that may occur in or near the project area. The King County *Sensitive Areas Map Folio* (King County 1990) and the *Catalog of Washington Streams and Salmon Utilization* (Williams et al. 1975) were reviewed for information regarding fisheries resources.

Analysis of agency information and aerial photographs along with environmental studies prepared for the proposed project allowed for development of an inventory and assessment of resources that could be affected by the proposed project. A field reconnaissance of the project area was conducted on August 24, 2001, to verify information collected on vegetation communities, wildlife, fish, and general wildlife use of the project area. Habitats within approximately 500 feet of the proposed build alternatives were assessed. Wetlands within the project area are identified and documented in Section 3.6, *Wetlands*.

In accordance with Section 7 of the ESA, a BA is being prepared to provide a detailed evaluation for all listed, proposed, candidate species, and species of concern identified by USFWS and NMFS as potentially occurring in the project area. Consultation with USFWS and NMFS resulted in an agreement for preparation of a BA and associated Section 7 coordination on the Preliminary Preferred Alternative (Alternative C2) (Grettenberger pers. comm. 1998, Nelson pers. comm. 2000). The threatened and endangered species discussion presented herein includes summary information from the BA being prepared for the proposed project.

3.7.2 Affected Environment

The discussion is divided into three elements—vegetation and wildlife, fish, and threatened and endangered species. Vegetation and wildlife describes upland plant communities and potential wildlife use in the project area. Vegetation and wildlife of the project area are discussed together because of the close interaction between these two natural resources. The *Vegetation and Wildlife* section also discusses wetlands, but in the context of wildlife habitat. A detailed description of wetlands in the project area and an analysis of the proposed project's effects on wetlands are presented in Section 3.6, *Wetlands*. The *Fish* section discusses the freshwater habitat and potential fish use of the project area. The *Threatened and Endangered Species* section discusses listed threatened and endangered wildlife, fish, and plant species that are regulated under the ESA.

Vegetation and Wildlife

Vegetation communities within the project area consist of mowed and unmowed grassland areas; shrubland; mixed deciduous/coniferous forest; commercial and residential areas containing a fragmented mixture of native, nonnative, and ornamental plant species; and wetlands.

The project area is located within a densely populated urban area of western King County that is dominated by commercial and residential development. As a result, the majority of vegetation communities located within the project area are fragmented and associated with roads or located between residential and commercial development. The Tyee Valley Golf Course, Sea-Tac Airport, and facilities associated with the airport, are the significant features in the northern portion of the project area. The I-5 improvements, which account for 6.7 miles of the project length, is the significant feature in the southern portion of the project area.

Grassland areas are common throughout the project area. Portions of the project area that are dominated by grassland habitat include the Tyee Valley Golf Course and habitat adjacent to I-5. Plant species within the grassland habitat include a variety of native and nonnative grasses and herbaceous species that are common within King County. Grassland areas associated with the Tyee Valley Golf Course are fairways that are frequently mowed. Grassland habitat adjacent to I-5 generally consists of a mosaic of mowed and unmowed grassland areas interspersed with parcels of shrubland, mixed deciduous/coniferous forest, and wetlands. Various combinations of native and nonnative tree and shrub species occur adjacent to I-5. The majority of these vegetation communities are located within 100- to 200-foot-wide tracts of land between the roadway and residential and commercial development.

Fragmented stands of mixed deciduous/coniferous forest are also located in several areas in the northern portion of the project area, including south of

South 192nd Street and the Des Moines Creek Park area. Mixed deciduous/coniferous forest habitat is dominated by an assemblage of species typical of Puget Sound lowland forests. Nonnative, invasive species such as English ivy (*Hedera helix*), Scot's broom (*Cytisus scoparius*), and Himalayan blackberry (*Rubus procerus*) are frequent components of the shrub and forested habitats. Forested habitat in the project area is typically relatively young, second growth forest. No stands of old growth forest habitat are located within the project area.

Commercial and residential areas often include a combination of mowed grasses and a fragmented mixture of native, nonnative, and ornamental trees and shrubs. Most of the habitat associated with residential and commercial development is located south of Tyee Valley Golf Course and north of the project area associated with the I-5 corridor.

The South Airport Link design options H0, H2-A, and H2-B are located in the northeast portion of the project area, in a densely populated urban area dominated by residential and commercial development. The dominant features of this portion of the project area are buildings, parking lots, and paved roads, primarily associated with Sea-Tac Airport facilities.

Riparian habitat within the project area is limited to areas associated with Des Moines Creek. South of South 200th Street the riparian habitat of Des Moines Creek includes high quality shrub and forested habitat within Des Moines Creek Park. North of South 200th Street, the riparian habitat of Des Moines Creek is dominated by fairways with mowed grasses within the Tyee Valley Golf Course. Tree canopy and bank vegetation are largely absent in this area. Des Moines Creek also flows through several ponds in the Tyee Valley Golf Course that function as wetland habitat.

Several wetland communities were identified along the alignments of the build alternatives. These wetlands are all palustrine systems and include open water, emergent, scrub-shrub, and forested wetland systems. A detailed discussion of these wetlands is presented in Section 3.6, *Wetlands*.

The mosaic of vegetation communities within the project area provides habitat for a variety of terrestrial and aquatic wildlife. Wildlife diversity is generally related to the structure and composition of plant species within vegetative communities. Wetlands and forested areas with well-developed shrub layers are likely to support the greatest number of species and populations of wildlife (Brown 1985). Wildlife habitats in the project area range in quality from low in commercial and residential areas, to high in the wetland habitat and forested riparian habitat associated with Des Moines Creek Park.

A moderate variety of native birds, mammals, reptiles, and amphibians are expected to inhabit shrubland, forested, and wetland habitats in the project area.

Areas of mixed deciduous/coniferous forest in the northern portion of the project area provide valuable habitat for native wildlife species. These areas are likely to provide breeding habitat for edge species, interior-dependent wildlife species, and migrant songbirds.

Ponds located in the Tyee Valley Golf Course, other wetlands in the project area, and riparian areas associated with Des Moines Creek provide habitat for a variety of amphibians, reptiles, mammals, and birds that depend on water for foraging and breeding habitat. Open-water sections of the ponds and wetlands in the project area are also expected to provide habitat for wintering and migratory waterfowl.

Urbanized areas near Sea-Tac Airport, SR 99, and I-5, and along roadways with adjacent businesses and residences offer the least valuable wildlife habitat in the project area because of their fragmented and disturbed nature. The relatively narrow habitats and the proximity between areas with high levels of human activity limits the value of available wildlife habitat to species that are not sensitive to human disturbance. Additionally, wildlife species that typically prefer interior forest habitat or require large areas of unbroken habitat to forage and reproduce are unlikely to regularly occur in these portions of the project area. These areas likely support an assemblage of native wildlife species typically found in western Washington and King County that have adapted to disturbance associated with populated urban areas, as well as nonnative wildlife species. No evidence of rare, uncommon, or unique wildlife or wildlife habitat is apparent within the project area (Guggenmos pers. comm. 2001, Moody pers. comm. 2001).

Fish

The project area is located within the Lower Duwamish River Basin (Water Resource Inventory Area [WRIA] 9). Freshwater and marine resources that support fisheries and other aquatic biota within WRIA 9 include Puget Sound, Duwamish River, Green River, and a variety of streams, tributaries, and lakes. The proposed project passes through five stream basins (Des Moines Creek, Miller Creek, Lower Green River, Lower Puget Sound, and Mill Creek). Basin boundaries and stream locations are shown in Figure 3.5-1.

Des Moines Creek is the only fish-bearing aquatic resource located within 2,000 feet of the proposed build alternatives. Wetland habitats within the project area that are not associated with Des Moines Creek have no known fish use (Guggenmos pers. comm. 2001, King County 1990, Williams et al. 1975).

Des Moines Creek Basin

Des Moines Creek is the main drainage course in the Des Moines Creek Basin. Originating from Bow Lake north of South 192nd Street, Des Moines Creek generally flows south to southwest and eventually empties into Puget Sound near South 222nd Street.

A Catalog of Washington Streams for the Puget Sound Region (Williams, et al. 1975) lists coho salmon and possibly chum salmon as the primary salmonid species using Des Moines Creek. WDFW considers cutthroat to be the dominant trout species in Des Moines Creek, although steelhead and rainbow trout have also been observed (Parametrix 1994, Phillips pers. comm. 1998). The WDFW Priority Habitat and Species (PHS) data system identifies the reach of Des Moines Creek from Puget Sound to RM 1.0, as providing an anadromous fish presence and priority anadromous/resident fish presence (Guggenmos pers. comm. 2001). King County and WDFW have not detected spawning activity upstream of RM 1.0 (Masters pers. comm. 1999, Phillips pers. comm. 1998, Schnieder pers. comm. 1999). WSDOT and King County identify the box culvert at Marine View Drive, at approximately RM 0.4, as a fish barrier that "appears to limit all anadromous fish passage" (King County 1997).

From Puget Sound to South 200th Street (RM 2.1), Des Moines Creek flows in a natural channel through forested habitat that provides nearly unbroken shade cover. Portions of this reach contain good spawning habitat; however, rearing habitat is limited (Johnson 1989, Shapiro 1999). Upstream of South 200th Street the creek contains little or no salmon spawning or rearing habitat. In this reach the creek flows through the Tyee Valley Golf Course. The final 3,600-foot reach of the creek is culverted and channelized up to Bow Lake.

Miller Creek, Lower Green River, Lower Puget Sound, and Mill Creek Basins

Natural resource information identifies the location of the nearest fish bearing streams in these basins with fish use by resident or anadromous fish as more than 2,000 feet from the project area (Guggenmos pers. comm. 2001, King County 1990, Williams et al. 1975). A detailed analysis and description of fish habitat and fish use within these basins is presented in the technical reports previously prepared for the proposed project.

Threatened and Endangered Species

According to correspondence with state and federal agencies, wildlife and fish species that are listed as threatened or endangered may occur near the project area. Table 3.7-1 shows the federally listed species under the jurisdiction of USFWS or NMFS that could occur near the project area.

Species under USFWS jurisdiction include bald eagle, marbled murrelet, and the Coastal-Puget Sound Distinct Population Segment (DPS) of bull trout (Berg pers. comm. 2001). NMFS indicated that Puget Sound chinook salmon, listed as threatened, could occur near the project area, and identifies the project area as occurring within the designated critical habitat for Puget Sound chinook salmon. NMFS also identified one candidate species for listing, coho salmon, as potentially occurring near the project area (Kirkpatrick pers. comm. 2001).

Table 3.7-1
USFWS and NMFS Listed Endangered, Threatened, Proposed, and Candidate Species Identified by Federal Agencies That May Occupy or Use Areas Affected by the Proposed Project

Common Name	Scientific Name	Federal Status	State Status
USFWS			
Bald Eagle	*Haliaeetus leucocephalus*	Threatened	Threatened
Bull Trout (Coastal/Puget Sound DPS)	*Salvelinus confluentus*	Threatened	Candidate
Marbled Murrelet	*Brachyramphus marmoratus marmoratus*	Threatened	Threatened
NMFS			
Chinook Salmon (Puget Sound ESU)	*Oncorhynchus tshawytscha*	Threatened	Candidate
Chinook Salmon Critical Habitat (Puget Sound ESU)	*NA*	Critical Habitat	None
Coho Salmon (Puget Sound/ Straight of Georgia ESU)	*Oncorhynchus kisutch*	Candidate	None

Source: Berg pers. comm. (2001), Kirkpatrick pers. comm. (2001).

ESU = Evolutionary Significant Unit

NA = not applicable

A review of the WDFW PHS data system and nongame data system revealed that no federal or state-listed sensitive, threatened, endangered, or proposed wildlife species regularly occupy, breed, or forage within 1 mile of the project area (Guggenmos pers. comm. 2001).

WDFW identified four bald eagle nests and/or breeding territories located within 3 miles of the project area. None of these nests are located within 1 mile of the project area. One nest is located along the northeast corner of Angle Lake, more than 1 mile north of the project area. A second nest is located south of North Lake, more than 1 mile south of the project area. The third and fourth nests are located along the shoreline of Puget Sound, more than 2 miles west of the project area. A fifth nest is located south of Seahurst Park, more than 4 miles northwest of the project area (Guggenmos pers. comm. 2001).

Wintering populations of bald eagles use shoreline areas along Puget Sound for foraging and perch sites. Bald eagles may perch near the project area; however, quality breeding and foraging habitats typically associated with bald eagles are not located adjacent to the proposed project, and no bald eagle breeding, nesting, or winter roosting is documented within 1 mile of the project area (Guggenmos pers. comm. 2001).

Marbled murrelets occur in many areas of western Oregon and Washington, where suitable forested habitat occurs within approximately 50 miles of Puget Sound or the Pacific Ocean (Hamer et al. 1991). Potential murrelet habitat has been described as mature coniferous forest, coniferous forest with an old growth component, old growth forest, or younger coniferous forests that have deformations or structures suitable for nesting.

WDFW has not documented any marbled murrelet occupancy sites within at least 5 miles of the project area (Guggenmos pers. comm. 2001). Potentially suitable marbled murrelet nesting habitat is not located within 5 miles of the project area. Old-growth forest communities typically associated with marbled murrelet habitat are not located in western King County.

On October 29, 1999, the Coastal-Puget Sound DPS of bull trout was listed by the federal government as a threatened species because of habitat degradation, dams and diversions, and predation by nonnative fish. Freshwater and anadromous populations of bull trout have been documented in Washington. While USFWS has indicated that the species may be present in the project area, it does not provide specific habitat use information (Berg pers. comm. 2001). A 1999 distribution map by USFWS does not identify current or historic spawning areas for bull trout within 1 mile of the project area (USFWS 1999). A 1993 report on the distribution and status of bull trout and Dolly Varden in Washington does not identify any drainages within 1 mile of the project area as having populations of bull trout (Washington State Department of Wildlife [WDW] 1993). Bull trout have not been documented and are very unlikely to occur in Des Moines Creek (Schnieder pers. comm. 1999, Phillips pers. comm. 1998, Masters pers. comm. 1999).

On March 24, 1999, the Puget Sound chinook salmon Evolutionary Significant Unit (ESU) was listed by NMFS as a threatened species. Juveniles and adults of Puget Sound populations of chinook salmon migrate through Puget Sound. Adult chinook salmon returning to Puget Sound rivers to spawn typically pass through Puget Sound between July and October (NMFS 1999).

On February 16, 2000, NMFS designated critical habitat of the Puget Sound chinook salmon ESU as protected under the ESA (50 CFR Part 226). The rule was effective March 17, 2000. Critical habitat for the Puget Sound chinook salmon includes all marine, estuarine, and fresh waters that are accessible to chinook salmon.

According to NMFS, Puget Sound chinook salmon may occur in the vicinity of the proposed project. NMFS does not provide specific habitat use data. The NMFS data system identifies potential species occurrence in a project area based on the Township and Range where the project is proposed. NMFS' reference to chinook salmon is likely in regard to the Puget Sound and Green River habitat. Puget Sound chinook salmon are not documented and are unlikely to occur in Des Moines Creek (Guggenmos pers. comm. 2001, Masters pers. comm. 1999, Schnieder pers. comm. 1999).

NMFS has received petitions to list Puget Sound/Straight of Georgia coho salmon as threatened, though they are not protected under the ESA at this time (Kirkpatrick pers. comm. 2001). Coho salmon are documented in Des Moines Creek from the outlet at Puget Sound to RM 1.0.

WDFW documented the presence of pileated woodpeckers more than 1 mile northwest of the project area (Guggenmos pers. comm. 2001). This species is currently considered a candidate for state listing as threatened or endangered. Pileated woodpeckers are typically found in dense, mature forests.

The WDFW PHS data system and the WDNR NHP were consulted regarding rare plants and priority habitats within the project area. No federal or state-listed sensitive, threatened, or endangered plant species or high quality native plant communities are located within the areas that would be directly affected by the proposed alignments (Guggenmos pers. comm. 2001, Moody pers. comm. 2001).

3.7.3 Environmental Impacts

Alternative A (No Action)

Under the No Action Alternative, impacts on vegetation and wildlife, fish, and threatened and endangered species associated with the proposed project would not occur. No impacts or construction would occur that would entail removal or alteration of existing vegetation communities, wildlife, or fish habitats within the project area.

Impacts Common to All Build Alternatives

The section below describes long-term impacts associated with construction of the proposed project. Short-term impacts associated with construction of the proposed project are described in Section 3.7.5, *Construction Activity Impacts and Mitigation.*

Vegetation and Wildlife

Potential impact area estimates are based on aerial photo analysis and preliminary engineering plans prepared for the proposed project and represent

3.7 Vegetation, Wildlife, Fish, and Threatened and Endangered Species

3.7.1 Studies and Coordination

This section is based on previous reports, including the *SR 509/South Access Road EIS Discipline Report: Vegetation, Wildlife, and Fisheries* (CH2M HILL March 2000), the *SR 509/South Access Road EIS Discipline Report: South Airport Link* (CH2M HILL August 2001), the *SR 509/South Access Road EIS: I-5 Improvements Report* (CH2M HILL October 2001).

To identify and evaluate vegetation, wildlife, fish, and associated habitats within the project area, information was gathered from a variety of sources. USFWS, NMFS, and the WDFW were contacted to provide information on federal and state threatened, endangered, proposed, and candidate species that may occur in or near the project area. The Washington State Department of Natural Resources (WDNR) Natural Heritage Program (NHP) was consulted regarding priority habitats and sensitive plant and wildlife species that may occur in or near the project area. The King County *Sensitive Areas Map Folio* (King County 1990) and the *Catalog of Washington Streams and Salmon Utilization* (Williams et al. 1975) were reviewed for information regarding fisheries resources.

Analysis of agency information and aerial photographs along with environmental studies prepared for the proposed project allowed for development of an inventory and assessment of resources that could be affected by the proposed project. A field reconnaissance of the project area was conducted on August 24, 2001, to verify information collected on vegetation communities, wildlife, fish, and general wildlife use of the project area. Habitats within approximately 500 feet of the proposed build alternatives were assessed. Wetlands within the project area are identified and documented in Section 3.6, *Wetlands*.

In accordance with Section 7 of the ESA, a BA is being prepared to provide a detailed evaluation for all listed, proposed, candidate species, and species of concern identified by USFWS and NMFS as potentially occurring in the project area. Consultation with USFWS and NMFS resulted in an agreement for preparation of a BA and associated Section 7 coordination on the Preliminary Preferred Alternative (Alternative C2) (Grettenberger pers. comm. 1998, Nelson pers. comm. 2000). The threatened and endangered species discussion presented herein includes summary information from the BA being prepared for the proposed project.

3.7.2 Affected Environment

The discussion is divided into three elements—vegetation and wildlife, fish, and threatened and endangered species. Vegetation and wildlife describes upland plant communities and potential wildlife use in the project area. Vegetation and wildlife of the project area are discussed together because of the close interaction between these two natural resources. The *Vegetation and Wildlife* section also discusses wetlands, but in the context of wildlife habitat. A detailed description of wetlands in the project area and an analysis of the proposed project's effects on wetlands are presented in Section 3.6, *Wetlands*. The *Fish* section discusses the freshwater habitat and potential fish use of the project area. The *Threatened and Endangered Species* section discusses listed threatened and endangered wildlife, fish, and plant species that are regulated under the ESA.

Vegetation and Wildlife

Vegetation communities within the project area consist of mowed and unmowed grassland areas; shrubland; mixed deciduous/coniferous forest; commercial and residential areas containing a fragmented mixture of native, nonnative, and ornamental plant species; and wetlands.

The project area is located within a densely populated urban area of western King County that is dominated by commercial and residential development. As a result, the majority of vegetation communities located within the project area are fragmented and associated with roads or located between residential and commercial development. The Tyee Valley Golf Course, Sea-Tac Airport, and facilities associated with the airport, are the significant features in the northern portion of the project area. The I-5 improvements, which account for 6.7 miles of the project length, is the significant feature in the southern portion of the project area.

Grassland areas are common throughout the project area. Portions of the project area that are dominated by grassland habitat include the Tyee Valley Golf Course and habitat adjacent to I-5. Plant species within the grassland habitat include a variety of native and nonnative grasses and herbaceous species that are common within King County. Grassland areas associated with the Tyee Valley Golf Course are fairways that are frequently mowed. Grassland habitat adjacent to I-5 generally consists of a mosaic of mowed and unmowed grassland areas interspersed with parcels of shrubland, mixed deciduous/coniferous forest, and wetlands. Various combinations of native and nonnative tree and shrub species occur adjacent to I-5. The majority of these vegetation communities are located within 100- to 200-foot-wide tracts of land between the roadway and residential and commercial development.

Fragmented stands of mixed deciduous/coniferous forest are also located in several areas in the northern portion of the project area, including south of

South 192nd Street and the Des Moines Creek Park area. Mixed deciduous/coniferous forest habitat is dominated by an assemblage of species typical of Puget Sound lowland forests. Nonnative, invasive species such as English ivy (*Hedera helix*), Scot's broom (*Cytisus scoparius*), and Himalayan blackberry (*Rubus procerus*) are frequent components of the shrub and forested habitats. Forested habitat in the project area is typically relatively young, second growth forest. No stands of old growth forest habitat are located within the project area.

Commercial and residential areas often include a combination of mowed grasses and a fragmented mixture of native, nonnative, and ornamental trees and shrubs. Most of the habitat associated with residential and commercial development is located south of Tyee Valley Golf Course and north of the project area associated with the I-5 corridor.

The South Airport Link design options H0, H2-A, and H2-B are located in the northeast portion of the project area, in a densely populated urban area dominated by residential and commercial development. The dominant features of this portion of the project area are buildings, parking lots, and paved roads, primarily associated with Sea-Tac Airport facilities.

Riparian habitat within the project area is limited to areas associated with Des Moines Creek. South of South 200th Street the riparian habitat of Des Moines Creek includes high quality shrub and forested habitat within Des Moines Creek Park. North of South 200th Street, the riparian habitat of Des Moines Creek is dominated by fairways with mowed grasses within the Tyee Valley Golf Course. Tree canopy and bank vegetation are largely absent in this area. Des Moines Creek also flows through several ponds in the Tyee Valley Golf Course that function as wetland habitat.

Several wetland communities were identified along the alignments of the build alternatives. These wetlands are all palustrine systems and include open water, emergent, scrub-shrub, and forested wetland systems. A detailed discussion of these wetlands is presented in Section 3.6, *Wetlands*.

The mosaic of vegetation communities within the project area provides habitat for a variety of terrestrial and aquatic wildlife. Wildlife diversity is generally related to the structure and composition of plant species within vegetative communities. Wetlands and forested areas with well-developed shrub layers are likely to support the greatest number of species and populations of wildlife (Brown 1985). Wildlife habitats in the project area range in quality from low in commercial and residential areas, to high in the wetland habitat and forested riparian habitat associated with Des Moines Creek Park.

A moderate variety of native birds, mammals, reptiles, and amphibians are expected to inhabit shrubland, forested, and wetland habitats in the project area.

Areas of mixed deciduous/coniferous forest in the northern portion of the project area provide valuable habitat for native wildlife species. These areas are likely to provide breeding habitat for edge species, interior-dependent wildlife species, and migrant songbirds.

Ponds located in the Tyee Valley Golf Course, other wetlands in the project area, and riparian areas associated with Des Moines Creek provide habitat for a variety of amphibians, reptiles, mammals, and birds that depend on water for foraging and breeding habitat. Open-water sections of the ponds and wetlands in the project area are also expected to provide habitat for wintering and migratory waterfowl.

Urbanized areas near Sea-Tac Airport, SR 99, and I-5, and along roadways with adjacent businesses and residences offer the least valuable wildlife habitat in the project area because of their fragmented and disturbed nature. The relatively narrow habitats and the proximity between areas with high levels of human activity limits the value of available wildlife habitat to species that are not sensitive to human disturbance. Additionally, wildlife species that typically prefer interior forest habitat or require large areas of unbroken habitat to forage and reproduce are unlikely to regularly occur in these portions of the project area. These areas likely support an assemblage of native wildlife species typically found in western Washington and King County that have adapted to disturbance associated with populated urban areas, as well as nonnative wildlife species. No evidence of rare, uncommon, or unique wildlife or wildlife habitat is apparent within the project area (Guggenmos pers. comm. 2001, Moody pers. comm. 2001).

Fish

The project area is located within the Lower Duwamish River Basin (Water Resource Inventory Area [WRIA] 9). Freshwater and marine resources that support fisheries and other aquatic biota within WRIA 9 include Puget Sound, Duwamish River, Green River, and a variety of streams, tributaries, and lakes. The proposed project passes through five stream basins (Des Moines Creek, Miller Creek, Lower Green River, Lower Puget Sound, and Mill Creek). Basin boundaries and stream locations are shown in Figure 3.5-1.

Des Moines Creek is the only fish-bearing aquatic resource located within 2,000 feet of the proposed build alternatives. Wetland habitats within the project area that are not associated with Des Moines Creek have no known fish use (Guggenmos pers. comm. 2001, King County 1990, Williams et al. 1975).

Des Moines Creek Basin

Des Moines Creek is the main drainage course in the Des Moines Creek Basin. Originating from Bow Lake north of South 192nd Street, Des Moines Creek generally flows south to southwest and eventually empties into Puget Sound near South 222nd Street.

A Catalog of Washington Streams for the Puget Sound Region (Williams, et al. 1975) lists coho salmon and possibly chum salmon as the primary salmonid species using Des Moines Creek. WDFW considers cutthroat to be the dominant trout species in Des Moines Creek, although steelhead and rainbow trout have also been observed (Parametrix 1994, Phillips pers. comm. 1998). The WDFW Priority Habitat and Species (PHS) data system identifies the reach of Des Moines Creek from Puget Sound to RM 1.0, as providing an anadromous fish presence and priority anadromous/resident fish presence (Guggenmos pers. comm. 2001). King County and WDFW have not detected spawning activity upstream of RM 1.0 (Masters pers. comm. 1999, Phillips pers. comm. 1998, Schnieder pers. comm. 1999). WSDOT and King County identify the box culvert at Marine View Drive, at approximately RM 0.4, as a fish barrier that "appears to limit all anadromous fish passage" (King County 1997).

From Puget Sound to South 200th Street (RM 2.1), Des Moines Creek flows in a natural channel through forested habitat that provides nearly unbroken shade cover. Portions of this reach contain good spawning habitat; however, rearing habitat is limited (Johnson 1989, Shapiro 1999). Upstream of South 200th Street the creek contains little or no salmon spawning or rearing habitat. In this reach the creek flows through the Tyee Valley Golf Course. The final 3,600-foot reach of the creek is culverted and channelized up to Bow Lake.

Miller Creek, Lower Green River, Lower Puget Sound, and Mill Creek Basins

Natural resource information identifies the location of the nearest fish bearing streams in these basins with fish use by resident or anadromous fish as more than 2,000 feet from the project area (Guggenmos pers. comm. 2001, King County 1990, Williams et al. 1975). A detailed analysis and description of fish habitat and fish use within these basins is presented in the technical reports previously prepared for the proposed project.

Threatened and Endangered Species

According to correspondence with state and federal agencies, wildlife and fish species that are listed as threatened or endangered may occur near the project area. Table 3.7-1 shows the federally listed species under the jurisdiction of USFWS or NMFS that could occur near the project area.

Species under USFWS jurisdiction include bald eagle, marbled murrelet, and the Coastal-Puget Sound Distinct Population Segment (DPS) of bull trout (Berg pers. comm. 2001). NMFS indicated that Puget Sound chinook salmon, listed as threatened, could occur near the project area, and identifies the project area as occurring within the designated critical habitat for Puget Sound chinook salmon. NMFS also identified one candidate species for listing, coho salmon, as potentially occurring near the project area (Kirkpatrick pers. comm. 2001).

Table 3.7-1
USFWS and NMFS Listed Endangered, Threatened, Proposed, and Candidate Species Identified by Federal Agencies That May Occupy or Use Areas Affected by the Proposed Project

Common Name	Scientific Name	Federal Status	State Status
USFWS			
Bald Eagle	*Haliaeetus leucocephalus*	Threatened	Threatened
Bull Trout (Coastal/Puget Sound DPS)	*Salvelinus confluentus*	Threatened	Candidate
Marbled Murrelet	*Brachyramphus marmoratus marmoratus*	Threatened	Threatened
NMFS			
Chinook Salmon (Puget Sound ESU)	*Oncorhynchus tshawytscha*	Threatened	Candidate
Chinook Salmon Critical Habitat (Puget Sound ESU)	*NA*	Critical Habitat	None
Coho Salmon (Puget Sound/ Straight of Georgia ESU)	*Oncorhynchus kisutch*	Candidate	None

Source: Berg pers. comm. (2001), Kirkpatrick pers. comm. (2001).

ESU = Evolutionary Significant Unit

NA = not applicable

A review of the WDFW PHS data system and nongame data system revealed that no federal or state-listed sensitive, threatened, endangered, or proposed wildlife species regularly occupy, breed, or forage within 1 mile of the project area (Guggenmos pers. comm. 2001).

WDFW identified four bald eagle nests and/or breeding territories located within 3 miles of the project area. None of these nests are located within 1 mile of the project area. One nest is located along the northeast corner of Angle Lake, more than 1 mile north of the project area. A second nest is located south of North Lake, more than 1 mile south of the project area. The third and fourth nests are located along the shoreline of Puget Sound, more than 2 miles west of the project area. A fifth nest is located south of Seahurst Park, more than 4 miles northwest of the project area (Guggenmos pers. comm. 2001).

Wintering populations of bald eagles use shoreline areas along Puget Sound for foraging and perch sites. Bald eagles may perch near the project area; however, quality breeding and foraging habitats typically associated with bald eagles are not located adjacent to the proposed project, and no bald eagle breeding, nesting, or winter roosting is documented within 1 mile of the project area (Guggenmos pers. comm. 2001).

Marbled murrelets occur in many areas of western Oregon and Washington, where suitable forested habitat occurs within approximately 50 miles of Puget Sound or the Pacific Ocean (Hamer et al. 1991). Potential murrelet habitat has been described as mature coniferous forest, coniferous forest with an old growth component, old growth forest, or younger coniferous forests that have deformations or structures suitable for nesting.

WDFW has not documented any marbled murrelet occupancy sites within at least 5 miles of the project area (Guggenmos pers. comm. 2001). Potentially suitable marbled murrelet nesting habitat is not located within 5 miles of the project area. Old-growth forest communities typically associated with marbled murrelet habitat are not located in western King County.

On October 29, 1999, the Coastal-Puget Sound DPS of bull trout was listed by the federal government as a threatened species because of habitat degradation, dams and diversions, and predation by nonnative fish. Freshwater and anadromous populations of bull trout have been documented in Washington. While USFWS has indicated that the species may be present in the project area, it does not provide specific habitat use information (Berg pers. comm. 2001). A 1999 distribution map by USFWS does not identify current or historic spawning areas for bull trout within 1 mile of the project area (USFWS 1999). A 1993 report on the distribution and status of bull trout and Dolly Varden in Washington does not identify any drainages within 1 mile of the project area as having populations of bull trout (Washington State Department of Wildlife [WDW] 1993). Bull trout have not been documented and are very unlikely to occur in Des Moines Creek (Schnieder pers. comm. 1999, Phillips pers. comm. 1998, Masters pers. comm. 1999).

On March 24, 1999, the Puget Sound chinook salmon Evolutionary Significant Unit (ESU) was listed by NMFS as a threatened species. Juveniles and adults of Puget Sound populations of chinook salmon migrate through Puget Sound. Adult chinook salmon returning to Puget Sound rivers to spawn typically pass through Puget Sound between July and October (NMFS 1999).

On February 16, 2000, NMFS designated critical habitat of the Puget Sound chinook salmon ESU as protected under the ESA (50 CFR Part 226). The rule was effective March 17, 2000. Critical habitat for the Puget Sound chinook salmon includes all marine, estuarine, and fresh waters that are accessible to chinook salmon.

According to NMFS, Puget Sound chinook salmon may occur in the vicinity of the proposed project. NMFS does not provide specific habitat use data. The NMFS data system identifies potential species occurrence in a project area based on the Township and Range where the project is proposed. NMFS' reference to chinook salmon is likely in regard to the Puget Sound and Green River habitat. Puget Sound chinook salmon are not documented and are unlikely to occur in Des Moines Creek (Guggenmos pers. comm. 2001, Masters pers. comm. 1999, Schnieder pers. comm. 1999).

NMFS has received petitions to list Puget Sound/Straight of Georgia coho salmon as threatened, though they are not protected under the ESA at this time (Kirkpatrick pers. comm. 2001). Coho salmon are documented in Des Moines Creek from the outlet at Puget Sound to RM 1.0.

WDFW documented the presence of pileated woodpeckers more than 1 mile northwest of the project area (Guggenmos pers. comm. 2001). This species is currently considered a candidate for state listing as threatened or endangered. Pileated woodpeckers are typically found in dense, mature forests.

The WDFW PHS data system and the WDNR NHP were consulted regarding rare plants and priority habitats within the project area. No federal or state-listed sensitive, threatened, or endangered plant species or high quality native plant communities are located within the areas that would be directly affected by the proposed alignments (Guggenmos pers. comm. 2001, Moody pers. comm. 2001).

3.7.3 Environmental Impacts

Alternative A (No Action)

Under the No Action Alternative, impacts on vegetation and wildlife, fish, and threatened and endangered species associated with the proposed project would not occur. No impacts or construction would occur that would entail removal or alteration of existing vegetation communities, wildlife, or fish habitats within the project area.

Impacts Common to All Build Alternatives

The section below describes long-term impacts associated with construction of the proposed project. Short-term impacts associated with construction of the proposed project are described in Section 3.7.5, *Construction Activity Impacts and Mitigation.*

Vegetation and Wildlife

Potential impact area estimates are based on aerial photo analysis and preliminary engineering plans prepared for the proposed project and represent

the maximum extent of clearing that would occur under each of the build alternatives. Construction elements include lane construction, intersection construction, on-ramp and off-ramp construction, access roads, bridges, laydown and equipment storage areas, and stormwater detention facilities. Actual clearing or disturbance would likely be less than the total area shown on Table 3.7-2.

Table 3.7-2
Vegetation Community Impacts Under Each of the Proposed Build Alternatives (acres)

Habitat Types	Alternative B	Alternative C2 (Preliminary Preferred)	Alternative C3
Mixed Deciduous/Coniferous Forest	106.5	48.2	67.3
Shrubland	40.5	28.1	33.3
Grassland	37.7	30.9	24.1
Residential and Commercial Development	15.3	19.1	19.5
Wetlands	7.7	0.2	5.4
Total	**207.7**	**126.5**	**149.6**

Operation impacts on vegetation communities would be limited to shading associated with the bridges that would cross wetlands and Des Moines Creek. Bridges would restrict sunlight and precipitation to underlying vegetation. Other than those communities shaded by bridges, operation of the project would not affect existing vegetation communities.

The proposed project would result in audible and visual disturbances to wildlife following construction. Species particularly sensitive to such disturbances would likely avoid the project area. Operation-related impacts on wildlife are expected to be relatively minor and related principally to ambient noise levels associated with vehicular traffic. Wildlife not tolerant of traffic disturbance would attempt to relocate to quieter areas. This avoidance behavior requires individuals to find new food sources and/or nesting areas. Such areas are usually already occupied, and the increased stress of competition for limited resources could cause displaced wildlife to perish. Other behavioral reactions include altered migration patterns and changes in individual's home ranges (Informatics 1980). Noise effects primarily would be limited to the immediate vicinity of roadways. The portion of the project associated with I-5 is an existing roadway that has been in place for several decades. Noise levels associated with vehicular traffic on I-5 following construction are expected to be consistent with current traffic noise. Noise impacts associated with operation of the SR 509 freeway extension are unlikely to be significant because it is located within a populated urban area.

Wildlife mortality from vehicles would likely increase in areas where new roads are constructed. Fragmentation of habitat would affect wildlife movement and restrict species home ranges. Animals that would most likely be affected are black-tailed deer and small mammals such as raccoon, opossum, and skunk (Informatics 1980). Mortality rates for mammals may be greatest during spring and early summer when young animals disperse from nesting locations (Leedy 1975).

Fish

In evaluating risks to fish habitat, water quality in receiving waters is the primary concern. Des Moines Creek is the only fish-bearing aquatic resource that would be crossed by the proposed project. None of the build alternatives would include stream crossings within the Miller Creek, Lower Green River, Lower Puget Sound, and Mill Creek basins. Potential operation impacts on Des Moines Creek include water quality degradation from operation and maintenance activities associated with stormwater runoff from new and existing impervious surfaces near the creek. The extent of the impacts would depend on several factors, including the amount of new impervious surfaces and increased pollutant loading in stormwater runoff, the types and locations of stormwater treatment facilities, and the pollutant-removal efficiencies of the facilities. Significant water quality degradation is not expected as long as stormwater management plans, facilities, and related BMPs are installed and maintained to comply with the King County *Surface Water Design Manual* (King County 1998) and WSDOT's *Highway Runoff Manual* (WSDOT 1995). Section 3.5, *Water Quality*, contains more detailed information on water quality impacts.

Worn rubber from tires, lubricants, heavy metals in the fine sediments, and fuel on the road would wash off with the rain and possibly flow into receiving waters, including Des Moines Creek and the Green River. These impacts, relative to existing effects from nonpoint source pollution, would not be significant because all runoff from new impervious surfaces would be treated under the build alternatives.

New impervious areas under the build alternatives would be drained by stormwater collection systems. Stormwater runoff from the project area would not be discharged directly to offsite streams or wetlands; however, large volumes of runoff entering the stormdrain system could temporarily exceed the design capacity. Excess flow could discharge to Des Moines Creek and cause erosion and subsequent sedimentation in the existing streambed. The potential for erosion and sedimentation would be low except in the case of extreme flooding events. See Section 3.5, *Water Quality,* for further detail on stormwater collection and treatment.

Another potential operational impact could result from accidental spills of deleterious or hazardous substances. Such impacts would likely be reduced to

insignificant levels by existing stormwater management plans and future mitigation stipulated in regulatory permits. The proposed build alternatives would provide a transportation corridor designed under current regulatory safety standards, which would result in a lower frequency of accidents compared with existing roads designed to earlier standards. Thus, the risk of accident-related spills would be expected to be lower than existing conditions because the new roadway would improve the overall safety of the road system.

Operation of the build alternatives could affect potential salmon and resident fish habitat in Des Moines Creek and marine receiving waters of Puget Sound. Potential impacts would depend on pollutant loads in stormwater runoff, runoff volumes and rates, and the configuration and effectiveness of stormwater management facilities (see Section 3.5, *Water Quality*). Currently, there are no water quality treatment facilities located within the proposed project area to treat stormwater runoff of impervious areas. The addition of stormwater detention and treatment facilities would improve the quality of stormwater runoff from the project area compared to existing conditions. With mitigation, potential unavoidable impacts on fish habitat are unlikely to be significant.

Threatened and Endangered Species

No federal- or state-listed sensitive, threatened, or endangered wildlife species regularly breed, forage, or regularly occupy the project area of the build alternatives. For this reason, and reasons discussed above for fish, no impacts on threatened and endangered species are anticipated. Threatened, endangered, listed, proposed, or candidate species that might occur in the project area will be addressed in the BA prepared for the proposed project. The BA will be reviewed at least 1 year before project construction. Concurrence from the USFWS and NMFS will be required to ensure that the conclusions are not affected by any change in the ESA designation of species in the project area, and to identify any change in the use of the project area by threatened or endangered species.

South Link Design Options H0, H2-A, and H2-B

Because of the similarity of the proposed alignments associated with the South Airport Link portion of the project area (design options H0, H2-A, and H2-B), impacts on vegetation and wildlife, fish, and threatened and endangered species would be the same for each design option under all build alternatives. Vegetation habitats in this portion of the project area are limited to fragmented patches of grassland communities adjacent to roads and parking lots and isolated ornamental shrubs and trees associated with commercial development. Because of the low quality habitat, fragmented nature, and high degree of disturbance in this portion of the project area, the

South Airport Link design options would have no significant impact on vegetation and wildlife.

Des Moines Creek is culverted below street level in this portion of the project area. The South Airport Link design options would not occur where the culvert is located. Based on the current engineering design, there would be no net gain or loss in impervious surface area under Option H0. Option H2-A would result in a net gain of 0.1 acre of impervious surface. Option H2-B would result in a net gain of 0.5 acre of impervious surface. Potential impacts on Des Moines Creek would be limited to water quality impacts. Water quality impacts on Des Moines Creek from stormwater runoff, relative to existing effects from nonpoint source pollution, would not be substantial because all runoff from new impervious surfaces would be treated under Options H0, H2-A, and H2-B. Some pollutant loading would be unavoidable with proposed stormwater treatment. These impacts would not likely be significant because concentrations of pollutants would be below Washington State water quality standards, which are protective of aquatic life. See Section 3.5, *Water Quality,* for more discussion.

Alternative B

Vegetation and Wildlife

Alternative B would have greater impacts on vegetation communities than Alternatives C2 and C3 (Table 3.7-2). Alternative B would require the removal of vegetation in the forested and riparian habitat in Des Moines Creek Park, at the park's narrowest point, in the area of South 209th Street. Approximately 0.5 acre of area within the park, dominated by mixed deciduous/coniferous forest habitat, would be affected by this alternative. This crossing would fragment the park south of South 209th Street from the portion of the park located between South 209th Street and South 200th Street. Riparian areas that would be affected under Alternative B occur within the Tyee Valley Golf Course and Des Moines Creek Park. Alternative B would result in less clearing of vegetation communities associated with residential and commercial development than Alternatives C2 and C3. Under Alternative B a significantly greater amount of forested and wetland habitat would be cleared than under Alternatives C2 and C3.

Fish

Alternative B would cross Des Moines Creek on one bridge near South 209th Street, at about RM 1.7. Alternative B would also cross the East Fork of Des Moines Creek at four locations north of South 200th Street in the Tyee Valley. Alternative B would not alter any existing stream crossings and would not involve in-water work. While anadromous fish runs do not occur in the reach of Des Moines Creek crossed by Alternative B, Des Moines Creek upstream and downstream of South 209th Street does contain quality

stream and riparian habitat. Anadromous fish runs are located in the downstream reach of Des Moines Creek below about RM 1.0 and in the receiving waters of Puget Sound. Alternative B would not involve any additional stream crossing and would not include any construction activity on streams within the Des Moines Creek, Miller Creek, Massey Creek, Lower Green River, Lower Puget Sound, and Mill Creek basins.

Threatened and Endangered Species

No federal- or state-listed sensitive, threatened, or endangered wildlife species regularly breed, forage, or occupy the Alternative B project area. For this reason, and reasons discussed above for fish, no impacts on threatened and endangered species are anticipated.

Alternative C2 (Preliminary Preferred)

Vegetation and Wildlife

Alternative C2 would have less impact on vegetation communities than Alternatives B and C3 (Table 3.7-2). Alternative C2 would encroach into the northeast corner of Des Moines Creek Park, requiring the acquisition of 2.9 acres of mixed deciduous/coniferous forest habitat within the park. Riparian areas that would be affected under Alternative C2 occur in the Tyee Valley Golf Course and the northern area of Des Moines Creek Park. No large habitat tracts would be fragmented.

Fish

Alternative C2 would bridge Des Moines Creek at one location in Des Moines Creek Park, at the northern portion of the park directly south of South 200th Street, at about RM 2.1. Four bridge crossings of the East Fork of Des Moines Creek would occur in the Tyee Valley Golf Course north of South 200th Street. Alternative C2 would not alter any existing stream crossings and would not involve in-water work. Aquatic habitat in the golf course area does not provide quality habitat for fish. While anadromous fish runs do not occur in the reach of Des Moines Creek that would be crossed by the proposed alignment, Des Moines Creek downstream of South 200th Street does contain quality stream and riparian habitat. Anadromous fish runs are located in the downstream reach of Des Moines Creek below about RM 1.0 and in the receiving waters of Puget Sound. Alternative C2 would not involve any additional stream crossing and would not include any construction activity on streams within the Des Moines Creek, Miller Creek, Lower Green River, Lower Puget Sound, and Mill Creek basins.

Threatened and Endangered Species

No federal- or state-listed sensitive, threatened, or endangered wildlife species regularly breed, forage, or occupy the Alternative C2 project area.

For this reason, and reasons discussed above for fish, no impacts on threatened and endangered species are anticipated.

Alternative C3

Vegetation and Wildlife

Alternative C3 would disturb less vegetation than Alternative B and more than Alternative C2 (Table 3.7-2). Alternative C3 would encroach into the northeast corner of Des Moines Creek Park, requiring the acquisition of approximately 3.3 acres of parkland. Riparian areas affected by Alternative C3 would be in the Tyee Valley Golf Course and the northern portion of Des Moines Creek Park. No large habitat tracts would be fragmented.

Fish

Alternative C3 would cross Des Moines Creek south of South 200th Street within Des Moines Creek Park at about RM 2.1. Alternative C3 would also cross the East Fork of Des Moines Creek at four locations north of South 200th Street within the Tyee Valley Golf Course. Alternative C3 would not alter any existing stream crossings and would not involve in-water work. Fish and wildlife habitat in the golf course area is low quality. While anadromous fish runs do not occur in the reach north of South 200th Street, the reach of Des Moines Creek south of South 200th Street does contain high quality fisheries resources. Alternative C3 would not involve any additional stream crossing and would not include any construction activity on streams within the Des Moines Creek, Miller Creek, Lower Green River, Lower Puget Sound, and Mill Creek basins.

Threatened and Endangered Species

No federal- or state-listed sensitive, threatened, or endangered wildlife species regularly breed, forage, or occupy the Alternative C3 project area. For this reason, and reasons discussed above for fish, no impacts on threatened and endangered species are anticipated.

3.7.4 Mitigation Measures

Mitigation measures for operation impacts would be similar for all build alternatives. Mitigation measures for construction impacts are discussed in Section 3.7.5. No mitigation measures are necessary for the No Action Alternative.

Vegetation and Wildlife

Establishment of native plant communities to replace exotic, invasive species would be an important component in mitigation. Covering, seeding, and/or

revegetating disturbed soils with native species would follow construction and final grading to help reduce soil erosion and colonization by nonnative species. Maintenance practices following construction of the proposed project could include a variable mowing schedule for grassy rights-of-way to create a diversity of grassland habitat over time. A post-construction monitoring program would be conducted and include measures to ensure mitigation effectiveness. If mitigation performance standards are not met during post-construction monitoring, additional mitigation would be required and implemented as appropriate.

Fish

Potential operational impacts on water quality and fisheries resources would be mitigated through compliance with drainage and erosion-control requirements and implementation of stormwater BMPs. More detailed discussion of measures used to mitigate potential impacts on water quality are presented in Section 3.5, *Water Quality*. These mitigating measures would reduce increases in pollutant loading to waters receiving stormwater runoff and reduce potential impacts on aquatic resources from water quality degradation.

Measures used to mitigate water quality degradation and associated impacts on fisheries include designing the preferred alternative to minimize impervious surface area. Additional measures could include exceeding drainage control requirements and maximizing opportunities for infiltration. Potential habitat impacts on anadromous and resident fish habitat at stream crossings would be mitigated by the project HPA conditions. Potential baseflow impacts could be reduced 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 that would otherwise adversely affect fish habitat in offsite streams. These mitigation requirements are expected to prevent significant impacts on water quality resulting from operation of the proposed build alternatives.

Mitigation measures related to water quality and hydrology impacts completed for operation impacts would be monitored after the proposed project is completed to determine their overall effectiveness and appropriateness. Roadway maintenance would be conducted in accordance with the BMPs outlined in the *Regional Road Maintenance Endangered Species Act Program Guidelines* (NMFS 2001).

Threatened and Endangered Species

No operation-related mitigation measures are necessary for terrestrial species. Fish and water quality-related design guidelines will comply with various federal, state, and local permit requirements. Implementation of these

measures will protect aquatic resources outside the project area. Mitigation for threatened and endangered aquatic species will be the same as those described above for fish.

3.7.5 Construction Activity Impacts and Mitigation

Construction Activity Impacts

Vegetation and Wildlife

The primary impact associated with project construction would be vegetation removal and loss of wildlife habitat. The extent of impact would depend on the type and quantity of affected vegetation for each alternative. Loss of plant communities that provide limited wildlife habitat, such as commercial and residential areas, would have a minor adverse effect, while more complex vegetation associations, such as forested areas and wetlands, would be of greater consequence.

Habitats associated with the proposed project that would be cleared include mowed and unmowed grassland areas; shrubland; mixed deciduous/coniferous forest; commercial and residential areas containing a fragmented mixture of native, nonnative, and ornamental plant species; and wetlands. An element of each of these habitat types would be cleared under each of the build alternatives.

Construction of the proposed project would create an environment conducive to the establishment of invasive and exotic species in native areas unless appropriate plant restoration and maintenance methods are implemented. Exposed, unvegetated, and/or compacted soils that result from land conversion would be susceptible to colonization by invasive species. Generally, construction would most likely promote the establishment of invasive weeds along the perimeter of undeveloped vegetation communities.

Construction also would result in soil compaction from the use of heavy equipment on the site. Soil compaction might cause direct damage to plants with shallow root systems and might reduce the infiltration of water and nutrients into the soil.

Clearing native vegetation during the proposed construction would eliminate and modify existing wildlife habitat (Table 3.7-2). Such impacts on habitats would displace and/or eliminate wildlife that currently depends on this vegetation. Loss of snags and coarse woody debris negatively affects primary and secondary cavity nesters. Removing the overstory adversely affects mammals and birds that use the canopy and it decreases thermal cover. Decreases in understory adversely affect ground-dwelling species. The loss of existing vegetation eliminates protective cover, nesting areas, and food for animals. Birds, small mammals, amphibians, and reptiles currently using the

project area would be adversely affected by this loss of habitat. Most wildlife species (such as birds and mammals) would be able to move away from areas of disturbance. Wildlife with limited mobility, such as amphibians, reptiles, and some small mammal species would be directly affected by road construction. While it is anticipated that some individuals of these species would perish during construction, it is not possible to accurately predict the actual number of wildlife that would be affected.

Wildlife populations are generally considered to be at or near carrying capacity in all habitat types (Krebs 1994, Morrison et. al. 1992, Miller 1990, Robinson and Bolen 1989, Wallace 1987). Once vegetation has been removed, wildlife displaced into adjacent habitats may be unsuccessful in colonizing nearby suitable habitats because these areas are usually already occupied. The increased stress of competition for limited resources and susceptibility to predation may cause displaced animals to perish or to displace other individuals that in turn might perish. Heavy equipment use during clearing and grading would cause the greatest audible and visual disturbance to wildlife.

Disturbances caused by road construction on the project site may affect wildlife in adjacent habitats by disrupting feeding and nesting activities. Forested habitats in the project area are used for breeding by migrant and resident songbirds. Increased noise levels created by operation of heavy machinery could cause birds to abandon their nests and may temporarily displace wildlife during construction. Many wildlife species, particularly mammals, are nocturnal and are relatively inactive during daylight hours. They typically retreat to burrows and other resting areas and generally would not be affected by construction noise during the day. Once construction activities are complete, wildlife might resume use of the site.

Wildlife species that typically prefer interior forest habitat or require large areas of unbroken habitat to forage and reproduce are unlikely to regularly occur in the project area. No large habitat tracts would be fragmented. No evidence of rare, uncommon, or unique wildlife or wildlife habitat is apparent within the project area. No critical or priority habitat would be affected.

Fish

Each of the build alternatives would include construction of bridge crossings over Des Moines Creek. No inwater work would occur during bridge construction. No other streams occur within 2,000 feet of the proposed alternatives.

Construction impacts are generally proportional to the amount of clearing and grading and the effectiveness of structural and nonstructural BMPs. Some nonpoint chemical pollution would be expected to result from general construction practices, even with BMPs employed. With the implementation

and maintenance of BMPs, there is a low likelihood for adverse impacts on fish habitat associated with the build alternatives. Construction practices resulting in soil compaction and tree removal might increase the rates of surface water runoff during storms. Impacts on offsite fish and fish habitat are not anticipated because stormwater will be managed using best available technology for detention and infiltration systems.

Exposing soil, removing vegetation, clearing, and grading associated with construction could result in increases in erosion and sedimentation and temporarily elevated levels of TSS. Adverse effects on streams associated with clearing and grading are well documented (Leedy 1975). Water quality is impaired and fisheries habitat is degraded when fine sediments less than 0.85 mm in diameter are released during uncontrolled major erosion events. Large volumes of fine sediments can collect in pools and low-gradient reaches to reduce stream capacity for fish rearing. Sediments can also decrease production of fish food organisms by embedding in stream substrates. Des Moines Creek is the only fish-bearing stream within 2,000 feet of the project area. Spawning habitat is not located in the reach of Des Moines Creek within the project area; however, adverse effects on water quality in the project area could harm downstream habitats (Puget Sound).

Construction equipment, materials, and waste generated onsite could be sources of pollutants, including oil and grease, hydraulic fluid, concrete leachate, and polynuclear aromatic hydrocarbons (PAHs). Accidental spills and releases of these materials could contaminate water resources. Water quality degradation from temporary increases in suspended solids and accidental spills could adversely affect fish and other aquatic biota. Degradation could occur through reduced light transmittance, photosynthesis, and primary productivity. Additionally, increased TSS could reduce feeding success, increase stress, and modify the behavior of fish using these areas, increasing susceptibility to disease or mortality.

If appropriate buffers and construction setbacks are not established in the location of the bridge crossings, trees and riparian vegetation might be removed, which would impair the function of the riparian zone. Des Moines Creek, upstream of South 200th Street does not have quality, native riparian vegetation and is frequently ditched or flows through culverts. For cover and prey organisms, fish need large woody debris that comes from the riparian zone and overhanging vegetation along stream banks.

Water quality impacts related to construction are expected to be short term and negligible with proper management. Construction activities would occur outside of stream channels, and the period of construction activity would be limited according to recommendations from WDFW, NMFS, and USFWS. Section 3.5, *Water Quality*, contains more information on potential water quality impacts.

Threatened and Endangered Species

No federal- or state-listed sensitive, threatened, or endangered wildlife species regularly breed, forage, or occupy the project area. For this reason, and reasons discussed above for fish, no impacts on threatened and endangered species are anticipated. Threatened, endangered, listed, proposed, or candidate species that may occur in the project area will be addressed in the BA that will be prepared for the proposed project.

Mitigation Measures

Mitigation measures for construction impacts would be similar for all build alternatives. No mitigation measures are necessary for the No Action Alternative.

Vegetation and Wildlife

Road construction would avoid significant forested areas, wetlands, and riparian areas, where possible. Construction of any of the build alternatives would require the clearing of mixed deciduous/coniferous woodland. Where possible, snags, brush piles, and downed trees would be left in forested and wetland areas, 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. Snags would be left standing where consistent with safety requirements, particularly when associated with wetlands (Leedy 1975). Construction activities would be scheduled to take into account timing recommendations from WDFW and other agencies to avoid disturbing breeding wildlife in sensitive habitats such as wetlands. While no construction timing restrictions are anticipated as conditions of project permits, land clearing of woody vegetation would be scheduled, to the extent possible, so that it does not occur in early spring when most bird species are nesting (Brown 1985).

Construction procedures would be used that would minimize damage to existing vegetation, avoid habitat loss, and minimize soil compaction and erosion.

Monitoring would be conducted during construction to ensure mitigation measures are successfully implemented and that performance standards are achieved.

Fish

Several measures are proposed to reduce or eliminate construction impacts on aquatic habitats by maintaining good water quality in the project area.

WSDOT is initiating several mitigation measures for the SR 509: Corridor Completion/I-5/South Access Road Project. Mitigation commitments based on the results of the 404 Merger Process would include:

- All streams would be crossed with bridges to minimize impacts on streams and fish habitat from the project. No in-water work would be conducted.
- The project is part of the Des Moines Creek Basin Plan. WSDOT would contribute $1.8 million towards the construction of a replacement bridge across Des Moines Creek at Marine View Drive (RM 0.3), and provide stream restoration and riparian zone enhancement in the vicinity of Marine View Drive. This bridge would replace an existing box culvert, which is identified in the Des Moines Creek Basin Plan as the major fish barrier in the Des Moines Creek system (King County 1997). While partial fish barriers are also located near the Midway Sewage Treatment Plant (RM 1.0), replacing the culvert at Marine View Drive would potentially significantly improve anadromous fish access up to RM 1.0 within the Des Moines Creek system.
- WSDOT would contribute an additional $70,000 to the design of the remaining projects associated with the Des Moines Creek Basin Plan. Enhancement opportunities of Des Moines Creek in the vicinity of the project area are being investigated. The type of mitigation could be enhancement or restoration of the stream or the riparian buffer in locations that are presently biologically or topographically deficient.

Additionally, the build alternatives would require fish and water quality-related design guidelines and other forms of mitigation to comply with various federal, state, and local permit requirements and applicable regulations defined in local comprehensive plans. Requirements or conditions of permits and government approvals might include conditions to provide specific protection of aquatic resources. Such conditions of permits or government approvals would include erosion and sediment control plans, stormwater management plans, limitations on the timing of construction, and BMPs (e.g., mulching, hydroseeding, check dams, biofiltration swales, phased clearing, silt fencing, and sediment ponds). Specifically, a spill control and containment plan (SCCP), a TESC, and an SPP would be developed prior to construction. Additionally, the design of the alternative would comply with the King County *Surface Water Design Manual* (King County 1998) and WSDOT's *Highway Runoff Manual* (WSDOT 1995). These mitigation requirements are expected to prevent significant impacts on water quality resulting from construction and operation of the proposed build alternatives.

In developing the SCCP, TESC , and SPP plans, appropriate construction BMPs would be selected for construction activities. Implementing BMPs would prevent or reduce potential impacts on surface water quality. At a

minimum, BMPs involving state and local jurisdictions would include the following: (1) phasing construction to minimize the amount of earth exposed to erosive forces; (2) designing construction entrances, exits, and parking areas to reduce tracking of sediment onto public roads; (3) implementing various types of sediment, erosion control, and water quality protection measures; (4) preserving the permeability of pervious areas within the project site to the greatest extent; and (5) monitoring and maintaining erosion, sediment, and water quality control BMPs.

In addition, project BMPs would include treatment of surface runoff from new impervious surfaces that are either approximately the same or slightly larger than the existing impervious surfaces. Thus, the BMPs would yield a net reduction in overall pollutant loading compared to existing conditions. This was discussed further in Section 3.5, *Water Quality*.

Where road construction includes stream crossings, WDFW would require an HPA, although no in-water work would occur. The HPA permit would likely require that construction near the creeks occur during a specified time, typically between July 1 and September 1. NMFS and USFWS might also provide construction window recommendations. Water-related construction would be timed to avoid critical migratory, spawning, and rearing periods of anadromous and important resident fish. In addition, a detailed erosion and sedimentation control plan would be prepared and implemented to prevent exposed soil or construction material from reaching the stream.

Impediments to fish passage would be averted by proper design and installation of bridges at stream crossings. The use of bridges for stream crossings could improve fish passage and reduce disturbance to benthic flora and fauna. Bridges would be designed to comply with WDFW criteria for safe fish passage.

In affected reaches of the stream, the goal of mitigation would be to create stable, usable stream channels that would function in a manner and quality consistent with properly functioning habitat. Efforts would be made to retain downed logs, overhanging banks, and streamside vegetation for shade, whenever possible. Habitat enhancement structures such as spawning gravel, boulders, root wads, and streamside cover could be used to add to the diversity of the channel. Root wads and boulders provide low-level or instream cover for fish, reduce water velocities, and encourage the formation of pools. Such channel features could provide areas for fish spawning, feeding, hiding, and holding, and thereby increase the productivity of the creek.

Mitigation measures related to water quality and hydrology impacts completed for construction impacts would be monitored after the project is completed to determine their overall effectiveness and appropriateness.

Threatened and Endangered Species

No construction-related mitigation measures are necessary for terrestrial species. Fish and water quality-related design guidelines will comply with various federal, state, and local permit requirements. Implementation of these measures will protect the aquatic resources of Des Moines Creek and other aquatic resources outside the project area. Mitigation for threatened and endangered aquatic species will be the same as those described above for fish.

SEA3-07 veg wildlife.doc/020220028

3.8 Land Use

3.8.1 Studies and Coordination

This section is based on the findings of the *SR509/South Access Road EIS Discipline Report: Land Use* (CH2M HILL October 2000), *SR 509/South Access Road EIS: South Airport Link* (August 2001), and *SR 509/South Access Road EIS: I-5 Improvements Report* (CH2M HILL October 2001). Personal communications and comprehensive plans, transportation plans, zoning codes, and relevant maps for each jurisdiction were reviewed to determine existing conditions and impacts. Aerial photographs taken in March 1997, and several site visits provided the data needed for this analysis.

For the purpose of this analysis, the project area is defined as the Cities of SeaTac and Des Moines and portions of the Cities of Kent and Federal Way and King County in the immediate vicinity of the proposed alignments and along the I-5 Corridor. The following agencies were contacted to obtain information for this Revised DEIS:

- City of SeaTac Planning Department
- City of Des Moines Planning Department
- City of Kent Planning Department
- City of Federal Way Planning Department
- King County

3.8.2 Affected Environment

Comprehensive Plan Designations

Comprehensive plans guide development toward a community's vision of its future. These plans allow communities to design their goals and to map a strategy to achieve those goals. To provide an overall context of planned land uses within the project area, generalized comprehensive plan designations and existing land uses are shown in Figures 3.8-1 and 3.8-2, respectively. Because the five affected jurisdictions have slight variations in their designations, they have been generalized into the following comprehensive plan designation categories:

- (RLD) Residential Low Density—Areas primarily of single-family residences
- (RHD) Residential High Density—Areas primarily of multifamily complexes, apartment complexes, and mobile home parks

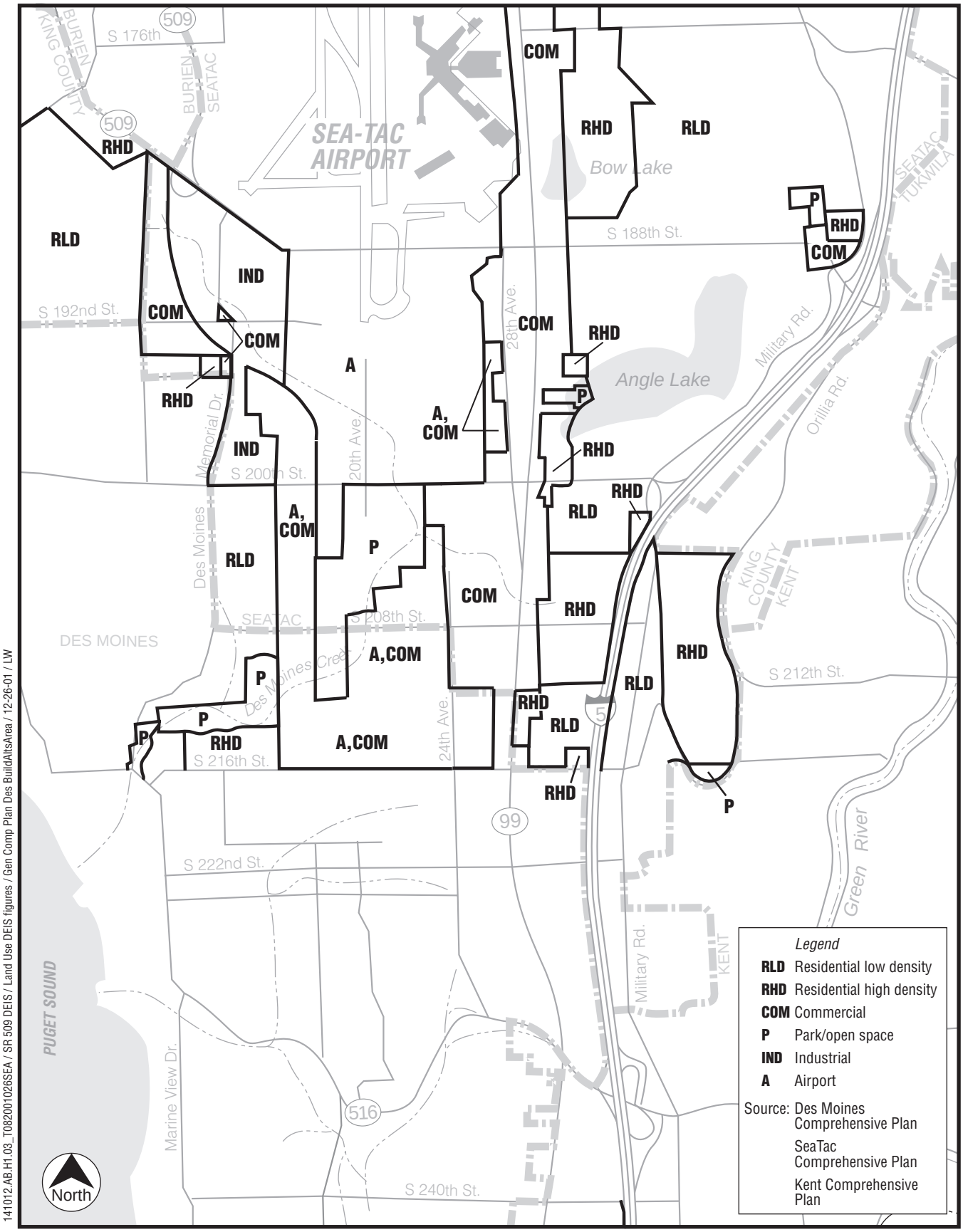

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FIGURE 3.8-1

Generalized Comprehensive Plan Designations in the Build Alternatives Area

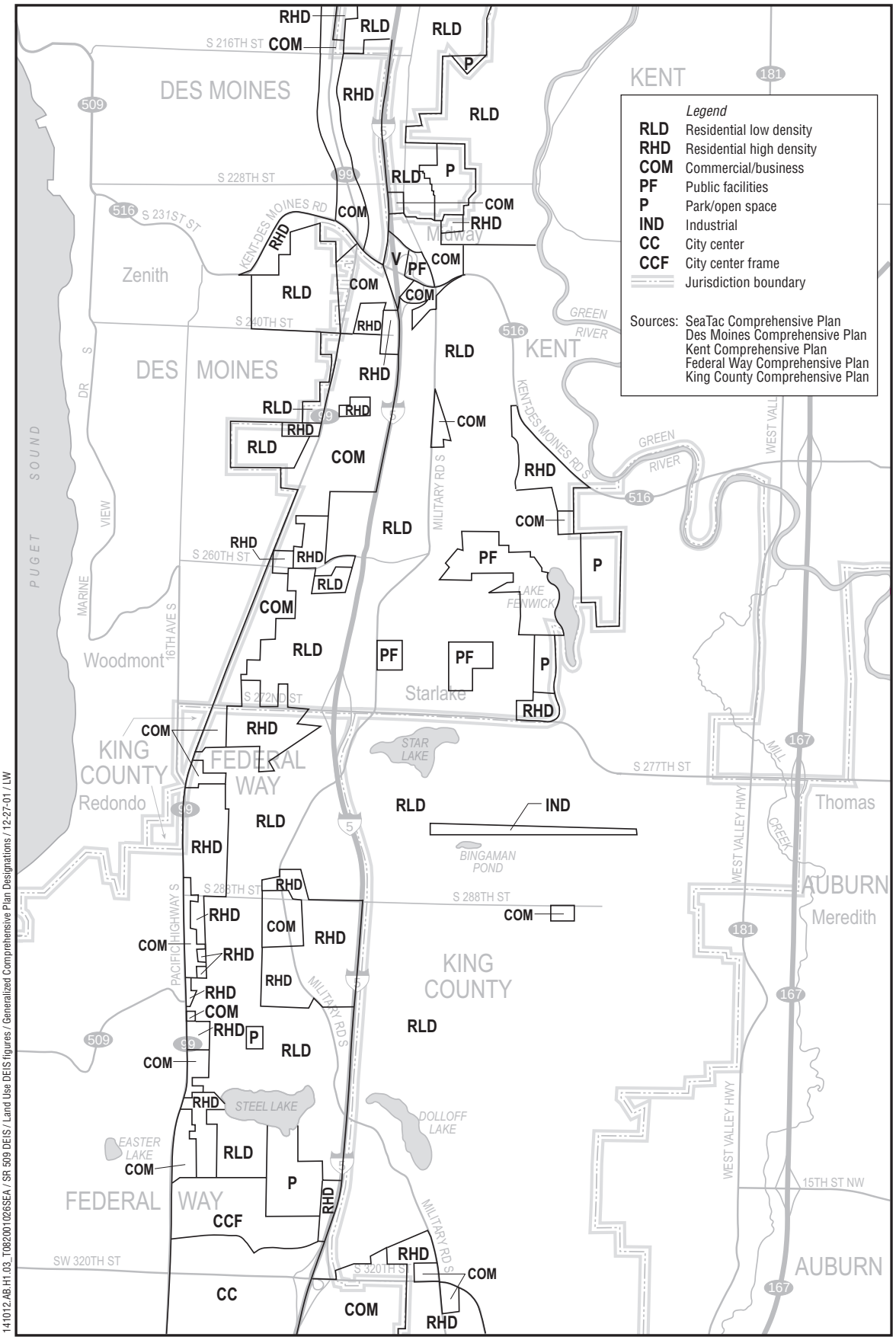

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FIGURE 3.8-2

Generalized Comprehensive Plan Designations in the I-5 Corridor Area

- (COM) Commercial—Areas primarily of wholesale and retail businesses, service businesses, and offices
- (IND) Industrial—Areas primarily of manufacturing and warehousing enterprises
- (P) Park—Park properties/open space
- (A) Airport—Land owned by the Port of Seattle, comprising Sea-Tac Airport and land from the Sea-Tac Airport Noise Remedy Program's Acquisition and Relocation Area (referred to hereafter as the Noise Remedy Program acquisition area)
- (CC) City Center—Land reserved for mixed use developments, aimed at providing a central gathering place for the community
- (CCF) City Center Frame—Land surrounding a designated city center
- (PF) Public Facilities—Land devoted to public uses, such as schools, fire stations, park and rides, etc.

Existing land uses were initially determined as they appear on the 1:400 scale aerial photographs taken in March 1997, and as they are listed in the comprehensive plans for the Cities of SeaTac, Des Moines, Kent, Federal Way, and portions of unincorporated King County. For example, parcels listed as single-family houses by the assessor's office that appeared to be used for residences on the aerial photograph were classified as Residential Low Density. Areas that appeared to be unused and covered by unlandscaped shrubs and trees with no listed improvements were classified as Vacant. In some cases, these vacant areas might be part of parcels that are committed to residential uses by actual parcel boundaries and zoning classifications. The land uses were confirmed by site visits. Existing land uses were compiled under the same designations as those used for comprehensive plan designations, with a few additions:

- V (Vacant)—Areas that appeared to be unused and covered by unlandscaped shrubs and trees with no listed improvements
- PGU (Public/Government Use)—For the existing use analysis, land used for fire stations, police stations, schools, and government offices
- RI (Religious Institution)—Land used for religious facilities

Figures 3.8-3 and 3-8.4 show existing land uses in the project area.

Zoning

Zoning often reflects existing land use patterns and comprehensive plan designations for an area. However, where existing uses are inconsistent with

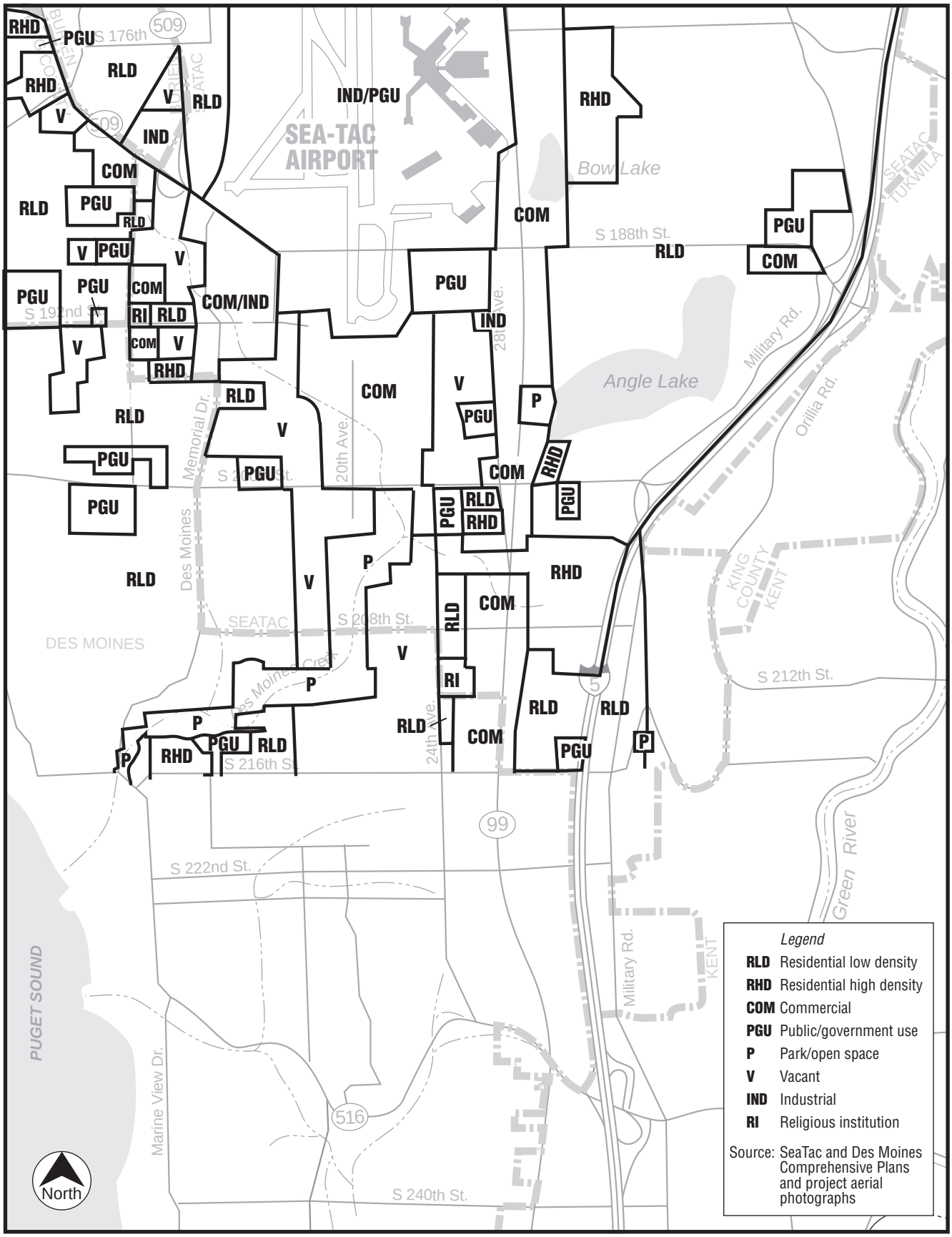

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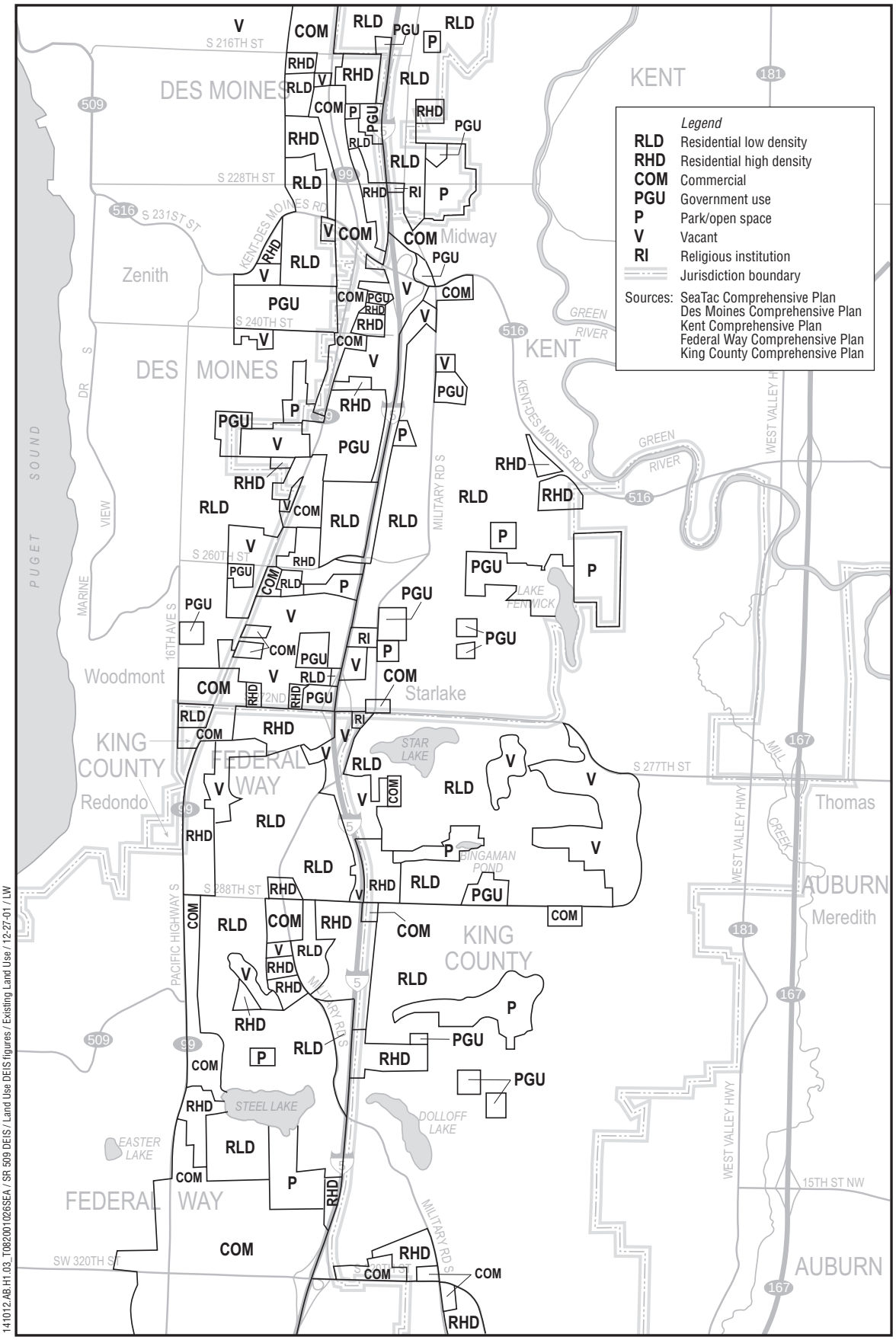
FIGURE 3.8-3

Existing Land Use in the Build Alternatives Area



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0 1900 3800
Scale in Feet

North

FIGURE 3.8-4

Existing Land Use in the I-5 Corridor Area

SR 509: Corridor Completion/I-5/South Access Road
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the planned uses for an area indicated in the relevant comprehensive plan, zoning for the area may reflect the planned use, rather than the existing use.

Land use zones are often more geographically and use-specific than comprehensive plan designations. For example, a comprehensive plan may direct an area to be developed as Residential Low Density and the zoning code may divide that same area into several zones emphasizing different densities of single-family residences. Because of the project area's large extent, only land use zoning was considered for the assessment of impacts within the project area.

Because different jurisdictions have different notations for similar types of zones, all zoning designations were unified by use and density under one common listing. The following zones have been used for this analysis:

- R-15000—Single-family residential zone with an approximate density of 2 dwelling units per acre; minimum lot size of 15,000 square feet
- R-9600—Single-family residential zone with an approximate density of 4.5 dwelling units per acre; minimum lot size of 9,600 square feet
- R-7200—The densest single-family residential zone at approximately 6 dwelling units allowed per acre; minimum lot size of 7,200 square feet
- M-2400—A moderate-density residential zone allowing approximately 18 dwelling units per acre
- H-1800—A high-density residential zone allowing 24 dwelling units per acre
- H-900—The densest residential zone at 48 dwelling units per acre
- MHP—Areas zoned for mobile home parks
- HC—Highway Commercial zone, found mainly along SR 99
- GC—General Commercial zone, including areas zoned for business parks and offices
- ABC—Properties zoned for the Aviation Business Center in the City of SeaTac
- A—Airport zoning including Sea-Tac Airport, as well as Port of Seattle-owned property such as the Noise Remedy Program acquisition area
- IND—Industrial property
- PRK—Park lands, including Hillgrove Cemetery, which is zoned as a park

Growth Management Act

The State of Washington's GMA requires that cities and counties within the state develop and adopt comprehensive plans. Mandatory elements of these plans are land use, housing, capital facilities, utilities, and transportation. The GMA also requires that when the comprehensive plans (or updates of existing plans) are adopted, the jurisdictions must also adopt and enforce ordinances reflecting the comprehensive plans. In most cases, this includes zoning provisions.

The proposed SR 509: Corridor Completion/I-5/South Access Road project is a part of Destination 2030, the regional transportation plan developed in compliance with GMA. Destination 2030 prioritizes major corridor projects in an effort to complete a regional transportation network the connects designated urban centers. Additional analysis of this project's consistency with adopted plans and policies can be found in section 3.8.3 of this document

Existing and Future Land Uses

The project area includes five jurisdictions: the Cities of SeaTac, Des Moines, Kent, Federal Way, and portions of unincorporated King County. The growth and development of these jurisdictions has been substantially influenced by several factors, including Sea-Tac Airport, which dominates the area both physically and economically; regional economic trends such as the growth of aerospace and computer industries and expansion of trade with Pacific Rim nations; regional transportation systems, primarily I-5, SR 516, and SR 99; and regional and state planning and development plans and regulations.

Besides Sea-Tac Airport, which is operated by the Port of Seattle, the project area is predominantly characterized by urban/suburban residential developments. Commercial development is concentrated in the downtown areas of the affected cities and as strip development along and extending a couple of blocks east and west of SR 99. (It should be noted that Highway 99 is referred to as Pacific Highway South in the Cities of Des Moines and Federal Way, and as International Boulevard in the City of SeaTac.)

City of SeaTac

Although the City of SeaTac was incorporated in 1990, its neighborhoods and commercial areas became well-established much earlier during the development booms of the 1940s and 1950s. The Port of Seattle is the largest property owner within the City, with about 2,471 acres at the airport, including land that has been acquired as part of the Noise Remedy Program (see Figure 3.2-1 in Section 3.2, *Noise*). Sea-Tac Airport is a dominant land

use presence within the City, substantially influencing the character and mix of uses found throughout the community.

Outside of the airport, the City is largely urban, composed primarily of well-established residential neighborhoods. Multifamily and mobile home park neighborhoods are generally located between the commercial areas along SR 99, just southeast of the airport.

Much of the commercial development south of the airport terminal along SR 99 in the City of SeaTac is focused on travel-related services, with the highest concentration closest to the main terminal.

The Tyee Valley Golf Course is located west of 24th Avenue South and extends from South 200th Street north to the toe of the slope that supports Runway 34R/16L. The 18-hole, public golf course is operated by a private company on land leased from the Port of Seattle. Since 1992, the lease has been renewed on a monthly basis. The golf course lease stipulates that termination depends on whether the property would be needed for airport-related development.

Des Moines Creek Park is a mostly undeveloped park that lies in the Cities of SeaTac and Des Moines. King County and the City of SeaTac are negotiating the transfer of land for that portion of land within SeaTac. The park provides an important open space link between the two cities and between other open space/recreational facilities in these jurisdictions. About 51.9 acres of the park are located in the City of SeaTac, generally south of South 200th Street and north of the abandoned South 208th Street right-of-way, and between the existing undeveloped SR 509 right-of-way and 23rd and 22nd Avenues South.

The Federal Detention Center is an approximately 275,000-square-foot facility lying along South 200th Street at 26th Avenue South, immediately south of the proposed SASA project. It consists of a single multistory structure providing roughly 500 units for short-term detention (generally 6 months or less) of pretrial and trial detainees, unsentenced inmates who are going through the sentencing process, and sentenced inmates awaiting assignment.

The FAA has designated that several areas around Sea-Tac Airport be protected and kept clear of obstructions to ensure the safety of arriving and departing aircraft, as well as people and property in the vicinity of the airport. These areas include the Runway Safety Area (RSA) immediately adjacent to the runway; the OFA, extending 1,000 feet off the end of the runway at a width of 800 feet; the XOFA, continuing another 1,500 feet past the OFA; and the Controlled Activity Area (CAA), which provides an additional 100 feet to 475 feet on both sides of the OFA and XOFA (the CAA becomes wider the farther away from the end of the runway). Collectively, these areas

are known as the RPZ. All areas within the RPZ have standards that define whether or not a road can exist in a given zone and under what conditions.

A variety of residential uses and mostly airport-related warehouses located off Des Moines Memorial Drive are found west of the proposed rights-of-way for the build alternatives. The remaining portion of the proposed rights-of-way in the City of SeaTac is located in the Noise Remedy Program acquisition area.

Future Development

Future development in the City of SeaTac will be guided by the *City of SeaTac Comprehensive Plan* (SeaTac 1994, with1999 updates) and the city's zoning code. The SeaTac Comprehensive Plan undergoes a yearly amendment process; the City Council acted on proposed 1999 amendments in December 1999. Subsequently, the city's zoning code was revised to reflect the new plan. In addition, the Port of Seattle adopted an update to the Sea-Tac Airport Master Plan by Resolution 3212 (as amended) on August 1, 1996.

Specific projects that have been proposed and formally reviewed and that were considered in this analysis are outlined below. These projects would likely have indirect land use effects on areas far beyond the project area; however, because they would be largely located in the City of SeaTac, they are addressed here.

Sea-Tac Master Plan Update and Third Runway. The Port of Seattle's latest update to its Sea-Tac Airport Master Plan addresses the airport in a comprehensive fashion, including airfield, terminal, parking, surface transportation, support facilities, and potential fill sites for the Third Runway, and recommends facility developments. The plan anticipates facilities that would accommodate the 38 million annual passengers expected to pass through Sea-Tac Airport in approximately 2010. Although the Final EIS was completed in 1996 (Port of Seattle and FAA 1996), a Supplemental EIS was prepared in 1997 (Port of Seattle and FAA 1997) to more accurately reflect aviation demand forecasts. A Record of Decision was issued in 1997 (FAA 1997).

Current surface transportation demand forecasts and other proposed actions in the area, including the proposed project, were considered in preparing the Sea-Tac Airport Master Plan Update. As a member of the Steering Committee for the proposed project, the Port of Seattle has provided input into the development of the proposed alternatives.

South Aviation Support Area. The SASA has been proposed to relocate existing line maintenance facilities, locate new maintenance expansion facilities (primarily hangars), and accommodate major base maintenance

facilities and air cargo uses in response to existing or future market demands associated with Sea-Tac Airport. The SASA would include large facilities located on approximately 100 acres south of South 192nd Street and north of South 200th Street. A taxiway bridge crossing over the proposed South Access Road and Des Moines Creek would provide direct access for airplanes between the SASA hangars and the aircraft operating area. The EIS prepared for SASA project assumed the existence of the SR 509 extension and the South Access Road (Port of Seattle and FAA 1992). The completion of these roadway projects is considered to be important to the development, operational efficiency, and success of the SASA project.

28th/24th Avenues South Arterial Project. The cities of SeaTac and Des Moines, the Port of Seattle, King County, Equitable Capital Group, and Alaska Airlines are modifying the alignment of 28th/24th Avenue South to accommodate local access traffic generated by anticipated development within the cities of SeaTac and Des Moines. The design has generally anticipated the potential development of the Aviation Business Center. Construction of the project from South 188th Street to South 202nd Street began in April 2000 and is substantially complete.

West SeaTac Sub-Area Plan. The City of SeaTac and the Port of Seattle intend to engage in a planning process to address land use alternatives in the West SeaTac Sub-Area (generally located west of Sea-Tac Airport). Some local residents believe residential uses adjacent to the airport are not appropriate, especially considering the Port of Seattle's proposed third runway.

City of Des Moines

The City of Des Moines has well-established patterns of land use. Most land within the City is developed as single-family residential and multifamily areas. Retail commercial development is located in the downtown/ marina area substantially west of the project area and along SR 99 (Pacific Highway South). Localized commercial development is also located along arterial streets, such as the Kent-Des Moines Road (SR 516).

Future Land Uses

Future development in the City of Des Moines is guided by the 1995 *Greater Des Moines Comprehensive Plan* (Des Moines Comprehensive Plan), which is supported by the City’s zoning code and map.

The Des Moines Comprehensive Plan recognizes that the City has undergone rapid growth and development during the last 10 years, and that such development has been substantially influenced by activities outside the City. Past development has resulted in substantial changes to, and in many cases deterioration of, the character of the City's neighborhoods and business

districts. The Des Moines Comprehensive Plan policies and implementation strategies are intended to correct land use inconsistencies and maintain community values.

Because of the severe noise impacts experienced from aircraft, the relatively large amount of undeveloped and underdeveloped land, and the close proximity to future large commercial centers to the north in the City of SeaTac, the City will encourage business park development in the north, south, and east subareas of the North Central planning neighborhood. The area is expected to develop with offices, wholesale trade, light manufacturing, research, and other related uses, while discouraging warehouses.

Specific projects that are being considered within the City of Des Moines include the following.

Pacific Ridge Neighborhood Improvement Plan. The City of Des Moines has developed a subarea plan for a portion of the North Midway neighborhood called Pacific Ridge. The plan focuses upon the area roughly bounded by South 212th Street to the north, Kent-Des Moines Road (SR 518) to the south, I-5 to the east, and the west line of the properties on the west side of SR 99 (Pacific Highway South). Des Moines is largely built out, making it difficult for the city to achieve population and employment growth targets. The transformation of Pacific Ridge will include replacement of lower-scale existing buildings with a denser combination of buildings (up to 120 feet tall) and open spaces designed for both pedestrians and motorists. The ability of the neighborhood to redevelop is based on its excellent transportation access, good views, nearby employment opportunities, established infrastructure, and stable soils. Goals, policies, and strategies for implementing the plan have been incorporated into the Des Moines Comprehensive Plan.

28th/24th Avenue South Arterial Project. This project is described in the section on the City of SeaTac above.

City of Kent

The project area includes a portion of the City of Kent, often referred to as the Midway area, which is generally southeast of the City of Des Moines and north of the Woodmont neighborhood. West of I-5, Kent is characterized by commercial development along SR 99 (Pacific Highway South), and neighborhoods that are composed of a combination of single-family residential areas, several mobile home parks, and residential high-density apartment complexes. The Midway Crossing Shopping Center, located in the southwestern quadrant of the SR 516/SR 99 (Pacific Highway South) interchange, is the primary neighborhood shopping center for the area. The northeast section of the SR 516/I-5 interchange features a park and ride, and a

short section of commercial development to the north on Military Road South.

Future Land Uses

Future development in the City of Kent will be guided by the *City of Kent Comprehensive Plan* (Kent 1995). The plan seeks to establish a framework of goals and policies that will implement the community's vision and enhance quality of life.

In May 2000, the City of Kent updated its *Comprehensive Plan Land Use Map* (Kent 2000), and is currently in the process of updating the 1995 Kent Comprehensive Plan.

The Kent Comprehensive Plan and land use map designates the area around the I-5/SR 516 interchange as commercial, with some single-family residential designations farther to the southeast. A mixture of vacant, developed, and land with redevelopment potential surrounds the southern portion of the interchange.

Future development potential exists near the South 272nd Street/I-5 intersection. This area is not within the Kent city limits, but is designated as potential annexation area. Most of the area between SR 99 (Pacific Highway South) and I-5 is vacant (from South 260th to South 272nd Street). The Kent Comprehensive Plan and land use map designates this area to be primarily commercial along SR 99 (Pacific Highway South), but the remaining area is single-family residential. The map also shows the area as accommodating community facilities in the future.

City of Federal Way

Improvements to I-5 would take place between South 272nd Street and South 310th Street within the City of Federal Way. Primary land uses bordering the project area to the west of I-5 include single-family high density and multifamily housing between South 272nd Street and South 316th Street. The Federal Way city center core, with primarily commercial land uses, borders the remaining 4 blocks of the project area, including the South 310th Steet/I-5 intersection.

Future Land Uses

Future development within the City of Federal Way will be guided by the *City of Federal Way Comprehensive Plan* (Federal Way 2000). The comprehensive plan, recently revised in 2000, included revisions to the City's comprehensive plan designations and zoning maps.

Future land use concepts recognized within the comprehensive plan that are applicable to the proposed project include:

- Promotion of new residential opportunities near transit centers

- Promotion of redevelopment of "strip commercial" areas along major arterials into attractive, mixed-use corridors served by automobiles and transit.

- Transformation of the retail core into an intensely developed city center that is the focus of civic activity and provides a sustainable balance of jobs and housing.

The transportation section of the Federal Way Comprehensive Plan mentions the plans for the I-5 improvements within the Federal Way planning area. Many of the City's goals outlined within the transportation section place high priority on the development of HOV lanes, and suggest applying for funding for HOV improvements and park and rides within the City (Federal Way 2000).

King County

Part of the project area would border areas of unincorporated King County, primarily to the east of I-5 and south of South 253rd Street. Commercial development is concentrated near SR 99 (Pacific Highway South), including a neighborhood shopping center at the intersection of South 260th Street. Multifamily residential complexes are generally located adjacent to the commercial areas. There are also sizeable vacant, open-space areas associated with riparian areas, and a large Class 1 wetland complex north of the King County Star Lake park-and-ride facility and the King County Star Lake gravel pit. East of I-5 near Star Lake, land use is generally single-family residential areas and vacant properties along Military Road South and commercial development near the intersections of Military Road South, and major crossroads.

Future Land Uses

Future guidance for the area is generally covered in the *King County Comprehensive Plan* (King County 2000), but also is substantially influenced by the surrounding cities. Land west of SR 99 (Pacific Highway South) was annexed by the City of Des Moines; the Cities of Federal Way and Kent also have annexation interests. Property owners within the applicable boundaries would have the final vote in determining any jurisdictional changes due to annexation. According to the 2000 King County land use map, areas bordering the east side of the I-5 project area, between South 272nd Street and South 310th Street are considered Urban Residential, with a density of 12 dwelling units per acre.

3.8.3 Environmental Impacts

This Revised DEIS considers the potential direct impacts of the proposed project on the quality of land uses in the project area. The most direct changes in land use would be property acquisitions necessary to construct SR 509, and the South Access Road, and to make the necessary improvements to I-5 between South 216th Street and South 310th Street.

Alternative A (No Action)

Under the No Action Alternative, the entire 96 acres of the existing SR 509 right-of-way would remain in its current use, in addition to the existing right-of-way along the I-5 corridor. Numerous options would be available to WSDOT for future use of the property, including, but not limited to, maintaining the right-of-way for other possible transportation-related projects or disposing of the property if no transportation-related use is found.

Under this alternative, the proposed project would not occur and local and regional traffic congestion patterns would continue to worsen. In turn, accessibility to the airport and businesses in the project area, as well as regional mobility, would be hindered. The livability of residential neighborhoods served by and adjacent to major arterials and highways would indirectly worsen from increased noise, air pollution, and commuting times.

Impacts Common to All Build Alternatives

Under all build alternatives, additional right-of-way would be required to accommodate new roadway surfaces, shoulder areas, structures, and cut-and-fill slopes.

All build alternatives would also use portions of the existing SR 509 right-of-way extending south of its current northern terminus and portions of the existing I-5 right-of-way extending between South 216th Street and South 310th Street. Construction of the proposed project would result in direct impacts by converting current vacant areas that provide a sense of open space to roadway use. Each build alternative would require rights-of-way through the Port of Seattle's large parking lots just east of the south end of Sea-Tac Airport's Runway 34R/16L. The South Access Road in this area would be a depressed roadway, with a tunnel providing access to the SASA.

All build alternatives would introduce a major roadway into areas characterized by residential, commercial, and park uses. A decrease in distance between land uses and new roadways would increase the exposure of businesses and residences to noise levels and highway glare, thereby indirectly reducing the livability of these areas. Conversely, overall local and regional access and mobility would be directly improved, thereby enhancing the livability of the affected communities.

Improved access between the planned urban center in the City of SeaTac and the new roadway would directly improve the intra- and interregional transport of goods, people, and services that would encourage these planned developments. Improvements to the I-5 corridor would accommodate the expected increase in volume stemming from the proposed project. Acquisition acreage totals provided below under each alternative include the rights-of-way needed for the I-5 improvements and the South Airport Link.

Alternative B

Residential areas that would experience direct impacts from increased noise levels and highway glare would include the 8th Avenue South/Des Moines Memorial Drive area; the Homestead Park area; and the Madrona, North Hill, Grandview, and Pacific Ridge neighborhoods. Although I-5 currently runs between Mansion Hill and Grandview, these neighborhoods would also experience additional noise from new C/D lanes stretching along I-5 to the I-5/SR 516 interchange. Such effects would indirectly affect the livability and market value of these properties.

Right-of-Way Acquisition

Alternative B would require the greatest amount of new right-of-way. As shown in Table 3.8-1, this alternative would require the acquisition of an additional 174.5 acres to 179.8 acres for right-of-way purposes, not including the use of unutilized I-5 right-of-way, new rights-of-way for major arterials, or the existing SR 509 right-of-way. The range in acreage represents the difference in right-of-way acquisition, depending on which South Airport Link design option is chosen. Most of the new right-of-way requirements would be located in the City of SeaTac. New right-of-way requirements in the City of Des Moines would mainly be from Port of Seattle property, with the rest spread evenly among single-family, multifamily, and park uses. Of the total acquired land, 47.0 acres and 27.8 acres to 30.5 acres would be in residential and commercial uses, respectively. Only 1.4 acres of industrial uses, all located within the City of SeaTac, would be required.

Approximately 77 acres of new right-of-way would be on vacant or undeveloped land; this is higher than the other build alternatives because the SR 509 alignment would travel south into the Noise Remedy Program acquisition area before turning east towards I-5. Of the 29.1 acres of acquisitions needed for right-of-way in Des Moines, 23.9 acres are vacant or undeveloped because of the Noise Remedy Program acquisition area. This buyout area constitutes most of the roughly 95.8 acres of public or government use land that would be required.

Alternative B would cross Des Moines Creek Park's narrowest point. Approximately 0.5 acre of Des Moines Creek Park would be required for a bridge spanning Des Moines Creek, resulting in a visual impact on the park

Table 3.8-1
Alternative B Right-of-Way Acquisition by Existing Land Use

	City of SeaTac		City of Des Moines		City of Kent		
	Total Land To Be Acquired (acres)	**Vacant Land To Be Acquired (acres)**	**Total Land To Be Acquired (acres)**	**Vacant Land To Be Acquired (acres)**	**Total Land To Be Acquired (acres)**	**Vacant Land To Be Acquired (acres)**	**Total Land To Be Acquired (acres)**
Existing Land Use Categories							
RLD (Residence Low Density)	34.2	2.6	2.8	0.8	--	--	37.0
RHD (Residence High Density)	7.6	--	2.4	--	--	--	10.0
COM (Commercial)	25.9 - 28.6	4.7	0.1	--	1.8	--	27.8 - 30.5
IND (Industrial)	1.4	0.6	--	--	--	--	1.4
PGU (Public/Government Use)	73.8 - 76.4	45.3	23.1	23.1	--	--	96.9 - 99.5
P (Park)	--	--	0.7	--	--	--	0.7
RI (Religious Institution)	0.8	--	--	--	--	--	0.8
Total	**143.6 - 148.9**	**53.1**	**29.1**	**23.9**	**1.8**	--	**174.5 - 179.8**

Note: Ranges reflect differences in right-of-way acquistions among the South Airport Link design options.

(although not precluding park and trail usage) C/D lanes associated with Alternative B would impact the eastern portion of a property adjacent to the Puget Sound Energy (PSE) electrical substation on South 221st Street. This property was recently designated by the City of Des Moines in the Pacific Ridge Neighborhood Improvement Plan as part of Midway Park. WSDOT and the City of Des Moines have been working together to ensure that the envisioned eastward expansion of the park would not encroach into the widened I-5 right-of-way proposed as part of this project.

Alternative B would have varying impacts on the major land uses within its vicinity. Retaining walls would be used to avoid taking land from Hillgrove Cemetery. The Federal Detention Center also would not be impacted. This alternative would take some land from the northwest corner of the Alaska Airlines Gold Coast Center, but would not take any of the buildings on the site, nor would it preclude the use of any of these buildings.

The SR 509 freeway extension would run just west of Sea-Tac Airport's proposed third runway RPZ. The South Access Road would skirt the RPZ of Runway 16L/34R, but would clip the southwest and northwest corners of the SASA. However, no RPZs would be encroached upon under Alternative B.

I-5 improvements between South 216th Street and SR 516 (South Kent-Des Moines Road) would account for 14.5 acres of the 174.5 acres to 179.8 acres needed for right-of-way under Alternative B. Most of the I-5 improvement acreage requirements (61 percent) would be located in the City of SeaTac. All the land impacted by the I-5 improvements within the City of SeaTac would be single-family residential, except for one religious institution, the Puget Sound Church of God Holiness.

Acreage needed for I-5 improvements in the City of Des Moines would be acquired from the eastern edge of the Pacific Ridge neighborhood; most of this land is zoned multifamily.

The City of Kent would have the least amount of land impacted as a result of the I-5 improvements—1.8 acres. Only commercial land uses would be impacted. The Kent park-and-ride lot would not be affected by the proposed I-5 improvements.

All land acquired would be immediately adjacent to the existing I-5 right-of-way, resulting in conversion of relatively small amounts of other land uses to right-of-way. Right-of-way acquired in the Pacific Ridge area would not prevent the planned scale of development.

Depending on which South Airport Link design option is chosen, the South Airport Link would account for as little as 0.6 acre, and as much as 5.8 acres, of the total 174.5 acres to 179.8 acres required for new right-of-way purposes

under Alternative B. All of the South Airport Link right-of-way requirements would be located in the City of SeaTac.

Zoning

Except for approximately 29.1 acres of property in the City of Des Moines and 1.8 acres in the City of Kent, all of the property affected by Alternative B is zoned by the City of SeaTac. Table 3.8-2 provides a summary of the area of each land use zone potentially required by Alternative B. Alternative B would use the most vacant land (not including the existing SR 509 and I-5 rights-of-way) of all the build alternatives. Approximately 95.5 acres of Airport-use zoned properties, including the Noise Remedy Program acquisition and relocation area and the SASA project area, would be required for Alternative B, constituting the greatest impact of all the affected land uses. The second greatest land use impacted under Alternative B would be single-family residential land. Approximately 35 acres of property zoned collectively as R-15000, R-9600, and R-7200 would be required for additional right-of-way under Alternative B. The South Airport Link design options would require from 0.6 acre to 5.8 acres of land zoned CB-C and AVO, depending on the design option chosen.

Alternative C2 (Preliminary Preferred)

Residential areas that would be directly impacted by increased noise levels and highway glare as a result of Alternative C2 would be the same as those in Alternative B. Such effects could indirectly affect the livability and market value of these properties.

Right-of-Way Acquisition

Alternative C2 would require the least amount of new right-of-way of all the build alternatives. As shown in Table 3.8-3, Alternative C2 would require 94.5 to 99.8 additional acres for right-of-way purposes, not including existing street rights-of-way. This alternative would require considerably less land in the City of Des Moines, compared to Alternative B, because none of the Noise Remedy Program acquisition and relocation area in Des Moines would be acquired. Most of the new right-of-way (85.7 acres to 91.0 acres) would still be in the City of SeaTac. Approximately 43.4 acres of the new right-of-way would be on vacant or undeveloped land. While the land use with the greatest loss would be the same as Alternative B (Public/Government Use), Alternative C2 would only require roughly one-third of the acreage (32.9 acres to 35.5 acres compared to 95.8 acres) needed under Alternative B. Approximately 29.4 acres and 11.2 acres to 13.9 acres would be acquired under Alternative C2 for Residential Low Density and Commercial land, respectively, less than would need to be acquired under Alternatives B and C3. More Residential High Density land would be acquired under Alternative C2 (17.4 acres) than any of the other build alternatives.

Table 3.8-2
Alternative B Right-of-Way Acquisition by Zone

	City of SeaTac	City of Des Moines	City of Kent	
	Total Land To Be Acquired (acres)	Total Land To Be Acquired (acres)	Total Land To Be Acquired (acres)	Total Land To Be Acquired (acres)
Low-Density Residential				
R-15000	3.1	--	--	**3.1**
R-9600	16.3	--	--	**16.3**
R-7200	14.5	1.1	--	**15.6**
High-Density Residential				
M-2400	6.5	--	--	**6.5**
H-1800	0.4	0.6	--	**0.9**
H-900	0.6	3.6	--	**4.2**
MHP	0.1	--	--	**0.1**
Commercial/Industrial				
HC	--	--	--	**--**
GC	11.8	--	1.8	**13.6**
CB	1.5 - 4.2	--	--	**1.5 - 4.2**
ABC	5.4	--	--	**5.4**
A	72.9 - 75.5	23.1	--	**96.0 - 98.6**
IND	10.6	--	--	**10.6**
Park				
P	--	0.7	--	**0.7**
Total	**143.6 - 148.9**	**29.1**	**1.8**	**174.5 - 179.8**

Note: Ranges reflect differences in right-of-way acquisitions among the South Airport Link design options.

Table 3.8-3
Alternative C2 Right-of-Way Acquisition by Existing Land Use

	City of SeaTac		City of Des Moines		City of Kent		
	Total Land To Be Acquired (acres)	**Vacant Land To Be Acquired (acres)**	**Total Land To Be Acquired (acres)**	**Vacant Land To Be Acquired (acres)**	**Total Land To Be Acquired (acres)**	**Vacant Land To Be Acquired (acres)**	**Total Land To Be Acquired (acres)**
Existing Land Use Categories							
RLD (Residence Low Density)	26.1	2.8	3.3	0.8	--	--	29.4
RHD (Residence High Density)	14.9	4.7	2.5	--	--	--	17.4
COM (Commercial)	8.2 - 10.9	2.7	1.2	--	1.8	--	11.2 - 13.9
IND (Industrial)	--	--	--	--	--	--	--
PGU (Public/Government Use)	32.9 - 35.5	32.4	--	--	--	--	32.9 - 35.5
P (Park)	2.9	--	--	--	--	--	2.9
RI (Religious Institution)	0.6	--	--	--	--	--	0.6
Total	**85.6 - 90.9**	**42.6**	**7.0**	**0.8**	**1.8**	**--**	**94.4 - 99.7**

Note: Ranges reflect differences in right-of-way acquisitions among the South Airport Link design options.

Approximately 2.9 acres of Des Moines Creek Park would be needed under this alternative. The existing trailhead parking area would be immediately adjacent to the SR 509 alignment (a small portion would actually be situated under the roadway structure). The rest of the park, however, would remain unaffected and contiguous. Midway Park would be affected in the same manner as Alternative B.

Under the C2 Alternative, SR 509 would cross the southern one-third of the Runway 16L/34R XOFA. The FAA has indicated that a road located in the southern one-third of the XOFA would not be required to have a tunnel or cut-and-cover design. The South Access Road would remain to the east of all RPZs. Construction within the XOFA would need to accommodate aircraft landing lights. Alternative C2 would completely avoid Hillgrove Cemetery, Alaska Airlines Gold Coast Center, and the Federal Detention Center.

Right-of-way acquisitions for improvements to the I-5 corridor between South 216th Street and South 310th Street and the South Airport Link design options would be the same as those described under Alternative B.

Zoning

Table 3.8-4 provides a summary of the area of each land use zone potentially required by Alternative C2. Land zoned Airport would constitute the greatest amount of right-of-way acquisitions (32.3 acres to 34.9 acres) under Alternative C2. Alternative C2 would require the most acreage zoned for mobile home parks (10.1 acres) of all the High Density Residential zoned land required for new right-of-way (22.2 acres). Alternative C2 is the only build alternative that would not impact any land zoned Industrial.

Alternative C3

Residential areas that would be impacted by increased noise levels and highway glare in Alternative C3 would be the same as those in Alternatives B and C2. Such effects could indirectly affect the livability and market value of these properties.

Right-of-Way Acquisition

As shown in Table 3.8-5, Alternative C3 would require 137.5 acres to 142.8 acres for right-of-way purposes, not including existing street rights-of-way. This alternative would require approximately the same amount of land in the cities of Des Moines and Kent compared to Alternative C2; most of the acreage (128.2 acres to 133.5 acres) would be in the City of SeaTac. Approximately 28.7 acres of the new right-of-way would be on vacant or undeveloped land, lower than Alternatives B and C2. The land use with the greatest loss would be Public/Government Use (65.7 acres to 68.3 acres). Although very little Residential High Density land would be acquired,

Table 3.8-4
Alternative C2 Right-of-Way Acquisition by Zone

	City of SeaTac	City of Des Moines	City of Kent	
	Total Land To Be Acquired (acres)	Total Land To Be Acquired (acres)	Total Land To Be Acquired (acres)	Total Land To Be Acquired (acres)
Low-Density Residential				
R-15000	3.1	--	--	**3.1**
R-9600	8.6	--	--	**8.6**
R-7200	9.4	1.6	--	**11**
High-Density Residential				
M-2400	4.4	--	--	**4.4**
H-1800	2.7	0.7	--	**3.4**
H-900	1.0	3.6	--	**4.6**
MHP	10.1	--	--	**10.1**
Commercial/Industrial				
HC	--	--	--	**--**
GC	5.4	1.1	1.8	**8.3**
CB	2.3 - 5.0	--	--	**2.30 - 5.0**
ABC	3.1	--	--	**3.1**
A	32.3 - 34.9	--	--	**32.3 - 34.9**
IND	0.3	--	--	**0.3**
Park				
P	2.9	--	--	**2.9**
Total	**85.6 - 90.9**	**7.0**	**1.8**	**94.4 - 99.7**

Note: Ranges reflect differences in right-of-way acquisitions among the South Airport Link design options.

Table 3.8-5 Alternative C3 Right-of-Way Acquisition by Existing Land Use							
	City of SeaTac		City of Des Moines		City of Kent		
	Total Land To Be Acquired (acres)	Vacant Land To Be Acquired (acres)	Total Land To Be Acquired (acres)	Vacant Land To Be Acquired (acres)	Total Land To Be Acquired (acres)	Vacant Land To Be Acquired (acres)	Total Land To Be Acquired (acres)
Existing Land Use Categories							
RLD (Residence Low Density)	30.4	1.4	5.6	0.8	--	--	36.0
RHD (Residence High Density)	1.8	0.3	1.8	--	--	--	3.6
COM (Commercial)	22.6 - 25.3	10.8	0.1	--	1.8	--	24.5 - 27.2
IND (Industrial)	0.1	0.1	--	--	--	--	0.1
PGU (Public/Government Use)	65.7 - 68.3	15.2	--	--	--	--	65.7 - 68.3
P (Park)	6.6	--	--	--	--	--	6.6
RI (Religious Institution)	1.0	--	--	--	--	--	1.0
Total	**128.2 - 133.5**	**27.8**	**7.5**	**0.8**	**1.8**	**--**	**137.5 - 142.8**

Note: Ranges reflect differences in right-of-way acquisitions among the South Airport Link design options.

substantial amounts of Residential Low Density and Commercial land would be acquired (36 acres and 24.5 acres to 27.2 acres, respectively).

Approximately 3.9 acres of Des Moines Creek Park would be needed under Alternative C3. Like Alternative C2, the SR 509 roadway structure would cover a portion of the existing trailhead parking area. The rest of the park would remain unaffected and contiguous. Midway Park would be affected in the same manner as Alternative B.

Under Alternative C3, SR 509 would cross the southern one-third of the Runway 16L/34R XOFA and would not be required to be in a cut-and-cover configuration, as indicated by the FAA. The South Access Road would remain to the east of all RPZs. Similar to Alternative C2, construction within the XOFA would need to accommodate aircraft landing lights. Alternative C3 would have no direct impacts on the Hillgrove Cemetery or the Federal Detention Center. This alternative would displace the Alaska Airlines Gold Coast Center.

Right-of-way acquisitions for improvements to the I-5 corridor between South 216th Street and South 310th Street and the South Airport Link design options would be the same as those described under Alternative B.

Zoning

Table 3.8-6 provides a summary of the area of each land use zone that would potentially be affected by Alternative C3. Except for approximately 7.5 acres of property within the City of Des Moines, and 1.8 acres in the City of Kent, all of the Alternative C3 property acquisitions would be zoned according to the City of SeaTac. Alternative C3 would impact more City of SeaTac General Commercial zones than Alternatives B or C2, but substantially less high-density residential land. Similar to Alternative B, the greatest impacts would be to land zoned Airport (65.1 acres to 67.7 acres). The second greatest impact by type of zoned land would be General Commercial (20.6 acres). Approximately 19.3 acres of property zoned R-7200 (Single-Family Residential) would be required for right-of-way under Alternative C3.

Relationship to Plans and Policies

This section identifies the relationship of the proposed project to relevant existing land use plans, policies, implementation strategies, and development regulations. The proposed project's consistency with policies that apply to recreational facilities is discussed in Section 3.10, *Social*, of this Revised DEIS.

Table 3.8-6
Alternative C3 Right-of-Way Acquisition by Zone

	City of SeaTac	City of Des Moines	City of Kent	
	Total Land To Be Acquired (acres)	Total Land To Be Acquired (acres)	Total Land To Be Acquired (acres)	Total Land To Be Acquired (acres)
Low-Density Residential				
R-15000	3.1	--	--	**3.1**
R-9600	8.7	--	--	**8.7**
R-7200	15.4	3.9	--	**19.3**
High-Density Residential				
M-2400	--	--	--	**--**
H-1800	1.6	--	--	**1.6**
H-900	--	3.6	--	**3.6**
MHP	0.2	--	--	**0.2**
Commercial/Industrial				
HC	--	--	--	**--**
GC	18.8	--	1.8	**20.6**
CB	0.1 - 2.8	--	--	**0.1 - 2.8**
ABC	8.2	--	--	**8.2**
A	65.1 - 67.7	--	--	**65.1 - 67.7**
IND	0.4	--	--	**0.4**
Park				
P	6.6	--	--	**6.6**
Total	**128.2 - 133.5**	**7.5**	**1.8**	**137.5 - 142.8**

Note: Ranges reflect differences in right-of-way acquisitions among the South Airport Link design options.

Regional Plans

Destination 2030 Metropolitan Transportation Plan

On May 24, 2001, Central Puget Sound leaders unanimously adopted Destination 2030 at a meeting of the PSRC's General Assembly in Seattle. Destination 2030 is the MTP for the central Puget Sound region and the transportation element of Vision 2020 (PSRC 2001). Destination 2030 does not replace Vision 2020 or the 1995 MTP; it provides added detail and clarification aimed at making implementation of the MTP easier. It also identifies future transportation improvements and examines how they will influence the performance of the region's transportation

systems, in addition to discussing how to preserve and manage the existing systems to make them more efficient (PSRC 2001).

Destination 2030 identifies various short term investment strategies in projects and programs (to occur prior to 2010), which will increase travel alternatives, complete regional systems, address transportation choke points, and fund projects that are "ready to go" (PSRC 2001). The completion of key freeway system missing links including SR 509 were some of the early actions identified within the "Ten Year Investment Program." All build alternatives would be consistent in implementing this strategy.

The proposed project is consistent with several of the priorities identified in Destination 2030. According to Destination 2030 (Chapter 5, Implementation Guidance and Actions: Completing Regional Roadway Systems), the region's priorities for roadway system development include:

- Completion of missing freeway links
- Completion of a regional arterial network
- Projects on major corridors
- Projects that connect designated urban centers

The No Action Alternative would be inconsistent with this plan by failing to support the strategies to improve regional mobility.

The proposed project is consistent with the goals and policies of the following plans:

Vision 2020 and Metropolitan Transportation Plan (MTP)

Urban Growth Policies

RG-1.9—Encourage growth in compact, well-defined urban centers which: (1) enable residents to live near jobs and urban activities; (2) help strengthen existing communities; and (3) promote bicycling, walking and transit use through sufficient density and mix of land uses. Connect and serve urban

centers by a fast and convenient regional transit system. Provide service between centers and nearby areas by an efficient, transit-oriented multimodal transportation system.

Regional Transit Policies

RT-8.18—Investments in transportation facilities and services should support compact, pedestrian-oriented land use development throughout urban communities, and encourage growth in urban areas, especially in centers.

RT-8.5—Encourage public and private sector partnerships to identify freight mobility improvements which provide access to centers and regional facilities, and facilitate convenient intermodal transfers between marine, rail, highway and air freight activities.

RT-8.6—Promote efficient multimodal access to interregional transportation facilities such as airports, seaports, and inter-city rail stations.

King County Countywide Planning Policies

Framework Policies

FW-15—All jurisdictions in the county, in cooperation with Metro, the Metropolitan Planning Organization, and the state, shall develop a balanced transportation system and coordinated financing strategies and land use plan which implement regional mobility and reinforce the countywide vision. Vision 2020 Regional Growth Strategies shall be recognized as the framework for creating a regional system of centers linked by High Capacity Transit and an interconnected system of freeway High Occupancy Vehicle (HOV) lanes, and supported by a transit system.

Transportation Policies

T-8—In order to maintain regional mobility, a balanced multimodal transportation system shall be planned that includes freeway, highway and arterial improvements by making existing roads more efficient. These improvements should help alleviate existing traffic congestion problems, enhance HOV and transit operations, and provide access to new desired growth areas, as identified in adopted land use plans. General capacity improvements promoting only Single Occupant Vehicle traffic shall be a lower priority. Transportation plans should consider the following mobility options/needs:

a. Arterial HOV treatments;

b. Driveway access management for principal arterials within the Urban Growth Area; and

c. Improvements needed for access to manufacturing and industrial centers, and marine and air terminals.

SeaTac Comprehensive Plan (1994, with 1999 amendments)

Transportation

Policy 3.2B—Proceed with environmental, feasibility, and funding studies to develop a new expressway or limited access arterial with multimodal capability to provide a south access route between the airport and I-5 with connections serving SeaTac's Urban Center.

Policy 3.2C—Continue coordination with the WSDOT and other local agencies to define and implement an extension of SR 509 to connect with I-5.

Policy 3.2J—Prior to construction of the South Access Roadway, development in the south portion of the Urban Center (excluding the South Aviation Support Area development) should be limited to the equivalent of 1,000,000 gross square feet unless the 28th/24th Avenue South (and associated improvements to South 200th Street) project is scheduled for completion within 6 years.

Policy 3.4C—Coordinate with Regional Transit Authority (RTA), Metro, WSDOT, King County, Port of Seattle, and other regional and local agencies to plan and implement for High Capacity Transit (HCT), and/or Personal Rapid Transit (PRT) systems to serve the City of SeaTac. Integrate the systems into planned transportation system improvements, such as the South Access Roadway project.

Greater Des Moines Comprehensive Plan (1995)

Conservation Element

Policy 4-03-04—Promote the preservation of native vegetation and mature trees; revegetation; and appropriate landscaping to improve air and water quality and fish and wildlife habitat.

Policy 4-03-05—Regulate significant land clearing, grading, and filling to minimize the area, time, and slope length of exposed soils and to reduce onsite erosion and offsite sediment transport. Prohibit any significant clearing, grading, or filling operations prior to drainage and erosion/sedimentation plan approval and implementation.

Policy 4-03-06—Regulate public and private development proposals in ways to ensure that the valuable functions of natural resources are preserved, restored, or improved.

Policy 4-03-07—Analyze the chain of environmental impacts from public and private development proposals in context of the whole watershed. Approve, condition, restrict, or deny development proposals based upon accurate and well-documented environmental information.

Policy 4-03-09—Take measures to control noise pollution and reduce noise impacts.

Policy 4-03-10—Regulate land uses to conserve all forms of energy.

Land Use Element

Policy 2-03-02—Preserve open spaces where appropriate to (1) protect environmentally sensitive areas; (2) provide visual separation between land use, neighborhood and city boundaries; and (3) moderate the environmental and visual impacts of new developments.

Policy 2-03-03—Limit future development to areas where adequate public facilities and services exist or can be concurrently provided.

Policy 2-03-04—Preserve the integrity of existing single-family neighborhoods.

Policy 2-03-05—Promote a land use pattern, scale, and density which supports public transportation services and encourages people to walk and bicycle, as well as provide convenient and safe automobile usage.

Policy 4-03-09—The city should plan for future development in the North Central neighborhood recognizing… (4) requirements of new development for transportation and other infrastructure improvements and (5) the potential for new development to enhance the economic or environmental quality of the city.

Implementation Strategy 2-04-20—Seek to minimize negative impacts of new development on neighborhoods by providing uniform standards at the interface of incompatible land uses which address, but are not limited to, the following: site access and circulation; structure height, bulk, and scale; preservation of views; separation or buildings; landscaping; density; and noise buffering.

Transportation Element

Policy 3-03-01—Design the transportation system to serve the Land Use Element of the Greater Des Moines Comprehensive Plan.

Policy 3-03-05—Maintain convenient access to business districts. Discourage traffic congestion that would negatively affect access to businesses.

Policy 3-03-07—Provide facilities to accommodate safe pedestrian and bicycle movement.

Policy 3-03-08—Support programs that improve transit service and promote transit use.

Policy 3-03-11—Minimize the adverse impacts of constructing new transportation facilities.

Policy 3-03-12—Ensure adequate funding for needed transportation improvements.

Policy 3-03-13—Minimize the impacts of noise generated from new or expanded transportation systems.

Policy 3-03-14—Provide opportunities for residents and business owners to participate in the design and development of Des Moines' transportation systems.

City of Kent Comprehensive Plan (Revision 1, October 1997)

Land Use Element

LU-2.1—Establish transportation levels of service that will help guide development into desired areas and discourage sprawling development patterns.

LU-21.1—Incorporate bicycle paths in all roadway designs, ensure that sidewalks and other pedestrian amenities are provided in conjunction with private and public development, and incorporate convenient transit stations in designs for mixed use development.

Community Design Element

CD-2.3—Design intersections to safely accommodate both pedestrian and vehicular traffic. Construct intersections with the minimum dimension necessary to maintain established levels of service.

CD-2.4—Provide attractive streetscapes with street trees and sidewalks on both sides of all streets, planting strips, attractive transit shelters, benches, and pedestrian-scale street lights in appropriate locations.

CD-2.7—In general, construct sidewalks on both sides of all new streets. In industrial districts, sidewalks may not be appropriate, unless significant pedestrian traffic is projected, the absence of a sidewalk poses a public safety risk, or the streets are on existing or planned transit routes.

CD-3.2—Except where they are necessary to reduce noise or to create private rear yards, discourage fences, walls, and other barriers that inhibit pedestrian traffic, isolate neighborhoods, or separate neighborhoods from main roads.

Transportation Element

TR-1—Locate commercial, industrial, multi-family, and other uses that generate high levels of traffic in designated activity centers around intersections of principal or minor arterials or around freeway interchanges.

TR-1.4—Along all principal and minor arterial corridors, consolidate access points to residential, commercial, and industrial development. Consider proposals to consolidate access points during development review, as part of road improvement projects, or as part of land use redevelopment projects.

TR-1.5—Ensure consistency between land use and transportation plans so that land use and adjacent transportation facilities are compatible.

TR-3—Provide a balanced transportation system that recognizes the need for major road improvements to accommodate many travel modes. Create a comprehensive street system that provides reasonable circulation for all users throughout the city.

TR-4—Eliminate disruptions that reduce the safety and reasonable functioning of the local transportation system.

TR-4.1—Maximize traffic flow and mobility on arterial roads, especially on regional through routes, while protecting local neighborhood roads from increased traffic volumes.

TR-4.6—Minimize the effects of regional traffic congestion and overflow onto the local transportation system.

TR-4.7—Develop strategies to reduce traffic flows in local areas experiencing extreme congestion.

TR-5.3—Protect neighborhoods from transportation facility improvements that are not in character with the residential areas. Encourage pedestrian and bicycle connections among residential developments to serve as an alternative to automobile use.

TR-5.4—Arrange streets and pedestrian parks in residential neighborhoods as an interconnecting network and connect them to other streets.

TR-7—Improve the nonmotorized transportation system for both internal circulation and linkages to regional travel, and promote the use of nonmotorized transportation.

TR-8—Encourage the development and use of alternatives to single-occupancy vehicles.

City of Federal Way Comprehensive Plan (1995, with 2000 revisions)

Transportation Policies

TP-9—Identify and implement changes to the transportation system that reduce reliance on the single occupant vehicle. Support state, regional, and local visions and policies.

TP-20—Take advantage of opportunities to open new road connections to create route alternatives, especially in areas with few access choices.

TP-29—Reduce reliance on the single occupant auto by prioritizing and implementing supportive local-level transit, HOV, and nonmotorized improvements.

TP-30—Identify and plan for multimodal freeway, arterial, and collector street improvements which ensure more efficient use of existing roads and enhancement of HOV, transit, and nonmotorized operations.

TP-32—Structure the City's improvement program to strategically place increments of public and private investment that complement the multi-modal vision of the plan. This should include "matching" improvements to supplement the efforts by other agencies to provide HOV and transit facilities.

TP-42—Arterial HOV improvements will be constructed along key corridors to improve flow and encourage use of these more efficient modes.

Transportation Goals

TG-7a.—Place high priority on development of HOV and transit priority lanes.

3.8.4 Mitigation Measures

Operational Impacts

WSDOT would continue to coordinate with local jurisdictions and regional authorities to integrate the proposed project or No Action Alternative with other transit-related projects and to minimize unavoidable adverse effects on land uses from the combination of the projects.

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.

For Alternatives B, C2, and C3, WSDOT would coordinate with the Cities of SeaTac and Des Moines to identify alternative property that could offset impacts resulting from the required acquisition of portions of Des Moines Creek Park. Such coordination is being conducted in conjunction with a detailed Section 4(f) Evaluation.

People and businesses displaced by new right-of-way acquisition would be entitled to relocation assistance and payment programs. A discussion of these programs is provided in Section 3.9, *Relocation*. Section 3.2, *Noise*, discusses mitigation of unavoidable adverse noise impacts; Section 3.14, *Visual Quality*, discusses mitigation of visual impacts.

3.8.5 Construction Activity Impacts and Mitigation

This analysis considers the temporary impacts of construction on the project area. It is assumed that these impacts would end after project construction is completed.

Alternative A (No Action)

No construction would occur under the No Action Alternative and, thus, there would be no construction impacts to land use.

Impacts Common to All Build Alternatives

Construction-related impacts affect the quality and character of existing land uses. These include impacts from noise, dust, and access and parking restrictions.

Noise impacts associated with the SR 509 extension would occur primarily to nearby residents along 8th Avenue South and Des Moines Memorial Drive near the SR 509 freeway extension, where the SR 509 alignment is similar for all of the build alternatives. Dust impacts on these residences and on commercial development would occur. Although the motels and restaurants located near the northern terminus of the South Access Road are insulated for airport-related noises, some additional noise and dust impacts on these businesses would likely occur. Temporary traffic congestion would occur along South 188th Street near its current interchange with SR 509, at varying locations along South 200th Street, and at different locations, along SR 99 and I-5, depending on the alternative.

All build alternatives would require substantial amounts of landform grading and filling, some of which would include jurisdictional wetlands, steep slopes, and the demolition of several buildings. These direct impacts would

require grading permits, sensitive areas ordinance variances, and demolition permits from each affected jurisdiction.

Alternative B

Noise and dust impacts associated with construction would occur at residences along 8th Avenue South near South 192nd Street, Des Moines Memorial Drive south of South 192nd Street, 15th Avenue South, south of South 200th Street, 24th Avenue South near South 208th Street, and in the City of SeaTac's Mansion Hill neighborhood. Commercial businesses on the west side of SR 99 from South 188th Street to roughly South 180th Street, businesses in the vicinity of the SR 99/South 208th Street intersection, and apartment complexes along South 208th Street and east of SR 99 would have noise and dust impacts. Homes and businesses along the west side of Military Road would also be affected, in addition to residents and businesses located along the I-5 corridor between South 216th Street and South 310th Street, especially those apartment complexes and other residences between 30th Avenue South and I-5 from South 216th Street south to SR 516. The King's Arms Motel located at the Kent Des Moines Road/I-5 intersection might experience a decline in business because of noise and construction.

Temporary traffic congestion would occur in the 24th Avenue South/ South 208th Street intersection area, along SR 99 in the vicinity of its current intersection with South 208th Street, along South 200th Street at the 2400 and 1600 blocks, Des Moines Memorial Drive just south of South 192nd Street, and along South 188th Street near its current intersection with Air Cargo Road. Local access traffic would not be able to use Air Cargo Road during some portions of construction of the South Airport Link. Further temporary traffic congestion would occur along South 216th Street near its current interchange with I-5 and at the South Kent-Des Moines Road (SR 516)/I-5 intersection. Buses and automobiles entering and exiting the Kent park and ride, located just northeast of the SR 516/I-5 interchange might experience delays because of the construction. Various streets that cross I-5 or are near to the proposed project might also encounter traffic congestion because of the I-5 improvements.

Alternative C2 (Preliminary Preferred)

Temporary direct impacts, including noise and dust from the construction of the proposed project, would be similar to those described under Alternative B. However, because approximately 80 fewer acres would be acquired under Alternative C2, it is expected that the construction would not impact as many residences or businesses as Alternative B. Although temporary direct impacts associated with the construction of the proposed project would vary depending upon the alternative, temporary construction impacts stemming from the I-5 improvements and the South Airport Link would be the same as those described under Alternative B.

Alternative C3

Temporary direct impacts from the construction of the proposed project would include noise, dust, and traffic congestion. Noise and dust impacts would occur at residences on South 194th Street, around Des Moines Memorial Drive and South 196th Street, around 24th Avenue South and South 208th Street, and in the City of SeaTac's Mansion Hill neighborhood adjacent to the proposed I-5/SR 509 interchange. Single-family homes and a business along the west side of Military Road would also be impacted. Construction impacts would also affect commercial business south of South 208th Street on SR 99.

Temporary direct impacts from construction of the I-5 improvements and the South Airport Link would be the same as those described under Alternatives B and C2.

Construction Mitigation Measures

Various temporary traffic control measures would be implemented to minimize traffic congestion during construction.

Permits and approvals would be acquired to ensure that the proposed project is consistent with local comprehensive plans, zoning ordinances, and other applicable regulations.

SEA/3-08 land use.doc/020220059

3.9 Relocation

3.9 Relocation

3.9.1 Studies and Coordination

This section is based on the findings of the *SR 509/South Access Road EIS Discipline Report: Relocation* (CH2M HILL August 2000), *SR 509/South Access Road EIS: South Airport Link* (August 2001), and *SR 509/South Access Road EIS: I-5 Improvements Report* (CH2M HILL October 2001).

Displacements were determined from aerial photos with alignment overlays, and a range of relocation figures were calculated to show the minimum and maximum number of possible displacements. Impact estimates were confirmed with WSDOT staff through field-checks in the project area.

Single-family house values and sizes were obtained from records at the King County Department of Assessments. Information on project area demographics and economic issues was obtained from 2000 and 1990 U.S. Census data. Information on business characteristics and economic activity in the project area was obtained from published documents of affected jurisdictions and through consultation with city personnel. Additional contact was made with commercial property owners, as well as business owners, to confirm fundamental information about each individual business potentially impacted by the build alternatives.

The project area includes portions of five jurisdictions: the Cities of SeaTac, Des Moines, Kent, and Federal Way and King County. Staff in these jurisdictions were contacted to determine areas of planned or approved new development that could act as replacement housing.

3.9.2 Affected Environment

In general, the project area is characterized by somewhat lower minority and ethnic populations than the King County average, substantially lower housing prices than the county overall, and a lower-than-average median household income as shown in Table 3.9-1. Affected neighborhoods are described in Section 3.10, *Social*. Because displacements would only occur in the Cities of SeaTac, Des Moines, and Kent, demographic information for Federal Way has not been included. Demographic information for King County is included for reference.

The project area supports a wide variety of businesses. Businesses in the area around Sea-Tac Airport are generally related to airport operations and/or tourism. The businesses include airline and air freight companies, hotels and motels, rental car facilities, and similar services. Commercial development around SR 99 (Pacific Highway South) through the central and southern

Table 3.9-1
Characteristics of King County and the Cities of Des Moines, SeaTac, and Kent

	2000 Housing Characteristics					2000 Demographic Characteristics							
Jurisdiction	**Population**	**Households**	**Owner/ Renter Occupied (%)**	**Median House Value[a]**	**Mean Rent[a]**	**White (%)**	**Black (%)**	**American Indian, Alaska Native (%)**	**Asian (%)**	**Pacific Islander/ Native Hawaiian (%)**	**Other or Multirace (%)**	**Hispanic[b] (%)**	**Median Household Income[a]**
King County	1,737,034	710,916	60/40	$139,000	$510/month	75.7	5.4	0.9	10.8	0.5	6.7	5.5	$36,179
City of Des Moines	29,267	11,337	61/39	$109,100	$453/month	74.2	7.2	1.0	8.3	1.3	8.1	6.6	$32,145
City of SeaTac	25,496	9,708	54/46	$93,700	$487/month	62.9	9.2	1.5	11.1	2.7	12.8	13.0	$32,437
City of Kent	79,524	31,113	49/51	$107,100	$458/month	70.8	8.2	1.0	9.4	0.8	9.8	8.1	$32,341

Source: 2000 and 1990 U.S. Census

[a] *Data from the 1990 Census.*

[b] *Hispanic origin includes any race.*

portions of the project area is widely varied, with shops, restaurants, and service businesses catering to neighborhood residents and the surrounding communities. Industrial development is limited to scattered light-industrial, small-scale manufacturing businesses and warehouses located along major arterials in the City of SeaTac.

By the project design year of 2020, the Cities of SeaTac and Des Moines are predicted to experience substantial employment growth. Major contributors to this growth include the redevelopment of the City of SeaTac Central Business District (CBD), aviation-related developments (described in Sections 3.8 and 3.10 of this Revised DEIS), business redevelopment opportunities within the Noise Remedy Program acquisition area, and the buildout of areas designated for business park use in the *Greater Des Moines Comprehensive Plan* (Des Moines 1995). Realization of these employment projections would depend to some extent on the access provided by the proposed project's roadway improvements.

3.9.3 Environmental Impacts

Table 3.9-2 summarizes the relocation impacts of each build alternative. Impacts are characterized by a range of potentially displaced single-family and multifamily residential units and businesses. Ranges occur in the displacement totals because either (1) only part of a building would be impacted, resulting in the potential to avoid displacements, or (2) there is a difference in the number of displacements for the South Airport Link design options. Through innovative roadway design, the total number of displacements may be reduced.

Alternative A (No Action)

No displacements would occur under the No Action Alternative.

Alternative B

Alternative B would result in the displacement of 106 to 114 single-family residences, 253 to 266 multifamily units in 45 to 48 buildings, and 4 mobile homes. Most of these impacts would be within the Cities of SeaTac and Des Moines. Between 19 and 24 businesses and 1 church would also be displaced.

Residential

As many as 114 single-family homes could be displaced by this alternative. The neighborhoods of Grandview and Homestead Park would see the most single-family displacements, each neighborhood with 34 to 36. Four mobile homes located on individual parcels also would be displaced in the Grandview neighborhood. Neighborhoods in the City of Des Moines would have 5 to 6 single-family displacements. The South Airport Link design

Table 3.9-2
Displacements by Type, Alternative, and Neighborhood[a]

		City of SeaTac						City of Des Moines		City of Kent	
	Neighborhood	City Center	8th Avenue/ Des Moines Road	Homestead Park	Madrona	Mansion Hill	Grandview	North Hill	Pacific Ridge	Midway	Total
Alternative B	Single Family	0	7-8	34-36	6-8	20	34-36	2	3-4	0	106-114
	Multifamily[b]	0	0	0	138 (29)-143 (30)	0	0	12 (2)	103 (14)-111 (16)	0	253 (45)-266 (48)
	Mobile Home	0	0	0	0	0	4	0	0	0	4
	Business[b]	0-4 (4)	1 (1)-2 (2)	13 (4)	1 (1)	0	0	1 (1)	1 (1)	2 (2)	19 (10)-24 (15)
	Other	0	0	0	0	0	1	0	0	0	1
Alternative C2 Preliminary Preferred	Single Family	0	14	0	4-5	31-37	16	3	3-4	0	71-79
	Multifamily	0	0	0	54 (8)	0	0	18-22 (4)	103 (14)-111 (16)	0	175 (26)-187 (28)
	Mobile Home	0	0	0	0	0	4	0	0	0	4
	Business	0-4 (4)	1 (1)	10 (2)	1 (1)	0	0	1 (1)	1 (1)	2 (2)	16 (8)-20 (12)
	Other	0	0	0	0	0	1	0	0	0	1
Alternative C3	Single Family	0	15	19-20	0	42-43	27	5	3-4	0	111-114
	Multifamily	0	0	0	0	0	0	32 (6)	103 (14)-111 (16)	0	135 (20)-143 (22)
	Mobile Home	0	0	0	0	0	4	0	0	0	4
	Business	0-4 (4)	1 (1)	5-6 (3)	2 (2)	0	0	1 (1)	1(1)	2 (2)	12 (10)-17 (14)
	Other	0	0	0	0	0	1	0	0	0	1

[a] *Vacant parcels are not included.*

[b] *These displacements are given in units and (buildings).*

SF = single-family residences; MF = multifamily residences (units); MH = mobile homes; Bus = businesses; Other = non-profit organizations and religious institutions

options would cause no residential displacements, but the I-5 improvements would displace 3 to 4 single-family houses in the Pacific Ridge neighborhood in Des Moines. There would be no residential displacements in any other project area jurisdiction.

Alternative B would displace between 253 and 266 multifamily units in 45 to 48 buildings. Approximately 40 percent of these displacements would be caused by the I-5 improvements in the Pacific Ridge neighborhood. The Heritage Court and Silverwood Park complexes in Pacific Ridge, would each face substantial relocation impacts (111 units in 16 buildings). Most of the remaining multifamily displacements would be caused by the SR 509 mainline in the Madrona neighborhood. The Presidential Estates, Colonial Commons, and Maybill apartment complexes in Madrona would have the largest number of impacts. In North Hill, 2 buildings containing 12 units would be displaced by this alternative.

Demographic Characteristics

The neighborhoods of Homestead Park, Madrona, Grandview and Pacific Ridge would have the greatest displacement impacts. Owner and renter occupancy for the impacted Census blocks in these neighborhoods varies greatly but predictably. Apartment-heavy Census blocks in Madrona and Pacific Ridge have renter-occupied percentages of up to 100 percent. Conversely, affected Census blocks in Grandview and Homestead Park, which are predominantly single-family housing, have owner-occupation rates ranging from 70 to 90 percent. Affected census blocks in Madrona and Pacific Ridge have high minority populations (some over 50 percent) and median household incomes well below the respective Cities of SeaTac and Des Moines median household incomes. Homestead Park and Grandview have minority percentages at or below the City of SeaTac average. The median household income in Grandview is the highest of all the affected Census blocks.

Businesses

Between 19 and 24 businesses would be displaced by Alternative B. Table 3.9-3 shows the businesses and employees that would be displaced by Alternative B, as well as the other build alternatives. The South Airport Link design options would displace between 0 and 4 businesses, depending on the option selected. The I-5 improvements would displace 2 to 3 businesses.

Most of the displacements would be in the City of SeaTac; many of these displacements are either in the service industry or are warehouse uses. For warehouse businesses that use their location as a distribution point, proximity to the airport is key to their operation and is their main siting consideration. Most of the businesses displaced by this alternative would be from a grouping of three warehouses on South 200th Street near the Federal

Table 3.9-3
Maximum Business Displacements

Business	Alternative B	Alternative C2 (Preliminary Preferred)	Alternative C3	Address	Retail	Service	Restaurant	Industrial/ Manufacturing/ Warehouse	Employees
Squeaky Clean			x	21010 International Boulevard		x			1
Alaska Airlines Gold Coast Center			x	20833 International Boulevard		x			300
Pacific Auto			x	20856 International Boulevard		x			3
Alamo Rent-a-Car	x	x		20636 International Boulevard					20
Best Western Executel	x			20717 International Boulevard		x			80
Nordic Construction	x			2612 South 208th Street		x			20
PAC Stainless, Ltd	x			2407 South 200th Street				x	10
Orca Pacific	x	x		2403 South 200th Street				x	5
Fisher Bag Co.	x	x	x	2301 South 200th Street				x	2
AEI	x	x	x	2325 South 200th Street		x			5
Tricor America	x	x		2355 South 200th Street		x			42
Snow-tek USA	x	x		2361 South 200th Street	x				6
PacBrake Company	x	x		2367 South 200th Street				x	4
CDK International	x	x		2369 South 200th Street				x	4
Petra Hygenic Systems	x	x	x	2375 South 200th Street				x	4
Cleaning Systems, Inc.	x	x	x	2377 South 200th Street	x				3
Marinelli Shellfish	x	x	x	2383 South 200th Street	x				9
Tech-Marine Enterprises, Inc.	x	x	x	1122 South 194th Street		x			10
Foreman's Welding	x	x	x	18451 Des Moines Way South		x			1
Jim's Detail Shop	x			18429 Des Moines Way South		x			9
Poulsbo RV	x	x	x	23051 Military Road South	x				53
Gai's Northwest Bakery	x	x	x	23009 Military Road South	x				18
King's Arms Motel	x	x	x	23226 30th Avenue South		x			5
Airport Plaza Hotel	x	x	x	18601 International Boulevard		x			N/A
Budget "Park & Lock" Airport Parking	x	x	x	18445 International Boulevard		x			N/A
West Coast Gateway Hotel	x	x	x	18415 International Boulevard		x			N/A
Sharp's Roaster & Alehouse	x	x	x	18427 International Boulevard			x		N/A

Detention Center. Other business displacements are scattered throughout neighborhoods in the Cities of SeaTac, Des Moines, and Kent.

None of the businesses reported that employee transfers would be feasible, mainly because their other locations were already fully staffed and would be unable to increase staffing levels. Nearly all of the businesses would choose to relocate rather than to suspend operations. Many would relocate within the City of SeaTac—primarily to remain close to Sea-Tac Airport.

Alternative B would acquire property from the Puget Sound Church of God Holiness that would require the removal of buildings immediately adjacent to the proposed right-of-way.

Alternative C2 (Preliminary Preferred)

Displacement impacts under Alternative C2 would be smaller than under Alternative B. Alternative C2 would result in the displacement of 71 to 79 single-family residences, 175 to 187 multifamily units in 26 to 28 buildings, and 4 mobile homes. The displaced single-family units would be primarily in the Mansion Hill and Grandview neighborhoods in the City of SeaTac. Most of the multifamily displacements would be in the Pacific Ridge neighborhood in Des Moines. There also would be 16 to 20 businesses and 1 church displaced under Alternative C2.

Residential

As many as 79 single-family houses could be displaced by Alternative C2. The Mansion Hill neighborhood would see the most single-family displacements. Four mobile homes located on individual parcels would be displaced in the Grandview neighborhood. Only 6 to 7 single-family displacements would occur in the City of Des Moines.

Alternative C2 would displace 175 to 187 multifamily units in 26 to 28 buildings. Substantially fewer multifamily units would be displaced in the Madrona neighborhood compared to Alternative B. Impacts on apartment complexes in this neighborhood would be much less severe under Alternative C2. There would be more multifamily units acquired in the North Hill neighborhood compared to Alternative B.

Alternative C2 would pass through an area where four mobile home parks currently exist—Tyee Valley Mobile Home Park, Des Moines Estates, Town and Country Lane, and Town and Country Villa. The Port of Seattle, according to FAA noise mitigation policy (Part 150), has committed to relocating these mobile homes as a part of their current noise mitigation plan. These relocations would occur prior to the construction of the proposed project. The Port's mitigation plan is independent of the SR 509 project and is based upon current and future noise levels and the ability to mitigate

certain types of residences from higher noise levels. WSDOT is working closely with the Port of Seattle to partner in the coordinated and timely relocation of the mobile home residents.

For both single-family and multifamily units, the I-5 improvements would have the same impact as described under Alternative B. Up to 111 multifamily units in 16 buildings in the Heritage Court and Silverwood Park complexes would be displaced in the Pacific Ridge neighborhood.

Demographic Characteristics

The Madrona and Pacific Ridge neighborhoods would have the greatest displacement impacts under Alternative C2. The displacements in Madrona would occur slightly farther south than under Alternative B; however, this section of the neighborhood still contains many of the multifamily developments that contribute to the high renter-occupancy rate. This area of Madrona has similar characteristics to those described under Alternative B. The same Census blocks in Pacific Ridge would be impacted as in Alternative B.

Businesses

Alternative C2 would displace between 16 and 20 businesses (Table 3.9-3), most of which would be in the City of SeaTac. Service businesses and industrial/manufacturing/warehouse businesses would be the most common types of business displacements. Similar to Alternative B, the warehouses on South 200th Street would represent the most concentrated area of displacements. The South Airport Link design options and I-5 improvements would cause the same number of displacements as in Alternative B.

Because many of the same businesses impacted by Alternative B would be impacted by Alternative C2, siting issues and opinions on relocation options are the same as those described above.

Alternative C2 would have the same impact on the Puget Sound Church of God Holiness as Alternative B.

Alternative C3

Alternative C3 would displace more single-family houses, but fewer multifamily houses than Alternative C2. Alternative C3 would result in the displacement of 111 to 114 single-family residences, 135 to 143 multifamily units in 20 to 22 buildings, and 4 mobile homes. Most of the single-family impacts would be within the City of SeaTac's Mansion Hill neighborhood. Multifamily impacts would only occur in the North Hill and Pacific Ridge neighborhoods in Des Moines. Twelve to 17 businesses and 1 church would also be displaced by this alternative.

Residential

The number of single-family displacements would be roughly the same as in Alternative B. However, Alternative C3 would acquire fewer homes in the Homestead Park area and more houses in the Mansion Hill neighborhood. Mansion Hill would have the greatest number of single-family displacements. The South Airport Link design options and I-5 improvements would have the same displacements as the other two build alternatives.

Alternative C3 would displace the fewest multifamily units of any of the alternatives. All multifamily displacements would be in the City of Des Moines. Thirty-two units in six buildings would be displaced along South 194th Street in the North Hill neighborhood, and 111 units in 16 buildings (Heritage Court and Silverwood Park complexes) would be displaced in the Pacific Ridge neighborhood. The Pacific Ridge displacements would result from the I-5 improvements.

Demographic Characteristics

Alternative C3 would impact nearly the same Census blocks as Alternative B. The main difference is that Alternative C3 would mostly avoid the Madrona neighborhood—areas with Census blocks with a high minority populations and a high percentage of renter-occupied housing. Instead, Alternative C3 would impact additional blocks in the Mansion Hill neighborhood. This area has a lower percentage of minority residents than the City of SeaTac average. Comprised of mainly single-family houses, it also has a much higher owner-occupied housing rate than the City of SeaTac. Overall, Alternative C3 impacts Census blocks with a lower percentage of minorities and a comparable median household income compared to City of SeaTac and City of Des Moines averages.

Businesses

Alternative C3 would displace between 12 and 17 businesses. Unlike Alternatives B and C2, business displacements under Alternative C3 generally would be well spread out among the project area neighborhoods. This alignment would only partially encroach on the largest warehouse located on South 200th Street, thereby allowing businesses to operate in the remaining portion. Most of the displacements would be service businesses. The South Airport Link design options and I-5 improvements would cause the same number of displacements as in Alternative B and C2.

Because many of the same businesses impacted by Alternative B and C2 would be impacted by this alternative, siting issues and opinions on relocation options are the same as those described above. One exception is the Alaska Airlines Gold Coast Center, which employs an estimated 300 people. Because of the large amount of office and meeting space contained in

the center, it poses a unique relocation challenge. Alaska Airlines intends to expand their facilities at this site to accommodate their west coast and regional headquarters for maintenance and operation. Similarly sized buildings close to the airport are scarce. Representatives of Alaska Airlines have indicated that the facility would relocate to a different city (outside the region) if displaced.

Alternative C3 would have the same impact on the Puget Sound Church of God Holiness as Alternatives B and C2.

3.9.4 Mitigation Measures

It is a State of Washington policy that persons displaced as a result of programs designed to benefit the public as a whole shall be provided relocation assistance in a consistent manner. Individuals, families, and businesses displaced by transportation and other public works projects may be eligible for relocation advisory services and payments provided under 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 replacement housing payments, including purchase supplements, rental assistance, and down-payment assistance.

As the proposed project is built and right-of-way is acquired in phases, displaced households and businesses would become eligible for relocation assistance. Because the impacts would be staggered over time, WSDOT would be able to identify suitable replacement facilities over time as they develop. In some cases, acquisition of property would be made a couple of years before the actual relocation happens, and the State could act as landlord for many people if necessary. WSDOT is committed to working with local housing authorities to ensure that all displacees would find suitable housing.

In the same manner, comparable relocation alternatives would be found for businesses in the area. Because the types of businesses displaced are common in the project area, similar commercial space (as well as employment opportunities for any displaced jobs) exists nearby. Retail and industrial (warehouse) space would be the two types of commercial space needed for relocation purposes. Displaced businesses occupying warehouse space near the airport would be relocated with similar proximity to the airport, so that they can maintain their essential close access. The success of these businesses depends on close proximity to the airport. The most desirable locations for commercial retail space are in shopping centers, such as the Midway Crossing complex at the intersection of SR 516 and SR 99 (Pacific Highway South). Planned redevelopment in each of the four closest jurisdictions to the proposed project (Cities of SeaTac, Des Moines, Kent, and Federal Way) is also expected to increase retail space, as well as residential units.

The City of SeaTac is already heavily urbanized; therefore, there is limited potential for extensive new development. Most new residential development would happen through infill and redevelopment (Scarey pers. comm. 1998). A number of new warehouse/office developments in the project area are reported to be offering space for lease. The City of SeaTac has 160 acres of undeveloped land that could easily accommodate the types of warehouses and light industrial uses that would be displaced in that area. Large warehouse/industrial facilities located on South 192nd and South 186th Streets, similar to those on South 200th Street that would be displaced, could potentially serve as relocation sites. Additional redevelopment within the City of SeaTac, such as in their recently designated city center or near the 28th/24th Avenue South Arterial Project (some already built), could provide additional retail or airport-related commercial space. Land around 28th/24th Avenue South in particular has already been zoned for airport-related commercial uses.

The City of Des Moines has two areas of active development and redevelopment—the Pacific Ridge neighborhood and downtown Des Moines. The downtown area of the City of Des Moines is becoming highly gentrified, with many beachfront cabins being replaced with expensive condominiums. Although this type of development might be out of the price range of many of the displacees, there are opportunities for more affordable units to be developed under the current zoning, which allows mixed-use development (Loch pers. comm. 2001). The City has not yet made a formal planning effort to encourage more affordable housing units in the downtown area, instead allowing redevelopment to occur as dictated by the real estate market. Downtown Des Moines also has a concentration of general retail stores and land appropriately zoned for such uses. Available retail space is currently limited in Des Moines, however. This condition is not likely to improve as no new construction is under way and when new space is developed, tenants are identified beforehand (Varacalli pers. comm. 2000).

The Pacific Ridge neighborhood is planned to undergo substantial intensification of land uses in accordance with its recently adopted plan. New zoning in Pacific Ridge will allow the replacement of lower-scale existing buildings with new structures five to eight stories in height. Emphasized land uses will include retail, office, and multifamily residential uses. The City's economic analysis showed that in 20 years, Pacific Ridge could accommodate 8,800 people compared to 3,653 current residents. New multifamily units are anticipated to be market rate, particularly condominiums, which would improve owner-occupancy rates in the neighborhood (*Pacific Ridge Neighborhood Improvement Plan 2000* [Des Moines 2000]). In addition, a 50-acre business park planned adjacent to Pacific Ridge will provide new business and employment opportunities for area residents.

The City of Kent has no current large-scale housing developments planned; however, this year's comprehensive plan amendments include several rezones in residential areas. The City is amending their Downtown Subarea Plan, which could include an intensification of uses and the inclusion of mixed-use zones. Furthermore, the City is planning the area near the Kent Station Sound Transit commuter site. This area would be expected to develop with transit-friendly uses, including a substantial number of housing units (Osborne pers. comm. 2001).

Although the City of Federal Way has no specific large-scale planning efforts underway that would intensify land uses, there is a consistent amount of development activity within the city. Currently, 23 separate residential projects, including both single-family and multifamily units, are either pending or have preliminary approval. These developments are scattered throughout the city. Federal Way also has a number of office and retail developments either planned or under construction.

Because all of the multifamily buildings and units affected are rental apartment buildings, relocation of those affected residents would involve moving them to comparable rental units, which are abundant in the Cities of SeaTac and Des Moines project vicinity (with more currently planned). Single-family relocations mean a more difficult and costly process because this would involve relocating the families to comparable single-family homes in the project vicinity, which are less abundant and far more expensive (than rental relocations).

3.9.5 Construction Activity Impacts and Mitigation

Construction Activity Impacts

Construction activities would not result in any additional displacements for any of the build alternatives.

Mitigation Measures

No mitigation measures are proposed for construction activities.

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3.10 Social

3.10.1 Studies and Coordination

This section is based on the findings of the *SR 509/South Access Road EIS Discipline Report: Social* (CH2M HILL February 2000), *SR 509/South Access Road EIS: South Airport Link* (August 2001), and *SR 509/South Access Road EIS: I-5 Improvements Report* (CH2M HILL October 2001). The primary source of demographic data was the 2000 U.S. Census because it is the most comprehensive, complete, and detailed data source currently available. Block group-level statistics on housing characteristics, racial/ethnic composition, income level (from 1990 U.S. Census; 2000 data were not available at the date of publication of this document), and related information were obtained for each of the project area neighborhoods that would be affected by the build alternatives. The project area is composed of portions of five jurisdictions: the Cities of SeaTac, Des Moines, Kent, and Federal Way, and King County. Aggregated data for the Cities of Des Moines, SeaTac, and Kent, and King County were used to establish a regional context for comparison. Reconnaissance of the affected neighborhoods was used to confirm neighborhood boundaries and identify the locations of important community facilities, such as churches and schools, whose access or usage patterns might be disrupted if the proposed project were built.

3.10.2 Affected Environment

Community Cohesion

Areas of the Cities of SeaTac and Des Moines within the project area are mostly residential neighborhoods with commercial development concentrated along SR 99. Residential and commercial development along I-5 from approximately South 230th Street to South 272nd Street is within the Kent city limits. South of South 272nd Street, the City of Federal Way lies on the west side of I-5; unincorporated portions of King County lie to the east. Demographic characteristics for the Cities of SeaTac, Des Moines, and Kent, where measurable impacts to community cohesion are likely, are presented in Table 3.10-1. Information for King County has been included for comparative purposes.

The identification of neighborhoods for analysis purposes was based on neighborhood descriptions in comprehensive planning documents. Figure 3.10-1 shows the general locations of project area neighborhoods. Nine neighborhoods that could potentially be impacted by the proposed project were identified. Each neighborhood is discussed briefly below.

Table 3.10-1
Project Area Social Characteristics

	City of SeaTac	City of Des Moines	City of Kent	King County
Households				
Owner Renter Occupied (%)	54/46	61/39	49/51	60/40
Median House Value* ($)	93,700	107,600	107,100	139,500
Median Contract Rent* ($)	487	510	458	510
Median Household Income* ($)	32,437	32,145	32,341	36,179
Population (%)				
White	62.9	74.2	70.8	75.7
African-American	9.2	7.2	8.2	5.4
American Indian, Alaska Native	1.5	1.0	1.0	0.9
Asian	11.1	8.3	9.4	10.8
Pacific Islander/Native Hawaiian	2.7	1.3	0.8	0.5
Other or Multirace	12.8	8.1	9.8	6.7
Hispanic Origin	13.0	6.6	8.1	5.5
Over 65	9.7	14.9	7.3	10.5

Source: 2000 U.S. Census; the 1990 U.S. Census was used where noted with an asterisk.

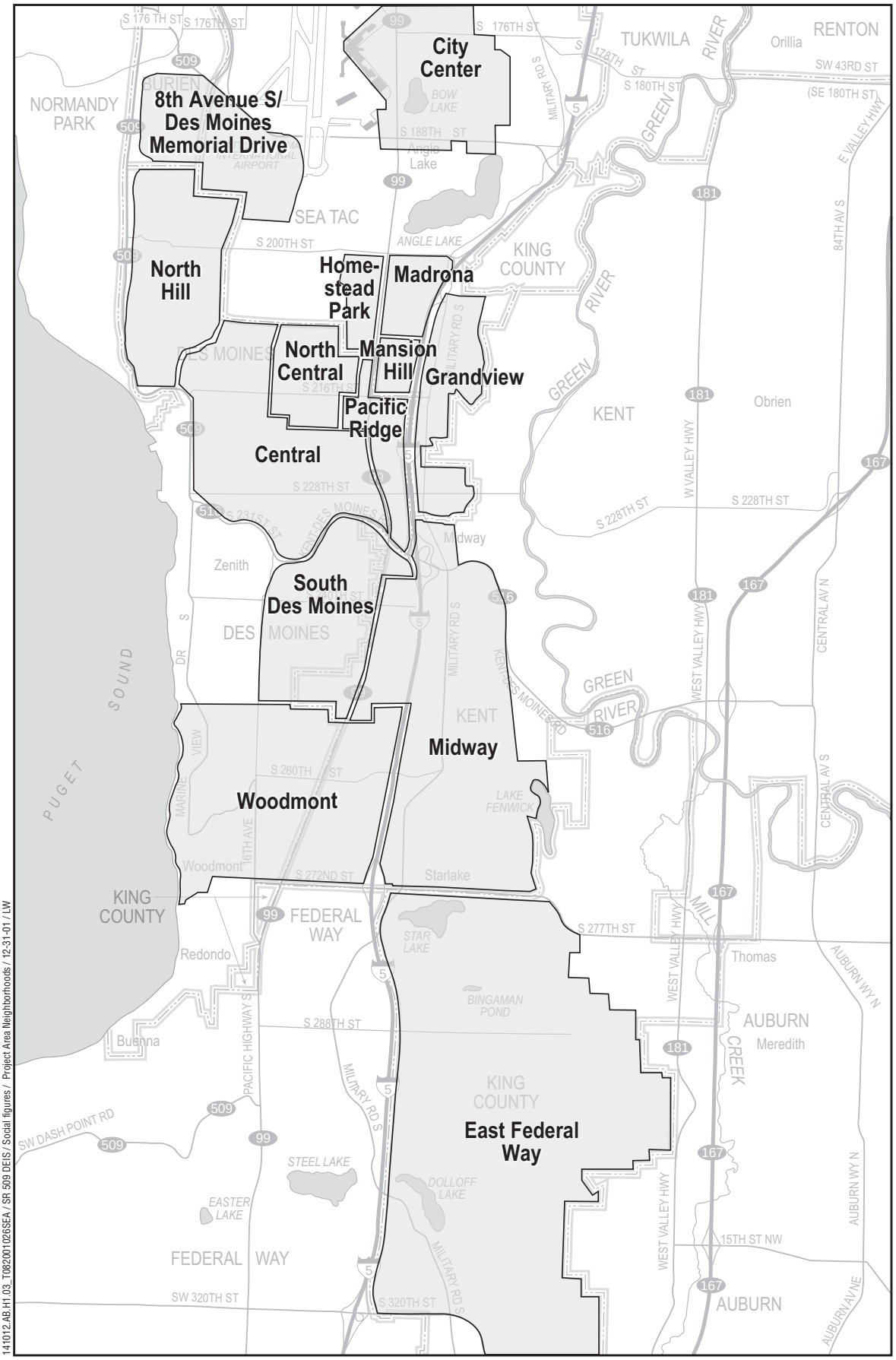

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FIGURE 3.10-1

General Location of Project Area Neighborhoods

City of SeaTac

Sea-Tac Airport is located almost squarely in the center of the City of SeaTac. It has to a large extent defined the patterns of commercial and residential development in the city. Although SR 99 is densely developed with commercial enterprises, many of the businesses are airport- and tourism-related. Consequently, there are few businesses catering specifically to neighborhood residents. With a median value of $93,500 for owner-occupied housing units, as compared to a median value of $140,100 for King County as a whole (Table 3.10-1), the City of SeaTac includes some of the region's most affordable housing. Rental prices are also somewhat less, on average, than for King County overall.

Five SeaTac neighborhoods would be measurably affected to varying degrees by the proposed project. The City Center neighborhood, which could have four displacements from the South Airport Link design options, would not have a substantial enough impact to community cohesion to merit detailed discussion. The characteristics of impacted neighborhoods, as reflected in census data, are described below.

8th Avenue South/Des Moines Memorial Drive

This neighborhood consists mainly of a few scattered single-family houses and multifamily dwellings, interspersed with commercial and industrial businesses, in the area south and east of the current terminus of SR 509 and partially within Burien. Because of the relatively low density of development and an increasing mixture of land uses, this area is less socially cohesive than more traditional neighborhood groupings such as residential subdivisions. The City of SeaTac's long-range plans for the neighborhood include increased business park and industry development, which would likely accelerate a residential-to-commercial transition.

Seventy-three percent of the residences in this neighborhood are owner-occupied, well above the average for the City of SeaTac and King County. Median household income is slightly higher than the city's median income. The median value of homes ($102,746) is the highest in the City of SeaTac project area neighborhoods; the average rent, however, is slightly below the averages for the City of SeaTac and King County. Eighth Avenue South/ Des Moines Memorial Drive has the smallest percentage of minorities of the SeaTac neighborhoods, with 23 percent minority residents. There is a slightly higher proportion of residents over the age of 65 in the neighborhood compared to the City and County.

Homestead Park

This small neighborhood is located just west of SR 99 south of South 200th Street. It consists mainly of single-family homes to the south and

mobile home parks to the north. Tucked between the commercial development along SR 99 to the east and the fences of the Noise Remedy Program acquisition area to the west, the neighborhood is internally cohesive. Within the context of the city, however, it is an isolated residential pocket in an area of increasing commercial development. Both the SeaTac Comprehensive Plan and the zoning code designate the area for airport-related commercial development; therefore, the existing residences are nonconforming uses in terms of the code.

Homestead Park's owner-occupancy percentage of 80 percent is substantially above the City of SeaTac's rate, and is the second highest average in the project area. This is likely due to the proportionately large number of mobile homes within the neighborhood. The average prices of homes ($94,789) are slightly higher than the City of SeaTac average, but they are well below the King County average. The median household income is also below that of SeaTac and King County. Homestead Park has roughly the same percentage of minorities as the City of SeaTac. The percentage of elderly residents in Homestead Park, however, is only half that of SeaTac and King County.

Mansion Hill

This established neighborhood lies just west of I-5 between approximately South 211th Street and the southern ends of 31st and 32nd Avenues South. Bordered on the north by a steep bluff and on the east by I-5, the neighborhood is made up of single-family houses, many with views west to Puget Sound. This neighborhood is extremely cohesive and has organized on behalf of various issues in the past (Booth pers. comm. 1994).

The percentage of owner-occupied housing in Mansion Hill (60 percent) is on par with the rates of the City of SeaTac and King County. Mansion Hill's median household income is close to the median for the City of SeaTac. The average house is more expensive than the average SeaTac house, and the average rental prices ($568 per month) are the most expensive of the project area neighborhoods in the City of SeaTac. Mansion Hill has a lower percentage of minorities than the City of SeaTac overall, but has a considerably higher proportion of elderly residents (20.2 percent).

Madrona

This established neighborhood lies just west of I-5, from South 200th Street to just south of South 208th Street. Its southernmost portion contains several large apartment complexes, which tend to be of newer construction than many in the project area. In the northern part of this neighborhood, single-family residential subdivisions ring the Madrona Elementary School.

The Madrona neighborhood consists mainly of rental units. The very low (12 percent) owner-occupied housing rate is nearly one-fifth of the City of

SeaTac and King County percentages, and is well below most of the other neighborhoods in the project area. It has the lowest median household income ($26,875 per year) of the SeaTac project area neighborhoods. The average home price ($89,800) and average rents ($499 per month) are the lowest of the project area neighborhoods in the City of SeaTac. Madrona has a high minority percentage (55 percent) compared to the other SeaTac neighborhoods. Madrona also has the smallest percentage of residents over 65 (3.5 percent) of the SeaTac neighborhoods.

Grandview

The Grandview neighborhood is wedged between I-5 and the steep ridge that drops into the Kent Valley. Single-family houses exist primarily along Military Road and 33rd Avenue South. The Grandview neighborhood has lost some of its connection to the City of SeaTac because it is cut off from the Mansion Hill and Madrona neighborhoods and there are few crossing points over I-5, limiting access to public facilities.

Eighty-five percent of the homes in Grandview are occupied by owners; this is the highest rate of all the neighborhoods in the project area. Grandview has the highest median household income level ($39,215) of any of the SeaTac project area neighborhoods. The average house value and average rent prices ($100,114 and $551, respectively) are above SeaTac averages. Grandview has a smaller percentage of minority residents than the City of SeaTac or King County. The percentage of residents over 65 is close to those for both the City of SeaTac and King County.

City of Des Moines

Located south of SeaTac along the Puget Sound shoreline, the City of Des Moines is a bedroom community, suburban in character, with commercial and civic activity split between its downtown district near the waterfront and SR 99. Although somewhat more affluent overall than the City of SeaTac, Des Moines' median owner-occupied housing value of $107,600 (at the time of the 1990 census) still represents an area of lower-priced housing compared to the region. It has a higher proportion of elderly than the county overall, primarily because of several large nursing homes located within its boundaries.

The Des Moines Comprehensive Plan identifies nine neighborhoods within the Greater Des Moines planning area, which includes areas east, south, and north of Des Moines in the Cities of SeaTac and Kent. These areas are socially contiguous with Des Moines neighborhoods despite being outside the city limits. Two of these neighborhoods—Pacific Ridge and North Hill—would be directly affected by one or more of the build alternatives. Both of these Des Moines neighborhoods are described below.

Pacific Ridge

The Pacific Ridge (formerly North Midway) neighborhood is dominated by commercial development along SR 99, including considerable automobile-related businesses in the vicinity of its intersection with SR 516. Several multifamily residential complexes are located between the commercial development along SR 99 and I-5 to the east and single-family residential areas to the west. The City of Des Moines has developed a subarea plan for Pacific Ridge that will include replacement of lower-scale existing buildings with a denser combination of buildings (up to 120 feet) and open spaces designed for pedestrians and motorists.

Due to the prevalence of multifamily housing, the Pacific Ridge neighborhood has a high renter-occupied percentage (87 percent)—the highest of all the project area neighborhoods. At the time of the 2000 U.S. Census, Pacific Ridge also had the largest percentage of minorities (66 percent) of all the project area neighborhoods. The median household income of $20,689 is also the lowest of all of the project area neighborhoods. Still, the average value of homes ($119,100) is about 10 percent higher than for the City of Des Moines overall; the average rent ($479 per month) is lower than the City of Des Moines and King County averages. This neighborhood has a small percentage of elderly residents.

North Hill

The North Hill neighborhood exists in the very northwestern corner of Des Moines. It is made up almost entirely of single-family subdivisions and has two elementary schools (one contains kindergarten through third grade, the other fourth through sixth grades) located in the center of the neighborhood. Several homes in this neighborhood have quality views of Puget Sound or the Cascade Mountains.

Because of the prevalence of single-family homes, the North Hill neighborhood has a high owner-occupied percentage (63 percent). North Hill also has the second-highest median household income level of all of the project area neighborhoods. At $103,300, the average home price is less than the King County and Des Moines averages. The average rent price, however, is the most expensive of any of the project area neighborhoods. At an average of $660 per month, North Hill's rent is nearly 30 percent greater than the King County or Des Moines $510 average. North Hill is more racially homogenous than most of the project area, having an 80.8 percent white population. Fewer elderly residents live in this neighborhood (6.5 percent compared to 14.9 percent in Des Moines).

City of Kent

A small portion of the City of Kent would be affected as a result of the I-5 improvements. The affected area begins at the South 229th Place/Military Road intersection, and stretches southward to the intersection of I-5 and SR 516. This area includes a couple of businesses north of SR 516 and a series of residential subdivisions along the east side of I-5. This area is loosely associated with the Midway neighborhood. Despite two business displacements, community cohesion impacts would be very minor; therefore, no demographic data are presented.

Regional and Community Growth

Local and Regional Population and Employment

Like the entire Puget Sound region, the project area experienced considerable growth during the 1980s as the Northwest economy grew, and the Seattle area's quality of life was praised by the national media. It is likely that rapid growth in the project area is also partly the result of relatively low housing prices; the low housing prices became particularly important during the late 1980s when the average price of homes in King County increased so dramatically that home ownership became out of reach for many families. Of the project area cities, only the City of SeaTac showed modest growth during the 1980s. This is probably due, in part, to the large buyout of single-family homes that took place because of the Port of Seattle's Noise Remedy Program.

Population in the project area is expected to continue to increase. Implementation of the GMA by cities and counties in the Puget Sound region through the use of comprehensive plans and zoning will serve to concentrate population and employment growth into areas already developed or identified for development within urban growth boundaries (UGBs). In the project area, the City of SeaTac plans to replace some areas currently occupied by single-family housing with its proposed urban center development, which will be centered around Sea-Tac Airport and aviation-related businesses (see *Status of Communities* below). In contrast, the City of Des Moines is expected to increase its residential population, primarily through annexation and infill of less densely developed neighborhoods.

Status of Communities

On the whole, project area communities are fairly stable, with increases in population and employment expected to result from intensification of, rather than changes in, existing land uses such as in the Pacific Ridge neighborhood (see *SR 509/South Access Road EIS Discipline Report: Land Use* [CH2M HILL October 2000]). One exception is the redevelopment of the City of SeaTac CBD, which is discussed below.

The City of SeaTac has embarked on a process of substantial transition as a result of proposals to establish the city as an urban center focused on an expanded and redeveloped CBD, much of which is in the Homestead Park neighborhood. A number of projects are expected to be factors in the urban center's development: a proposed mixed-use CBD core located west of SR 99 between South 192nd and 204th Streets; the SASA, an airport-related facility on 100 acres lying west of the proposed CBD; and proposed land use changes for the west SeaTac subarea, including the Third Runway Project. A number of local and regional transportation system improvement projects, including the proposed project, are seen as essential factors in the development of the urban center.

Recreation

Recreational facilities that could be impacted by the build alternatives include three parks (including a planned trail extension), a golf course whose operation would be directly affected by the proposed project, and a school playfield. This section describes the potentially affected facilities. Project area parks are shown in Figure 3.10-2.

Des Moines Creek Park

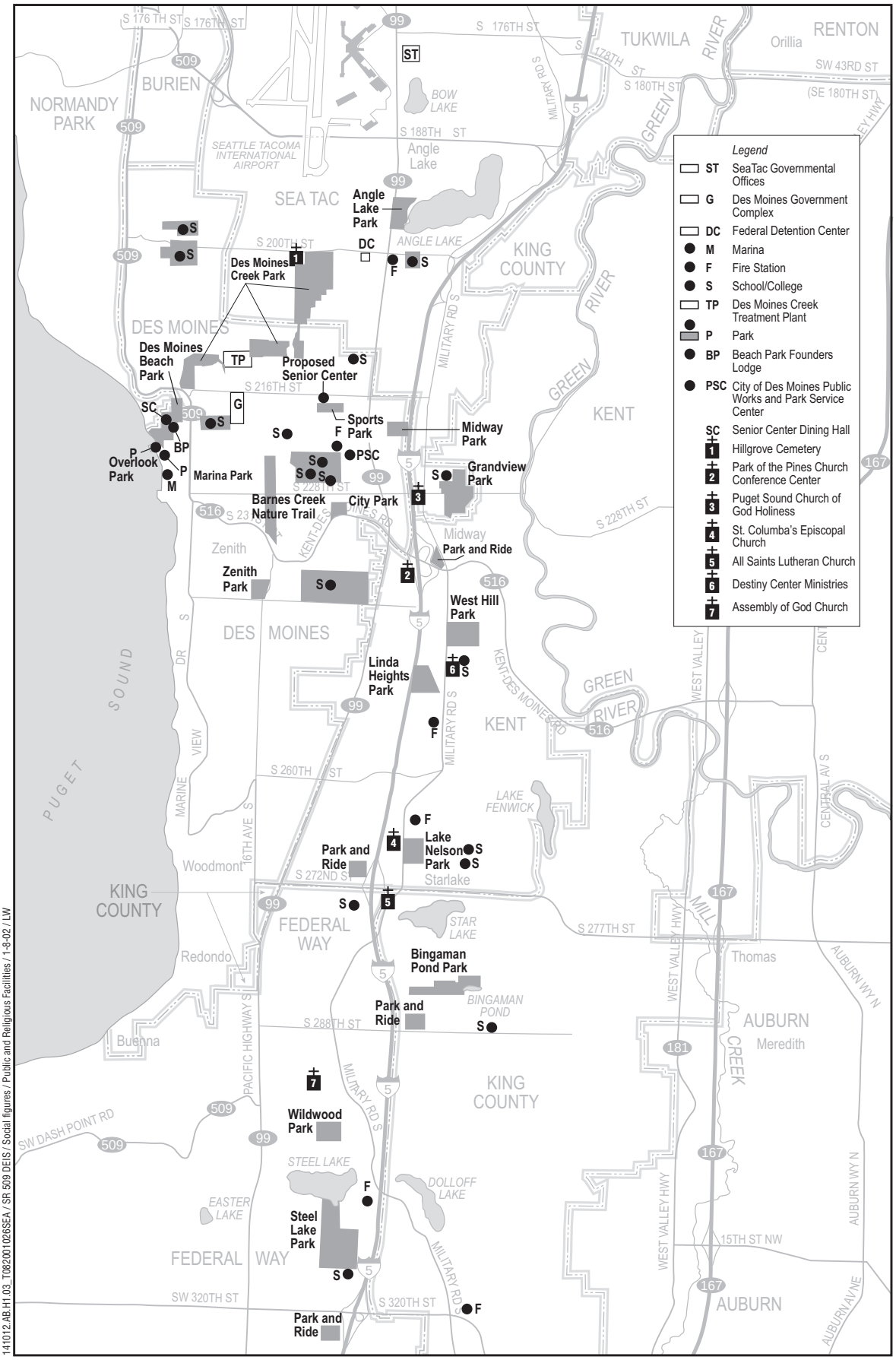
Located in a steep, wooded ravine that runs from northeast to southwest through the Cities of SeaTac and Des Moines, this 96-acre "conservancy and community" park is jointly managed by the two cities. The park is intended to protect the natural resources surrounding Des Moines Creek and, secondarily, to provide passive recreational opportunities for the citizens of SeaTac and Des Moines. Its primary value is its natural open space character. Access is currently limited by the fencing erected for the Port of Seattle's Noise Remedy Program, although a trail has been paved along the creek, with a trailhead at South 200th Street. The SeaTac Comprehensive Plan indicates a possible extension of the trail northward from the park to North SeaTac Park and linkages to the regional trail system.

Tyee Valley Golf Course

This 18-hole, 116-acre golf course, located directly south of Sea-Tac Airport, is operated as a public golf course through a lease between the Port of Seattle and a private company. Members of the public can use the golf course for a fee. The golf course lease is month-to-month, and stipulates that due to Port of Seattle needs (including the Des Moines Creek Basin Plan), the course will eventually be displaced from at least part of the location it currently occupies.

Midway Park

Midway Park is a 1.6-acre neighborhood park located along the south side of South 221st Street in the Pacific Ridge neighborhood and immediately adjacent to a PSE substation. Currently, the park contains



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0 1900 3800
Scale in Feet

North

FIGURE 3.10-2

Public and Religious Facilities

SR 509: Corridor Completion/I-5/South Access Road
Environmental Impact Statement

two small child play areas, a basketball court, an open playfield, and picnic tables.

Midway Park is dominated by noise from traffic on I-5. The current measured L_{eq} in the middle of the park were 70 dBA in the morning and 71 dBA in the afternoon. Such noise levels are above the FHWA NAC for parks of 67 dBA (L_{eq}).

Linda Heights Park

Linda Heights Park is a neighborhood park located on a site owned by the City of Kent Public Works Department for its regional stormwater retention and sanitary sewer lift station. The newly remodeled park is adjacent to the I-5 right-of-way at approximately South 248th Street west of 35th Avenue South. Comprising 4.2 acres, the park includes one half basketball court, picnic tables, play equipment, and public art. Linda Heights Park is designated in the Kent Comprehensive Plan as a neighborhood park, which is used primarily by residents in the surrounding neighborhood.

I-5 traffic noise is a dominant feature of the park. Current L_{eq} in the park are 69 dBA. Such noise levels are above the FHWA NAC for parks of 67 dBA.

Mark Twain School Playfield

The Mark Twain Elementary School playfield is located immediately west of the I-5 right-of-way and south of South 272nd Street. The playfield is used during school hours for the school's physical education program; after hours, the playfield is available for public use, including the Federal Way Youth Soccer League. I-5 traffic noise is a dominant feature. The measurable L_{eq} was 67 dBa, thus exceeding the FHWA NAC for a school or park.

Services and Utilities

Figure 3.10-2 shows the location of public facilities in the project area.

Schools

The project area is served by the Highline, Federal Way, and Kent School Districts. Although attendance boundaries have been established for schools within each respective district, students may attend another school in a given district. The service area of each school varies with the area's population density and the school's grade level.

Bus transportation is generally provided for students living outside a set distance from, but within the attendance boundaries of, their designated school. Information regarding school bus routes on I-5 is listed below, in addition to each district's bus policy.

Highline School District 401

The Highline School District serves the Cities of SeaTac and Des Moines. There are several schools in and about the project area. Bus transportation is provided for students living outside a set distance from, but within the attendance boundaries of, their designated school. School buses transport elementary students who live more than 1 mile from the school, junior high students who live more than 1-1/2 miles away, and high school students who live more than 2 miles away. The Director of Transportation within the Highline School District estimates that 6 to 10 buses travel on I-5 daily; in addition, buses going on field trips use I-5 from time to time (Carr pers. comm. 2001).

Kent School District

Schools close to the project area in the Kent School District include the Kent Learning Center and Neely O'Brien Elementary School. Bus transportation is provided for students living outside a set distance from, but within the attendance boundaries of, their designated school. School buses transport elementary students (Kindergarten through 6th grade) who live more than 1-1/3 miles from the school, junior high students who live more than 1-3/4 miles away, and high school students who live more than 2 miles away. Within these boundaries, students may walk to school. Special Education students who require special transportation are picked up and dropped off as close to their home as possible, depending on their disability. According to the transportation department within Kent School District, 2 bus routes currently travel on I-5 each day in addition to the daily buses; buses also use I-5 for field trips throughout the year (Catton pers. comm. 2001).

Federal Way School District

The Federal Way School District covers all of Federal Way and also extends east across I-5 into some parts of unincorporated King County. Several Federal Way schools are close to the project area. Students residing more than 1 radius mile measured as a straight line from their assigned school to their residence are eligible for bus transportation. Students living within the 1-mile radius may also be eligible for bus service if the walking route is evaluated as hazardous according to state guidelines. Such routes are called "safety routes." Students with disabilities may be eligible for transportation service without distance limitations, depending on the student's abilities. According to the Federal Way School District transportation department, at least 2 bus routes currently travel on I-5 each day. Buses might also use I-5 during field trips (Calhoon pers. comm. 2001).

Highline Community College in Des Moines is also located within the project area. It serves Community College District 9, whose boundaries extend from the southern boundary of Seattle to Pierce County, and from Puget Sound to the western city limits of Kent and Auburn. The student population, however,

is drawn from far beyond the district's boundaries. Each year about 10,000 students enroll at the college, which provides opportunities in higher education, vocational training, and continuing education.

Religious Institutions

The project area contains a number of churches of varying denominations, some of which have preschools and schools associated with them (Figure 3.10-2). Two churches are located close to the proposed footprint of construction—Puget Sound Church of God Holiness located at Military Road and South 228th Street, and St. Columba's Episcopal Church located at 26715 Military Road. One church conference center—Park of the Pines Church Conference Center on 30th Avenue South—is also located in the project area. Additionally, the Christian Faith Center operates a private school on 24th Avenue South near South 208th Street in the City of SeaTac. Because of denominational affiliations and personal preferences, church attendance is not typically tied to place of residence; people may travel across town or to a neighboring town to attend the church of their choice.

Medical Services

Medical services in the project area include several general purpose and specialty clinics. Hospitals serving the project area are all located outside of its boundaries. They include the Highline Community Hospital, which maintains a hospital facility in the area west of SeaTac, a hospital facility northeast of SeaTac, Auburn General Hospital, Valley Medical Center in Renton, and St. Francis Hospital in Federal Way. A University of Washington Physicians' Clinic operates in the Midway Shopping Center in Kent.

Fire and Police Protection

Fire protection and other emergency services in the project area are provided by King County Fire Districts No. 26 and 37 and the fire departments of Kent, Federal Way, and SeaTac. These fire districts work cooperatively, using automatic response and mutual aid agreements to enhance fire protection and related emergency services. A hazardous materials response team, Plan 20, provides specialized equipment and personnel for emergencies involving hazardous materials. Fire District No. 39 in Federal Way has command responsibility for Plan 20, although King County Fire District No. 26 is also involved.

Police protection in the project area is provided by the SeaTac, Des Moines, Kent and Federal Way police departments. The King County Sheriff is present at the SeaTac police department. The Port of Seattle also maintains police and fire departments, whose primary service area is Sea-Tac Airport. Police departments participate in cooperative enforcement activities, as

outlined in various interlocal agreements for such things as jail services; use of K-9 units; and bomb, SWAT, and hostage negotiation units.

The Federal Detention Center is an approximately 275,000-square-foot facility with a single multistory structure providing roughly 500 units for short-term detention of pretrial and trial detainees, unsentenced inmates who are going through the sentencing process, and sentenced inmates awaiting transfer to another federal facility. Built in 1996, it lies along South 200th Street at 26th Avenue South, immediately south of the proposed SASA project.

Cemeteries

The Hillgrove Cemetery, located on South 200th Street west of 18th Avenue South, is the only cemetery near the proposed improvements. Created in 1900, it is the final resting place of many early pioneers. Some of its headstones date to the early 20th century.

Governmental Institutions and Services

Governmental facilities in the project area include the SeaTac City Hall and the Des Moines governmental complex. These facilities house city administration, planning and public works, and police departments, as well as the cities' municipal courts. The Des Moines governmental complex also contains the City's public library. The Des Moines Parks and Public Works Service Center is located on the corner of South 223rd Street and 24th Avenue South. In addition to the facilities noted, Des Moines operates an 800-slip public marina, the Senior Center Dining Hall, and the Beach Park Founders Lodge.

Water

Domestic and fire protection water within the project area is provided by the Highline Water District, Lakehaven Utility District, and the City of Kent. The Highline Water District spans from the north end of the project area (South 216th Street) to approximately South 288th Street. The Lakehaven Utility District begins near the intersection of I-5 and South 288th Street and continues south to encompass the rest of the project area. The Lakehaven Utility District serves parts of south Des Moines, unincorporated parts of King County, and all of Federal Way. The City of Kent has its own domestic water system, which currently extends north to Military Road South, south of the SR 516/I-5 interchange.

The Highline Water District and the Port of Seattle each have a well located in the vicinity of South 200th Street and 20th Avenue South. A Seattle Public Utilities (formerly Seattle Water Department) transmission line runs south along Des Moines Memorial Drive to South 216th Street. Water mains 10 inches in diameter or larger are located along SR 99, as well as along

several east-west arterials (South 200th, 208th, and 216th Streets, as well as parallel to I-5) (Keown pers. comm. 2001). Within the Lakehaven Utility District, there are at least 4 water mains that cross I-5 between South 288th Street and South 317th Street (Bowman pers. comm. 2001). A water main crosses underneath I-5 at South 240th Street and ties the City of Kent water system to the Highline Water District. This water main connects to Kent pump station #8, located at 35th Avenue South and South 240th Street. The Highline-Kent intertie acts as a critical emergency back-up water supply to the City of Kent (Hall pers. comm. 2001).

Sanitary Sewer

Portions of the project area are serviced by sewer lines from the Midway Sewer District, Lakehaven Utility District, and the City of Kent. Major facilities within the project area include the Des Moines Creek Treatment Plant and a number of sewer trunk lines 10 inches or larger in diameter. Trunk lines in the vicinity of the proposed build alternatives alignments run along Des Moines Creek from near Sea-Tac Airport to the treatment plant, along 16th and 20th Avenues South, and along SR 516 from Marine View Drive to SR 99. Smaller lateral lines also exist throughout the project area. Two Kent system pump stations in the project area are located at the South 224th Street/Military Road South intersection and at Linda Heights Park where South 248th Street and 35th Avenue South intersect. One 8-inch sewer main crosses I-5 near South 260th Street (Kase pers. comm. 2001). At least one sewer main in the Lakehaven District crosses I-5 in the project area (Bowman pers. comm. 2001).

Electrical Power

Electrical service within the project area is provided by PSE. Five substations are located within the project area, along with a number of overhead and underground transmission lines. The Midway Transmission Substation, located near the corner of 30th Avenue South and South 211th Street, is a major area electrical facility that delivers power to local distribution substations. Next to the transmission switching substation is a distribution substation that feeds into 115 kV transmission lines.

Five PSE transmission lines cross the I-5 project area in an east to west fashion. The crossings occur at South 216th Street, South 221st Street, South 22nd Street, South 224th Street, and South 288th Street. Furthermore, there are plans for a sixth crossing of I-5 near South 224th Street. The proposed line would carry twice the power (230 kV) of the existing 115 kV lines.

The Bonneville Power Administration owns a Bulk Transmission System line that crosses I-5 around South 320th Street and provides power to all the PSE transmission lines.

Natural Gas

PSE also supplies natural gas to portions of the project area. A major high-pressure trunk line follows SR 99 and branches off to South 222nd Street, runs west to 16th Avenue South, and continues outside the project area. A gas supply main runs along Military Road South throughout the entire length of the project area. This gas main crosses I-5 twice, once near Star Lake Road and a second time farther south near Steel Lake.

Other Utilities

The Olympic Pipeline Company operates petroleum supply lines and the Petroleum Supply Aircraft Fuel Tank Farm near the southeast corner of Sea-Tac Airport. Access roads, system feeds, and distribution routes for the fuel facilities are also located in this area.

Other

Other services in the project area include cable television provided by TeleCommunications, Inc. (TCI), conventional telephone provided by U.S. West Communications, and wireless cellular service provided by a number of companies, such as U.S West/New Vector, Cellular One, AT&T Wireless, GTE, Sprint, Nextel, and Voice Stream. Solid waste collection and disposal within the project area is provided by a conglomerate of companies including Tri-Star (RST), SeaTac Disposal, Nick Raffo Garbage Company, Kent Disposal Company, Federal Way Disposal, and Rabanco. Various recycling centers are located throughout the project area, in addition to residential curbside and yard debris services. Nonrecycled waste is disposed of in the King County Cedar Hill landfill, located approximately 20 miles southeast of Seattle. According to the King County Solid Waste Division, the Cedar Hill landfill has approximately 14 million tons or 15 years capacity.

Pedestrians and Bicyclists

Pedestrian and bicyclist facilities in the project area consist of sidewalks, paved and unpaved shoulders, walkways, and trails. Most of these facilities are shared roadway shoulders and sidewalks. One exception (the Des Moines Creek Trail) is discussed in the *Recreation* section of this Revised DEIS. There are no pedestrian or bicyclist facilities on I-5. Pedestrian and bicyclist facilities in the project area are discussed in greater detail in the *SR 509/ South Access Road EIS Discipline Report: Transportation* (CH2M HILL January 2002).

3.10.3 Environmental Impacts

Community Cohesion

Community cohesion would be affected in all affected neighborhoods to some degree through the loss of single- and multifamily homes, the physical fragmentation of residential areas, and the disruption of access to community facilities and services. Total impact on community cohesion was assessed by observing the pattern of right-of-way acquisition and the resulting physical disruption (such as demolition of houses and severing of neighborhood streets) that the proposed roadway would cause with each build alternative. The main general difference between the three build alternatives is that Alternatives B and C2 would have greater impacts on the Madrona neighborhood, while Alternative C3 would have greater impacts on the Mansion Hill neighborhood.

Alternative A (No Action)

Neighborhoods such as 8th Avenue South/Des Moines Memorial Drive and Homestead Park, which are planned for a transition to new commercial development, could retain their cohesion for a greater amount of time.

Impacts Common to All Build Alternatives

Pacific Ridge Neighborhood

Several multifamily units near I-5 would be displaced. Sixteen apartment buildings with 111 multifamily units would be acquired in the Pacific Ridge neighborhood. The displacements would occur mostly within two large apartment complexes, Silverwood Park and Heritage Court. No roads would be severed. While the I-5 improvements could impact the cohesiveness of the eastern edge of the Pacific Ridge neighborhood, there would be no accessibility issues for residents within the remaining portions of the neighborhood. Overall, there would be a moderate impact on this neighborhood.

Midway Neighborhood

Social cohesion impacts on the Midway neighborhood would be limited to two businesses displacements and limited right-of-way acquisition along I-5. Local streets and access to nearby services would be maintained. Impacts would be low.

Alternative B

Alternative B would route a limited-access roadway with heavy traffic volumes through five existing neighborhoods in the City of SeaTac: 8th Avenue South/Des Moines Memorial Drive, Homestead Park, Mansion Hill,

Madrona, and Grandview. Homestead Park would experience the greatest impacts resulting from displacements and physical fragmentation. Of these five neighborhoods, 8th Avenue South/Des Moines Memorial Drive would experience the lowest level of impacts on community cohesion because the fewest number of residential units would be displaced. Two neighborhoods in Des Moines, North Hill and Pacific Ridge would also be affected by Alternative B.

Eighth Avenue South/Des Moines Memorial Drive Neighborhood would experience the lowest level of impact on community cohesion in the City of SeaTac, considering that development is scattered and the major arterials (South 188th, 192nd, and 200th Streets) would remain intact. The neighborhood as a whole would be physically fragmented, but arterial connections would maintain accessibility between single-family residences west of the proposed right-of-way and commercial activity to the east of the right-of-way. Census blocks that would be affected generally have home ownership rates at or above the City of SeaTac and King County averages. Housing values range from below to above the city average. Alternative B would not preclude access to any community facilities from this neighborhood.

Homestead Park Neighborhood

Impacts on this neighborhood would be moderately severe, involving the acquisition of between 34 and 36 single-family homes for new right-of-way. Affected census blocks in Homestead Park have owner-occupant rates ranging from 70 to 90 percent. Homestead Park also has a minority population at or below the City of SeaTac average. The Alternative B alignment would isolate the remaining single-family homes in the southern part of the neighborhood from the rest of Homestead Park. It would also make access to these homes more circuitous because South 208th Street would be closed just west of SR 99.

Madrona Neighborhood

The southern section of this neighborhood, which is composed mainly of multifamily complexes, would experience numerous displacements as a result of Alternative B. Apartment-heavy census blocks in Madrona and Pacific Ridge have renter-occupied percentages of up to 100 percent. Affected census blocks in Madrona have high minority populations (some over 50 percent) and median household incomes well below the City of SeaTac median household incomes. Twenty-nine to thirty buildings with 138 to 143 multifamily units would be displaced. Although these multifamily complexes would suffer severe impacts on their internal cohesion, impacts on Madrona as a whole would be less severe. South 208th Street would be closed just west of SR 99; however, a new access road would be constructed to preserve access to remaining residential units. This would help to keep the

neighborhood together physically, and would keep access to community facilities intact. Thus, despite a large number of displacements, the total level of impacts on Madrona would be moderate.

Mansion Hill Neighborhood

Impacts on community cohesion under Alternative B in the Mansion Hill neighborhood would be low to moderate. Twenty single-family homes would be displaced as a result of this alternative. All of these displacements would occur around the intersection of South 211th Street and 32nd Avenue South; even though this intersection would be severed, no internal circulation problems or external access difficulties would be created. Because only the northeast corner of the neighborhood would be impacted, no part of the neighborhood would be physically fragmented from the rest.

Grandview Neighborhood

Social cohesion impacts in this neighborhood would be moderate. Alternative B would displace between 34 to 36 single-family homes along the residential streets parallel to I-5. The cohesion of these local residential streets would be impacted, but the overall effect on the neighborhood would be lower because the impact would be isolated along the edge of the neighborhood. A similar impact would occur near South 216th Street and 32nd Avenue South. Just south of the neighborhood, one business (that does not appear to have strong connections to the surrounding neighborhood) would be displaced. Affected census blocks in Grandview have higher owner occupation rates than the City of SeaTac. Grandview also has minority percentages at or below the City of SeaTac average. The median household income in Grandview is the highest of all the affected census blocks. This alignment would not fragment the neighborhood into parts, and would preserve arterial connections (Military Road South and South 216th Street) across I-5 that connect the neighborhood to public facilities located in SeaTac and Des Moines.

North Hill Neighborhood

With two single-family displacements, 12 multifamily displacements, and no physical fragmentation, this neighborhood would experience limited impacts on social cohesion. Of the neighborhoods with measurable community cohesion impacts, North Hill would be the least impacted neighborhood under Alternative B.

Alternative C2 (Preliminary Preferred)

Eight Avenue South/Des Moines Memorial Drive and North Hill

Impacts on community cohesion in areas north of South 200th Street would occur in the same neighborhoods as in Alternative B. In this area, the

Alternative C2 alignment would run farther west in the northwest project area, resulting in slightly more residential displacements in North Hill and along 8th Avenue/Des Moines Memorial Road. Despite the larger number of displacements in these neighborhoods, the overall social impacts would be primarily the same as described under Alternative B. The displacements would be confined to the same isolated areas, and internal and external access and circulation would remain intact.

Homestead Park Neighborhood

Alternative C2 would have a low impact on the Homestead Park neighborhood. Although a sizable portion of this neighborhood would be acquired for the future SR 509 right-of-way, the land acquired would be vacant (following the Port of Seattle's relocation of homes in four mobile home parks). Single-family houses south of South 208th Street would become more isolated in the midst of anticipated and planned commercial development, even though their access to SR 99 and South 208th Street would remain intact. Access to services would not be any more circuitous with the proposed alignment in place. No neighborhood arterial streets would be cut off as a result of Alternative C2.

Madrona Neighborhood

Alternative C2 would impact less of the Madrona neighborhood than Alternative B. Under Alternative C2, 8 buildings with 54 multifamily units would be displaced. Although South 208th Street would be closed from SR 99 (Pacific Highway South), WSDOT would coordinate with the City of SeaTac to construct a new access connection between South 208th and South 204th Streets along the western portion of the existing I-5 right-of-way to preserve access to the remaining residential units. This would help to keep the neighborhood from becoming physically fragmented, and would keep access to community facilities intact. Thus, despite a large number of displacements, the total level of impact on Madrona would be moderate.

Mansion Hill Neighborhood

Impacts on community cohesion in the Mansion Hill neighborhood would be moderately severe. Under Alternative C2, 31 to 37 single-family homes would be displaced. All of these displacements would occur near the intersection of South 211th Street and 32nd Avenue South. All but three would be displaced as a result of property acquisition; the other three would be displaced as a result of lost access. Aside from these three houses, Alternative C2 would not create any internal circulation problems or any external access difficulties within the Mansion Hill neighborhood. No part of the neighborhood would be physically fragmented from the rest because only the northeast corner of the neighborhood would be impacted.

Grandview Neighborhood

Impacts to the Grandview neighborhood would be similar but of a lesser degree compared to Alternative B. Displacements in Grandview would only occur in the southern half of the neighborhood street. The cohesion of local residential streets in that area would be impacted, but the overall effect on the neighborhood would be low. This alignment would preserve arterial connections (Military Road South and South 216th Street) across I-5, connecting the neighborhood with public facilities located within SeaTac and Des Moines.

Alternative C3

Eight Avenue South/Des Moines Memorial Drive and North Hill

Alternative C3's impacts on community cohesion in areas north of South 200th Street would be the same as Alternative C2. Alternatives C2 and C3 would have similar alignments in the 8th Avenue South/Des Moines Memorial Drive and North Hill neighborhoods.

Madrona Neighborhood

Alternative C3 would not affect the Madrona neighborhood.

Homestead Park Neighborhood

Impacts on the Homestead Park neighborhood would be similar to Alternative B, except that fewer single-family homes would be displaced.

Mansion Hill Neighborhood

Alternative C3 would traverse a wide portion of Mansion Hill as it crosses SR 99 and heads toward I-5, similar to Alternative C2, but to a greater degree. This would result in moderately severe social cohesion impacts. Alternative C3 would displace between 42 and 43 single-family housing units. Internal circulation would be disrupted because the Alternative C3 alignment would turn several neighborhood streets into cul-de-sacs and isolate houses on South 211th Street from the rest of the neighborhood. There would no longer be any through streets in the neighborhood, making access to services more circuitous.

Grandview Neighborhood

Social cohesion impacts on the Grandview neighborhood would be somewhat less than Alternative B, but more than Alternative C2. Alternative C3 would displace 27 single-family houses; these displacements would occur in the same general areas and would have the same general effect as in the other two build alternatives.

Regional and Community Growth

Alternative A (No Action)

Because of the general lack of north-south access and direct access to the southern end of Sea-Tac Airport, the No Action Alternative would conflict with the GMA's concurrency requirements for proposed development in the area. Two possible consequences would be the denial of permits for proposed projects or an attempt by one or more jurisdictions to improve the transportation network on a patchwork basis, perhaps with funding obtained from developer fees. Neither scenario represents a long-term solution to providing the infrastructure needed to support local and regional goals for the concentration of growth in SeaTac and Des Moines.

Impacts Common to All Build Alternatives

As a single project, the proposed project would not constitute a direct cause of growth in the community or the region. In the context of regional planning under the GMA, the proposed project would serve two important functions: (1) to provide a critical and long-needed transportation link that could help alleviate traffic problems on I-5 and project area surface streets, and (2) to assist jurisdictions within the project area to direct and achieve development in accordance with their comprehensive plans. This latter function of the proposed project would respond to the GMA's requirement that the infrastructure (primarily roads and utilities) necessary to support development must be in place within 6 years of that development. Meant to ensure that development will not inflict severe impacts on inadequate transportation and utility systems, this "concurrency requirement" has become a crucial consideration in community planning.

The comprehensive plans of the Cities of SeaTac and Des Moines (where most of the population and employment growth in the project area is expected to occur) stress the need for SR 509 and the South Access Road, or another north-south roadway of equivalent function, to help implement planned development projects and increase densities to the levels allowed by zoning. The City of SeaTac also requires the South Access Road to realize its goals for the CBD and the SASA site. In some cases, permitting of new development is explicitly made contingent on the presence of north-south roadway capacity.

It is not anticipated that growth in the project area would result in critical changes in population characteristics. Although housing values in the project area have appreciated in a manner consistent with the regional market, these houses remain affordable to people of low and moderate income. To the extent that people live near their places of work, income levels might rise because of jobs created in the proposed business parks and in airport-related

enterprises. The ethnic and racial composition of the project area would not be expected to change substantially over time.

Recreation

The proposed project has the potential to affect five recreational facilities: Des Moines Creek Park and the associated Des Moines Creek Trail, Tyee Valley Golf Course, Midway Park, Linda Heights Park, and Mark Twain School Playfield. Impacts on these facilities except the golf course are described in detail in Chapter 4, *Draft Section 4(f) Evaluation.* A summary of those impacts are presented below.

Alternative A (No Action)

No impacts to recreational facilities would occur under the No Action Alternative.

Impacts Common to All Build Alternatives

To the extent that the proposed project would improve transportation conditions in the project area, access to local recreational facilities would be improved.

A substantial amount of the Tyee Valley Golf Course would be acquired for future right-of-way under the build alternatives. These impacts would likely result in closure of the golf course and termination of the lease agreement by the Port of Seattle. However, depending on the timing of other proposed and nearby projects (the SASA and/or the Des Moines Creek Basin Plan regional detention facilities), the golf course could be reconfigured to a 9-hole course or closed before the construction of the proposed project.

There would be no direct impacts on Midway Park. Although the City of Des Moines' Parks Master Plan indicates that the park will be extended to the existing I-5 right-of-way, the City and WSDOT have been working together to ensure that the envisioned eastward expansion of the park would not encroach into the widened I-5 right-of-way proposed as part of this proposed project. Noise levels in the park would increase approximately 1dBA, which is generally imperceptible to human hearing.

No land would be directly acquired from Linda Heights Park. There would be slight increases in noise levels; however, given the high existing and projected noise levels from freeway traffic, actual impacts may be imperceptible to human hearing.

The project proposes a new southbound auxiliary lane south of South 272nd Street, resulting in the highway being moved closer to the center edge of the playfield. It is not anticipated, however, that there would be any direct impact

to the facility. Moving roadway traffic closer to the playfield would result in a slight, but unnoticeable, increase in noise level.

Alternative B

Approximately 0.5 acre within Des Moines Creek Park would be required for additional right-of-way to accommodate two proposed bridges over Des Moines Creek. Because the bridges would cross over the streamside trail, the trail would continue to be used; however, the visual and noise impacts of the roadway above the trail would further impair the natural, secluded character of the park, which is already substantially affected by aircraft noise. The planned northern extension of the trail would not be affected.

Alternative C2

SR 509 would cross the northeast corner of Des Moines Creek Park, requiring acquisition of approximately 2.9 acres of the park. The alignment would be elevated through the park and would skirt the Des Moines Creek Park trailhead and associated parking area, but would not necessarily displace it. The roadway would separate a small 2.8-acre triangular area to the north from the remaining 90 acres of the park to the south. Except for the trailhead parking area, this separated northern area is currently not used for recreation (roughly one-half is wetland) and is not planned for future recreational development. The rest of the park would remain unaffected and contiguous. The elevated roadway structure would be a dominating visual feature in the north portion of the park and associated trail, and would cause a visual impact for park and trail users. Noise levels would be noticeably higher from additional traffic, despite the existing high noise levels from aircraft. Noise impacts would only be in the localized area at the northeast section of the park, and would be somewhat diminished due to the elevation of the structure. This acquisition of parkland would not preclude the use of Des Moines Creek Trail, although it could indirectly affect the character of the trail (and park) with visual and noise impacts.

Alternative C3

Alternative C3 would clip the northeast corner of Des Moines Creek Park, requiring acquisition of approximately 3.9 acres of the park. The roadway structure would cover roughly 75 percent of the existing trailhead parking area. Similar to Alternative C2, however, the structure would be well above the parking area, allowing for continued use after construction. As with Alternative C2, the rest of the park would remain unaffected and contiguous. This impact would not preclude the use of Des Moines Creek Trail, although it would indirectly affect the character of the trail (and park) with visual and noise impacts.

Services and Utilities

Alternative A (No Action)

No impacts on services or utilities would occur under the No Action Alternative, although continued and increasing traffic congestion on project area streets would eventually impede the progress of emergency service vehicles and make access to area facilities and services slower.

Impacts Common to All Build Alternatives

As described below, each of the build alternatives would have similar impacts on services and utilities. Existing underground utilities within the project area limits would be field located and surveyed to develop a base map that shows the location of underground utilities. This base map would be checked and verified by the utility companies and used to identify conflicts between proposed improvements and existing utilities.

Schools

The project's primary impact on schools would be the disruption of access for students living within a school's attendance boundaries. Impacts would be most severe on children who live within the school district's "walk boundary," because those who live on the far side of the proposed roadway might be forced to make long detours to cross it. Neighborhoods where such impacts could occur include Homestead Park and Mansion Hill, where students walking to Madrona Elementary School would likely face more circuitous routes to school and additional traffic. Access to the Christian Faith Center School for those who walk or drive would also be more circuitous. Conversely, better traffic flow after construction would allow school buses to reach their destinations more quickly.

Religious Institutions

All of the build alternatives would partially acquire property from the Puget Sound Church of God Holiness. This would require the removal of buildings immediately adjacent to the proposed right-of-way, displacing the church.

Medical Services

The build alternatives would not have an adverse impact on area medical services and would, overall, improve access to major regional medical facilities.

Fire and Police Protection

Emergency access to project area properties could be disrupted because of the severing of through streets. Delays in emergency response time could result

from the need to detour to the nearest roadway crossing, and then double back through neighborhood streets to the scene of the emergency. Homes in the south area of Homestead Park would likely be most affected—emergency vehicles would no longer be able to access these homes using South 208th Street. Completion of the 28th/24th Avenue South Arterial Project would alleviate this problem. The Federal Detention Center would be unaffected.

Cemeteries

No impacts on cemeteries would occur under any of the build alternatives.

Governmental Institutions and Services

The build alternatives are not expected to seriously impair access to, or use of, governmental institutions or services in the project area.

Water and Sanitary Services

The build alternatives could parallel or cross several water mains and sewer trunk lines. Relocation of these lines could be required in crossing areas and in areas where the lines would lie within excavated portions of the right-of-way.

Electrical Power

Under the build alternatives, the proposed project would cross overhead or underground wires in several areas. Crossings would occur underground at two locations: where I-5 intersects with South 272nd Street, and farther south at the I-5/Military Road intersection near Star Lake Road. These electrical lines would have to be relocated as a result of the I-5 improvements (Yurovchak pers. comm. 2001). The remaining crossings would all be overhead and might require relocation if the support poles were displaced because of the proposed project.

Natural Gas

The build alternatives would parallel or cross up to five high-pressure natural gas trunk lines.

Other Utilities

The build alternatives would not be expected to impact the Olympic pipeline or Northwest Fuel Farm.

Other

Minor short-term impacts on telecommunication lines, including cable television and telephone, might occur because of improvements to I-5 in the

project area and construction of the SR 509 freeway extension. In addition, solid waste collection and disposal companies might experience temporary traffic congestion associated with construction; however, these short-term impacts would occur only during construction.

Pedestrian and Bicyclist Facilities

Alternative A (No Action)

There would be no impacts on pedestrian or bicyclist facilities.

Impacts Common to All Build Alternatives

Although the proposed project would to some extent affect King County's plans for nonmotorized transportation facilities in the area, the project design can generally accommodate the widened shoulders and additional lanes or sidewalks called for in the Nonmotorized Transportation Plan in the *King County Comprehensive Plan* (King County 2000).

3.10.4 Mitigation Measures

Community Cohesion

The effects of a limited-access roadway on community cohesion are difficult to mitigate. If either Alternative B or C2 is selected, WSDOT is committed to constructing a new access connection between South 208th and South 204th Streets to preserve access to remaining apartment complexes in the Madrona neighborhood. In addition, WSDOT will investigate the possibility of providing revised access to the three homes near the intersection of South 211th Street and 32nd Avenue South that would lose access as Alternative C2 is currently designed or the residents will be provided with full relocation services. WSDOT will continue to refine the selected alternatives to further minimize impacts to neighborhoods. Other measures that WSDOT could consider include:

- Investigate the feasibility and benefits of maintaining through access on key neighborhood streets (even if not arterials) by means of additional overcrossings or undercrossings.

- Investigate the feasibility and benefits of installing pedestrian access across the roadway to provide connection between portions of bisected neighborhoods.

- Work with school districts and other community service providers to solve access problems caused by cutoff streets.

Regional and Community Growth

Because the regional and community growth facilitated by the proposed project would be consistent with local and areawide plans and policies, no mitigation is proposed.

Recreation

Alternative B

WSDOT is committed to replacing any lost parkland acreage with an equal amount of acreage adjacent to the park's boundary and of reasonably equivalent or greater recreational utility. The exact location of the replacement acreage would be determined through a coordinated land swap between WSDOT and the Cities of SeaTac and Des Moines. Mitigation for noise and visual impacts are addressed in Section 3.2, *Noise*, and Section 3.14, *Visual Quality*, of this document.

Alternatives C2 and C3

WSDOT is committed to replacing any lost parkland acreage with an equal amount of acreage adjacent to the park's boundary and of reasonably equivalent or greater recreational utility. The exact location of the replacement acreage would be determined through a coordinated land swap between WSDOT and the City of SeaTac.

To mitigate the potential impacts of Alternatives C2 and C3 on Des Moines Creek Park, an extension of the existing Des Moines Creek Trail from its current terminus northward to North SeaTac Park is being investigated. A preferred alternative for the trail was identified in *White Paper: North Extension of Des Moines Creek Trail* (CH2M HILL July 2000). The trail would extend along the south side of South 200th Street to 18th Avenue South. The trail would then turn to the north with at-grade signalized crossings of South 200th Street and 18th Avenue South at the South 200th Street/18th Avenue South intersection. The trail would continue northward along the western edge of the proposed SR 509 fill slopes. The trail would terminate at South 188th Street with future segments with linkages to the regional trail network to be completed by others. This trail design was recommended for incorporation into the design of Alternative C2; the white paper also acknowledged that the design could be incorporated into Alternative C3.

Services and Utilities

Schools

Mitigation for impacts on neighborhood access to schools could include the following measures:

- Extend school bus routes to include children whose school access would be disrupted.

- Provide pedestrian-safety features (sidewalks, crossing lights, crossing guards) along walking routes from affected areas to neighborhood schools.

Medical Services

No mitigation would be necessary for medical service facilities.

Fire and Police Protection

WSDOT would coordinate with area police departments and fire districts on the location of freeway crossings to develop access plans for emergency services in areas where street access would be changed by the proposed project. Care would be taken to ensure that water lines on cut-off streets would be of adequate size to meet fire flow standards. If street cutoffs were to result in excessively circuitous neighborhood access routes that could substantially hinder the progress of emergency vehicles, WSDOT would investigate possibilities for providing alternate access by extending existing streets (such as cul-de-sacs) into the affected neighborhoods.

Cemeteries

No mitigation is necessary.

Governmental Institutions and Services

No mitigation is necessary.

Water and Sewer Services

No mitigation is necessary.

Electrical Power

No mitigation is necessary.

Natural Gas

No mitigation is necessary.

Pedestrians and Bicyclists

Pedestrian and bicycle facilities along the local streets would be redirected to the nearest arterial that would cross the proposed improvements.

Other Utilities

No mitigation is necessary.

3.10.5 Construction Activity Impacts and Mitigation

Construction Activity Impacts

Construction-related impacts of the build alternatives on neighborhoods would include additional traffic on neighborhood streets, detours, congestion, increased dust and exhaust from construction vehicles, and increased noise levels in the vicinity of construction sites. Details of these impacts and the mitigation proposed for them are contained in the Transportation Discipline Report, *SR 509/South Access Road EIS Discipline Report: Air Quality* (WSDOT 1999), and *SR 509/South Access Road EIS Discipline Report: Noise* (CH2M HILL July 2001).

Under Alternative B, the Des Moines Creek Trail would likely need to be closed for safety measures during construction of the bridges over Des Moines Creek Park. Under Alternatives C2 and C3, the trailhead parking area and the northern end of the trail would likely need to be closed for safety reasons during construction of the elevated roadway structure in the park. In all cases, WSDOT would work closely with the City of SeaTac to minimize disruption to these facilities and, when unavoidable, work with the City to implement alternative routes/detours.

School bus routes using I-5 and local streets might be somewhat delayed during construction.

Mitigation Measures

Mitigation measures for construction-related transportation, air quality, visual quality, and noise impacts are discussed in the applicable SR 509/South Access Road EIS discipline reports and in previous sections of this document.

WSDOT would coordinate with project area water and sewer districts on potential relocations of mains, trunk lines, and other facilities. Service disruption impacts would be minimized through early warning notifications to customers regarding scheduled outages.

WSDOT would work with PSE to avoid or minimize disruption of the local power and gas supply. Crossings of transmission and distribution lines could be mitigated as follows:

- Wood, power transmission and distribution poles could be replaced, as necessary, with tall steel poles to provide adequate roadway and flyover ramp clearance.

- WSDOT could coordinate with Puget Power to locate new transmission and distribution poles and to ensure that required transmission and distribution line relocations would not result in service interruptions.

- Crossings of high-pressure gas pipelines would meet PSE's standards for protection of its pipelines. During final design of the selected alternative, WSDOT would submit plans of the crossings to PSE for review and approval prior to construction.

3.10.6 Compliance with Executive Order 12898 and FHWA Order 6640.23 on Environmental Justice

The build alternatives were evaluated for compliance with Presidential Executive Order (EO) 12898 and FHWA Order 6640.23. These orders establish that it is federal policy to avoid, to the extent practicable, disproportionately high and adverse human health or environmental impacts on minority or low-income populations. For purposes of this analysis, NEPA significant adverse impacts are considered synonymous with high and adverse impacts as described in EO 12898 and FHWA Order 6640.23. As reported in the series of discipline reports prepared for the project and confirmed through further discussions with the report authors, no significant adverse impacts are expected as a result of this project after proposed mitigation measures are implemented. Consequently, no project impacts can be described as high and adverse in the context of EO 12898 or FHWA Order 6640.23. Because no high and adverse impacts are expected to result from this project, this analysis concludes that no high and adverse human health or environmental effects are expected to fall disproportionately on minority or low-income populations. Therefore, the Proposed Project can be considered to be consistent with the policy established in EO 12898 and FHWA Order 6640.23.

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3.11 Economics

3.11 Economics

3.11.1 Studies and Coordination

This section is based on the findings of the *SR 509/South Access Road EIS Discipline Report: Economics* (CH2M HILL June 2001), *SR 509/South Access Road EIS: South Airport Link* (October 2001), and *SR 509/South Access Road EIS: I-5 Improvements Report* (CH2M HILL October 2001). The project area primarily includes portions of three jurisdictions: SeaTac, Des Moines, and Kent. Information on overall economic activity in the project area was gathered from the Southwest King County Chamber of Commerce, the Greater Des Moines Chamber of Commerce, and the Puget Sound Regional Council.

Information on displaced businesses and property impacted by right-of-way acquisition was obtained from the *SR 509/South Access Road EIS Discipline Report: Land Use* (CH2M HILL October 2000) and *SR 509/South Access Road EIS Discipline Report: Relocation* (CH2M HILL August 2000). Information on the existing commercial real estate market in the project area was obtained from telephone interviews with two local commercial real estate brokers.

Data on population and employment in the project area was obtained from the *SR 509/South Access Road EIS Discipline Report: Transportation* (CH2M HILL January 2002). Information on taxable retail sales and sales tax rates was obtained from the Washington State Department of Revenue. Information on total assessed value, by jurisdiction, and parcel-specific assessed values and property tax levy rates were obtained from the King County Department of Assessments. Information on annual revenues for affected cities was obtained from annual budget reports from the Cities of SeaTac, Des Moines, and Kent.

3.11.2 Affected Environment

Overall Economic Activity

The project area supports 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.

Table 3.11-1 presents the population and number of households in the project area. In 2000, the City of Kent had a population of approximately 79,524,

and the Cities of Des Moines and SeaTac had populations of 29,267 and 25,496, respectively. The total number of households within the three cities is approximately 52,158.

Table 3.11-1
Population and Households in Project Area

Jurisdiction	Population	Households
Des Moines	29,267	11,337
SeaTac	25,496	9,708
Kent	79,524	31,113
Total	**134,287**	**52,158**

Source: 2000 U.S. Census

Table 3.11-2 shows the employment levels in the overall project area in 1990, as well as future employment levels with and without the proposed project. The largest center of employment is Kent, which accounted for 33,855 jobs in 1990. However, the City of SeaTac is the only jurisdiction in the project area that is expected to experience greater employment growth by 2020 with construction of the proposed project. According to projections used in the travel demand modeling, the proposed project would increase job growth at a greater rate than the No Action Alternative. Employment levels with the proposed project are expected to grow at an annual rate of 2.4 percent from 1990 levels to 2020. By comparison, employment levels are estimated to grow at an annual rate of 1.8 percent under the No Action Alternative for the same time period.

Table 3.11-2
Future Employment in Project Area

	Employment Levels			Average Annual Growth Rate Between 1990 and 2000	
Area*	1990-91 Census	2020 with Project	2020 Alternative A (No Action)	With Project (%)	Alternative A (No Action) (%)
SeaTac	19,725	59,201	41,626	3.7	2.5
Des Moines	3,278	10,854	10,854	4.1	4.1
Kent Valley	33,855	44,209	44,209	0.9	0.9
Total	**56,858**	**114,264**	**96,689**	**2.4**	**1.8**

Source: SR 509/South Access Road Corridor EIS Phase II, Travel Demand Forecasting Procedures and Assumptions (CH2M HILL October 1993).

** Areas based on aggregation of PSRC Transportation Analysis Zones and do not match municipal boundaries.*

The primary retail businesses in the project area are located in Des Moines, Kent, and Tukwila. Industrial development in the project area is limited to scattered light-industrial and small-scale manufacturing enterprises located along major arterials, such as Des Moines Memorial Drive, South 200th Street, and South 188th Street.

Several large commercial/industrial and transportation-related projects are currently proposed within the project area, including:

- An Aviation Business Center consisting of civic, hotel, conference, and aviation base facilities on a 200-acre site between SR 99 and the proposed South Access Road.

- A Port of Seattle-sponsored airline maintenance facility (SASA) on a 100-acre site south of South 192nd Street and north of South 200th Street.

- A multimodal Light Rail Transit station (South King County Terminus) just north of South 200th Street in the 28th Avenue South corridor. An associated parking lot for 500 to 900 cars is also planned. Construction is currently anticipated for 2004 to 2006.

- A 15-acre sports park identified by the City of Des Moines as a Priority One project. Priority One projects are considered to be of pressing importance or are one-time opportunities that meet an identified need of the community.

- The 28th/24th Avenue South arterial project, which would modify the alignments of 28th/24th Avenue South to accommodate local access traffic generated as a result of the anticipated development of the Cities of SeaTac and Des Moines. The design has generally anticipated the potential development of the Aviation Business Center noted above. (Portions of this proposed project are currently under construction or recently completed.)

- A third runway on the west side of the Sea-Tac Airport. The final EIS was completed in February 1996.

- A 99-room hotel at the northwest corner of South 200th and 28th Avenue South. A SEPA review is being conducted by the City of SeaTac.

Residential and commercial/industrial growth within the project area is expected to continue. For example, the King County Growth Management Planning Council (GMPC) has designated the Cities of SeaTac and Kent as 2 of the 14 “urban centers” targeted to absorb much of the residential and employment growth within King County over the next 20 years (King County 1994).

City Revenue Sources

As shown in Table 3.11-3, the Cities of SeaTac, Des Moines, and Kent receive the majority of their revenues from property and retail sales and use taxes.

Table 3.11-3
1999 Tax Revenues by Type

Type of Tax	City of SeaTac	City of Des Moines	City of Kent
Property	$7,589,148	$2,127,201	$16,981,356
Retail Sales and Use	$7,415,194	$1,382,330	$14,172,845
Parking	$4,230,468	NA	NA
Utility Business	NA	$1,478,559	$6,645,603
Gambling	$232,901	$23,037	$422,956
Other	$1,926,771	$1,041,512	$21,191
Total	**$21,394,482**	**$6,052,639**	**$38,243,951**

Source: City of Des Moines Finance Department, City of Kent Finance Department, City of SeaTac Finance Department.

NA = not applicable

3.11.3 Environmental Impacts

Alternative A (No Action)

Under the No Action Alternative, no businesses or residences would be displaced by right-of-way acquisition for the proposed project, and there would be no resulting job losses or decreases in property or sales tax revenue. Traffic congestion on I-5, other north/south arterials, and some east/west arterials would likely continue to worsen under the No Action Alternative, despite numerous roadway improvements. This would further impair the movement of goods and people within the Cities of SeaTac and Des Moines and to Sea-Tac Airport and the seaport. Increased congestion would also dampen the potential economic growth in the communities in the project area. Population and employment are expected to grow more slowly in the City of SeaTac under the No Action Alternative.

Impacts Common to All Build Alternatives

During operation of the proposed project, the movement of goods and people from I-5 to Sea-Tac Airport and other locations along the SR 509 corridor would be improved under all of the build alternatives. Commercial vehicles and individual passengers traveling to and from Sea-Tac Airport would experience travel time savings due to the improved roadway. The movement

of commercial freight would be enhanced along the SR 509 and I-5 corridors. According to the *Freight Mobility Study: SR 509/South Access Road Project* (CH2M HILL December 1998), completion of the proposed project would result in improved reliability of goods movement, decreased travel times for several routes along the Seattle to Tacoma corridor, and improved access to a large amount of industrially zoned land near Sea-Tac Airport. The proposed project would likely encourage development of vacant land or redevelopment of existing properties.

The City of SeaTac is expected to receive greater employment growth with construction of the proposed project. As shown in Table 3.11-2, approximately 59,200 jobs are projected to be located within the City of SeaTac by 2020 under the build alternatives versus a projection of 41,600 jobs under the No Action Alternative. The difference in employment levels can be attributed to the City of SeaTac's policies to control development in its proposed activity center until access to the area is improved (see CH2M HILL January 2002, Appendix B, Travel Forecasting Methodology).

The level of congestion on north/south arterial corridors within the project area, including SR 99 (International Boulevard) and Des Moines Memorial Drive, would decrease as trips currently made on surface streets divert onto SR 509 and the South Access Road. Overall mobility along these arterials would be improved, resulting in better access to businesses. Traffic volumes on east-west streets might increase or decrease, depending on the location of new interchanges proposed under the build alternatives. It is expected that traffic flow along South 188th Street would improve with the completion of the proposed project. Overall, access, mobility, and operating conditions would improve with construction of the proposed project.

Business Displacement

Right-of-way acquisition for the three build alternatives would displace between 12 and 24 businesses. Alternative B is expected to displace between 19 and 24 businesses, 13 of which are located in the Homestead Park neighborhood in the City of SeaTac. Alternative C2 would displace between 16 and 20 businesses, with 10 businesses also located in Homestead Park. Alternative C3 would displace between 12 and 17 businesses, including approximately 3 to 4 business in the Homestead Park area. All of the build alternatives would displace 2 businesses in the Midway neighborhood in Kent and between 0 to 4 businesses in the SeaTac city center.

Depending on the design option selected, the construction of the South Airport Link would be expected to displace between 0 and 4 businesses in the SeaTac city center. The I-5 improvements would displace 2 to 3 businesses.

Businesses in the project area are generally engaged in airport operations, tourism, retail, restaurant, and services that cater to neighborhood residents

and the surrounding communities, as well as Sea-Tac Airport. Business displacements might reduce the sales tax revenue collected by the affected jurisdictions, depending on where, when, or whether the impacted businesses relocate. Similarly, the employment represented by those displaced businesses would also be affected.

While recognizing that supply-demand relationships change frequently, two commercial real estate brokers familiar with the real estate market in the SeaTac and Des Moines area indicated that the supply of available retail and office space within the project area is limited (Stoll pers. comm. 1999; Corr pers. comm. 1999). They suggested that businesses in the cities of SeaTac and Des Moines that would be displaced under any of the build alternatives might find it difficult to relocate within the project area. According to one broker, the low supply is partly because there is little demand in the area for commercial strip locations. The most desirable locations for commercial retail space appear to be shopping centers, such as the Midway Crossing shopping center at the junction of SR 99 and SR 516 (Corr pers. comm. 1999).

Overall, the market in the Cities of SeaTac and Des Moines is tight for the types of commercial space occupied by the businesses that would potentially be displaced. SeaTac and Des Moines could experience the most business displacements under all the build alternatives, losing between 10 and 22 businesses within the project area. This suggests that businesses displaced within the Cities of SeaTac and Des Moines might find it difficult to relocate within the project area.

Sales and Property Tax Revenue

Impacts on sales tax revenues are difficult to predict and would depend on where businesses affected by the proposed project relocate. Relocating outside of the project area jurisdiction would result in decreased sales tax revenues for that jurisdiction.

Approximately 95 to 180 acres of additional right-of-way would be required to accommodate the various build alternatives. All of the build alternatives would use some portion of the existing state-owned and tax-exempt right-of-way located between South 188th Street and SR 516. The remaining right-of-way would be acquired from taxable property within the jurisdictions affected by the proposed project. The taxable property acquired would be removed from the cities' tax rolls, adversely impacting property tax revenues.

For the purpose of determining potential initial property tax impacts, taxable property within the proposed right-of-way of each build alternative was assigned to one of the six following land use categories: commercial, industrial, public/government use, residential-high density, residential-low density, and religious institutions. A database containing all the properties

affected by the build alternatives was prepared using maps and tax information for affected parcels from the King County Department of Assessments (King County 2000). This information was used to assign developed properties to one of these categories based on existing land use. Vacant land was assigned to a land use category based on the zoning for the property as indicated in the database.

The figures were calculated for each build alternative by grouping taxable properties to show the initial property tax impact for each jurisdiction by build alternative. The total property tax impact includes the initial property tax impact for full displacements and for partial encroachments. The tax impact for the partial encroachments was calculated by multiplying the estimated 2000 property tax collected for the parcel by an estimate of the percentage of the parcel taken for the proposed project.

For all build alternatives, the initial property tax impact is not expected to be substantial. The fiscal impacts associated with the initial loss of property tax revenues represents less than 1 percent of each jurisdiction's total tax revenues. The impacts on sales tax revenues are also not likely to be substantial.

The initial tax impacts associated with displacements would likely be offset eventually by tax revenues associated with increased development of vacant land and redevelopment of existing buildings throughout the project area. There is a large amount of vacant industrial land near the Sea-Tac Airport that would be more accessible with construction of the proposed project, which could lead to new development. Some commercial development such as office buildings, retail complexes, restaurants, and hotels would also likely occur on land adjacent to new or improved interchanges. This would definitely be the case if the employment projections for the City of SeaTac prove to be accurate.

3.11.4 Mitigation Measures

There are no economic impacts associated with any of the build alternatives that would require mitigation.

3.11.5 Construction Activity Impacts and Mitigation

Construction Activity Impacts

The estimated cost of constructing the SR 509: Corridor Completion/I-5/ South Access Road project for each alternative is presented in Table 3.11-4.

Table 3.11-4 Estimated Project Costs for the Build Alternatives	
Alternative	**2001 Dollars**
Alternative B	$715 million
Alternative C2 (Preliminary Preferred)	$690 million
Alternative C3	$695 million

Source: CH2M HILL estimates.

These costs do not include the South Airport Link, the last 1,000 feet connecting the South Access Road to airport roadways.

These estimates are based on preliminary design information and may be revised during the final design and construction phase of the project.

Depending on the alternative selected, construction of the build alternative would result in a $690 to $715 million project and the associated positive impacts on employment and overall economic activity in the project area. As shown in Table 3.11-5, it is estimated that 4,534 to 4,698 person-years of employment would be needed for the build alternatives, which translates into an average of 648 to 671 construction jobs over the 7-year construction period.

Table 3.11-5 Estimated Employment Impacts by Alternative		
Alternative	**Person-years of Employment**	**Average Annual Construction Jobs**
Alternative B	4,698	671
Alternative C2 (Preliminary Preferred)	4,534	648
Alternative C3	4,567	652

Source: CH2M HILL estimates.

Project construction would also result in so-called multiplier effects. Indirect impacts would occur as construction firms purchase materials from local suppliers who in turn, employ workers and purchase materials. Induced impacts would occur when wages paid to workers in construction trades or supporting industries are spent on locally produced goods and services.

The magnitude of the indirect and induced impacts within the project area would depend on many factors, including:

- Where construction workers live and spend their income

- Where equipment and material needed for construction would be purchased

- The extent to which the proposed project is funded by out-of-region sources

When local funds are used, residents and businesses have that much less income to spend on other goods and services in the regional economy, thus representing a shift in the local economy's product mix rather than net new economic activity. At the state level, project construction would result in economic benefits to the extent that federal funding is received.

Impacts on businesses during construction might include temporarily increased congestion, noise, dust, and possibly interrupted or more difficult access. Temporary reduction in retail sales might result as customers avoid shopping in the construction area. Any temporary loss in sales tax revenue resulting from impacts on businesses during construction would be partially offset by sales tax revenues generated by construction spending in the region.

Mitigation Measures

Measures to mitigate identified economic impacts resulting from construction could include the following:

- Installing temporary signage to inform drivers that access to businesses during construction is unchanged, temporarily changed, or restricted.

- Requiring contractors to submit and receive approval of a construction plan to maintain access for all properties and businesses adjacent to construction activity.

- Coordinating with affected business owners to develop and implement strategies to maintain access to businesses during construction.

- Informing businesses or tenants displaced by new right-of-way acquisition or other construction activities that they would be entitled to relocation assistance in accordance with the Uniform Relocation Assistance and Real Property Acquisition Act of 1970, as amended by RCW 8.26.

SEA/3-11 econ-1.doc/020220031

3.12 Historic and Archaeological Resources

3.12 Historic and Archaeological Resources

3.12.1 Studies and Coordination

This discussion is based on the following reports:

- *SR 509/South Access Road EIS Discipline Report: Historical and Archaeological Preservation* (CH2M HILL January 2000).
- *SR 509/South Access Road EIS Discipline Report: South Airport Link* (CH2M HILL August 2001)
- *Technical Memorandum: SR 509/South Access Road Alternative C2 Minimized* (CH2M HILL September 2001)
- *SR 509/South Access Road EIS: I-5 Improvements Report* (CH2M HILL October 2001)

Site files of the Washington State Office of Archaeology and Historic Preservation (OAHP) and the King County Cultural Resources Division were examined to check for any historic or prehistoric sites previously found within the project area. For the purpose of this analysis, the project area has been defined as the cities of SeaTac, Des Moines, Kent, and Federal Way and unincorporated King County in the immediate vicinity of the proposed SR 509 extension and South Access Road and along the I-5 corridor between the proposal SR 509 interchange and South 310th Street. These jurisdictions were contacted for information about known cultural resources. The Des Moines Historical Society was also contacted for information.

Cultural resource survey and excavation reports pertinent to the project area were examined at OAHP to gain an understanding of the types and density of cultural resources that could be present. The National Register of Historic Places (NRHP) and the Washington State Register of Historic Places (WSRHP) were checked to see if any listed properties were within the proposed alignment of the three build alternatives.

During preparation of the *Final Environmental Impact Statement, Proposed Master Plan Update Development Action at Seattle-Tacoma International Airport* (Port of Seattle and FAA 1996), useful documentation of cultural resources in the project area was compiled. The Airport Master Plan and the proposed project share large areas of overlap. Efforts to identify potentially historic buildings in the project area focused on examination of properties not otherwise reviewed by Shapiro & Associates for the Airport Master Plan.

Tribal consultations occurred to secure information about traditional use areas and/or culturally sensitive locations within or adjacent to the project area that should be avoided.

Following the completion of the literature review and records search, a reconnaissance was conducted of the three build alternative alignments. The reconnaissance involved driving through the Areas of Potential Effect (APE) of each project alternative to identify and then record previously unrecorded historic properties. The APE is the anticipated ground-disturbing footprint of construction, lay down areas, and one-property deep. A separate reconnaissance survey to identify archaeological sites was also conducted.

Because systematic cultural resource surveys for the APE had not been previously conducted, all buildings located within the APE that appeared to be potentially eligible for inclusion in the NRHP were recorded. Recording each property of potential historical or architectural significance entailed photographing each building and preparing an OAHP Historic Inventory Property Form. Within the APE, seven individual properties of potential historical or architectural significance were identified. The inventory forms for these properties were included in the Historical and Archaeological Preservation Discipline Report (CH2M HILL January 2000).

The archaeological reconnaissance survey attempted to examine all open, easily accessible areas within the APE. Unfortunately, much of the project area could not be systematically examined because the area has been dramatically altered by urban development (roads/buildings/structures) or obscured by dense, impenetrable vegetation (Des Moines Creek Park, neighborhoods "cleared" of homes by the Port of Seattle Noise Remedy Program, now overgrown with vegetation). Geotechnical borings and test pits associated with preconstruction activities were archaeologically monitored at locations near the intersection of the existing SR 509 terminus at Des Moines Memorial Drive South. No noteworthy cultural deposits were observed in the 4 borings and 12 backhoe test pits (Luttrell 2001).

3.12.2 Affected Environment

Background Cultural Resource Information

Prehistory

The project area is located within the Southern Puget Sound archaeological study area (Wessen 1985). This study area encompasses all of King County and most of northwestern Washington. Over 325 cultural resource surveys have been conducted within this study area, with most efforts focused in King and Pierce counties. Over 300 prehistoric sites have been recorded that include shell middens, lithic scatters (the remains of chipped stone tools and tool manufacturing debris), and wet sites (sites in water-saturated areas).

Indian burials have been found in association with 14 of the shell middens. Archaeological sites within the Southern Puget Sound area date between 11,000 and 250 years B.P. (before present) (Wesson 1985, Thompson and Stilson 1988). Two dugout cedar canoes were found in the project area at Angle Lake (sites 45-KI-422 and -423). See the Historical and Archaeological Preservation Discipline Report (CH2M HILL January 2000) for a more in-depth discussion.

Ethnography

During the ethnographic period, there were two Coast Salish groups that may have used the natural resources within the project area. The Muckleshoot Bands occupied the White River Valley to the west of Des Moines; the Duwamish Bands occupied the central Puget Sound near Seattle (Spier 1936).

Coast Salish cultures were maritime adapted, exploiting both terrestrial and aquatic mammalian resources, as well as harvesting the abundant fish, berries, and roots that were present (Greengo 1966, Jorgenson 1969). At European contact, the project area was occupied by the Duwamish Indian Tribe and several major Duwamish villages were located along the Green River and along the shoreline of Puget Sound (Campbell 1981, Thompson and Stilson 1988). Known campsites of the *St-ka-mish* (Green River) and the *Skopahmish* (White River) Indians were located just south of the project area (King County Site Files, No. 0064).

According to Kennedy (1989), there is ample evidence of Duwamish and Muckleshoot travel through the Des Moines area. The tribes liked to come over the hills, following the streambeds, to catch spawning salmon and dig for clams. Shell mounds have been found on the beaches and near the mouths of Des Moines, Massey, and McSorley Creeks. An Indian grave was uncovered while sluicing down the bank on the northwest side of the Van Gasken-Pedersen property to fill in Des Moines Creek for a millpond.

The project area also abounds with Indian stories and legends. One of the earliest stories infers that this area was once an island, as told by Tom Milroy (an upper-Puyallup Indian informant) to anthropologists Thomas T. Waterman and Arthur Ballard (Kennedy 1989).

Several Indian place names are located in the general project vicinity (Waterman ca. 1920). These include Three Tree Point (*S-he-lahb*) [“loading things into a canoe”]; *Qah-weils* [“glistening white”]—a white rock now under the east side of the parking lot of Anthony’s HomePort Restaurant east of the Des Moines marina float B; *Ko-KWOI-lt-sah* [“Blanket Rock”]—located at Redondo; *Tsike’ib* [“swift, cold stream” located just north of Des Moines (Des Moines Creek); D.Lkok [one of the forks of Des Moines Creek]; *Ba’xkwab* [“prairie”—an open space in the timber], now the present

site of downtown Des Moines; *Tca'gKqks* ["the first one in"—Massey Creek]; and *Tca'xgwEs* [McSorley Creek].

Historical Background

While navigating down the east side of Vashon Island in 1792, British naval Captain George Vancouver observed smoke hanging over the forest where local Indians had set fire to the underbrush to drive out their quarry deer (Kennedy 1989). Following Vancouver's initial visit, Puget Sound remained untraveled by Europeans for 32 years. On November 28, 1824, James McMillan embarked with a party of 40 to locate a site for a new Hudson's Bay Company post on Puget Sound. During their return trip, McMillan's party was driven ashore at Three Tree Point, just north of present day Des Moines (Kennedy 1989).

In 1833, Hudson's Bay Company constructed Fort Nisqually to secure fur-trading holdings in the area, and a few years later, a fur trading post was built just south of the proposed project (Nikulla 1977). Hudson's Bay Company constructed this secondary post because the Indians in the area were friendly and using the area as a campground and because there were trails to the site through the dense, otherwise impenetrable forest (Nikulla 1977). The spot was also close to the Sound and allowed for easy transportation of goods and furs.

This secondary post was abandoned in 1846 when the 49th parallel was designated as the U.S./Canadian boundary and, in 1869, the U.S. paid Hudson's Bay Company for its rights and claims. In the early 1880s, Jacob Reith settled on the abandoned Hudson's Bay post through a 640-acre timber claim (Nikulla 1977). A recent cultural resource survey of the original Indian campground, Reith homesite, and the Hudson's Bay post site indicates no remains are currently observable (Larson and Lewarch [ed.] 1994).

In the mid-1850s, the state militia erected a blockhouse in the vicinity to protect white settlers during the Indian uprisings. Its exact location is uncertain but is believed to have been either south of Three Tree Point and north of Massey Creek or at the present Masonic Home site in Zenith (Kennedy 1989).

The Puyallup to Duwamish segment of the historic Military Road, which passes along the eastern edge of the project area, was constructed in 1858 but was in many places a rough trail, winding around stumps and unfit for wagons.

Des Moines' first settler, John Moore, acquired a 154-acre land claim from the government in July 1872 under the provisions of the Homestead Act (Bagley 1929). Due to unpaid taxes, Moore's land was sold to John Murray in 1881 and, in turn, Murray sold it to F.O. Chezum in 1886 for $600

(Kennedy 1989). F.A. Blasher, who arrived in 1888 from Iowa, convinced other Midwesterners to follow him to the area (Warren 1981). Active development of a townsite began in 1889 when J.W. Kleeb, O.W. Barlow, and Blasher organized the Des Moines Improvement Company. They laid out a townsite on about 120 acres of the original Moore land claim. Kleeb called the city Des Moines after his former home in Iowa (Bagley 1929).

Good stands of fir and cedar made lumbering an important industry in the early days. The first sawmill was built by the Des Moines Improvement Company in 1889 and was sold in 1900 to William Van Gasken.
Des Moines' easily accessible shoreline and deep harbor facilitated hauling logs to the mills. The steep hillside above Des Moines included valleys and several streams, which was ideal terrain for logging. During this period, the extensive logging of the Des Moines Creek Canyon probably occurred (Lyons 1992). Oxen were driven up the valleys to drag down the heavy timbers to the water's edge (Eyler and Yeager 1972).

Town growth was rapid, according to an 1890 advertisement in a southwestern Washington business directory, which claimed that Des Moines had some 300 houses, business blocks, a school, churches, mercantile houses, hotels, blacksmith and wagon shops, a chair factory, a boat manufactory, brick yards, and the only tin factory on the coast (Kennedy 1989). In 1890, James Markwell came to the area to start a shingle bolt business that employed about 25 men. At his mill were a bunkhouse and cookshack. Markwell also drove the pilings and built a dock out from the old Indian burial grounds, on the northwest side of the Van Gasken property. In 1918, a millpond was excavated at the Markwell mill site, exposing a Native American burial site (Kennedy 1989).

Despite considerable promotion and speculation, the area began to decline after 1891 until 1903, when property once again was avidly sought by those seeking retreat from city life in pleasant country surroundings (Warren 1981). The Southern Pacific Land Company filed a plat in late 1891, adding 40 acres south of the Town of Des Moines plat. In 1890, James Hyatt built a three-story hotel and started a store in this same building. In 1908, Herman and Annie Draper established their home for children in the former Hyatt Hotel; it was still operating as such on the eve of the Great Depression (Bagley 1929). In the early 1890s, Robert and Anna Hanke started a second hotel in the area.

The Des Moines Wharf and Improvement Company, which was organized in late 1892 by Hanke, John Flynn, and William Martin, constructed the wharf at Des Moines. Beginning in the 1880s, a succession of small steamers (known as the Mosquito Fleet) linked the area with neighboring communities on the Sound until 1919 (Warren 1981). Transportation to outside communities also was available by walking or riding to the Interurban stations at neighboring Kent or O'Brien in the White River Valley. Even

before brick-surfaced roads replaced the rutted mud or gravel roads in 1916, bus service to Seattle was inaugurated (Warren 1981).

Telephone service came to the area by 1908, provided by Pacific Telephone and Telegraph Company. Fred Russell started a water works in 1914, but as late as 1929, most property owners still drew water from their own wells. By the 1920s, electricity was supplied by Puget Sound Power & Light Company (Bagley 1929). Even as late as the 1920s, the area had no public sewer system, and citizens maintained their own septic tanks.

In 1915, changes took place in the area that had far reaching effects. Until 1915, most transportation was by water, providing residents equal access to both Seattle and Tacoma. When the first roads to the area were built, they came from Seattle. With convenient land access, the Mosquito Fleet and local ties with Tacoma declined. As a result of better roads and the automobile, the area experienced another growth spurt during and after WWI, which continued through the Great Depression because of the availability of inexpensive housing (Kennedy 1989).

Prior to the completion of the "Brick Highway" (Des Moines Memorial Drive) in 1916, much work had to be done to the existing gravel road before it could be bricked. Curves were straightened, wet spots and springs were filled in or drained, and in 1912/13, a bridge was built across Des Moines Creek (canyon). By 1922/23, the bridge had worn out, the canyon was filled in, and Des Moines Creek was channeled through culverts (Kennedy 1989).

Other important transportation links included the Kent-Des Moines Road, which was first just a trail around the turn of the century but was later improved to a winding two-lane road. In the 1920s and 1930s, (SR 99 Pacific Highway South) was built to Tacoma. Throughout the first decades of the 20th century, a car-ferry service between Vashon Island and Des Moines embarked at the dock on S. 227th Street (Kennedy 1989).

Although there were several attempts to establish small industries, the area depended primarily on its lumber and shingle mills, chicken ranches, and truck gardens. During World War II, defense plants south of Seattle attracted a sizable number of new residents.

The Boeing Company was a major factor that contributed to population growth in the area during and after World War II. But the most important event was the decision to build the Seattle-Tacoma Airport at Bow Lake; ground breaking took place on January 2, 1942 (Eyler and Yeager 1972).

As the airport grew in the post-war years, it took the homes and property of many of the pioneer families. Most of these families stayed in the vicinity but moved away from the immediate airport area. In recent years, the Port of Seattle has implemented a Noise Remedy Program, consisting chiefly of

noise insulation improvements to affected residences and businesses. In many cases, the remaining stock of pre-World War II and/or historic housing units have been subject to noise abatement window retrofits. The replacement of original windows with modern triple-pane insulated windows has compromised the original architectural integrity of these remaining houses.

Known/Recorded Historic and Archaeological Resources

Hillgrove Cemetery (King County Historic Site Survey, No. 0844), which is located at South 200th Street near 16th Avenue South, is the final resting place of numerous local pioneers (Eyler and Yeager 1972). Prior to 1900, the dead were taken to Kent or Seattle for burial. In 1900, Frederick Kindling, who lived on the south side of 200th Street east of Des Moines Way, donated a 1 acre piece of ground for a cemetery.

In the post-war years, vandalism became a major problem in the cemetery, but in the early 1970s, the Maywood Garden Club took on the cemetery as a special project and made many improvements. In 1975, local Girl and Boy Scouts of Maywood School were also working to improve the cemetery (Draper 1975).

Cemeteries are generally excluded from NRHP listing unless they derive their primary importance from graves of persons of transcendent importance, from age, from distinctive design, or from association with important historic events. The Hillgrove Cemetery does not appear to meet any of these requirements. Hillgrove Cemetery was determined ineligible for listing in the NRHP (Shapiro & Associates 1995).

Recently, a small shellmound was discovered in Marine View Park (City of Normandy Park) after a winter storm in January 1996 (Leeds 1996). This prehistoric archaeological site was designated 45-KI-446 by the OAHP and is located outside the project area.

For the *Final Environmental Impact Statement, Proposed Master Plan Update Development Action at Seattle-Tacoma International Airport* (Port of Seattle and FAA 1996), Shapiro & Associates undertook a comprehensive review of known/recorded cultural resources. The Master Plan area overlaps large portions of the project area. Shapiro & Associates conducted a literature search, an evaluation of previously inventoried properties, and a field survey. A total of 67 sites (two previously recorded and 65 newly identified) were recorded within the proposed “acquisition area.” OAHP determined that none of the 67 properties were NRHP-eligible. In the spring of 1995, the Cities of Burien, Des Moines, and Normandy Park designated a number of historic resources that had been included in the Airport Community Coalition Historic Properties Survey as locally significant; none of these resources are in the project area.

Ms. Melanie Draper (Des Moines Historical Society) provided a list of 12 historic properties in Des Moines. None of the structures are located within the project area.

Traditional Cultural Properties

Traditional cultural properties (TCPs) are one of a number of historic property types that can be eligible for listing in the NRHP. "Culture" is understood to mean the traditions, practices, lifeways, arts, crafts, and social institutions of any community, be it an Indian tribe, a local ethnic group, or people of the nation as a whole. "Traditional" refers to those beliefs, customs, and practices of a living community of people that have been passed down through the generations, usually orally or through practice. A TCP can be:

- A location associated with the traditional beliefs of a Native American group about its origins, its cultural history, or the nature of the world
- A rural community whose organization, buildings and structures, or patterns of land use reflect the cultural traditions valued by its long-term residents
- An urban neighborhood that is the traditional home of a particular cultural group and that reflect its beliefs and practices
- A location where Native American religious practitioners have historically gone, and are known or thought to go today, to perform ceremonial activities in accordance with traditional cultural rules or practice
- A location where a community has traditionally carried out its economic, artistic, or other cultural practices important in maintaining its historical identity

A TCP can be defined as one that is eligible for inclusion in the NRHP because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community (Parker and King 1990).

Recently, Larson and Lewarch (1991) reported that no studies of Duwamish traditional cultural use have been undertaken in the general project vicinity but suggest that Waterman's (1920) thesis on geographic names is a good source of information on areas with potential Duwamish religious significance. As noted previously, Waterman's (1920 and 1922) studies documented several spots on the landscape that were named by the local tribes. These "place-names" can be TCPs if they designate spots that have high cultural importance to the tribes today.

In order that TCPs are adequately considered in this analysis, several local tribes were contacted to solicit information about traditional Indian use of the project area (see *Studies and Coordination* above). Consultations with tribes has not yet resulted in the identification of TCPs in the immediate project area.

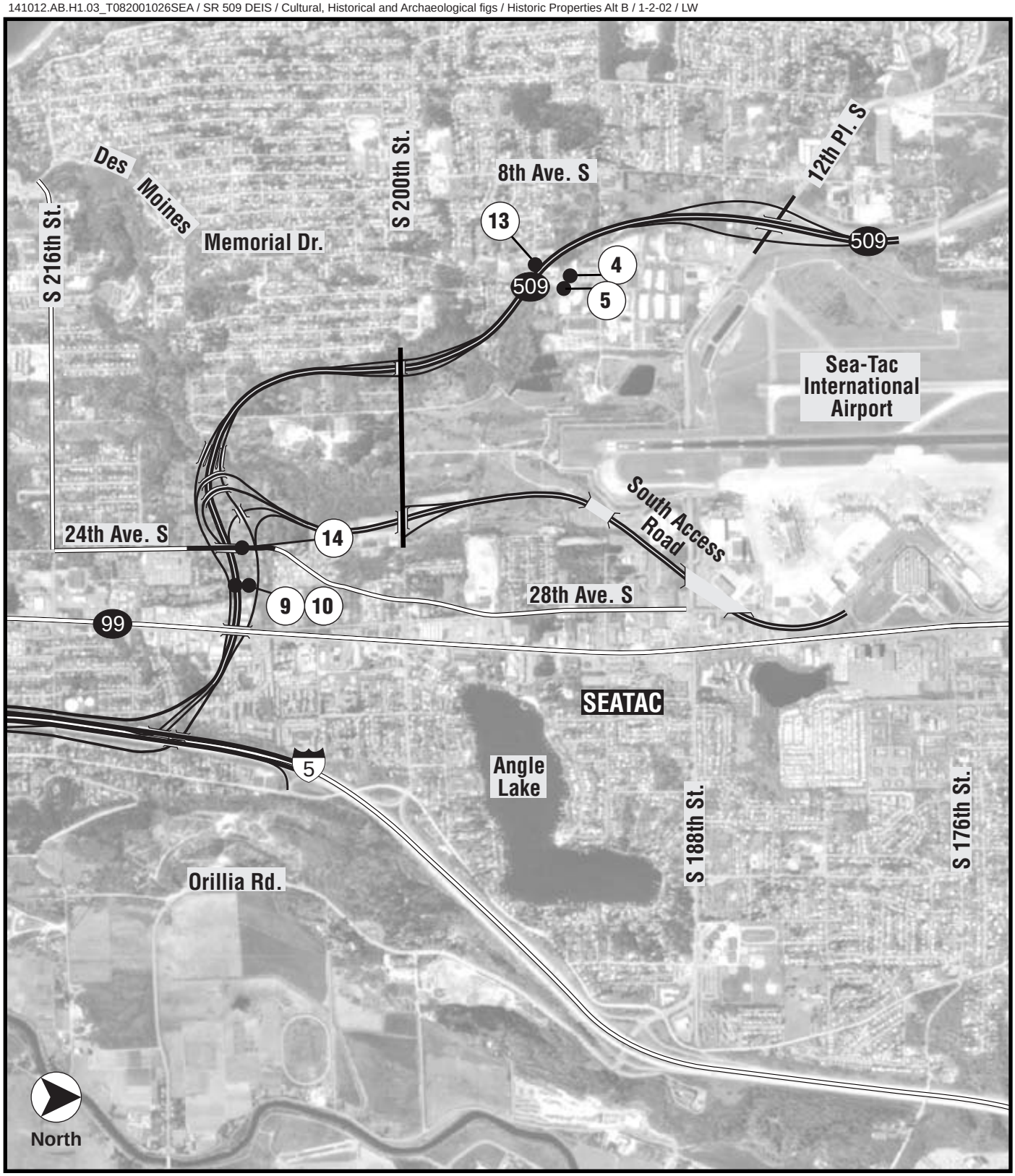
Historic Properties

The field investigation identified historic properties potentially eligible for listing on the NRHP, which is the official federal list of cultural resources worthy of preservation. Cultural resources listed in the NRHP include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archaeology, engineering, and culture. The criteria for eligibility for NRHP are defined as:

> the quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and,
>
> - that are associated with events that have made a significant contribution to the broad patterns of our history; or
> - that are associated with the lives of persons significant in our past; or
> - that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
> - that have yielded, or may be likely to yield, information important in prehistory or history.

Seven properties of potential historic or architectural significance lie within the APE (see Figures 3.12-1 through 3.12-3).

No known state or NRHP-listed or NRHP-eligible buildings or structures are located within the APE. The potentially historic or architecturally significant buildings described below are anticipated to be ineligible for listing in the NRHP because they either lack historic or architectural significance or they have lost their architectural integrity. However, the final decision regarding their eligibility rests with the OAHP. Informal consultations with Mr. Griffith of OAHP regarding the possible NRHP eligibility of these buildings have been conducted intermittently. Mr. Griffith has suggested that when FHWA



0 1/4 1/2 3/4 1 MILES

Legend

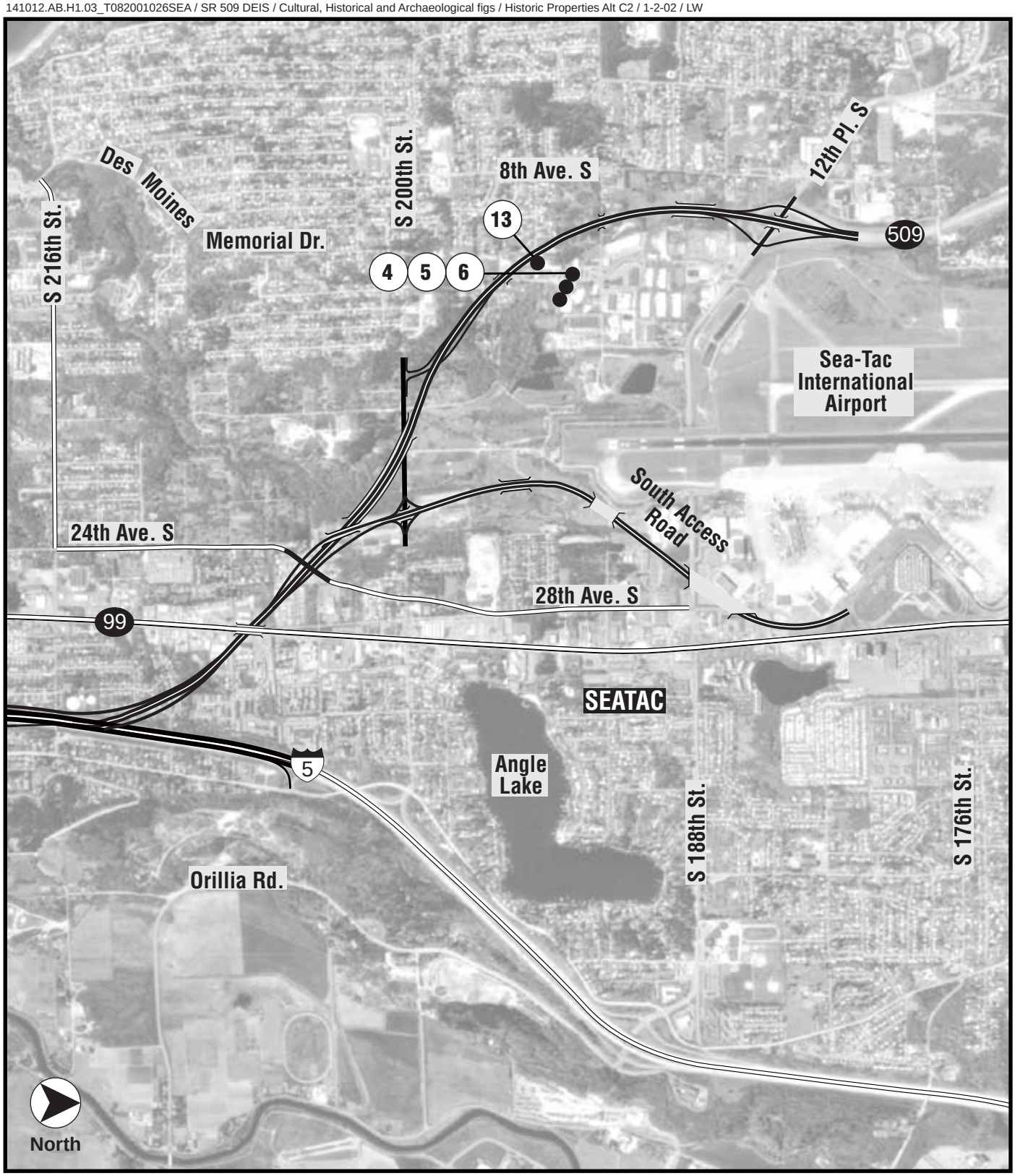
SR 509/South Access Improvements

4 Location of Historic Properties
e.g., 1829 South 222nd Street, Des Moines

FIGURE 3.12-1

Locations of Historic Properties – Alternative B

SR 509: Corridor Completion/I-5/South Access Road Environmental Impact Statement



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Legend

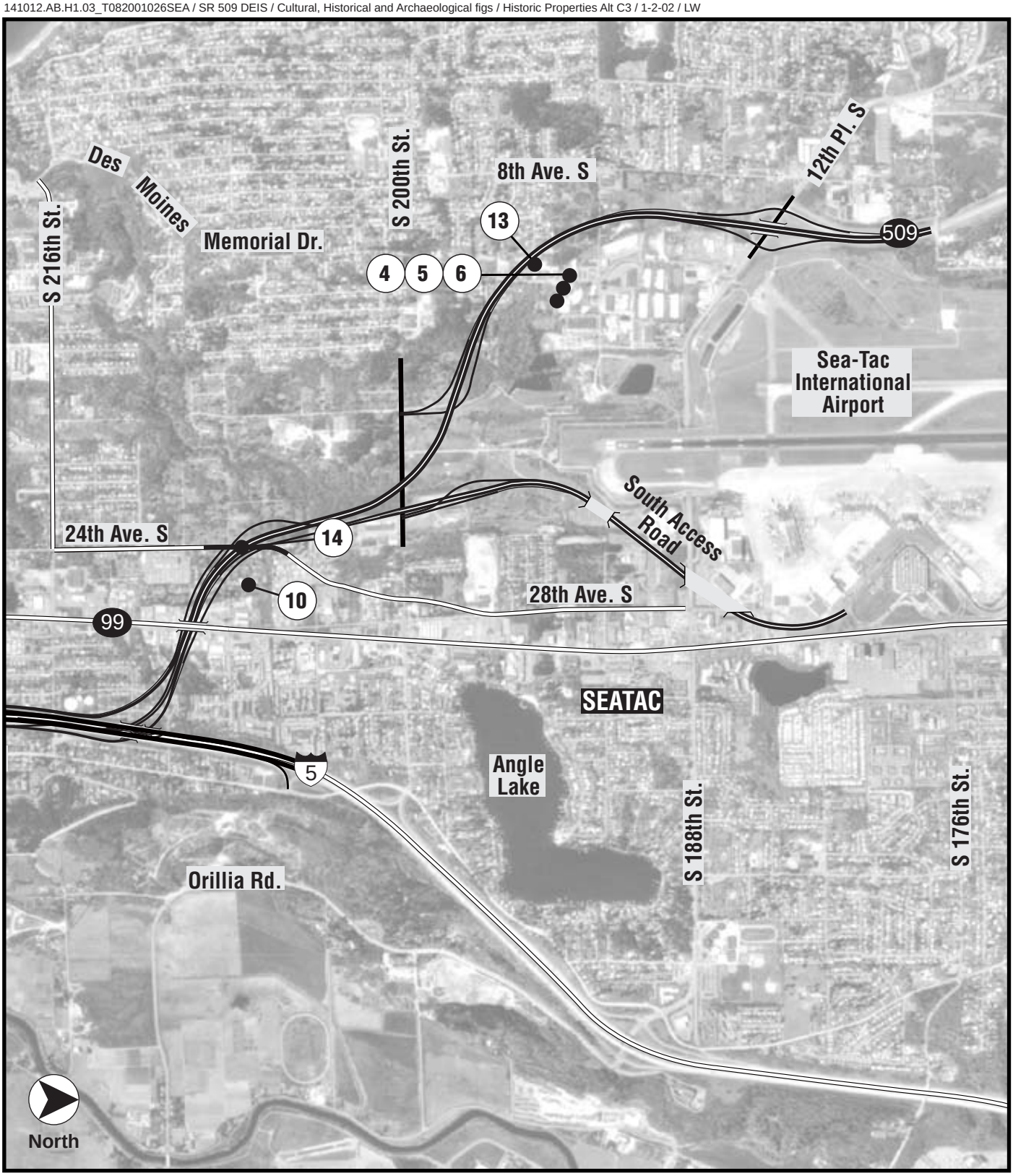
SR 509/South Access Improvements

4 Location of Historic Properties
e.g., 1829 South 222nd Street, Des Moines

FIGURE 3.12-2

Locations of Historic Properties – Alternative C2 (Preliminary Preferred)

SR 509: Corridor Completion/I-5/South Access Road
Environmental Impact Statement



0 1/4 1/2 3/4 1 MILES

Legend

SR 509/South Access Improvements

4 Location of Historic Properties
e.g., 1829 South 222nd Street, Des Moines

FIGURE 3.12-3

Locations of Historic Properties – Alternative C3

SR 509: Corridor Completion/I-5/South Access Road
Environmental Impact Statement

formally consults with OAHP, his office is likely to concur with the recommendation that none of these buildings are eligible for NRHP listing.

Property No. 4—19422 Des Moines Way South, SeaTac, Washington (98148)

This one-story residence has a full basement and a wide beveled board siding (10 inch) that is common in the area. Windows are six-over-one double hung wood sashes except for an aluminum slider in the south elevation. All of the original windows are covered with aluminum storm windows. An exterior battered brick chimney is located on the south elevation. The low, front gable roof is covered with composition shingles and has brackets under the projecting eaves. A modern garage with a gable roof and plywood siding is located behind the residence. Although this building is a relatively intact example of a simple, front gable Craftsman house, it is a plain example of a common building type in the area. It has no architectural significance and no association with historically important people or events. It is unlikely to be eligible for listing on the NRHP.

Property No. 5—19434 Des Moines Way South, SeaTac, Washington (98148)

This one and one-half story, rectangular building was constructed in 1926. It has a full basement and beveled board siding. Windows are one-over-one double hung wood sashes in sets of two and three. The windows are covered with aluminum storm windows. A small solarium window was added to the south elevation. The front door in the west elevation was replaced and a wood railing added to the small front porch. A large aluminum window is located in the half-story in the north elevation. A shed roofed dormer is located in the front of the side-gable roof. Exposed purlins and knee braces are located at the eaves. Although this building is a relatively intact example of a simple, front gable Craftsman house, it is a plain example of a common building type in the area. It has no architectural significance and no association with historically important people or events. It is unlikely to be eligible for listing on the NRHP.

Property No. 6—1205 South 196th Street, SeaTac, Washington (98148)

This is a one and one-half story Tudor-style residence built in 1929. It has a rectangular floor plan and a full basement with concrete walls. The front facing cross gable has an oriel on the first floor and a small leaded glass window in the upper half-story, which is the only original window remaining. The rest were replaced with triple-glazed vinyl windows that simulate six-over-six double hung windows. The high-pitched roof with flush eaves is covered with composition shingles. A one and one-half story garage is located just east of the residence. The stucco building has a medium-pitched composition shingle roof. A leaded glass window is located in the west gable

end in the upper half-story. This is a simple example of a Tudor-style residence with replacement windows. Preliminary analysis suggests this building is not eligible for listing on the NRHP.

Property No. 9—2604 208th Avenue South, SeaTac, Washington (98198)

This is a simple single-story vernacular residence with a basement. It has narrow beveled board siding. Windows are wood frame in a mixture of one-over-one double hung, fixed, and casement styles. An exterior red brick chimney is located on the west elevation. The gable roof has clipped corners and is covered with composition shingles. At the time of recordation, a project was underway to convert the attic to living space. A door had been cut into the west gable and an exterior wood stairway was under construction. This simple vernacular residence is not architecturally significant, has no association with historically important people or events, and is unlikely to be eligible for listing on the NRHP.

Property No. 10—2413 208th Avenue South, SeaTac, Washington (98148)

This is a rectangular 1½ story Craftsman-style residence. It has wide beveled board siding and one-over-one double hung wood sash windows, with the exception of the large, single pane front window, which is probably a modern replacement. A small porch with a gabled roof projects slightly from the front of the building. The front gable roof has composition shingles and knee braces under the eaves. This building was moved to its current location in 1955. This simple Craftsman-style residence is not architecturally significant, has no association with historically important people or events, and is unlikely to be eligible for listing on the NRHP.

Property No. 13—19405 Des Moines Drive South, Des Moines, Washington (98198)

This is a single-story residence constructed in 1937. The original exterior siding has been covered or replaced with asbestos shingles. The house has a gable roof with a small center gable forming the porch over the front door on the east elevation. The roof is covered with composition shingles. The front door has been replaced with a new metal door and the windows have been replaced with new vinyl windows. The simple vernacular residence has no architectural significance and no association with historically important people or events. It is unlikely to be eligible for listing in the NRHP.

Property No. 14—20704 24th Avenue South, SeaTac, Washington (98148)

This is a single-story residence on a concrete basement foundation. The house was constructed in 1940 and its exterior walls are covered with clapboard siding. All original windows have been replaced with aluminum

windows. The house has a gable roof with a small porch gable extending over the door on the south-facing façade. The roof is covered with composition shingles. The eaves project only slightly with no exposed rafters or joists. The building has no architectural significance and the replacement windows have compromised the structure's integrity. The property has no known association with important people or events. This property is unlikely to be eligible for listing in the NRHP.

3.12.3 Environmental Impacts

The Advisory Council on Historic Preservation's regulations implementing Section 106 of the NHPA create a process by which federally assisted undertakings are reviewed for their effect on properties listed on the NRHP or those determined to be eligible for listing.

The Criteria of Effect and Adverse Effect are applied to determine whether the proposed project could affect the property and whether those effects should be considered adverse. If the undertaking could change in any way the characteristics that qualify the property for inclusion in the NRHP, for better or for worse, it is considered to have an effect. If the undertaking could diminish the integrity of such characteristics, it is considered to have an adverse effect. Potential adverse effects on historic resources in the APE include, but are not limited to:

- Physical destruction of an entire historic resource
- Damage or alteration of a portion of a historic resource
- Introduction of visual elements that are out of character with the historic resource or alter its setting
- Introductions of long-term audible or atmospheric elements that are out of character with the historic resource or alter its setting
- Introductions of short-term audible, visual, or atmospheric elements that are out of character with the historic resource or alter its setting

Alternative A (No Action)

No impacts would occur to known state or National Register listed or eligible cultural resource sites.

Alternatives B, C2, and C3

Once constructed and operational, none of the build alternatives would produce any long-term impacts on known state or National Register listed or eligible cultural resource sites. Impacts during project construction, and associated mitigation measures, are discussed in *Construction Activity Impacts and Mitigation,* Section 3.12.5.

3.12.4 Mitigation Measures

Because no long-term impacts on state or National Register listed or eligible cultural resource sites are anticipated, no mitigation is proposed. Possible impacts associated with project construction and associated mitigation measures, are discussed in the *Construction Activity Impacts and Mitigation* section immediately following.

3.12.5 Construction Activity Impacts and Mitigation

Construction Impacts

As previously noted, there are no recorded archaeological sites in the APE that could be impacted by the proposed project. Because the APE has generally been drastically altered by urban development, the likelihood of encountering unknown sites during construction is remote. The *Construction Mitigation Measures for Archaeological Sites* section below discusses the steps that would be taken if an unrecorded site were encountered during construction.

Seven potentially historic buildings have been identified within the APE of the build alternatives. These potentially historic buildings would be threatened by one or more of the alternatives (see Figures 3.12-1 through 3.12-3). The buildings potentially affected by each of the build alternatives are discussed below.

Alternative B

Alternative B would require the removal of the following buildings:

- Property No. 4—19422 Des Moines Way South, SeaTac, Washington (98148)
- Property No. 5—19434 Des Moines Way South, SeaTac, Washington (98148)
- Property No. 9—2604 208th Avenue South, SeaTac, Washington (98198)
- Property No. 10—2413 208th Avenue South, SeaTac, Washington (98148)
- Property No. 13—19405 Des Moines Drive South, Des Moines, Washington (98198)
- Property No. 14—20704 24th Avenue South, SeaTac, Washington (98148)

Alternative C2 (Preliminary Preferred)

Alternative C2 would require removal of the following buildings:

- Property No. 4—19422 Des Moines Way South, SeaTac, Washington (98148)
- Property No. 5—19434 Des Moines Way South, SeaTac, Washington (98148)
- Property No. 6—1205 South 196th Street, SeaTac, Washington (98148)
- Property No. 13—19405 Des Moines Drive South, Des Moines, Washington (98198)

Alternative C3

Alternative C3 would require removal of the following buildings:

- Property No. 4—19422 Des Moines Way South, SeaTac, Washington (98148)
- Property No. 5—19434 Des Moines Way South, SeaTac, Washington (98148)
- Property No. 6—1205 South 196th Street, SeaTac, Washington (98148)
- Property No. 10—2413 208th Avenue South, SeaTac, Washington (98148)
- Property No. 13—19405 Des Moines Drive South, Des Moines, Washington (98198)
- Property No. 14—20704 24th Avenue South, SeaTac, Washington (98148)

Construction Mitigation Measures for Archaeological Sites

Archaeological monitoring occurs when a qualified archaeologist observes/ inspects subsurface ground-disturbing construction operations. If the archaeological monitor observes what appear to be cultural deposits, construction would be temporarily halted in the "find" location until a preliminary analysis of the find could be made. Archaeological monitoring is often conducted where construction is scheduled in areas of high probability for containing archaeological sites (but which exhibit no outward indications that such sites are actually present). Archaeological monitoring is often conducted in areas where preconstruction subsurface testing is not feasible. If required, archaeological monitoring would be undertaken by an archaeologist who meets the Secretary of the Interior's standards and guidelines (36 CFR 61).

In the event that potentially significant archaeological remains are found during construction, the following typical late discovery procedures followed by WSDOT would be applied here.

WSDOT's Late Discovery Procedures

WSDOT has operational procedures to deal with inadvertent discoveries of cultural or historical resources during construction. The following generally describes WSDOT's procedures.

If a WSDOT field inspector is notified a discovery has been made, either from the project archaeologist monitoring construction in archaeologically sensitive areas or from the construction contractor's field staff, the matter would immediately be brought to the attention of designated WSDOT officials.

WSDOT might then issue a "Stop Work Order" in the immediate area until an assessment by the police and/or the project archaeologist could be made. Construction crews are often reassigned to other tasks in another area (typically at least 50 to 100 feet away). Pending arrival of knowledgeable personnel, WSDOT would preserve the discovery site to prevent further damage.

WSDOT field personnel would locate the excavation (such as by cross streets) in order to better direct other people to the site by phone. WSDOT office staff would be verbally briefed by field personnel as to the circumstances of the discovery. If bones were involved, especially on the surface or buried shallowly, then the police from the local jurisdiction would be called to the site by WSDOT to determine if it is a crime scene. If the bones seem to be of a human origin, the reporting officer would contact the Medical Examiner (usually the County Medical Examiner) to begin a possible criminal investigation.

If the project archaeologist is not already on-scene, WSDOT staff would contact the designated project archaeologist. In addition, designated WSDOT Region personnel would be advised of the situation and developments as they occur. The WSDOT Regional Environmental and Special Services office would serve as the hub of information. Telephone or e-mail contacts to and from the field would occur as each development occurs. The goal would be "full communication" to facilitate adjustment to possible changing conditions.

At the first indication of a possible link of the discovered remains to an Indian tribe, the project archaeologist would typically contact the tribe(s) and coordinate work with them. This might involve having a tribal staff archaeologist on site or merely sharing the written findings with the tribe. Human skeletal remains are a sensitive subject; bones of Native Americans

are typically returned to the current tribe (to which they can be linked) for reburial by the tribe. Artifacts or sites of religious significance to the tribes are issues to be dealt with in a sensitive manner with the tribe.

Traditional Cultural Properties

No TCPs have been identified in the project area. Should ongoing consultations with the Tribes result in the identification of TCPs in the project area, additional consultations with the Tribes and WSDOT would be required to develop acceptable mitigation measures.

Historic Properties (Buildings)

Although none of the potentially historic or architecturally significant buildings within the project area are considered likely to be eligible for listing in the NRHP, if one or more of the seven buildings are determined by OAHP to be NRHP-eligible, potential mitigation measures might include:

- Modification of project design to avoid or limit physical alteration of a historic resource, and visual, atmospheric, or long-term noise impacts
- Review and approval by the State Historic Preservation Officer (SHPO) of project design elements that may damage, alter, or obscure views of a historic resource
- Review and approval by the applicable local Landmarks Preservation Board of project design elements that may damage, alter, or obscure views of a designated local landmark
- Modification of construction methods to avoid or limit construction-related impacts
- Relocation of historic resource to appropriate new site

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3.13 Hazardous Waste

3.13 Hazardous Waste

3.13.1 Studies and Coordination

This section summarizes information contained in the *SR 509/South Access Road EIS Discipline Report: Hazardous Waste* (WSDOT February 2000), *SR 509/South Access Road EIS: South Airport Link* (October 2001), *Update to the Existing SR 509 Supplement 5 Hazardous Waste Discipline Report* (IT Corporation October 2001), and *Draft SR 509/South Access Road EIS: I-5 Corridor Hazardous Waste Discipline Report* (IT Corporation November 2001). For this analysis, the project area is defined as the area within one mile of the proposed build alternatives.

Environmental Data Resources, Inc. (EDR), conducted database searches of all available federal, state, and local environmental regulatory databases sites within 1.0 mile of the proposed project alternatives. Database searches for the proposed SR 509 freeway extension and South Access Road were conducted in April 1997 (EDR 1997). A review of U.S. EPA Region 10 Internet regulatory files was conducted in November 1998 and December 1999 did not reveal any changes from the listing provided by EDR. Washington State Department of Ecology (Ecology) files were reviewed in September 2001 to update the database information. Database searches were conducted for the South Airport Link design options in June 2000, and for the I-5 improvements in October 2001.

An historical review of the project area in the vicinity of the I-5 improvements was conducted in September 2001 using historical aerial photos, historical topographic maps, and Kroll maps. Information was also obtained from the *Real Estate Services/Environmental Affairs Office Potentially Contaminated Property Inventory Final Report* (WSDOT May 1997). This inventory report identifies properties that are currently owned by WSDOT and are under Real Estate Services management that have a potential for contamination. Further information was obtained from a Port of Seattle report completed in1996 that describes the underground storage tank (UST) status of properties purchased as part of the Sea-Tac Airport Noise Remedy Program.

Validation of the list of known or suspected contamination sites was conducted by review of Ecology enforcement and regulatory files and telephone interviews with representatives from Ecology, Port of Seattle, City of Des Moines, Des Moines Fire District, and the Masonic Church. In addition, site visits were conducted to areas of concern to confirm exact locations of properties and proximity to other sites.

3.13.2 Affected Environment

Land Use

Land use in the project corridor has generally remained the same for the last 50 to 60 years. Commercial properties tend to be located in the vicinity of interchanges along I-5 and along SR 99/Pacific Highway South, with residential properties located to the west and east of the commercial corridor.

One of the largest facilities in the area is Sea-Tac Airport, which is a focal point for construction because of its economic importance in the Pacific Northwest. The airport, which opened in 1944, includes passenger and cargo terminals, baggage conveyance, and aircraft maintenance and fueling facilities.

Physical Environment

Geology and soils in the project area are described in Section 3.4 of this Revised DEIS. Three major aquifers underlie the project area. These include the Vashon advance outwash and two older outwash deposits. The highly seasonal nature of the groundwater restricts its use for drinking water purposes. The main water table is usually encountered 60 to 90 feet bgs. Perched groundwater as shallow as 9.8 feet bgs has been encountered. Noncontinuous zones of perched groundwater have been encountered in the southeast portion of the airport property at a depth ranging from ground level to 50 feet bgs. Free-floating petroleum products have been measured in monitoring wells in the area of the airport. The amount of free-floating product has fluctuated over the multiple years of monitoring.

List of Sites with Known or Suspected Contamination

Based on the research described above, 45 sites of known or suspected contamination were identified in and along the alignment of the proposed project alternatives (Table 3.13-1). Sites in the vicinity of the proposed SR 509 freeway extension are identified with a number. Sites in the vicinity of the South Airport Link are identified with a number preceded by the letter "S," and those along the I-5 corridor are identified with a number preceded by the letter "I."

Table 3.13-1 List of Potential or Known Contaminated Sites			
Site No.	**Site**	**Address**	**Level of Contamination**
2	Battery Power Systems, Inc.	2367 South 200th Street	Substantially contaminated
6	Exxon #7-3287/BP #3124	2841 South. 188th St./18803 International Blvd.	Reasonably predictable
7	Foreman's Welding	18451 Des Moines Memorial Dr.	Reasonably predictable
8	Hertz Corp. Car Rental	18625 Des Moines Memorial Dr.	Reasonably predictable
14	Olympic Fuel Tank Farm	2600 Block of South 188th Street.	Reasonably predictable
18	S. 192nd Street Residential Property	1112 South 192nd Street	Reasonably predictable
21	Tech-Marine Enterprises	Near 19265 Des Moines Memorial. Dr.	Reasonably predictable
24	Alaska Airlines Gold Coast Center	20833 International Blvd.	Reasonably predictable
25	Helen's Auto Sales	20848 Pacific Highway South	Substantially contaminated
26	Pacific Auto Brake & Muffler	20856 Pacific Highway South	Substantially contaminated
27	Super Mechanics	21027 Pacific Highway South	Reasonably predictable
28	VIP Sports Bar & Restaurant	20842 Pacific Highway South	Reasonably predictable
29	Alamo Rent-A-Car	20636 Pacific Highway South	Reasonably predictable
30	Unocal #3964	20658 Pacific Highway South	Reasonably predictable
31	PAC Center	2407 South 200th Street	Reasonably predictable
32	Budget-Rent-A-Car of WA-OR	19030 28th Avenue South	Reasonably predictable
33	Sea Tac Gull #263	18812 Pacific Highway South	Reasonably predictable
S-1	Pan Am Fuel Farm	Sea-Tac Airport	Reasonably predictable
S-2	Northwest Airlines Tank Farm	18211 Air Cargo Rd.	Substantially contaminated
S-3	Air Cargo Road	Sea-Tac Airport	Substantially contaminated
S-4	Delta Fuel Farm	Sea-Tac Airport	Reasonably predictable
S-5	Former sewage treatment plant/Masterpark[a]	18220 International Boulevard	Reasonably predictable
S-6	My Place Tavern & Restaurant/West Coast Gateway Hotel[a]	18415 Pacific Highway South/ International Boulevard [b]	Reasonably predictable
S-7	Sharp's Roaster and Ale House	18427 Pacific Highway South/ International Boulevard[b]	Reasonably predictable
S-8	Shell Oil Service Station (also part of Budget Rent-A-Car of Washington)	18443 Pacific Highway South/ International Boulevard [b]	Reasonably predictable
S-9	Various car rental businesses/Budget Rent-A-Car of WA[a]	18445 Pacific Highway South/ International Boulevard [b]	Reasonably predictable

Table 3.13-1
List of Potential or Known Contaminated Sites

Site No.	Site	Address	Level of Contamination
S-11	Swept Wing Inn & Office Building/Airport Plaza Hotel & Mogul Garden Restaurant[a]	18601 Pacific Highway South/ International Boulevard [b]	Reasonably predictable
S-12	Liquor Store	18617 Pacific Highway South/ International Boulevard	Reasonably predictable
S-13	Mini-Mart	18615 Pacific Hwy South/ International Boulevard	Reasonably predictable
S-14	Budget Rent-A-Car of WA-OR	2806 South 188th Street	Reasonably predictable
I-4	Kent Highlands Landfill	Military Rd. and SR 516	Reasonably predictable
I-5	Kings Dry Cleaners	23416 Pacific Highway South	Reasonably predictable
I-6	Park of the Pines Church	23458 30th Avenue South	Reasonably predictable
I-7	Midway Auto Body	23454 30th Avenue South	Reasonably predictable
I-9	Murray's Collision Center	23608 30th Avenue South	Reasonably predictable
I-14	Highline Water District	23828 30th Avenue South	Reasonably predictable
I-15	Midway Sewer District	3030 South 240th Street	Reasonably predictable
I-16	King County Housing Authority	South 239th Street and Military Rd.	Reasonably predictable
I-17	City of Kent Pump Station 8	South 240th and 35th Avenue South	Reasonably predictable
I-22	Linda Heights Park Pump Station	3406 South 248th Street	Reasonably predictable
I-23	Gresham Transfer, Inc.	24300 Pacific Highway South	Reasonably predictable
I-27	Midway Landfill	24808 Pacific Highway South	Substantially contaminated
I-34	Circle K Gasoline Station	27121 Military Road S.	Reasonably predictable
I-41	76 Gasoline Station	2535 South 320th Street	Reasonably predictable
I-46	Puget Sound Church of God Holiness	22809 Military Road South	Reasonably predictable
	Residential Displacements	Varies by Alternative	Reasonably predictable

[a] *Property name provided in chronological order, beginning with the oldest available name and ending with the current property name.*
[b] *All known street names provided for the historic and current property addresses.*

Using *Guidelines for Preparing Hazardous Waste Discipline Reports* (WSDOT and FHWA 1997), sites on the list are defined as being reasonably predictable or substantially contaminated. Reasonably predictable means that the site is or is likely to be contaminated, but the cost estimates for cleanup using best engineering methods can be reasonably estimated without sampling. Substantially contaminated includes several categories or types of contamination: (1) the site might have a potential for being contaminated with known or unknown contamination, but further investigation, including limited sampling, needs to be completed before cost estimates can be established; (2) the site is, or potentially might be, so contaminated as to create a substantial cost liability for WSDOT in acquisition or construction. In this case, where sampling reports are not available, limited sampling is necessary to define the type and extent of contamination. Four situations typically fit this latter category of "substantially contaminated:"

- The site area is large.
- The chemical is expensive or difficult to treat.
- There is a long history of industrial usage.
- There is a high potential for impact on groundwater sources.

The six sites identified as "substantially contaminated" include Air Cargo Road at the Sea-Tac Airport (Site S-2); Northwest Airlines Inc. Tank Farm at 18211 Air Cargo Road (Site S-3); Battery Power Systems Inc. at 2367 South 200th Street (Site 2); Helen's Auto Sales at 20848 Pacific Highway South (Site 25); Pacific Auto Brake & Muffler at 20856 Pacific Highway South (Site 26); and Midway Landfill at 20848 Pacific Highway South (Site I-27). Details of these sites and those identified as "reasonably predictable" have been described in the various discipline reports identified in Section 3.13.1.

3.13.3 Environmental Impacts

Alternative A (No Action)

No sites of known or potential contamination would be affected by the No Action Alternative. Associated hazardous waste impacts would be limited to the potential for release of fuel or motor oils from equipment used during routine maintenance of existing roads. Increased future traffic congestion under the No Action Alternative could increase the potential for hazardous materials spills in the area.

Impacts Common to All Build Alternatives

The probability of encountering contamination would be high regardless of the build alternative. The level of involvement with hazardous materials depends on the alternative. Impacts fall into the categories of general construction impacts, impacts on public health, and operational impacts. These impacts would be similar for all sites, regardless of the build alternative, and are discussed below.

Construction Impacts

General construction impacts would occur regardless of the build alternative. The general types of construction impacts as well as any specific impacts are discussed below.

Building Demolition Debris, Asbestos, and Lead-Based Paint

Each of the build alternatives would require the acquisition of additional commercial and residential properties. In addition to regular building debris from demolition, the acquisition of residential and commercial properties would pose the risk of also acquiring household hazardous waste such as pesticides, fertilizers, solvents, fuels, and leftover lead-based paint. This waste, along with the regular building demolition debris, would need to be removed, tested, and disposed of following state, federal, and local regulations.

The most likely source of asbestos-containing materials would be residences because of the age of the buildings and the common use of asbestos in pre-1978 construction. Materials that often contain asbestos in residential buildings include floor tiles, counter tops, and roofing materials. Commercial buildings can also contain a major level of asbestos contamination, often in association with insulation for the heating and cooling system or gaskets in boilers.

Lead-based paint is resistant to abrasion and commonly found in the paint on door and window jams of residences built prior to 1978. Many commercial buildings might contain lead-based paint, because it was popular for its longevity and resistance to abrasion.

Contaminated Soil

Each of the build alternatives could require acquisition of sites that contain contaminated soil or are adjacent to sites that contain contaminated soil that might have migrated into the proposed roadway right-of-way. Soil contamination in the vicinity of the proposed project could include gas, oil- and diesel-range petroleum hydrocarbon, solvents, and heavy metals (including lead) in the vicinity of automotive service and fueling stations and dry cleaners, as well as potential heating oil contamination at residential and commercial properties. Jet A fuel and possibly AvGas could be encountered in the vicinity of the airport. Municipal solid wastes could be encountered in the soil excavated from Midway Landfill as part of the I-5 improvements.

All of these contaminants require special handling, treatment, and disposal. Contaminated soil must be removed and tested before treatment or disposal at approved facilities.

Contaminated Groundwater

Contaminated groundwater that might be encountered during excavation or during dewatering would require special handling prior to proper disposal. Perched layers of groundwater are common for all the build alternatives. Exposing a perched groundwater layer might create a migratory route for contamination already in the groundwater or surrounding soil, as well as for any contamination that may be introduced into the exposed groundwater.

Worker Protection

Exposure of workers to hazardous wastes would be more likely than exposure to the public because of workers' proximity to hazardous materials and wastes during construction operations. The most common materials that a worker might be exposed to would be petroleum-based products such as fuels and hydraulic fluids. The common routes of exposure would be inhalation, ingestion, and skin contact. Petroleum products could cause damage to the eyes, exposed skin, or lungs. Use of regular personal protective equipment (PPE) and proper hygiene would reduce the risk of exposure. Conveyance pipes containing product (from gas stations, the airport, or other unknown sources) might still be buried along the alternative alignments, creating an exposure risk. Air quality (and associated health concerns) could be affected as a result of disturbing volatile substances during construction.

Encountering unanticipated contamination in both soil and groundwater could expose workers to potential hazardous conditions. Proper training in the use of spill prevention materials and standard operating procedures in the event of a spill from an unanticipated source would be necessary to protect worker health. The most likely source of unknown contamination for this proposed project would be petroleum-based materials and wastes.

Underground Storage Tanks

USTs would create the greatest risk when an unknown tank would be encountered during excavations because of the explosion hazard and the potential of creating a spill if the tank is ruptured. Vapors trapped within the tank might reach explosive limits and cause an explosion when ignited by a spark or some other incendiary device like a cigarette.

Air Quality

Construction activities might affect air quality. Common air contaminants would include dust, vapors, and fire. Dust contaminated with petroleum-based products or other contaminants and petroleum vapors might be released during large excavations. Dust would create the most likely source of air quality problems for the build alternatives.

Vapors may occur within a confined space during construction of a tunnel or covered structure, depending on the manner of construction. An explosion hazard and a low oxygen hazard exist in these areas if contaminated soil, groundwater, or both are present. An open excavation can also create a hazard similar to a confined space if gases collect in the breathing zone.

Storm and Surface Water Contamination

The most likely risk for storm and surface water contamination would be from runoff from stockpiles and open excavation areas. Additional details are provided in Section 3.6, *Water Quality*.

Public Health Impacts

Public health concerns related to hazardous wastes would fall into two categories: (1) public perceptions of harm, and (2) actual impacts on human health resulting from construction activities. The public has a heightened awareness of potential impacts on health from contaminated sources. Summaries of public complaints contained in Ecology's Environmental Report Tracking System (ERTS) exemplify the public's concerns for health and well-being when real or perceived contamination is involved. A good public relations program is the best way to address this from a public health concern.

Public health impacts from construction would be related to exposure to a release of hazardous materials. A spill of materials brought onsite or encountered during construction, including dust, might expose the public to hazardous substances that pose a health risk. The most likely type of material that might be released would be a petroleum-based product, such as fuels and lubricants. The most likely route of exposure to the public would be through inhalation and direct contact with the skin. Jet A fuel is the most likely hazardous material that would be encountered during construction in the vicinity of Sea-Tac Airport. Jet A fuel is refined kerosene, a hydrocarbon solvent. An uncontrolled burn of petroleum-based products could cause short-term and long-term health effects, especially for people with respiratory and other health problems. Inhalation exposure symptoms range from nausea and loss of muscle coordination to kidney damage.

Another path of exposure would be encountering unknown contamination during construction. The most likely routes of exposure would be through the air and surface water. The greatest danger here would be due to the unknown nature of any contaminants that might be encountered. Spill prevention materials and careful work would be key to preventing a release that might endanger the public.

Operational Impacts

Construction of the proposed project would improve traffic flow in the project area. This would ultimately serve to reduce the risk of accidents, including those involving hazardous substances, thereby decreasing the amount of harmful substances that could enter soil and water resources.

Impacts of hazardous materials and waste from normal operations would primarily be associated with runoff of contaminants entrained in stormwater. Contaminants likely to be in stormwater runoff include fuel, lubricants, heavy metal compounds from tires, and automobile engine coolants such as ethylene glycol. Stormwater and water quality treatment facilities would be designed to collect and retain pollutants from traffic operations. Additional operational impacts might include herbicides used as part of a roadside vegetation management program. Operational impacts related to hazardous waste and water are primarily associated with stormwater quality, and are addressed in Section 3.4, *Water Quality*, of this Revised DEIS.

Alternative B

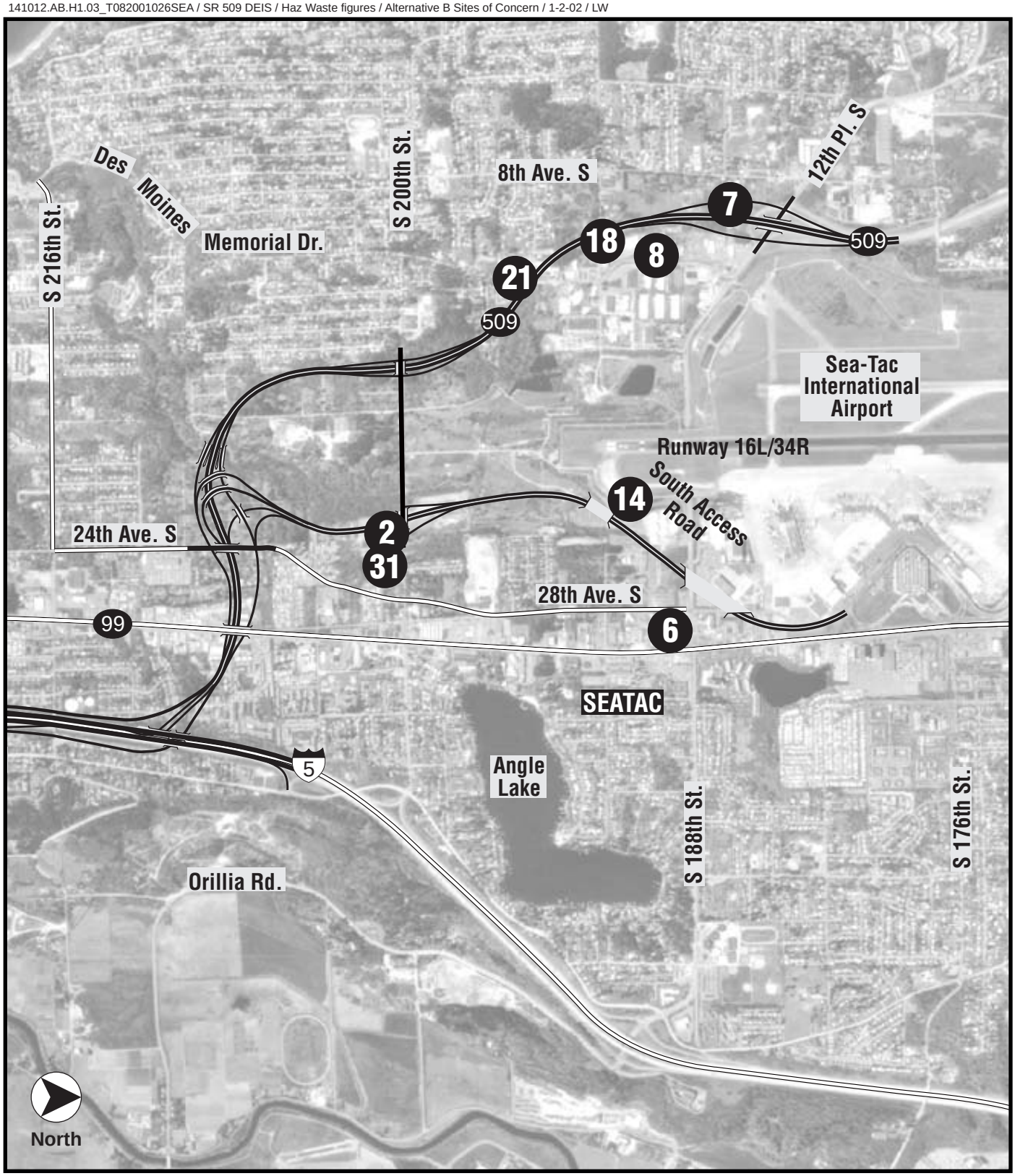
Under Alternative B, a total of 36 known or suspected contaminated sites could be affected by the proposed project. Of these, four sites are considered as substantially contaminated (Sites 2, S-2, S-3, and I-27).

One substantially contaminated site and seven reasonably predictable sites were identified in the vicinity of the SR 509 freeway extension and South Access Road west of South 188th Street. See Figure 3.13-1 for site locations and Table 3.13-1 for site identification. The substantially contaminated property is known as Battery Power System Inc. (Site 2). This site is located within the proposed right-of-way, and the probability of encountering adverse environmental conditions during construction is high.

The building that formerly housed Battery Power System, Inc. (Site 2), could potentially create a construction liability because of the unknown potential or level of contamination that might exist. No record of soil or groundwater sampling was found to evaluate whether the former or current use is contaminating the area. Based on the site's historic use, contamination could include heavy metals, solvents, and grease and oil. This site would need further evaluation and sampling before construction.

Of the seven reasonably predictable sites, four (Sites 7, 18, 21, and 31) are located within the proposed right-of-way, and the remaining three are adjacent (Sites 6, 8, and 14).

Of the sites located within the proposed right-of-way, Foreman's Welding (Site 7) may be potentially contaminated with heavy metals, oil, grease, and glycol or antifreeze. The WSDOT-owned South 192nd Street property (Site 18) contains a tenant-owned residence. Trespassing and dumping has



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Legend

SR 509/South Access Improvements

33 Potential Hazardous Waste Site

FIGURE 3.13-1

Sites of Concern – Alternative B

SR 509: Corridor Completion/I-5/South Access Road Environmental Impact Statement

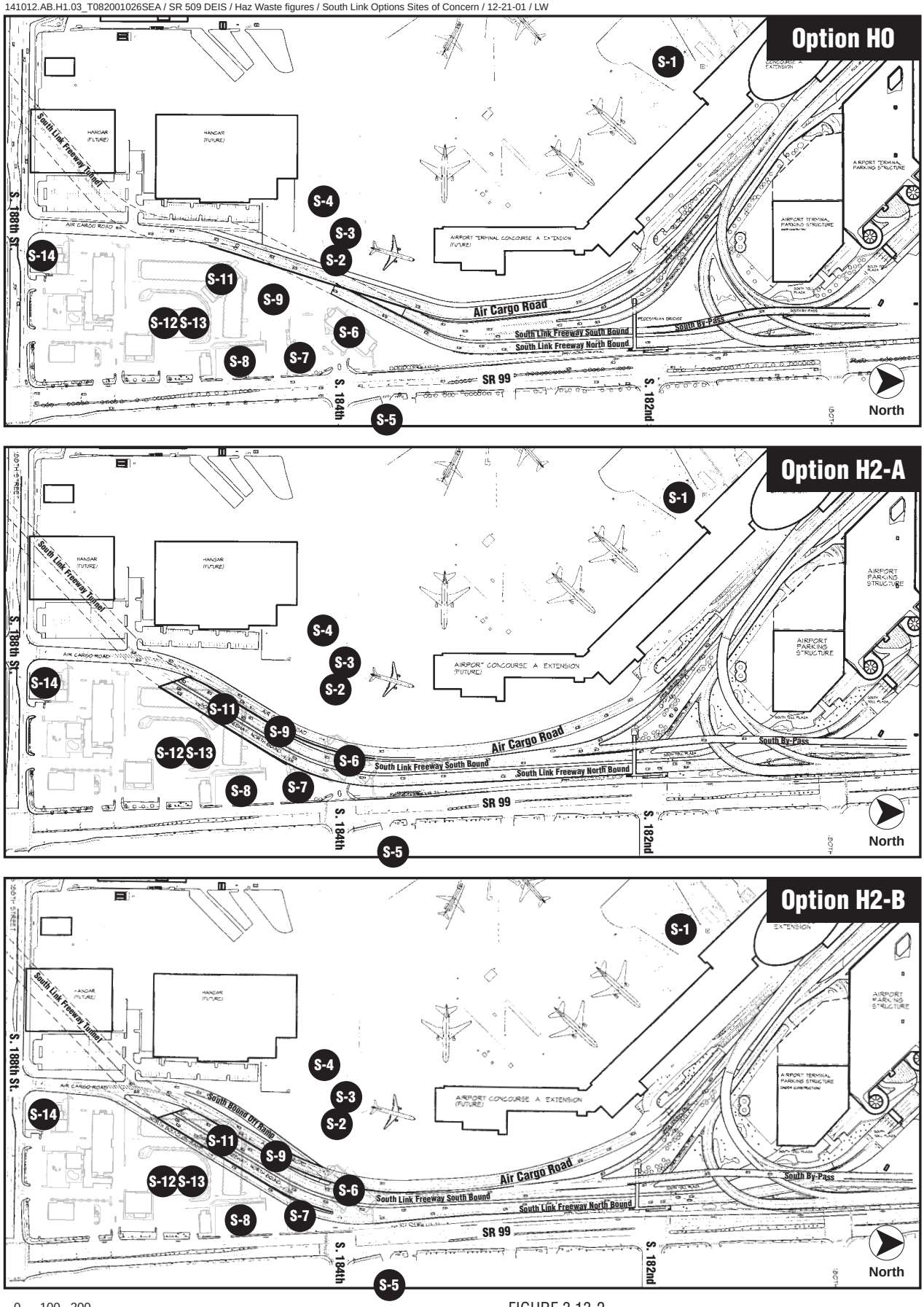
been documented along the northern portion of the property. The most common type of materials dumped on the property is household garbage; however, 55-gallon drums containing unknown materials have also been dumped. Tech-Marine Enterprises (Site 21), located near 19265 Des Moines Memorial Drive, is a machine shop that leases the adjoining WSDOT-owned property for parking. The large machinery parked at the site may have leaked fuels and lubricants. No information was available at Ecology for PAC Center (Site 31). PAC Center consists of an office and warehouse building.

Thirteen sites are located in the vicinity of the South Airport Link (Figure 3.13-2, Table 3.13-1). Two of the sites, known as Northwest Airlines Tank Farm (Site S-2) and Air Cargo Road (Site S-3), are considered substantially contaminated. The remaining 11 sites are considered reasonably predictable. The Northwest Airlines Tank Farm (Site S-2) is located in the proposed right-of-way for Design Option H-0. Air Cargo Road is located in the proposed right-of-way for Design Options H-0, H2-A, and H2-B. Five additional sites (Sites S-6, S-7, S-8, S-9, and S-11) are located in the proposed right-of-way of Design Options H2-A and H2-B.

Construction of the South Airport Link would require a major cut. This cut could potentially affect the Northwest Airlines Tank Farm (Site S-2) (Design Option H-0 only) and Air Cargo Road (S-3). The Northwest Airlines Tank Farm (Site S-2) has TPH contamination from Jet A fuel USTs. Free-floating product was observed in the perched layers of groundwater in the vicinity of the Northwest Airlines Tank Farm at approximately 30 feet bgs. This site is being cleaned up and cleanup might be finished before construction of the South Airport Link begins. Air Cargo Road (Site S-3), which encompasses the southeast corner of the Sea-Tac Airport, except for the area identified as the Northwest Airlines Tank Farm (Site S-2), is also contaminated with petroleum products including Jet A fuel and possibly Av Gas, as well as gas, oil-, and diesel-range petroleum, solvent contamination, and heavy metals (including lead). Extensive cleanups are in progress at this site. Large amounts of soil, both contaminated and uncontaminated would need to be segregated, removed, and disposed of appropriately if the cleanup at the Northwest Airlines Tank Farm and Air Cargo Road sites are not completed prior to construction of the South Airport Link.

The Shell Oil Service Station, also part of the Budget Rent–A-Car of WA-OR on International Boulevard (Site S-8) and the adjacent car rental businesses/Budget Rent-A-Car (Site S-9) reportedly had USTs, which creates a potential for total petroleum hydrocarbons (TPH) contamination.

The West Coast Gateway Hotel (Site S-6) and Airport Plaza Hotel (Site S-11) could have lead paint or asbestos. The West Coast Gateway Hotel (Site S-6) or the Sharp's Roaster and Ale House (Site S-7) could potentially have TPH soil and/or groundwater contamination, but the source would most likely be from offsite (RZA 1989).



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Approx. Scale in Feet

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S-14 Potential Hazardous Waste Site

FIGURE 3.13-2

Sites of Concern – South Airport Link

SR 509: Corridor Completion/I-5/South Access Road Environmental Impact Statement

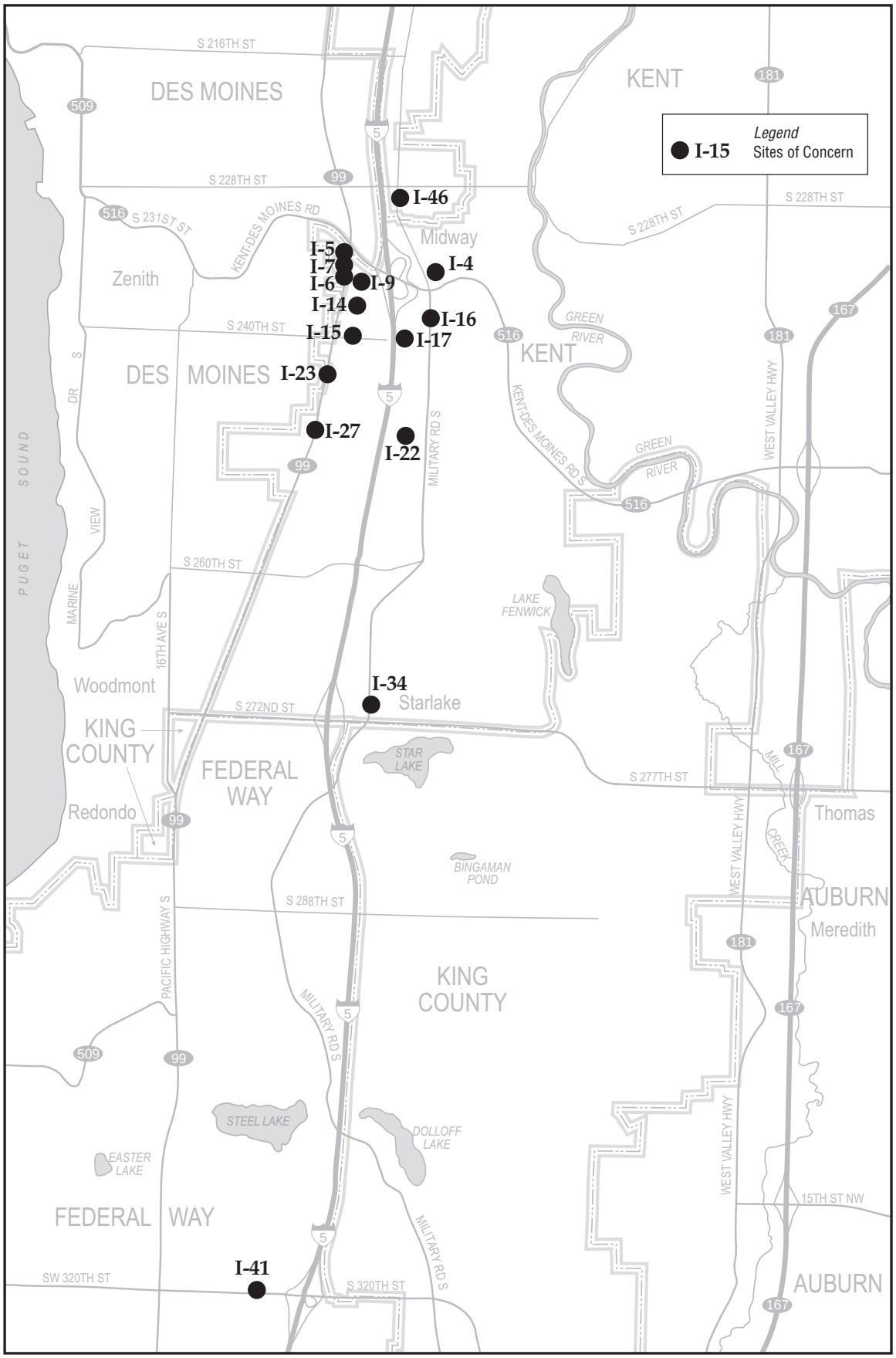
The Pan Am Fuel Farm (Site S-1) site is the only one listed as having a potential air quality effect because of the methane concentrations found in the soil. This site is adjacent to the proposed project right-of-way, but construction could affect the movement and location of the methane pocket (Landau 1997). One additional site on Port of Seattle property associated with fuel farm contamination is the Delta Fuel Farm (Site S-4). This site is adjacent to the proposed project right-of-way and has extensive cleanups in progress. Sites 12, 13, and 14 are also adjacent to the project right-of-way but are not likely to be impacted by construction.

Construction of the I-5 improvements could require a cut adjacent to or through a portion of the Midway Landfill (Site I-27) (Figure 3.13-3, Table 3.13-1), which is a substantially contaminated site. The Midway Landfill was listed as a National Priority List (NPL) site in 1986 due to contaminated groundwater and air. The Midway Landfill, which operated from 1966 to 1983, was created primarily to accept demolition materials, wood waste, and other slowly decomposing materials, but other industrial wastes were also put in the landfill, including paint sludges, oily wastewater and sludges, alkaline wastes, and coolant. In 1985, combustible gas was detected in structures buried 3,000 feet down from the landfill. Contaminated groundwater was found beyond the landfill boundary.

Known groundwater contamination within the landfill included organic solvents, heavy metals, PCBs, and other organic and inorganic contaminants. In addition, there is potential contamination adjacent to the landfill. This might include contamination from migration of hazardous waste, contaminated groundwater, and/or off-gassing materials from the Midway Landfill into the proposed right-of-way for the I-5 improvements. In September 2000, EPA signed a Record of Decision (ROD) describing the final plan for long-term health and environmental protections at Midway Landfill. Under the ROD, the City of Seattle is required to continue to operate, maintain, and monitor existing environmental systems at the landfill. The City is required to sample groundwater from the site until groundwater cleanup standards have been met.

Because of the proximity of this property to I-5, the landfill's listing as an NPL site, and the potential for groundwater to flow towards I-5, potential impacts on the alignment are considered to be high. The primary problem presented by a cut in this area would be the volume of soil and municipal solid waste, both contaminated and uncontaminated, that would have to be excavated, segregated, removed, and disposed.

Fourteen reasonably predictable sites have been identified in the vicinity of the proposed I-5 corridor improvements. Of these, five sites (Sites I-4, I-5, I-9, I-23, and I-46) are of moderate concern because they are located close to the proposed project but have known impacts on the environment, primarily on groundwater. The remaining nine sites are of low concern because they



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0 1900 3800
Scale in Feet

North

FIGURE 3.13-3

Sites of Concern – I-5 Corridor

SR 509: Corridor Completion/I-5/South Access Road
Environmental Impact Statement

are located at a lower elevation than or downgradient from I-5 or are located at a considerable distance.

Sites that contain contaminated soil or are adjacent to sites that contain contaminated soil that have migrated into the proposed roadway right-of-way could include Kent Highlands Landfill (Site I-4), Kings Dry Cleaners (Site I-5), Midway Auto Body (Site I-7), Gresham Transfer, Inc. (Site I-23), Midway Landfill (Site I-27), and 76 Gasoline Station (Site I-41). Contaminated groundwater is known to be present at each of these sites. Contaminated soil and groundwater encountered during excavation or dewatering would require special handling prior to proper disposal.

USTs present risks should an unknown tank be encountered during excavations because of the explosive hazard and the potential of creating a spill if the tank is ruptured. Fuel storage tanks are known to exist at Midway Auto Body (Site I-7), Circle K Gasoline Station (Site I-34), and 76 Gasoline Station (Site I-41). Heating oil tanks are likely to exist at residential and commercial properties.

Alternative C2 (Preliminary Preferred)

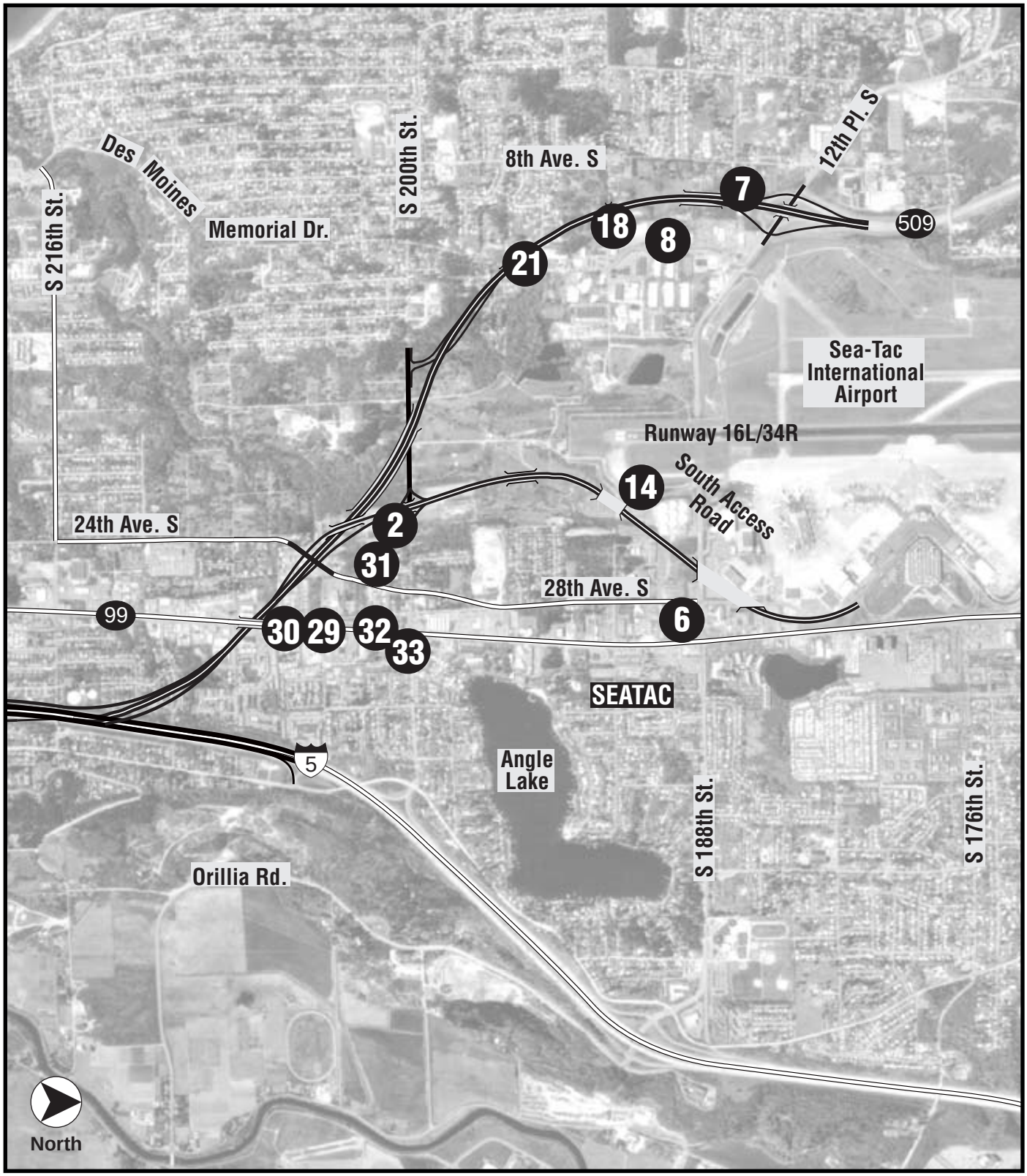
Under Alternative C2, a total of 40 known or suspected contamination sites could be affected by the proposed project. Of these, four sites are considered as substantially contaminated (Sites 2, S-2, S-3, and I-27). All of these are also affected by Alternative B.

Sites of concern potentially affected by construction of the SR 509 freeway extension and South Access Road (west of South 188th Street) include one substantially contaminated site and seven reasonably predictable sites identified for Alternative B, as well as four additional sites: Alamo Rent-A-Car (Site 29), Unocal #3964 (Site 30), Budget-Rent-A-Car of WA-OR (Site 32), and Gull Service Station #263 (Site 33) (Figure 3.13-4, Table 3.13-1). Each of these four sites is considered reasonably predictable and would likely be located within the proposed roadway right-of-way. These sites have the potential for soil and/or groundwater contamination from existing or previously removed fuel tanks.

Sites of concern that could be affected by construction of the proposed South Airport Link design options and I-5 corridor improvements are the same as described under Alternative B.

Alternative C3

Under Alternative C3, a total of 40 known or suspected contamination sites could be affected by the proposed project. Of these, six sites are considered as substantially contaminated (Sites 2, 25, 26, S-2, S-3, and I-27).



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SR 509/South Access Improvements

33 Potential Hazardous Waste Site

FIGURE 3.13-4

Sites of Concern – Alternative C2 (Preliminary Preferred)

SR 509: Corridor Completion/I-5/South Access Road Environmental Impact Statement

Sites of concern potentially affected by construction of the SR 509 freeway extension and South Access Road include three substantially contaminated sites: Battery Power Systems, Inc. (Site 2), affected by Alternatives B and C2 as well as Helen's Auto Sales (Site 25) and Pacific Auto Brake and Muffler (Site 26) (Figure 3.13-5, Table 3.13-1). Both pose a risk of encountering unknown USTs and related piping. The three substantially contaminated sites are located within the proposed right-of-way, and the probability of encountering adverse environmental conditions during construction is high. Alternative C3 could affect nine reasonably predictable sites. Five sites (Sites 7, 18, 21, 24, and 28) are located within the proposed right-of-way, and the remaining four sites (Sites 6, 8, 14, and 27) are adjacent.

Sites of concern that could be affected by construction of the proposed the South Airport Link design options and I-5 corridor improvements are the same as described under Alternative B.

3.13.4 Mitigation Measures

By anticipating and carefully planning for potential hazardous waste issues during design and project planning phases, major liabilities can be prevented or minimized. Where avoidance of a site is not possible, mitigation of construction impacts would be implemented. Mitigation for long-term operation impacts, such as contaminants in roadway runoff and accidental spills, are described in Section 3.5 *Water Quality*.

General Mitigation

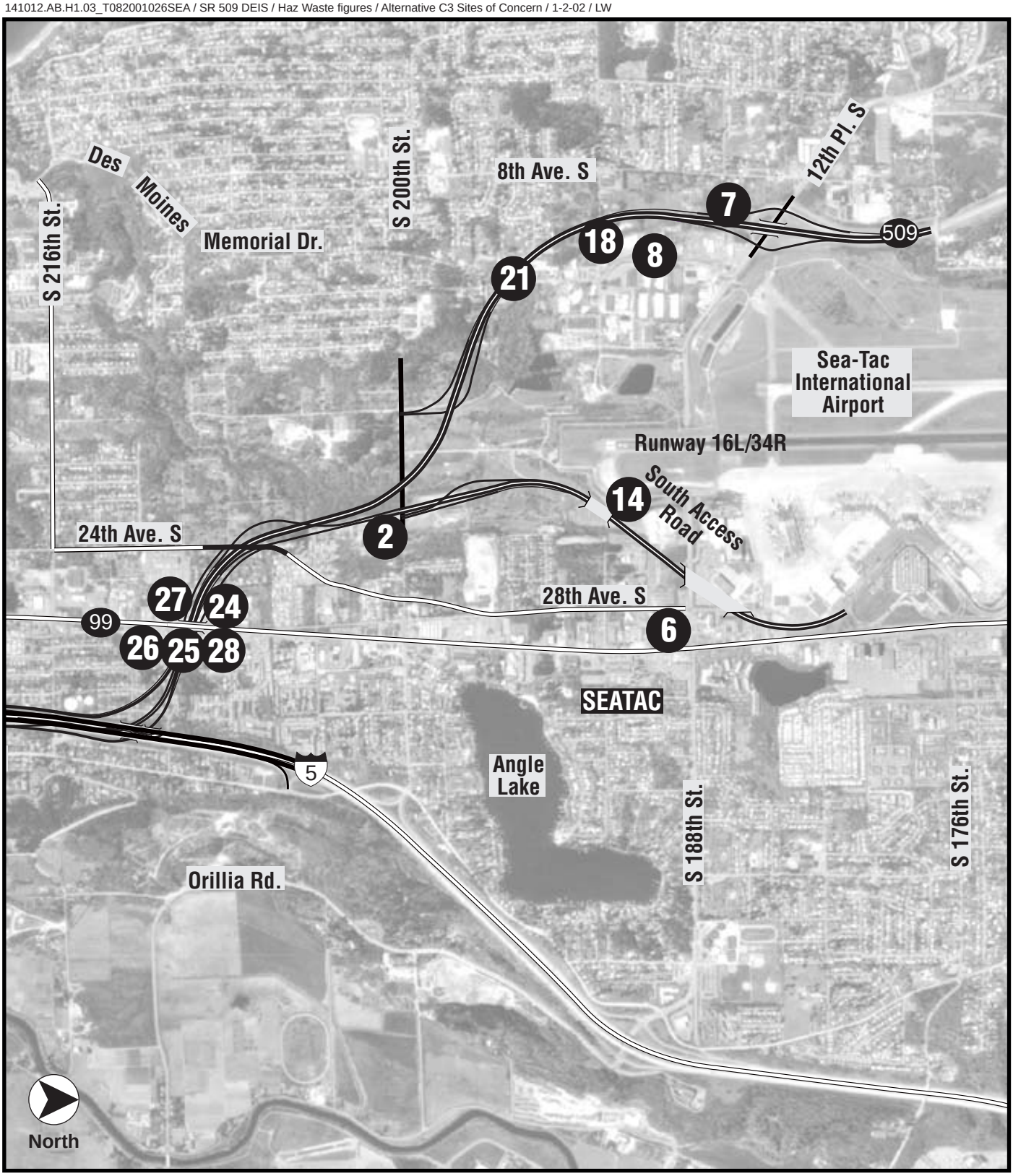
Many construction practices are general and occur whether contamination is present or not. These practices also are important for sites containing hazardous materials. Erosion control and spill prevention planning are two such measures.

Erosion Control

The Erosion Control Plan is an important tool for preventing the erosion of contaminated soil. The plan would be required to address stormwater diversion, use of stormwater conveyance, and covering hazardous waste stockpiles to control erosion of contaminated soils.

Spill Prevention, Containment, and Countermeasures Plan

WSDOT now requires the inclusion of a Spill Prevention, Containment, and Countermeasures (SPCC) Plan specification in all construction contracts. The contractor would use the plan to demonstrate its planning efforts for the prevention and response to spills and emergencies during construction. For this proposed project, the SPCC Plan would address procedures for the release of known contamination, such as soil petroleum contamination, and



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SR 509/South Access Improvements

33 Potential Hazardous Waste Site

FIGURE 3.15-5

Sites of Concern – Alternative C3

SR 509: Corridor Completion/I-5/South Access Road Environmental Impact Statement

materials that the contractor brings onsite. The plan would also need to address procedures when encountering unknown contamination. Examples of unknown contamination would include conveyance piping and unidentified soil contamination. The plan would also need to identify coordination efforts and procedures between the contractor and local and state emergency response agencies both before and during construction.

Building Demolition, Asbestos, and Lead-Based Paint

Generation of building demolition debris, asbestos, and lead paint wastes might occur at some sites. Preconstruction investigation and testing would be needed to determine the location and quantity of asbestos and lead-based paint waste so that these wastes could be appropriately abated prior to demolition. In addition, buildings containing lead-based paint would be sampled to determine the appropriate characteristics of the debris for disposal purposes. Mitigation for asbestos containing materials would include removal and disposal of asbestos-containing material prior to demolition.

Underground Storage Tanks

USTs and associated abandoned fuel lines, potentially containing product, are known to exist at a number of sites in the project area. Home heating oil USTs also might exist at residential displacements. Preconstruction planning and surveys to determine the existence of USTs would be essential. Planning would include contracting contingencies for removal and disposal of USTs and any associated contaminated soil.

Contaminated Soil and/or Groundwater Cleanup

Contaminated soil is present at a number of sites in the project area. Mitigation of contaminated soil would include preconstruction planning to define the areas where contaminated soil would be encountered, designing road cuts to minimize the quantity of contaminated soil that must be managed, and implementing viable cleanup alternatives for contaminated soil.

Potential options for mitigation of contaminated soil would include capping to prevent contact, removal followed by disposal or treatment, and determining alternative cleanup levels using *Interim Total Petroleum Hydrocarbon Guidelines* (Ecology 1997).

Contaminated groundwater is known to be present at a number of sites in the project area. Groundwater impacts could occur if dewatering is a necessary part of construction and might create long-term liability associated with property acquisition. Construction activities such as large excavations can create a migratory pathway or change the movement of contamination in the groundwater by introducing new contaminants or changing the hydraulics of the area. Mitigation of contaminated groundwater impacts could be

accomplished by minimizing treatment and discharge for groundwater generated during dewatering activities. An effective way to do this would be to limit excavation activities to low water table seasons.

Worker Protection

Worker protection would be accomplished by proper training of workers in the recognition and handling of hazardous waste and the proper use of PPE and hygiene techniques. The selected contractor would evaluate what level of PPE is required prior to commencing construction activities in known and potentially contaminated areas. Work with contaminated materials might require that cleanup workers comply with Occupational Safety and Health Administration (OSHA) and Washington Industrial Safety and Health Act (WISHA) training regulations.

Air Quality

Potential air quality impacts associated with hazardous materials were identified for some sites in the project area. Preconstruction planning for potential air quality impacts would be essential. The planning would identify situations in which air quality impacts would be anticipated and develop measures to minimize or mitigate those impacts. Sites where contaminated dust could be generated would be monitored and dust suppression measures implemented. Venting with forced air, worker respiratory protection, and strict enforcement of no open flame regulations could be implemented to mitigate impacts from potential accumulations of dangerous or explosive vapors from contaminated soils and groundwater, as well as low oxygen atmospheres during confined space and tunneling activities.

Contamination of Stormwater Runoff

Preventing the contamination of stormwater runoff would be the most effective means of mitigation. At any of the sites where hazardous wastes are identified or anticipated, implementing a program to divert or prevent contact of stormwater with contaminated materials should be identified and implemented. A standard contract specification detailing the preventive actions that would be followed should be included as part of contract required submittals. Detailed descriptions of mitigation measures to prevent contamination of stormwater runoff are presented in Section 3.5 *Water Quality*.

Human Health

Public health and safety impacts would be a concern for all phases of the proposed project. Mitigation of human health impacts could be achieved through implementation of a public awareness program and public relations policies. Information would be provided to local citizen interest groups and

the media regarding programs implemented by WSDOT for hazardous waste protection.

Dust from excavation activities would be a concern because of traffic close to the project area. Access to the construction area would be restricted to construction workers. In addition, WSDOT now requires that the construction contract include a SPCC Plan specification to ensure that proper planning and handling procedures are followed to prevent and respond to a spill or fire. The SPCC would also lay out the planning coordination effort between WSDOT's contractor and the local fire departments, local emergency management, and any other concerned agencies.

Substantially Contaminated Sites

Air Cargo Road and Northwest Airlines Tank Farm

Construction would require a substantial cut through the Air Cargo Road site and Northwest Airlines Tank Farm area. The primary problem presented by these two sites would be the large amount of soil, both contaminated and uncontaminated, that would be segregated, removed, and disposed. Vertical walls would be constructed where feasible to reduce the amount of contaminated and uncontaminated material requiring excavation.

Construction would likely affect the bioremediation system installed at the former Northwest Airlines Tank Farm. Part of the preconstruction planning would include an update of the bioremediation progress to assess whether the contaminated soil adjacent to the site is cleaned up and how construction might affect the bioventing system in place. No further mitigation would be needed if Ecology considered the soil to be clean. However, removal or capping of contaminated soil would likely be the mitigation options available if the site does not bioremediate with the venting system currently in place.

WSDOT would coordinate with Northwest Airlines, the Port of Seattle, and possibly Ecology to ensure that stakeholders consider construction needs in the cleanup of Northwest Airlines USTs and Air Cargo Road. Coordination would be crucial to outline a plan for treatment, disposal, and construction timing to ensure that the independent cleanup of the Northwest Airlines Tank Farm is achieved.

Battery Power Systems, Inc., Building

The building that housed the former Battery Power Systems, Inc., business could potentially create a construction liability for WSDOT due to the unknown potential or level of contamination that may exist. No record of soil or groundwater sampling was found to evaluate whether former or current use is contaminating the area. This site would need further evaluation and sampling before construction.

Helen's Auto Sales and Pacific Auto Brake & Muffler

The properties operated by Helen's Auto Sales and Pacific Auto Brake & Muffler could create construction liability similar to that of the Battery Power Systems, Inc., building due to the unknown potential or level of contamination that might exist. The limited availability of historic information and current condition of the sites would require further investigation and possibly sampling of the properties if Alternative C3 is the chosen alternative.

Midway Landfill

Construction could require a cut through Midway Landfill or potentially contaminated soils adjacent to the landfill. The proposed I-5 improvements would extend 30 feet from the existing western edge of I-5 asphalt pavement. The current landfill cover system (comprised of layers of low permeability clayey silt/silty clay, a 50-mil synthetic membrane, a geonet drainage layer, one foot of sand and one foot of topsoil planted with shallow rooted grass), borders I-5 for approximately 2000 feet. The membrane liner is placed against the concrete barrier asphalt pavement. Refuse (municipal solid waste) is encountered approximately 15 feet from the edge of the membrane liner. As a result, large amount of soil, both contaminated and uncontaminated, would need to be excavated, segregated, removed, and disposed. The membrane liner would need to be repaired.

In addition, a gas extraction system consisting of a series of gas extraction wells (PD series) are located along the perimeter of the landfill cover system 3.5 to 5 feet away from the existing asphalt shoulder of I-5. The gas extraction wells would have to be reconfigured. Furthermore, in the northern portion of the landfill, two parallel 24-inch drainage lines are located less than 20 feet from the edge of the landfill cover. At least one of the drainage lines would need to be reconfigured.

In summary, potential mitigation activities of Midway Landfill resulting from construction activities that would need to be considered include:

- Geotechnical investigations and waste limit investigations
- Construction of a vertical retaining wall
- Odor control during excavation
- Repair of any damage to the existing geomembrane cover system
- Reconfiguration of the existing landfill gas collection system
- Reconfiguration of the existing drainage lines
- Proper disposal of municipal solid waste

Innovative approaches to cleanup and disposal could further reduce the amount of hazardous materials removal before and during construction. For instance, reconfiguration of the waste behind the retaining wall, but within

the current footprint of the landfill, might eliminate the need for disposal of municipal solid waste.

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3.14 Visual Quality

3.14 Visual Quality

3.14.1 Studies and Coordination

This section is based on the *SR 509/South Access Road EIS Discipline Report: Visual Quality* (CH2M HILL June 2000) and *SR 509/South Access Road EIS: I-5 Improvements Report* (CH2M HILL October 2001). This analysis follows the procedure outlined in Visual Impact Assessment for Highway Projects by the FHWA (FHWA 1981).

In brief, visual resource management (VRM) is a systematic approach for assessing visual resources in a project area and using the findings to assess project impacts. While VRM terminology is not uniform, there is general agreement on the broad elements of the major approaches. These approaches consider visual experience to be the product of both visual resources and viewer response. A project such as a highway causes visual resource change that can be measured objectively. Viewer response to this change, although subjective, usually displays broad patterns of consensus. Thus, visual impacts include both landscape change and viewer response to that change.

The visual environment was assessed through field studies, and the principal features were identified. Photographs were taken of views that might be affected by the proposed project. In addition, meetings and personal interviews were held with representatives of the following agencies: City of SeaTac, Department of Planning and Community Development and Public Works Department; City of Des Moines, Public Works Department and Community Development Department; Port of Seattle, Aviation Planning Department; and WSDOT's Northwest Region.

The starting point for visual assessment is to determine the limits of the visual environment (in other words, the project area), which includes considering the regional landscape, the geographical area from which the proposed project may be visible (its viewshed), as well as the specific views that the proposed project is likely to change or create.

3.14.2 Affected Environment

Regional Visual Characteristics

The terrain of the project area is a rolling plateau that extends north to south and is bordered by parallel valleys carved by glacial action and occupied by Puget Sound and the Green River. The plateau generally rises 100 to 300 feet above the valley floors and the surface of Puget Sound. Most valley walls are moderately steep.

Land use patterns and associated structures relate to the underlying terrain. The flat crest of the plateau is occupied by Sea-Tac Airport. The associated airport terminal and support buildings range from one to four stories in height and are moderate to large in scale. Aviation-related office, hotel, warehouse/ distribution, and industrial uses cluster on the relatively flat ground immediately east and south of the airport and range from one to eight stories in height. The rolling terrain along Des Moines Creek and the gentler valley walls, such as along I-5, are occupied by single-family and multifamily residential uses. The buildings associated with these uses range from one to three stories in height, and their scale ranges from small to moderate. Many of the steeper valley walls support dense greenbelts of primarily deciduous native trees.

Within this regional landscape, scenic views are available from hilltops, plateau edges, valley walls, and shorelines to distant and midground features that include the Cascade Mountains, Mount Rainier, the Olympic Mountains, and Puget Sound and its islands. Local features associated with high-quality foreground views include rock exposures, steep slopes and bluffs, rivers and streams, stands of mature coniferous and deciduous trees, and parks.

Project Visibility

The visual environment that would be affected by a project is limited to the area from which the proposed project would be visible; this area is termed the project viewshed. The project viewshed is also the area that could be seen from the proposed project itself.

Visual Resources

The visual resources in the project area include the following:

- Creeks, sloped areas, wooded areas, and the Tyee Valley Golf Course
- Locations with scenic views to distant features that include Puget Sound, the Olympic Mountains, the Cascade Mountains, and Mount Rainier

Viewers

Identifying the viewers who would see a project and the aspects of the visual environment to which they are most likely to respond is the key to understanding and predicting viewer response to a project's effects on visual resources.

Within the project area, the following are the principal groups likely to view the proposed project and exhibit high viewer sensitivity:

- Persons engaged in recreation at existing sites, including the Tyee Valley Golf Course, Des Moines Creek Park, Angle Lake Park, Barnes Creek

Nature Trail, Des Moines Sports Park, Linda Heights Park, and Midway Park

- Residents of predominantly single-family areas, including the existing Manhattan Hill (8th Avenue South/Des Moines Memorial Drive), Maywood (also known as City Center), North Hill, North Central, Grandview, Midway, and East Federal Way

- Residents of neighborhoods combining multifamily and single-family areas, including the existing Mansion Hill, Pacific Ridge, and South Des Moines, as well as an area in Federal Way west of I-5 (The difference from predominantly single-family areas is in viewing conditions: one-story vs. two- to four-story structures and the degree of view obstruction by trees and structures.)

- Parents, teachers, and children at existing schools and associated play-fields (generally located in residential areas and functioning as community parks when schools are out of session)

Viewer groups likely to exhibit moderate- or low-viewer sensitivity are located in other portions of the project area, listed in order of decreasing sensitivity:

- Travelers along the existing arterial streets, highways, and freeways that traverse the project area

- Employees and visitors in existing office and hotel centers along International Boulevard South, particularly in the SeaTac "International Gateway" area along International Boulevard South between South 176th and South 188th streets, and the SeaTac Angle Lake area along 28th Avenue South between South 192nd and South 200th streets

- Employees and visitors in existing commercial, distribution, transportation, and industrial business areas along International Boulevard South, South 188th Street, 12th Place South, and Des Moines Memorial Drive South between 12th Place South and South 194th Street

- Currently vacant areas, planned for future development as airport-related business centers, including the SeaTac Aviation Business Center

- The Port of Seattle is in the process of implementing the Noise Remedy Program for Sea-Tac Airport. As a result, areas along the east, west, and south sides of Des Moines Creek Park are currently vacant, although planning for their redevelopment for more compatible uses is underway. Much of the area west of 28th Avenue South between South 188th and South 200th streets is also in low-intensity transitional use because the Port of Seattle has acquired it for the SASA.

Key Views of the Proposed Project

Key views have been selected to represent the range of views of the build alternatives within the project area, evaluate the existing visual quality of those views, and assess the visual impacts of these alternatives on the key views. The views 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. The key view locations are listed in Table 3.14-1 and mapped in Figure 3.14-1. (Key view photographs are provided in the Visual Quality Discipline Report (CH2M HILL June 2000) and the *SR 509/South Access Road EIS: I-5 Improvements Report* (CH2M HILL October 2001).

Visual Quality

Evaluating the existing visual quality within the project area provides an indicator of the relative value of visual resources and the importance of potential changes to these resources. Three criteria are used to evaluate the quality of a visual resource: vividness, intactness, and unity. Vividness is the memorability of landscape components as they combine in striking and distinctive visual patterns. Intactness is the visual integrity of the natural and human landscape and its freedom from encroaching elements. Unity is the visual coherence and compositional harmony of the landscape considered as a whole (FHWA 1981). The usefulness of these evaluative criteria are that they can help to identify mitigation measures and assess their relative effectiveness.

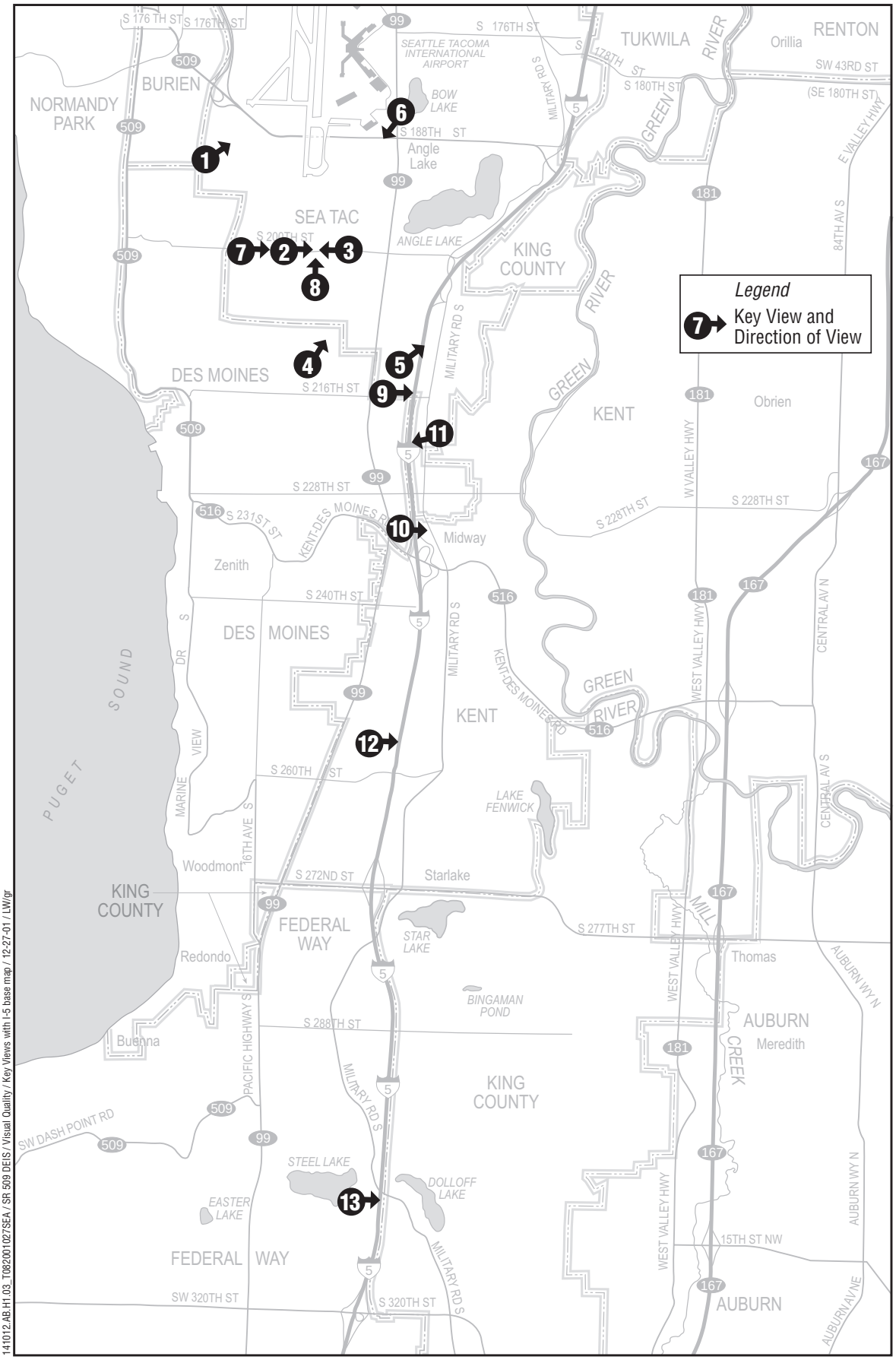
The visual quality rating for each key view is based on the evaluative criteria of vividness, intactness, and unity. The Visual Quality Discipline Report and the I-5 Improvements Report (CH2M HILL June 2000 and October 2001) document in detail those ratings.

Landscape Units

To facilitate the description and analysis of the visual environment likely to be affected by the proposed project alternatives, the foreground landscapes along the route alternatives have been grouped into landscape units having similar visual resource characteristics. These landscape units are described in Table 3.14-2 below and are shown in Figure 3.14-2.

Figure 3.14-2 also characterizes the landscape units in terms of the RCP adopted by WSDOT (WSDOT 1996). The following are the three classifications that appear to coincide with the types of visual character that presently exist within the project area:

Table 3.14-1 Key Views of the Proposed Project			
Key View	**Location**	**Direction**	**Distance**
1	South 192nd Street at Prince of Peace Church parking lot	Northeast	Foreground, Middle ground, Background
2	South 200th Street at Hillgrove Cemetery	East	Foreground, Middle ground
3	South 200th Street and 26th Avenue South	West	Foreground, Middle ground
4	Des Moines Creek Trail	Northeast	Foreground
5	South 211th Street and 32nd Avenue South	Northeast	Foreground, Middle ground
6	South 182nd Street and International Boulevard South	Southwest	Foreground
7	South 200th Street and 14th Avenue South	East	Foreground, Middle ground
8	South 200th Street at Des Moines Creek Trailhead	North	Foreground, Middle ground
9	South 212th Street and 31st Avenue South	East	Foreground, Middle ground
10	Kent-Des Moines Road to South 216th Street	East	Foreground, Middle ground, Background
11	South 216th Street to South 228th Street	West	
12	South 260th Street to South 252nd Street	East	Foreground
13	South 310th Street to South 298th Street	East	Foreground, Middle ground



1410 12.AB.H1.03_T08200102 7SEA / SR 509 DEIS / Visual Quality / Key Views with I-5 base map / 12-27-01 / LW/gr

0 1900 3800
Scale in Feet

North

FIGURE 3.14-1

Key Views of the Proposed Project

SR 509: Corridor Completion/I-5/South Access Road
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Table 3.14-2 Landscape Units			
Landscape Unit No.	**Name and Key View**	**Visual Resources**	**Viewers**
1	Manhattan Hill; Key View 1	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
2	Maywood; Key View 7	Saddle along Des Moines Memorial Drive South, with internal views; mature coniferous trees; established single-family residential neighborhood and eastern portion acquired by Sea-Tac Airport Noise Remedy Program; existing visual quality is moderate	Moderate numbers of residential viewers with high viewer sensitivity, but exposure to mid-ground and distant views obstructed by terrain and dense tree cover
5	Upper Des Moines Creek; Key Views 2 and 8	Moderately broad stream valley with internal views; wooded slopes, bottomland meadows, and riparian trees; Tyee Valley Golf Course 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 midground 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 Trail to north, across South 200th Street and west of Sea-Tac Airport)
6	Lower Des Moines Creek; Key View 4	Narrow stream valley with internal views of steep wooded slopes and stream; Des Moines Creek Park and Trail; existing visual quality is high	Moderate numbers of recreational users with high viewer sensitivity and high viewer exposure to foreground and midground views (trail development in the City of Des Moines will increase numbers)
8	SeaTac Center; Key View 6	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
9	West Angle Lake; Key View 3	Gentle ridgetop with views east to Angle Lake basin and west to Des Moines Creek valley; street trees and ornamental plantings along International Boulevard South; remnant residential plantings within area acquired for the future SASA	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

Table 3.14-2 Landscape Units			
Landscape Unit No.	**Name and Key View**	**Visual Resources**	**Viewers**
		along west side of 28th Avenue South; 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)	multifamily portion of unit, but exposure is limited to foreground views
10	South 208th Street Draw; Key View 5	Saddle that interrupts ridgetop and drains west to Des Moines Creek with internal views; mature coniferous and deciduous trees in undeveloped portion of unit east of SR 99 and along I-5; office and hotel structures appear to be replacing remaining small commercial and industrial buildings along SR 99; large mobile home community west of SR 99; existing visual quality is moderate (most views) to moderately low (views along older commercial sections of SR 99)	Moderate numbers of visitors and employees with moderate viewer sensitivity and viewer exposure limited to foreground views except along filled portion of SR 99 at center of draw; moderate numbers of residential viewers with high viewer sensitivity in mobile-home portion of unit, but exposure is limited to foreground views
11	Mansion Hill; Key Views 5 and 9	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 single-family portion of unit, but exposure is generally limited to foreground views
12	Midway Ridge; Key Views 5, 10, and 11	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
13	Des Moines Creek Terrace; no key view	Relatively level terrace along 24th Avenue South, above Des Moines Creek Park with internal views; western portion acquired by airport noise remedy program, fenced and currently vacant, with dense stands of deciduous trees; eastern portion contains mixed residential	Low numbers of residential viewers with high viewer sensitivity in residential portion of unit, but exposure is generally limited to foreground views by dense tree cover and closure of much of the area to the public

Table 3.14-2 Landscape Units			
Landscape Unit No.	**Name and Key View**	**Visual Resources**	**Viewers**
		neighborhood; existing visual quality is moderate	
14	Midway Terrace; no key view	Relatively level terrace along 24th Avenue South, above Barnes Creek, with internal views; mature coniferous and deciduous trees; established single-and multifamily residential neighborhood 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
15	I-5 East Key Views 12 and 13	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

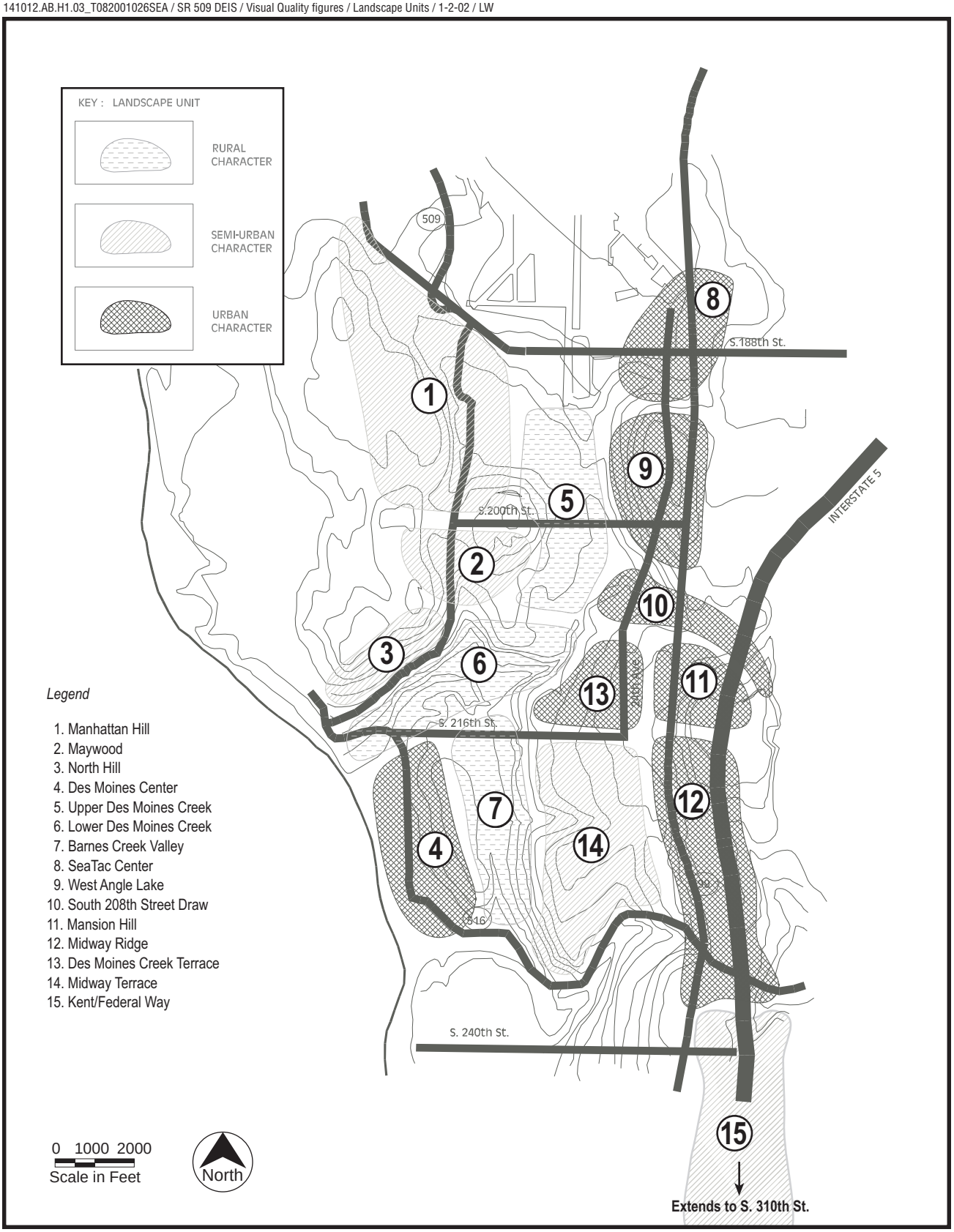

FIGURE 3.14-2

Landscape Units

SR 509: Corridor Completion/I-5/South Access Road Environmental Impact Statement

- Rural, characterized by natural-appearing landforms and vegetation that is predominantly native
- Semiurban landscapes that are transitional in character, with vegetation comprising a combination of native and nonnative species
- Urban, characterized by the predominance of buildings and other development and vegetation that is predominantly nonnative (ornamental) tree, shrubs, and ground cover, with remnants of native vegetation

Much of the project area appears rural and semiurban from the ground because of the amount of tree cover, although the amount of existing development revealed in aerial views could be considered urban.

3.14.3 Environmental Impacts

Project Features

The visibility and appearance of the proposed project build alternatives would be determined by the location and size of project facilities in relation to the adjoining topography, vegetation, and existing human development. Broadly speaking, the build alternatives have eight major visual components: (1) the cleared right-of-way in which the roadway and associated facilities are located, (2) the vertical roadway profile (elevated, surface, or depressed) in relation to existing topography, (3) grading, including cuts, fills, and surface drainage systems and basins, (4) bridges and major architectural elements such as retaining walls, (5) the extent of paved surface (travel lanes and shoulders), (6) roadside appurtenances such as noise walls, impact barriers and attenuators, and directional signs, (7) roadway lighting including standards (poles) and luminaires (light fixtures), and (8) roadside planting.

At the time of writing, preliminary engineering studies were underway, and a number of project design features had not yet been resolved. To complete the preliminary visual impact assessment, the preparers have made the following assumptions about project design:

- Right-of-way acquisition would sufficiently accommodate the grading of cuts and fills to finished slopes averaging 4:1 horizontal to vertical proportions, except where preliminary right-of-way limits indicate otherwise; retaining walls are assumed in these locations, with remaining slopes at 4:1.
- The typical project bridge design would be prefabricated girders supported on concrete bents and piers; retaining structures would be vertical concrete walls.

- The extent of paved surface would be limited to travel lanes and shoulders, with the widths described in the Description of Project Alternatives section of this Revised DEIS (Chapter 2); improvements to South 200th Street, as a result of the project; and the bike path, under Alternative C2 and possibly Alternative C3, would be paved.

- Impact barriers would be provided along the outer edges of all elevated structures, and barriers or guard rails would be provided in areas of high, steep fills.

- Noise walls would be provided along portions of the alignment as determined by WSDOT.

- Roadway lighting would be provided only at proposed project intersections and interchanges.

- Roadside planting would be limited to seeding necessary for slope stabilization and erosion control, without permanent irrigation systems.

Alternative A (No Action)

The visual resources of the project area would not change under the No Action Alternative; therefore, there would be no impacts to the visual environment.

Impacts Common to All Build Alternatives

Existing visual resources could be affected at several levels. First, they might add, alter, or remove some of the visible features that compose the basic visual resources of the landscape. Second, the build alternatives may change the visual character of existing resources and the quality of the views these resources compose. Visual impacts associated with operation of the SR 509/South Access Road Project could also include views of moving traffic and headlight glare.

Alternative B

Visual Resource and Quality Change

Table 3.14-3 summarizes the visual resource change that would be caused by the proposed project in the key views from which Alternative B would be visible. The table also indicates whether the change in quality would be low, moderate, or high. Of the eleven views affected by Alternative B, two views would experience a low level of change, five a moderate level, and four a high level. The four key views with a high level of change are Key View 4

Table 3.14-3 Visual Resource and Level of Quality Change, Alternative B						
Key View/Level of Quality Change	**Modification of Landform**	**Removal of Vegetation**	**Introduction of Manmade Structures**	**View Obstruction**	**Light and Glare**	**Shading**
1/Low (South 192nd Street at Prince of Peace Church parking lot)	SR 509: roadway berm (fill) and transition to cut between existing warehouses and office complex under construction on right (south) edge of immediate foreground South Access Road: most grading not visible (in valley behind and below main runway)	SR 509: removal of trees along Des Moines Way South, beyond office complex under construction on left (north) edge of immediate foreground South Access Road: removal of midground trees on hillside and skyline to east of Des Moines Creek valley (behind main runway)	SR 509: overpass bridge at 12th Place S; luminaires for intersection lighting; directional signs	SR 509: no scenic elements obstructed (project features all below midground skyline) South Access Road: same	SR 509: unlikely (top of luminaires below eye level) South Access Road: same	No shading of scenic resources or sensitive viewing areas is likely
2/Moderate (South 200th Street near 18th Avenue South)	South Access Road: midground cut on east side of Des Moines Creek valley South 200th Street: widen to 3 to 5 lanes (varies)	South Access Road: removal of midground trees on hillside and skyline on left side of South 200th Street South 200th Street: removal of foreground trees in valley for roadway widening	South Access Road: retaining walls likely below the SASA and Federal Detention Center South 200th Street: midground overpass, South Access Road ramps, widen to three to five lanes (varies), and luminaires	South Access Road: no scenic elements obstructed (project features all below midground skyline) South 200th Street: same	South Access Road: possible glare from luminaires at intersection with South 200th Street	No shading of scenic resources or sensitive viewing areas is likely
3/Moderate (South 200th Street & 26th Avenue South)	SR 509: screened by trees on intermediate ridge South Access Road:	SR 509: screened by trees on intermediate ridge South Access Road:	SR 509: screened by trees on intermediate ridge South Access Road:	SR 509: no scenic elements obstructed South Access Road: no scenic elements	SR 509: screened by trees on intermediate ridge South Access Road:	No shading of scenic resources or sensitive viewing areas is likely

Table 3.14-3 Visual Resource and Level of Quality Change, Alternative B						
Key View/Level of Quality Change	**Modification of Landform**	**Removal of Vegetation**	**Introduction of Manmade Structures**	**View Obstruction**	**Light and Glare**	**Shading**
	foreground cut on east side of Des Moines Creek valley South 200th Street: widen to three to five lanes (varies)	removal of foreground trees on both sides of downhill section of South 200th Street South 200th Street: remove trees in valley for roadway widening	removal of buildings in left foreground, retaining walls likely below the SASA and Federal Detention Center South 200th Street: overpass, northbound ramps to South Access Road, widening to five lanes, and luminaires	obstructed (project features all below South 200th Street)	possible glare from luminaires at intersection with South 200th Street	
4/High (Des Moines Creek Trail)	SR 509: some grading or other disturbance of foreground valley walls for bridge abutments, piers and drainage South Access Road: not visible in this view	Possible removal of foreground trees during bridge construction; possible preclusion of regrowth due to rainfall interception	Two bridge structures for SR 509 and access ramps to 24th Avenue South	Partial obstruction of view of valley walls		Increased shading of trail and creek valley, rainfall interception
5/High (South 211th Street and 32nd Avenue South)	SR 509: cut for ramps to I-5	Removal of mature foreground trees (residential plantings and I-5 roadside buffer)	Possible removal of foreground house and other neighboring homes and multifamily residences; exposure of I-5, SR 509 ramps, and HOV flyover ramp; or noise walls	Exposure to unattractive views of I-5	Possible headlight glare from I-5 and SR 509 traffic No roadway lighting likely	No shading of scenic resources or sensitive viewing areas is likely

Table 3.14-3 Visual Resource and Level of Quality Change, Alternative B						
Key View/Level of Quality Change	**Modification of Landform**	**Removal of Vegetation**	**Introduction of Manmade Structures**	**View Obstruction**	**Light and Glare**	**Shading**
6/Low (18200 International Boulevard South)	South Access Road: highway berm steepened and closer to International Boulevard South	Possible removal of existing mature roadside trees	Possible introduction of retaining walls and overpass to North Access Road Future Light Rail Transit alignment may be added to view	No obstruction of scenic resources likely Future Light Rail Transit alignment may obstruct view of South Access Road	Incremental impact (if any roadway lighting added) due to existing lighting along International Boulevard South	No shading of scenic resources or sensitive viewing areas is likely
7/Moderate (South 200th Street and 14th Avenue South)	SR 509: landform modification not visible (beyond crest of South 200th Street) South 200th Street: widen to at least four lanes beyond foreground intersection	SR 509: removal of existing trees visible beyond crest of South 200th Street South 200th Street: removal of trees on left for roadway widening	No highway structures visible	No obstruction of scenic resources likely	SR 509: no additional lighting	No shading of scenic resources or sensitive viewing areas is likely
10/High (Kent-Des Moines Road to South 216th Street)	Cut for interchange off-ramps, collector/distributor lanes, and underpass	Removal of mature vegetation	Construction of additional lanes and underpass, and possible installation of a noise barrier*	No obstruction of scenic resources likely	Light and glare impacts unlikely (top of luminaires below eye level)	No shading of scenic resources or sensitive viewing areas is likely
11/High (South 216th Street to South 228th Street)	Cut for ramps to I-5 and collector/distributor lanes	Removal of mature vegetation	Construction of additional lanes; removal of foreground residences; exposure of I-5; and possible installation of noise barrier*	No obstruction of scenic resources likely	Minor light and glare impacts possible	No shading of scenic resources or sensitive viewing areas is likely

Table 3.14-3 Visual Resource and Level of Quality Change, Alternative B						
Key View/Level of Quality Change	**Modification of Landform**	**Removal of Vegetation**	**Introduction of Manmade Structures**	**View Obstruction**	**Light and Glare**	**Shading**
12/Moderate (South 260th Street to South 252nd Street)	No modification to landforms identified	Removal of mature vegetation	Construction of additional lanes and possible installation of noise barrier*	No obstruction of scenic resources likely	Minor light and glare impacts possible	No shading of scenic resources or sensitive viewing areas is likely
13/Moderate (South 310th Street to South 298th Street)	No modification to landforms identified	Removal of some mature vegetation	Construction of additional lane and possible installation of noise barrier*	No obstruction of scenic resources likely	Minor light and glare impacts possible	No shading of scenic resources or sensitive viewing areas is likely
* *Noise barrier proposed as mitigation (*see Section 3.2, *Noise)*						

(Des Moines Creek Trail), Key View 5 (South 211th Street and 32nd Avenue South), Key View 10 (Kent-Des Moines Road to South 216th Street), and Key View 11 (South 216th Street to South 228th Street).

Viewer Response

Table 3.14-4 indicates the likely degree of viewer response to adverse visual impacts on a scale ranging from high to low, based on viewer sensitivity and exposure. High-sensitivity viewer groups are considered likely to have a high response to visual alteration, whether their exposure is high or moderate. Viewer response would be high at Key Views 1, 4, 5, 10, and 11.

Visual Impacts (View of the Road)

The visual impacts of a project result from two phenomena: physical changes to the visual environment and viewer response to those changes. To determine the visual impact of a key view, the level of visual quality change and viewer response ratings were averaged. The results of this averaging are shown in Table 3.14-5. Alternative B would have high level of impact on Key Views 4, 5, 10, and 11.

In addition, Table 3.14-5 ranks the alternatives in terms of overall visual impacts on the view of the road by assigning 7 points to impacts rated as high, 5 to medium impacts, and 3 to low impacts, and then summing and averaging the ratings. Alternatives B would have slightly less visual impact than Alternative C2, which would have the greatest visual impact of all the alternatives.

Table 3.14-6 summarizes the visual impacts of Alternative B on the view of the road in terms of the landscape units from which each alternative would be visible. The visual impact ratings in these tables have been generalized from the key views to the entire landscape units based on the degree to which affected visual resources and viewing conditions within the units are similar to those represented in the key views.

Visual Experience (View From the Road)

The relative quality of the visual experience afforded by the project build alternatives is an important consideration in project design. One of the project objectives is to “support local and regional comprehensive planning and development,” and consistency with those efforts requires visual quality within the proposed project. For example, the Community Image Background Report included in the SeaTac Comprehensive Plan (City of SeaTac 1994 with 1999 updates) includes recommended actions to “work with Washington State Department of Transportation to preserve and enhance greenbelts within the highway right-of-way” (Action 2B, page A6-10) and to “upgrade visual qualities” and “include visual enhancement in all road improvement projects, such as the SR 509 extension” (Action 3B, page A6-12).

Table 3.14-4
Viewer Response—Key Views

Key View	Alternative B	Alternative C2	Alternative C3
1 (South 192nd Street at Prince of Peace Church)	High	High	High
2 (South 200th Street at Hillgrove Cemetery)	Moderate	Moderate	Moderate
3 (South 200th Street and 26th Avenue South)	Moderate	Moderate	Moderate
4 (Des Moines Creek Trail)	High	None	None
5 (South 211th Street and 32nd Avenue South)	High	None	None
6 (South 182nd Street and International Blvd. South)	Moderate	Moderate	Moderate
7 (South 200th Street and 14th Avenue South)	Moderate	None	None
8 (South 200th Street at Des Moines Creek Trailhead)	None	High	High
9 (South 212th Street and 31st Avenue South)	None	High	High
10 (Kent-Des Moines Road to South 216th Street)	High	High	High
11 (South 216th Street to South 228th Street)	High	High	High
12 (South 260th Street to South 252nd Street)	Moderate	Moderate	Moderate
13 (South 310th Street to South 298th Street)	Low	Low	Low

Table 3.14-5
Visual Impact Rating and Ranking—Key Views

Key View	Alternative B		Alternative C2		Alternative C3	
1 (South 192nd Street at Prince of Peace Church)	Moderate	5	Moderate	5	Moderate	5
2 (South 200th Street at Hillgrove Cemetery)	Moderate	5	Moderate	5	Moderate	5
3 (South 200th Street and 26th Avenue South)	Moderate	5	Moderate	5	Low	3
4 (Des Moines Creek Trail)	High	7	None	0	None	0
5 (South 211th Street and 32nd Avenue South)	High	7	None	0	None	0
6 (South 182nd Street and International Blvd. South)	Low	3	Low	3	Low	3
7 (South 200th Street and 14th Avenue South)	Moderate	5	None	0	None	0
8 (South 200th Street at Des Moines Creek Trailhead)	None	0	High	7	Moderate	5
9 (South 212th Street and 31st Avenue South)	None	0	High	7	Moderate	5
10 (Kent-Des Moines Road to South 216th Street)	High	7	High	7	High	7
11 (South 216th Street to South 228th Street)	High	7	High	7	High	7
12 (South 260th Street to South 252nd Street)	Moderate	5	Moderate	5	Moderate	5
13 (South 310th Street to South 298th Street)	Moderate	5	Moderate	5	Moderate	5
Average		5.54		5.60		5.00
Ranking		2		1		3

Table 3.14-6 Visual Impacts, Alternative B: View of the Road			
Landscape Unit	**Representative View(s)**	**Generalized Visual Impact Rating**	**Visual Impacts**
1	Manhattan Hill; Key View 1	Moderate	Foreground views of SR 509 (including 12th Place South interchange) with associated cut slopes and tree clearing, seen by low numbers of residential viewers with high viewer sensitivity
2	Maywood; Key View 7	Moderate	Foreground views of widened South 200th Street at 14th Avenue South and SR 509 and associated cut slopes and tree clearing behind houses along 15th Avenue South, seen by moderate numbers of residential viewers with high viewer sensitivity
5	Upper Des Moines Creek; Key View 2	Moderate	Foreground views of widened South 200th Street at Des Moines Creek Park entry and trailhead parking lot, 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 South 200th Street
6	Lower Des Moines Creek; Key View 4A	High	Foreground and overhead views of bridge structures for SR 509 and ramps, with associated grading, removal of trees, shading, and interruption of visual continuity of scenic narrow stream valley, seen by moderate numbers of recreational users with high viewer sensitivity
8	SeaTac Center; Key View 6	Low	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
9	West Angle Lake; Key View 3	Moderate	Foreground views of South Access Road with associated cut slopes, retaining walls and tree clearing, as well as widened South 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

Table 3.14-6 Visual Impacts, Alternative B: View of the Road			
Landscape Unit	**Representative View(s)**	**Generalized Visual Impact Rating**	**Visual Impacts**
10	South 208th Street Draw; Key View 5	High	Foreground views of noise walls along SR 509 and South Access Road west of SR 99, seen by high numbers of residential viewers with high viewer sensitivity in mobile home park (although much of the remaining mobile home park may be removed by the 28th/24th Avenue South project and/or the Port of Seattle Noise Remedy Program). Foreground views of tree clearing and 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 single-family housing
11	Mansion Hill; Key View 5 east side	High	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
12	Midway Ridge; Key View 5 (similar, east side)	High	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
13	Des Moines Creek Terrace; no key view	Low	Foreground views of access roadways at intersection with 28th/24th Avenue South, seen by low numbers of residential viewers with high viewer sensitivity but very limited viewer exposure
15	Kent/Federal Way Key Views 10, 11, 12, and 13	High	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

Alternative B would provide the most potential distant views (six) of all build alternatives. The highest quality of these views would encompass the Olympic Mountains and the Puget Sound. Other views would include Sea-Tac Airport and Des Moines Creek Park. Overall, the views provided by Alternative B from the roadway would be the most attractive of all the alternatives.

Alternative C2 (Preliminary Preferred)

Visual Resource and Quality Change

Table 3.14-7 summarizes the visual resource change that would be caused by the proposed project in the key views from which Alternative C2 would be visible. Of the ten key views affected by Alternative C2, two views would experience a low level of change, four a moderate level, and four a high level. The two key views with a high level of change are Key View 2 (South 200th Street near 18th Avenue South), Key View 8 (South 200th Street at Des Moines Creek Trailhead), Key View 10 (Kent-Des Moines Road to South 216th Street), and Key View 11 (South 216th Street to South 228th Street).

Viewer Response

Table 3.14-4 indicates the likely degree of viewer response to adverse visual impacts on a scale ranging from high to low, based on viewer sensitivity and exposure. Under Alternative C2, viewers would have a high response to changes at three of its Key Views 1, 8, 9, 10, and 11.

Visual Impacts (View of the Road)

Table 3.14-5 shows that Alternative C2 would have a high level of impact on Key Views 8, 9, 10, and 11; a moderate level on Key Views 1, 2, 3, 12, and 13; and a low level on Key View 6. Overall, Alternative C2 would have the highest level of impact resulting from views of the road.

The visual impacts by landscape unit for Alternative C2 are presented in Table 3.14-8.

Visual Experience (View From the Road)

Alternative C2 would provide three potential distant views. For the most part these views would be confined and would not be very scenic. Tree-covered hillsides would provide the most visual interest for these views. Overall, the views provided by Alternative C2 from the roadway would be the least attractive of all the alternatives.

Table 3.14-7 Visual Resource and Level of Quality Change, Alternative C2 (Preliminary Preferred)						
Key View/Level of Quality Change	**Modification of Landform**	**Removal of Vegetation**	**Introduction of Manmade Structures**	**View Obstruction**	**Light and Glare**	**Shading**
1/Low (South 192nd Street at Prince of Peace Church parking lot)	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B
2/High (South 200th Street near 18th Avenue South)	SR 509 and South Access Road: midground fill in valley bottom South 200th Street: widen to three to five lanes (varies); widen existing cut on north (left) side at 18th for northbound entrance to SR 509 and southbound exit	SR 509 and South Access Road: removal of midground trees in valley bottom on both sides of South 200th Street South 200th Street: removal of foreground trees for roadway widening and to widen 18th for northbound entrance to SR 509 and southbound exit	SR 509 and South Access Road: viaduct structure in midground for SR 509 across northeast corner of Des Moines Creek Park and park entry, with flyover above for southbound South Access Road South 200th Street: widen to 3 to 5 lanes (varies), and luminaires; widen 18th to provide northbound entrance to SR 509 and southbound exit	South Access Road: no scenic elements obstructed (project features all below midground skyline) South 200th Street: same	SR 509 and South Access Road: possible glare from luminaires at intersection with South 200th Street	Some shading of northeast corner of Des Moines Creek Park, park entry, trailhead, and portion of creek is likely
3/Moderate (South 200th Street and 26th Avenue South)	SR 509 and South Access Road: foreground fill in valley bottom, midground cut on east side of Des Moines Creek valley	SR 509 and South Access Road: removal of foreground trees in valley on both sides of South 200th Street	SR 509 and South Access Road: viaduct structure in valley bottom for SR 509 across northeast corner of Des Moines Creek Park and park entry, with flyover above for	SR 509 and South Access Road: no scenic elements obstructed (project features all below South 200th Street)	SR 509 and South Access Road: possible glare from luminaires at SR 509 intersection with South 200th Street	Some shading of northeast corner of Des Moines Creek Park, park entry, trailhead, and portion of creek is likely

Table 3.14-7 Visual Resource and Level of Quality Change, Alternative C2 (Preliminary Preferred)						
Key View/Level of Quality Change	**Modification of Landform**	**Removal of Vegetation**	**Introduction of Manmade Structures**	**View Obstruction**	**Light and Glare**	**Shading**
	South 200th Street: widen to three to five lanes (varies)	South 200th Street: removal of midground trees along South 200th for roadway widening	southbound South Access Road mainline and overpass for northbound South Access Road mainline South 200th Street: widening to 3 to 5 lanes (varies) and luminaires; widen 18th to provide northbound entrance to SR 509 and southbound exit			
6/Low (18200 International Boulevard South)	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B
8/High (South 200th Street at Des Moines Creek Trailhead)	SR 509: midground fill beyond South 200th Street	SR 509 and South 200th Street: removal of foreground trees on left side of trail and along South 200th Street to right (small number associated with widening)	SR 509 and South Access Road: South Access Road to right in foreground and middle ground; SR 509 bridge crosses over Des Moines Creek and Trail behind and left of viewer	South Access Road: Possible exposure to unattractive views to right	SR 509 and South Access Road: possible glare from luminaires along 509 and South 200th Street/South Access Road interchange	Limited shading of northeast corner of Des Moines Creek Park, and portion of creek is possible (minimized by height of bridge)
9/Moderate (South 212th Street and 31st Avenue South)	SR 509: cut for ramps to I-5	Removal of mature midground trees (residential plantings and I-5 roadside buffer)	Possible removal of midground house and other neighboring homes; exposure of I-5, southbound 509 ramp to I-5; or noise walls	Exposure to unattractive views of I-5	Possible headlight glare from I-5 and SR 509 traffic No roadway lighting likely	No shading of scenic resources or sensitive viewing areas is likely

Table 3.14-7 Visual Resource and Level of Quality Change, Alternative C2 (Preliminary Preferred)						
Key View/Level of Quality Change	**Modification of Landform**	**Removal of Vegetation**	**Introduction of Manmade Structures**	**View Obstruction**	**Light and Glare**	**Shading**
10/High (Kent-Des Moines Road to South 216th Street)	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B
11/High (South 216th Street to South 228th Street)	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B
12/Moderate (South 260th Street to South 252nd Street)	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B
13/Moderate (South 310th Street to South 298th Street)	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B

Table 3.14-8 Visual Impacts, Alternative C2 (Preliminary Preferred): View of the Road			
Landscape Unit	**Representative View(s)**	**Generalized Visual Impact Rating**	**Visual Impacts**
1	Manhattan Hill; Key View 1	Moderate	Similar to Alternative B but includes a bridge over a wetland
5	Upper Des Moines Creek; Key Views 2 and 8	High	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 South 200th Street
8	SeaTac Center; Key View 6	Low	Same as Alternative B
9	West Angle Lake; Key View 3	Moderate	Foreground views of South Access Road with associated cut slopes, retaining walls, tree clearing, and flyover ramp, as well as widened South 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
10	South 208th Street Draw; Key View 5 (similar)	High	Foreground views of tree clearing and 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 single-family housing (much or all of the mobile home park would be removed by Port of Seattle Noise Remedy Program and/or by the 28th/24th Avenue South project)
11	Mansion Hill; Key View 9 east side	High	Same as Alternative B
12	Midway Ridge; Key View 9 (similar, east side)	High	Same as Alternative B
15	Kent/Federal Way; Key Views 10, 11, 12, and 13	High	Same as Alternative B

Alternative C3

Visual Resource and Quality Change

Table 3.14-9 summarizes the visual resource change that would be caused by the proposed project in the key views from which Alternative C3 would be visible. Of the ten key views affected by Alternative C3, one view would experience a low level of change, six a moderate level, and three a high level. The key views with a high level of change are Key View 8 (South 200th Street at Des Moines Creek Trailhead), Key View 10 (Kent-Des Moines Road to South 216th Street), and Key View 11 (South 216th Street to South 228th Street).

Viewer Response

Table 3.14-4 indicates the likely degree of viewer response to adverse visual impacts on a scale ranging from high to low, based on viewer sensitivity and exposure. Viewers under Alternative C3 would have a high response to changes to the same key views as Alternative C2: Key Views 1, 8, 9, 10, and 11.

Visual Impacts (View of the Road)

Table 3.14-5 shows that the SR 509 extension under Alternative C3 would not have a high level of impact on any key views; however, the I-5 improvements would have a high level of impact on Key Views 10 and 11. Alternative C3 would have a moderate level on Key Views 1, 2, 8, 9, 12, and 13, and a low level on Key Views 3 and 6. Overall, Alternative C3 would result in the least level of impact from views of the road for all build alternatives.

The visual impacts by landscape unit for Alternative C3 are presented in Table 3.14-10.

Visual Experience (View From the Road)

Alternative C3 would provide three potential distant views. Like Alternative C2, these views would mostly be confined and not very scenic. Tree-covered hillsides and Sea-Tac Airport would provide the visual interest for these views. Overall, the views provided by Alternative C3 from the roadway would be less attractive than Alternative B and more attractive than Alternative C2.

Table 3.14-9 Visual Resource and Level of Quality Change, Alternative C3						
Key View/Level of Quality Change	**Modification of Landform**	**Removal of Vegetation**	**Introduction of Manmade Structures**	**View Obstruction**	**Light and Glare**	**Shading**
1/Low (South 192nd Street at Prince of Peace Church parking lot)	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B
2/Moderate (South 200th Street near 18th Avenue South)	SR 509 and South Access Road: midground fill in valley bottom South 200th Street: widen to three to five lanes (varies); widen existing cut on north (left) side at 18th for northbound entrance to SR 509 and southbound exit	SR 509 and South Access Road: removal of midground trees in valley bottom on both sides of South 200th Street South 200th Street: removal of foreground trees for roadway widening and to widen 18th for northbound entrance to SR 509 and southbound exit	SR 509 and South Access Road: viaduct structure in midground for SR 509 across northeast corner of Des Moines Creek Park and park entry; overpass beyond for South Access Road mainline South 200th Street: widen to 3 to 5 lanes (varies), and luminaires; widen 18th to provide northbound entrance to SR 509 and southbound exit	South Access Road: no scenic elements obstructed (project features all below midground skyline) South 200th Street: same	SR 509 and South Access Road: possible glare from luminaires at intersection with South 200th Street	Some shading of northeast corner of Des Moines Creek Park, park entry, trailhead, and portion of creek is likely
3/Moderate (South 200th Street and 26th Avenue South)	SR 509 and South Access Road: foreground fill in valley bottom, midground cut on east side of Des Moines Creek valley	SR 509 and South Access Road: removal of foreground trees in valley on both sides of South 200th Street South 200th Street: removal of midground	SR 509 and South Access Road: foreground overpass for South Access Road mainlines, viaduct structure in valley bottom for	SR 509 and South Access Road: no scenic elements obstructed (project features all below South 200th Street)	SR 509 and South Access Road: possible glare from luminaires at 509 intersection with South 200th Street	Some shading of northeast corner of Des Moines Creek Park, park entry, trailhead, and portion of creek

Table 3.14-9 Visual Resource and Level of Quality Change, Alternative C3						
Key View/Level of Quality Change	**Modification of Landform**	**Removal of Vegetation**	**Introduction of Manmade Structures**	**View Obstruction**	**Light and Glare**	**Shading**
	South 200th Street: widen to three to five lanes (varies)	trees along South 200th for roadway widening	SR 509 across northeast corner of Des Moines Creek Park and park entry South 200th Street: widening to three to five lanes (varies) and luminaires; widen 18th to provide northbound entrance to SR 509 and southbound exit			
6/Moderate (18200 International Boulevard South)	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B
8/High (South 200th Street at Des Moines Creek Trailhead)	SR 509: midground fill beyond South 200th Street	SR 509 and South Access Road: removal of foreground trees on right side of the trailhead and along South 200th	SR 509 and South Access Road: SR 509 mainline parallel to trail in immediate foreground; viaduct structure for SR 509 diagonally across Des Moines Creek, trail, and park entry	SR 509 and South Access Road: view north across South 200th to golf course obstructed by viaduct (golf course could be closed or reduced in size by other future actions)	SR 509 and South Access Road: roadway lighting along SR 509 viaduct is unlikely	Some shading of northeast corner of Des Moines Creek Park, park entry, trailhead, and portion of creek is likely
9/Moderate (South 212th Street and 31st Avenue South	SR 509: cut for ramps to I-5	Removal of mature midground trees (residential plantings and I-5 roadside buffer)	Removal of midground house and (possibly) foreground homes; exposure of I-5, southbound SR 509 ramp to I-5; or noise walls	Exposure to unattractive views of I-5	Possible headlight glare from I-5 and SR 509 traffic No roadway lighting likely	No shading of scenic resources or sensitive viewing areas is likely

Table 3.14-9 Visual Resource and Level of Quality Change, Alternative C3						
Key View/Level of Quality Change	**Modification of Landform**	**Removal of Vegetation**	**Introduction of Manmade Structures**	**View Obstruction**	**Light and Glare**	**Shading**
10/High (Kent-Des Moines Road to South 216th Street)	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B
11/High (South 216th Street to South 228th Street)	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B
12/Moderate (South 260th Street to South 252nd Street)	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B
13/Moderate (South 310th Street to South 298th Street)	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B	Same as Alternative B

Table 3.14-10 Visual Impacts, Alternative C3: View of the Road			
Landscape Unit	**Representative View(s)**	**Generalized Visual Impact Rating**	**Visual Impacts**
1	Manhattan Hill; Key View 1	Moderate	Same as Alternative B
5	Upper Des Moines Creek; Key Views 2 and 8	Moderate – High	Foreground views of SR 509 viaduct at entrance to Des Moines Creek Park and trail to south, 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 South 200th Street
8	SeaTac Center; Key View 6	Low	Same as Alternative B
9	West Angle Lake; Key View 3	Moderate	Foreground views of South Access Road with associated cut slopes, retaining walls, tree clearing, and flyover ramp, as well as widened South 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
10	South 208th Street Draw; Key View 5 (similar)	High	Foreground views of tree clearing and 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 single-family housing (much or all of the mobile home park would be removed by Port of Seattle Noise Remedy Program and/or by the 28th/24th Avenue South project)
11	Mansion Hill; Key View 5 east side	High	Same as Alternative B
12	Midway Ridge; Key View 5 (similar, east side)	High	Same as Alternative B
13	Des Moines Creek Terrace (no key view)	Low	Foreground views of project with associated cut slopes, retaining walls, tree clearing, and flyover ramp; seen by low numbers of visitors with low viewer sensitivity inside Noise Remedy Program area (residences cleared by Port of Seattle)
15	Kent/Federal Way; Key Views 10-16	High	Same as Alternative B

3.14.4 Mitigation Measures

A variety of mitigation measures could be employed to partially or fully mitigate the potential adverse visual impacts identified for the build alternatives, including the following:

- Use an interdisciplinary design team to incorporate aesthetic considerations in project design subsequent to the environmental review process.
- Minimize clearing for construction and preserving existing stands of mature trees and other attractive natural vegetation as practical.
- Plant appropriate vegetation within the project right-of-way to preserve the semiurban 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 principles of architectural design to enhance the appearance of project features such as retaining walls and noise walls, including stepping and battering walls to reduce apparent height and scale; using the design vocabulary employed in the Sea-Tac Airport's North Access Road for the structures associated with the South Access Road; using surface texture on concrete surfaces to reduce apparent scale; and using concrete sealants to provide uniform color and help limit graffiti damage.
- Replace existing street trees and other trees (outside the minimum clear zone) to provide screening for sensitive visual resources and viewers (the minimum clear zone is defined in the WSDOT *Design Manual* [2000]).
- Investigate opportunities to acquire sufficient right-of-way 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.
- Design interchange intersections in conjunction with local jurisdictions and with care not to increase waterfowl attractance.

The level of mitigation measures are related to the level of visual impact indicated in the matrices for each landscape unit.

3.14.5 Construction Activity Impacts and Mitigation

Construction Activity Impacts

Temporary visual impacts during construction 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 rights-of-way 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 Measures

During construction, visual impacts could be reduced by locating material and equipment storage in areas that are not prominent. Light impacts could be minimized by shielding roadway lighting so that light sources (such as bulbs) are not directly visible from residential areas and local streets and to limit spillover ambient light in residential areas.

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3.15 The Relationship Between Local Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity

3.15 The Relationship Between Local Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity

With any development project, there are tradeoffs between impacts on the natural and man-made environments and the resulting project-related benefits. Each of the build alternatives considered in this Revised DEIS has similar, albeit varying, impacts that are common for transportation improvement projects, including right-of-way acquisition and the resulting displacement and relocation of structures, residences, and business establishments; economic changes; increased traffic noise; changes in the visual environment; and loss of natural areas such as wetlands and wildlife habitat. These impacts, however, are not considered to outweigh the long-term benefits of the project, and, in general, can be mitigated. The proposed improvements are designed to meet future traffic needs of the local community and the larger region that have been identified as resulting from projected growth and development trends. The project is expected to result in a long-term improvement in public mobility, access, and safety. It can be concluded, therefore, that the local short-term impacts and use of resources by the proposed project are consistent with the maintenance and enhancement of long-term productivity for the Puget Sound community.

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3.16 Irreversible and Irretrievable Commitments of Resources That Would Be Involved in the Proposed Action

3.16 Irreversible and Irretrievable Commitments of Resources That Would Be Involved in the Proposed Action

Implementation of the proposed action would involve the commitment of a range of natural, physical, human, and fiscal resources. The acquisition and use of land for the proposed improvements is considered an irreversible commitment during the period of the time that the land is used for a transportation facility. If a greater need arises for use of the land or if the roadway facility is no longer needed, the land could be converted to another use. At present, there is no reason to believe such a conversion would ever be necessary or desirable.

Considerable amounts of materials, labor, and energy would be expended during construction. These resources are generally not retrievable. Some of the materials, however, could be salvaged in the future when the life of the facility is completed and/or the facility is demolished. The resources used in the construction of the proposed facility are not in particularly short supply, and their use would not have an adverse effect on the continued availability of these resources.

Construction would require a substantial expenditure of both state and federal funds, which are not retrievable. Operation and maintenance of the proposed facility would also commit energy, human, and fiscal resources over the life of the roadway. The commitment of these resources is considered irretrievable.

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3.17 Secondary and Cumulative Impacts

3.17 Secondary and Cumulative Impacts

3.17.1 Secondary Impacts

The CEQ defines secondary impacts as "those that are caused by an action and are later in time and farther removed in distance but still foreseeable." These impacts are induced by the initial action.

The SR 509: Corridor Completion/I-5/South Access Road Project is consistent with local and regional land use plans that have already addressed growth. A similar level of projected growth is expected to occur in the project area with or without the project. Although the proposed project would support and facilitate planned growth, it would not induce growth. Additionally, there are no specific future development activities currently known that would be so dependent on the project that they would not proceed without the proposed project. Therefore, no secondary impacts are expected to result from the SR 509: Corridor Completion/I-5/South Access Road Project.

3.17.2 Cumulative Impacts

Cumulative impacts are those that "result from the incremental consequences of an action when added to other past and reasonably foreseeable future actions." The cumulative impacts of an action may be undetectable, but can add to other disturbances and eventually lead to a measurable environmental change.

The cumulative impacts evaluation for this Revised DEIS includes the transportation improvements shown on Figure 2.3-3 for the No Action Alternative in conjunction with the proposed project. These projects are assumed to be operational in the year 2020. The cumulative impacts discussion also includes the following projects:

- SeaTac Master Plan development, including the third runway and SASA
- SeaTac Airport Noise Remedy Program
- Des Moines Creek Technology Campus
- City of Des Moines Pacific Ridge Neighborhood Improvement Project
- City of SeaTac CBD
- City of SeaTac Aviation Business Center
- City of SeaTac 24th/28th Avenue South Arterial
- Des Moines Creek Basin Plan

These projects have already been, or will be, subject to separate environmental reviews; analysis of their specific impacts is not included in this Revised DEIS.

In a broad sense, all impacts on affected built and natural environment resources are cumulative. However, CEQ guidelines recommend a narrowing the focus of

the cumulative impacts analysis to important issues of national, regional, or local significance so as to "count what counts." For the SR 509: Corridor Completion/I-5/South Access Road Project, the cumulative impacts analysis focuses on surface water quality, fish and fish habitat, and wetlands because of their heightened importance in the Puget Sound region, and on residential displacements and relocations because of their importance on a local level.

The geographic limits of the project area for the cumulative impacts evaluation for surface water quality, fish and fish habitat, and wetlands are the five stream basins in which the proposed project is located: Miller Creek, Des Moines Creek, Lower Puget Sound, Mill Creek, and Lower Green River. The project area for displacements and relocations is the Cities of SeaTac, Des Moines, and Kent.

Surface Water Quality

Rivers streams and lakes in the project area have been extensively altered by development during the past century. The riverbed of the Lower Green River has been lowered and channelized for flood control purposes. Early last century, the Green River lost a significant source of its water with the diversion of the Cedar River to the south end of Lake Washington to supply water for the ship canal and locks between the lake and Puget Sound, and diversion of the White River to the Puyallup River.

Streams within the project area have also undergone considerable change. Most of the development within the stream basins has occurred in the past 50 years. There have been some declines in the quality of the streams. These include the typical pollutants associated with urban development—nitrogen, phosphorus, oil and grease, coliform, bacteria, and detectable levels of some herbicides and pesticides. However, the more serious and pervasive effects upon streams have been physical. Direct stream impacts resulting from past development include bank armoring and widening for flood control. In the past, it was common practice to route a stream into an underground culvert for hundreds or even thousands of feet to pass under a highway or developed property.

Streams now typically experience higher peak flows than they historically did. As a result, channel scouring and widening are common. Channel scour and bank erosion often lead to heavy sedimentation in low-gradient and downstream sections, particularly at stream mouths.

By the 1970s, there was recognition among the state and local agencies that some form of stormwater controls for new development was needed. Since then, several stormwater management plans, guidelines, and regulations have been issued, including the *Puget Sound Water Quality Management Plan*; the King County *Surface Water Design Manual*; and the Department of Ecology *Stormwater Management Manual for the Puget Sound Basin*, which has recently been revised. Implementation of these stormwater regulations and policies

assures that the rate of hydrologic and water quality degradation in developing areas will be greatly reduced from those that historically occurred.

Because stormwater regulations will continue to evolve, future water resource conditions in the project area are difficult to predict. Even with implementation of stormwater treatment and detention measures for all new development, increases in pollutant loads and adverse changes in existing hydrology to streams within the project area are likely to occur in streams within the project area.

The proposed project is located in five drainage basins: Miller Creek, Des Moines Creek, North Lower Puget Sound subbasin, Mill Creek, and Lower Green River. Each of these basins and subbasins lie completely within the designated UGBs of one or more jurisdictions. Because UGBs entirely cover the basins, full development can be expected to occur in the future.

Des Moines Creek basin will have the greatest percentage of high-density land uses, as designated by applicable comprehensive land use maps; which suggests a higher cumulative impact for the Des Moines Creek basin than the other basins. Approximately 35 percent of the basin is currently covered with impervious surfaces that drain to the steam system, well above the 10 percent impervious area threshold at which streams in the region typically start to show obvious signs of serious degradation. At buildout, urban development is expected to increase the impervious surface area in the basin to over 47 percent, an increase of 12 percent (Des Moines Creek Basin Committee, 1997).

Based on local comprehensive plans, the Mill Creek and Lower Green River basins will have the least high-density development in the future, thereby incurring the least cumulative impacts. Miller Creek Basin and North Lower Puget Sound Subbasin are quite similar with respect to future land use, and will have a moderate amount of high-density uses in the future, resulting in fewer cumulative impacts than the Des Moines Creek Basin, but more than the Mill Creek and Lower Green River basins.

Two of the largest projects currently proposed in the area are the SR 509 Corridor Completion/I-5/South Access Road and Sea-Tac Airport Master Plan improvements, including the SASA and new third runway. Together, these projects would contribute approximately 4 percent to the expected increase in impervious surfaces in Des Moines Creek basin, and 2 percent in Mill Creek basin (CH2M HILL October 2001, FAA and the Port of Seattle, 1996).

Fish and Fish Habitat

The GMA requires all cities and counties in the state to conduct planning for growth and protection of sensitive areas, and has more extensive requirements for the largest and fastest-growing cities and counties in the state. By requiring definition of Urban Growth Areas, the GMA relieves development pressure on

urban areas that generally contain the most viable fish habitat. King County and the Cities of SeaTac, Des Moines, Kent, and Federal Way have adopted sensitive areas ordinances that include the protection of wetlands and steams, with more stringent protection for streams that provide salmonid habitat. These ordinances establish restrictions on disturbance of aquatic habitat, including stream disturbance, wetland filling, and buffer encroachment.

The federal ESA established a legal framework to protect species considered to be in danger of extirpation. There are two classifications under which a species may be listed: Species determined to be in imminent danger of extinction throughout all of a significant portion of their range are listed as "endangered." Species determined likely to become endangered in the foreseeable future are listed as "threatened."

Two fish species occurring within the project area have been listed under the ESA: Puget Sound chinook salmon was listed as threatened in March 1999, and the Coastal-Puget Sound DPS of bull trout was listed as threatened in October 1999.

A year after the chinook salmon listing, Section 4D rules were published by the NMFS, which among other things, dictate control of stormwater and protection of streams and lakes that form habitat for wild chinook. This has had the short-term effect of expanding federal review over many types of development formerly subject only to local review. It is likely that over the long term, modifications to the 4D Rule and the development of habitat conservation plans will lead to a more streamlined approval process than is currently the case. It is clear that community land use plans and major development projects must specifically weigh potential impacts on streams and fish and be prepared to demonstrate adequate off-setting mitigation.

Agencies including the NMFS and WDFW have tracked population trends for anadromous salmonids. Although fish populations naturally fluctuate in response to factors such as climate variations, nearly all native salmonid populations in the region have undergone a severe declining trend since the human population began rapidly increasing over the past century.

Detailed information on the current state of fish populations and habitats is provided in Section 3.7 and the *Draft SR 509: Corridor Improvements/I-5/South Access Road Biological Assessment* (Shapiro & Associates, 2001).

Within the project area, the high rate of population and employment growth has driven the recent trend in adverse impacts on fish and fish habitat, primarily through habitat degradation. The effectiveness of regulatory protection for fish and fish habitat in counterbalancing the effects of projected growth in the project area cannot reliably be assumed. As discussed in the previous section, creating new impervious surfaces associated with development is a predictor of fish habitat degradation. Des Moines Creek Basin will have the greatest amount

of high density development and Mill Creek and Lower Green River basins will have the least.

Capital improvement projects identified in the Des Moines Creek Basin Plan include fish passage improvement at Marine View Drive, which is the major fish barrier in the Des Moines Creek system, as well as fish passage improvements at the Midway Treatment Plant, and measures to stabilize the flow regime of Des Moines Creek. These improvements, together with planned stream restoration and riparian zone enhancement, would improve anadromous fish access and habitat within the Des Moines Creek system.

Wetlands

Wetlands have not been recognized historically for their ecological importance. Many of these areas were filled, dredged, or developed to make the land useful for housing, industry, and agriculture. Between 1780 and 1980, the state of Washington lost an estimated 31 percent of its wetlands. Since that time, wetlands have been identified as providing important economic and environmental functions, such as protecting floodwaters, filtering sediment and pollutants, and providing spawning areas for commercially important fish and habitat for many important species of plants and wildlife.

In 1989, Washington adopted state goals for no net loss of acreage or ecological function of wetlands. These goals reflect the Clean Water Act, federal legislation that prohibits the discharge of soil into waters of the United States unless authorized by a permit issued under Section 404 of the Act. The USACOE has authority over such actions and requires the permittee to restore, create, enhance, or preserve nearby wetlands as compensation for the damage. This means of compensatory mitigation is intended to comply with the general goals of the Clean Water Act and the specific goal of "no net loss" of wetlands. Several regulations have been enacted on a federal and local level to achieve these goals. King County, and the Cities of SeaTac, Des Moines, Kent, and Federal Way have adopted sensitive areas ordinances that include the protection of wetlands and their associated buffers.

Urbanization is the primary cause of wetland loss within the central Puget Sound region and the project area. According to a 1998 WDNR publication, more than 90 percent of the wetlands in urban areas in Washington have been lost. Despite the goal of "no net loss," studies show that these goals are not being met. The magnitude of impacts on wetland functions is unknown. Primary wetland functions lost in the project area are due to an increase of impervious surfaces, which reduces aquifer recharge and alters wetland hydrology, and a decrease in overall wetland area and functional capability. These functions primarily include fish and wildlife habitat, stormwater retention, and sediment and toxics retention.

Future trends in wetland regulation are likely to focus on compensatory mitigation requirements. Regulatory agencies are expected to develop procedures to track the success and completion of mitigation efforts as this focus of mitigation efforts is moving towards emphasizing the replacement of wetland functions, rather than replacement of wetland area. In addition, research and publications show strong indication that mitigation banking is becoming a more favored means of mitigating wetland loss.

In evaluating cumulative impacts on wetland resources, there is a general correlation between increased urbanization and loss of wetland area and functions. As urban areas approach full build-out, there is not only direct loss of wetland area and function, but lack of suitable wetland mitigation sites. This lack results in a greater tendency toward out-of-basin and out-of-kind mitigation that does not replace the loss of wetland function within the watershed. Within the project area, this impact is greatest within the Miller Creek and Des Moines Creek basins because of the combined impacts of several large projects, most notably the Sea-Tac Airport Master Plan improvements, including the new third runway and SASA, which would have a combined wetland impact of approximately 12 acres (FAA and the Port of Seattle, 1997).

If cumulative impacts on large, high quality wetland systems were weighted most heavily, impacts would expected to be greatest in the Lower Green River Basin, which has the greatest number of high quality wetlands in the project area, and least in the Des Moines Creek basin.

Displacement and Relocation

Cumulative displacement and relocation impacts would be related to the additive effects of displacements related to this project and other area projects: 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 single-family and multifamily residences within the Noise Remedy Program acquisition area, primarily in the City of SeaTac.

The *Final Environmental Impact Statement for Proposed Master Plan Update Development Actions at Seattle-Tacoma International Airport* (Port of Seattle 1996) has identified 391 single-family displacements, 260 multifamily displacements, and 117 business displacements associated with the Third Runway. Displacements resulting from the Third Runway project would occur mainly to the west of Sea-Tac Airport and would be caused by construction of the runway. Some businesses located south of South 188th Street and east of Des Moines Memorial Drive would be displaced because of their location within the future third runway's RPZ.

The *Final Environmental Impact Statement for the 28th/24th Avenue South Arterial* has two preferred alternatives listed—Alternative 3 and Alternative 5

(Ficklin 1993). The City of SeaTac has confirmed that a final design for 28th/24th Avenue South is not available at this time; the final design for later phases (farther south) will proceed following the final design of SR 509 so that City engineers can best determine how to connect the two projects (Gut pers. comm. 2000). According to the Final EIS, as many as 26 single-family residences could be displaced. Approximately half of these identified displacements are within the footprint of the proposed SR 509 alternatives.

The Port of Seattle, according to FAA noise mitigation policy (Part 150), has committed to relocating all of the mobile homes in the Homestead Park neighborhood as part of their current noise mitigation plan, with relocations occurring within the time frame prior to or concurrent with construction of the proposed project. Approximately half of these mobile homes would otherwise be in the footprint of this project. The mitigation plan is independent of the proposed project and is based on current and future noise levels and the ability to mitigate certain types of residences from higher noise levels. The relocation of the mobile homes would represent a loss of generally affordable housing options.

4. Draft Section 4(f) Evaluation

4. Draft Section 4(f) Evaluation

4.1 Introduction

Federal law 23 U.S.C. Section 138, which is commonly known as Section 4(f) from its previous designation in the Department of Transportation Act of 1966 as 49 U.S.C. 1653(f), prohibits FHWA from using land from a publicly owned park, recreation area, wildlife or waterfowl refuge, or historic site except if (1) there is no feasible and prudent alternative to the use of the land and (2) if the project includes all possible planning to minimize harm to the property. If a feasible and prudent alternative that avoids such use is available, it must be selected. If such use is unavoidable, then measures must be identified that minimize and mitigate for direct and indirect harm to the property.

Section 4(f) provides a mandate to make special efforts to "preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites." The special efforts include a Section 4(f) Evaluation, which entails a detailed description of affected resources, discussion of direct (property acquisition) and indirect impacts on these resources from project alternatives, identification and evaluation of alternatives that avoid such impacts, and mitigation measures to minimize unavoidable adverse effects. Indirect impacts occur when the proposed project does not use land from a Section 4(f) property, but the project's proximity impacts (such as effects of noise or impacts on visual values of a park) are severe enough that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are substantially impaired according to 23 CFR 771.135(p)(2). Indirect impacts of this nature are referred to as a "constructive use."

4.1.1 Purpose and Need for the Proposed Action

The purpose of the SR 509: Corridor Completion/I-5/South Access Road Project is to improve regional highway connections with an extension of SR 509 from its current terminus to I-5 to serve future transportation needs in southwest King County and to enhance southern access to Sea-Tac Airport.

This project is needed to satisfy current and forecasted regional transportation demand, improve regional mobility and safety, and relieve local congestion. Improved southern access to the airport is needed to accommodate the increasing demands of passenger growth.

Chapter 1 of this Revised DEIS provides a more detailed discussion of the purpose of and need for the project.

4.1.2 Description of the Action

The FHWA, the WSDOT, the Port of Seattle, King County, and the Cities of Des Moines and SeaTac propose to improve regional highway connections with an extension of SR 509 to serve future transportation needs in southwest King County and to enhance southern access to and from Seattle-Tacoma International Airport (Sea-Tac Airport) by means of a new South Access Road. (Figure 4.1-1 shows the location of the project area within the larger metropolitan area and Figure 4.1-2 shows the details of the project area.) To accommodate an interchange at I-5 and SR 509, improvements to I-5 between approximately South 210th Street and South 310th Street are also proposed.

Three build alternatives (Alternatives B, C2, and C3) and a No Action Alternative (Alternative A) are considered in this Revised DEIS.

Alternative A (No Action)

The No Action Alternative (Figure 4.1-3) represents the baseline conditions assumed to exist in the future regardless of whether the proposed project is constructed. Under the No Action Alternative, the SR 509 freeway extension, the South Access Road to Sea-Tac Airport, and the improvements to I-5 would not be built. This alternative, as well as the other alternatives, is defined in Chapter 2.

Features Common to All Build Alternatives

Each alternative for the SR 509 freeway extension would originate at approximately South 188th Street/12th Place South. The northern terminus of the South Access Road would be at the south end of the airport terminal drives. The southern terminus of the South Access Road would connect with the SR 509 freeway extension; the location and design of this connection would vary with each alternative. There would be interchanges at South 200th Street and 28th/24th Avenue South, but not at SR 99. Improvements to I-5 would be the same for all build alternatives.

SR 509 Mainline/South Access Road

The configuration of the SR 509 freeway extension would be six lanes: two general purpose travel lanes and an inside HOV lane in each direction. The South Access Road would consist of two general purpose lanes in each direction, for a total of four lanes. In general, right-of-way widths would be at least 200 feet for the SR 509 freeway extension and at least 120 feet for the South Access Road. The SR 509 freeway extension would be designed to LOS D and a speed

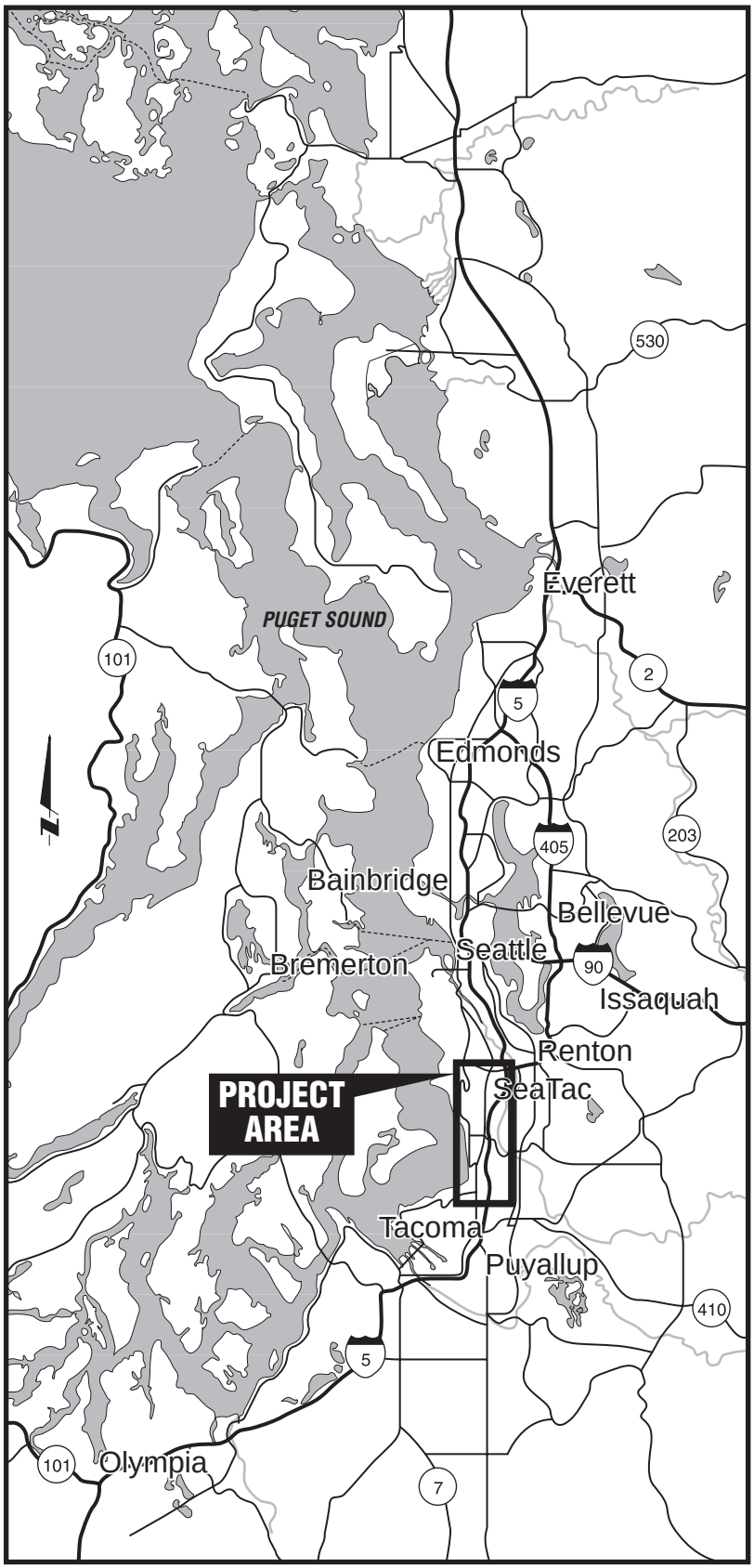

FIGURE 4.1-1

Project Area Location Map

SR 509: Corridor Completion/
I-5/South Access Road
Environmental Impact Statement

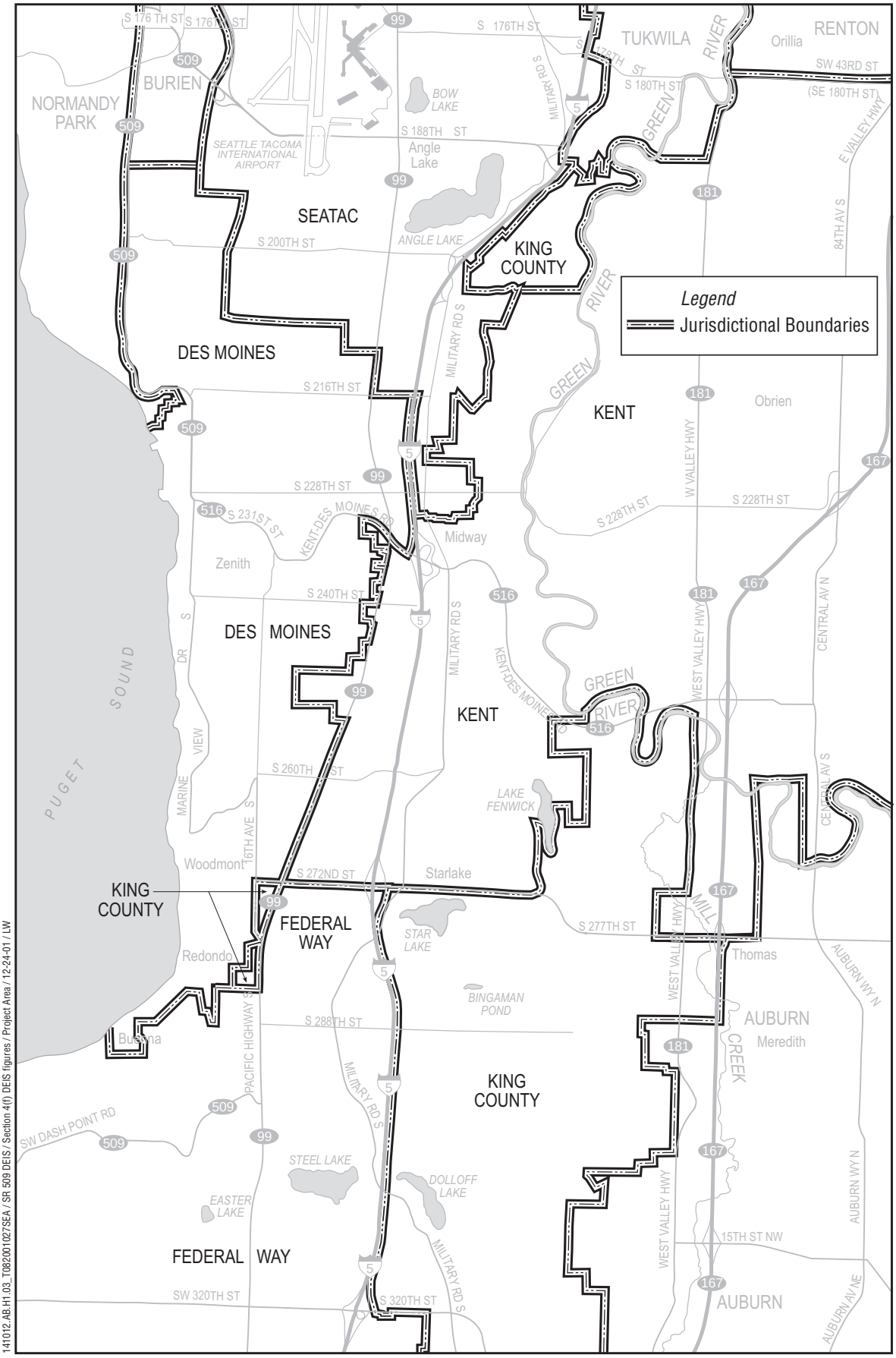

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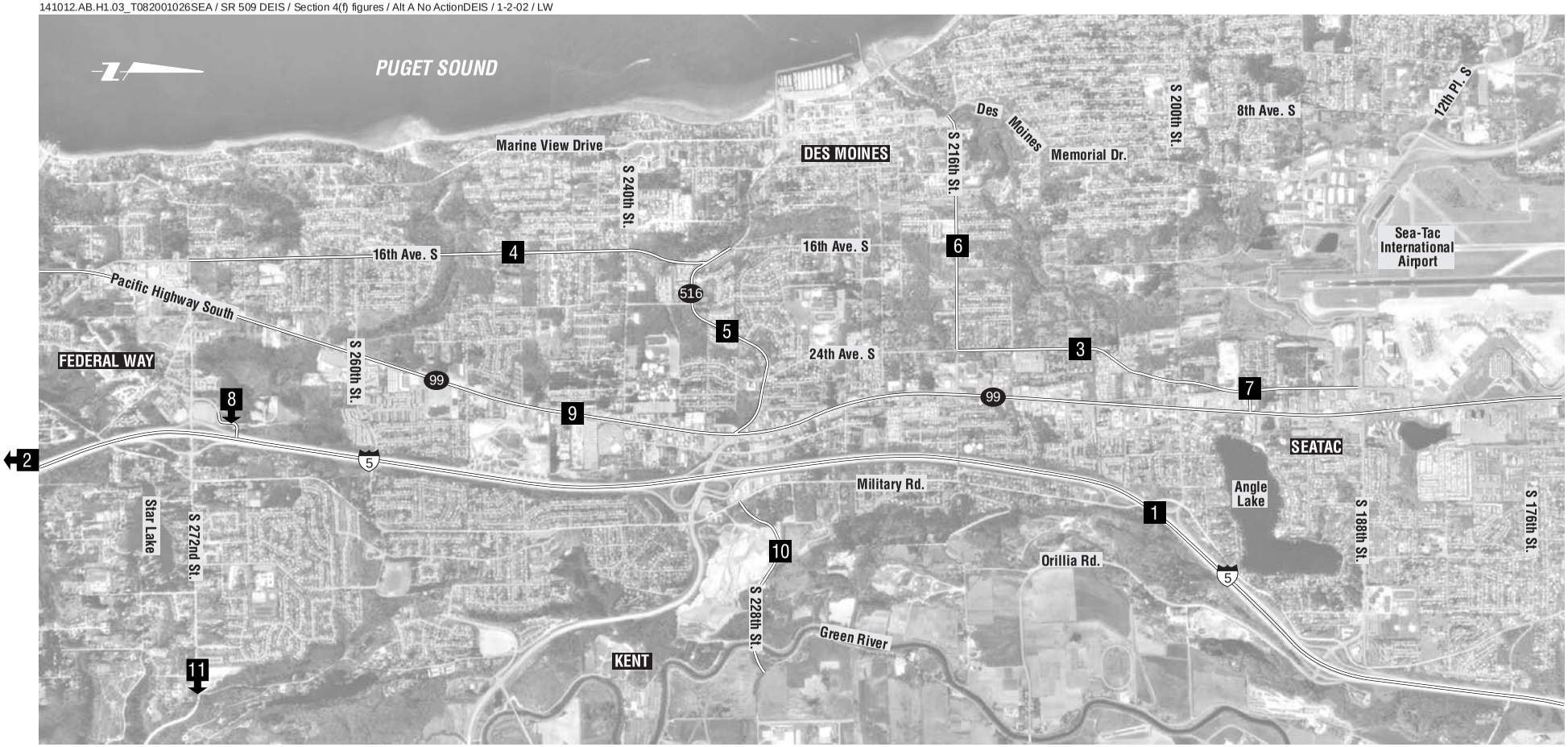
FIGURE 4.1-2

Project Area

SR 509: Corridor Completion/I-5/South Access Road
Environmental Impact Statement



Legend

Baseline Projects by others

0 1/4 1/2 3/4 1 MILES

Baseline Projects Assumed for No Action Alternative.

1. I-5 HOV Lanes
2. I-5 @ S. 317th Street Direct Access Ramp
3. 28th/24th Avenue S. Arterial (Phase 1 completed – S. 188th to S. 204th Streets)
4. 16th Avenue S.
5. Kent-Des Moines (SR 516) Road
6. S. 216th Street
7. S. 195th Street
8. I-5 @ S. 272nd Street In-Line Station
9. Pacific Highway S./International Boulevard (SR 99) (Phases 1 and 2 completed – S. 170th to S. 200th Streets)
10. S. 228th Street
11. S. 272nd/S. 277th Street Corridor

FIGURE 4.1-3

Alternative A (No Action)

SR 509: Corridor Completion/I-5/South Access Road Environmental Impact Statement

of 70 miles per hour (mph). The South Access Road would be designed to LOS D and a speed of 35 to 45 mph.

South Airport Link

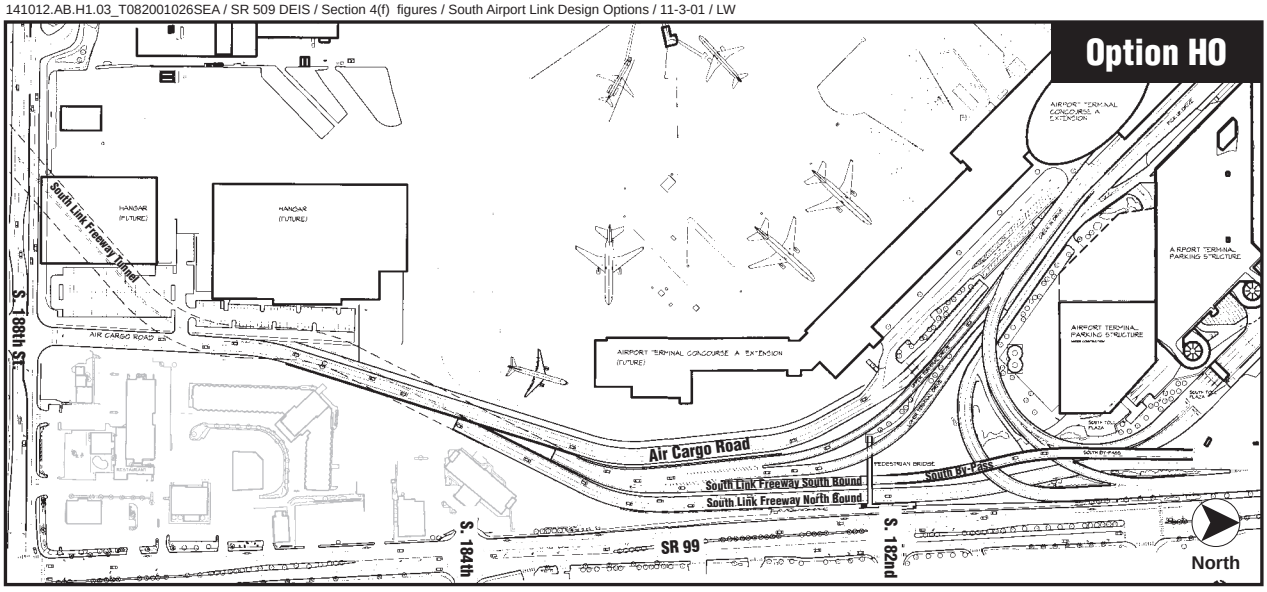
The South Airport Link, the last 1,000 feet of roadway connecting the South Access Road to the existing airport roadways, has three design options. At the south end, each design option crosses beneath South 188th Street and the southeast corner of Sea-Tac Airport via a tunnel. At the north end, the design options would maintain both southbound and northbound connections from the upper and lower terminal drives. Under Design Option H0, Air Cargo Road and the South Access Road would be "stacked" via an extended “S”-curve tunnel structure (Figure 4.1-4). Under Design Option H2-A, Air Cargo Road and the South Access Road would generally parallel each other and would be separated by medians (Figure 4.1-4). Design option H2-B would be essentially the same as Design Option H2-A, except that it would provide local access routes for northbound and southbound traffic at the intersection of South 188th Street and 28th Avenue South (Figure 4.1-4).

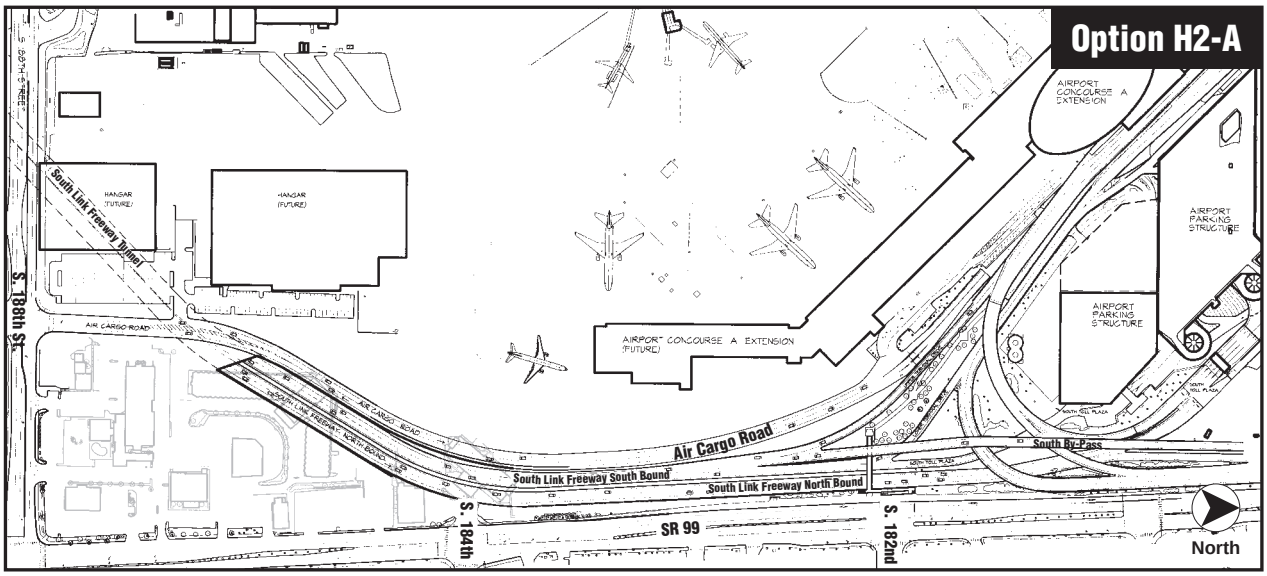
Improvements to I-5

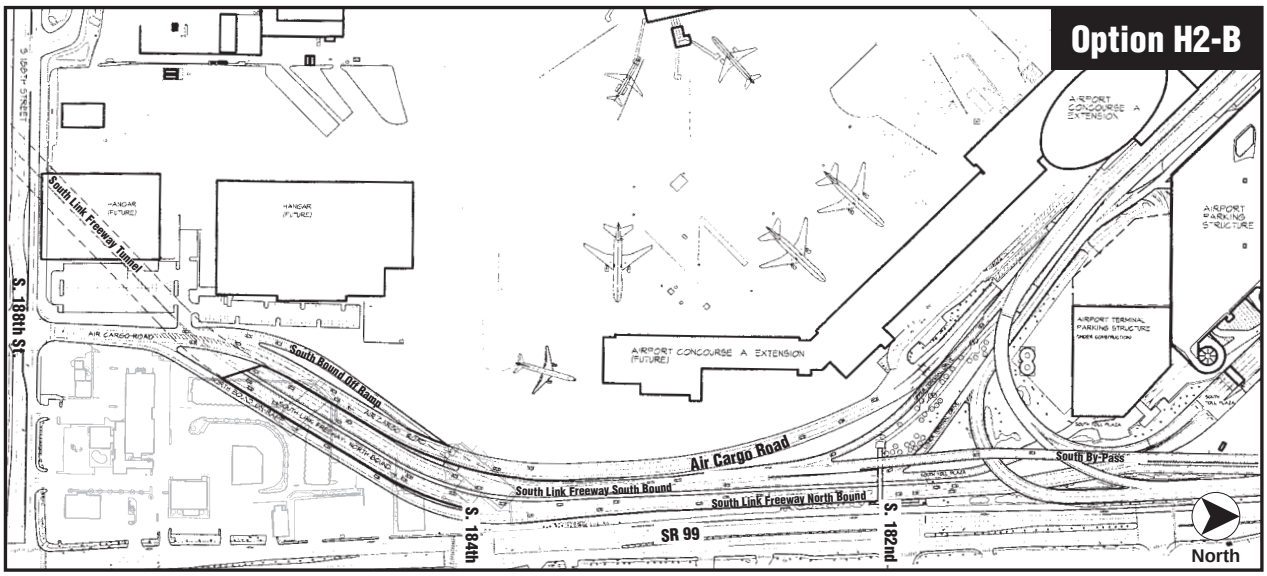
The southbound improvements to I-5 would include two new C/D lanes between the SR 509 convergence and SR 516, two new auxiliary lanes from SR 516 to South 272nd Street, and a new auxiliary lane from South 272nd Street to approximately South 310th Street, where the proposed project would match with an auxiliary lane to be constructed for the Sound Transit I-5 @ South 317th Street Direct Access Ramp project. On northbound I-5, a new auxiliary lane would extend between South 272nd Street and the SR 516 interchanges, and two new C/D lanes would start at the SR 516 interchange to serve I-5 traffic exiting to SR 509 and SR 516 traffic entering I-5. In addition, a South 228th Street extension and underpass would be constructed, providing a direct connection to northbound I-5 from South 228th Street and from southbound I-5 to South 228th Street. Figure 4.1-5 presents a schematic of the I-5 improvements. These improvements would cover approximately 6.7 miles.

Alternative B

Under Alternative B, the SR 509 mainline would extend southward from its existing terminus at South 188th Street/12th Place South and intersect with I-5 in the vicinity of South 211th Street (Figure 4.1-6). The freeway extension and the South Access Road would generally parallel each other in a north-south orientation on the west and east sides of Des Moines Creek Park, starting in the vicinity of South 208th Street and 24th Avenue South. The alignment would cross over Des Moines Creek and through Des Moines







0 100 200
Approx.
Scale in Feet

FIGURE 4.1-4
South Airport Link Design Options

SR 509: Corridor Completion/I-5/South Access Road
Environmental Impact Statement

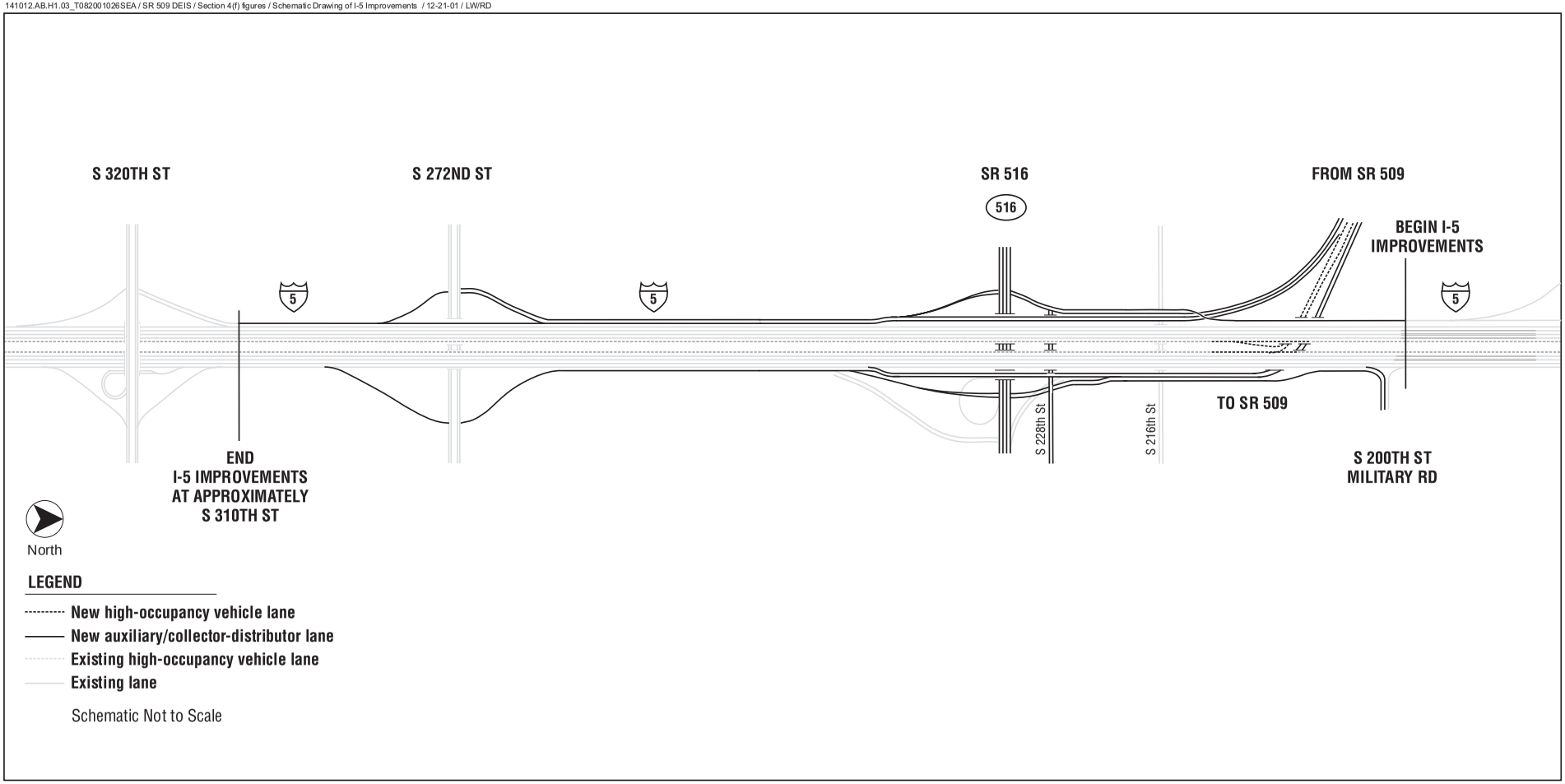
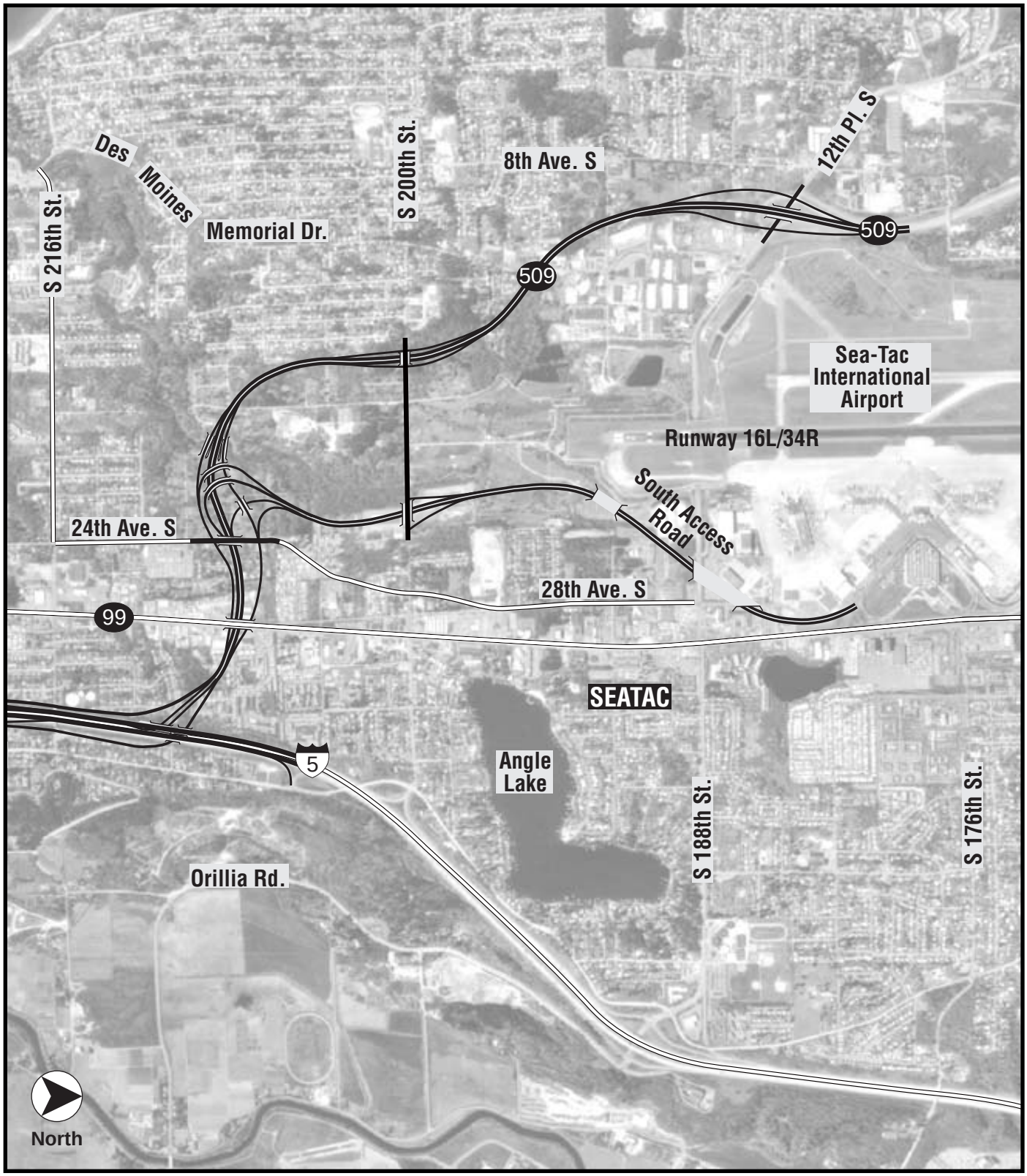


FIGURE 4.1-5

Schematic Drawing of I-5 Improvements

SR 509: Corridor Completion/I-5/South Access Road
Environmental Impact Statement



0 1/4 1/2 3/4 1 MILES

Legend

SR 509/South Access Improvements

FIGURE 4.1-6

Alternative B

SR 509: Corridor Completion/I-5/South Access Road Environmental Impact Statement

Creek Park at its narrowest point. The length of the SR 509 freeway extension, including the South Access Road, under Alternative B would be approximately 3.8 miles.

Alternative C2

Alternative C2 would begin at the existing SR 509 terminus at South 188th Street/12th Place South and intersect with I-5 in the vicinity of South 212th Street (Figure 4.1-7). Alternative C2 would cross to the east on the north side of Des Moines Creek Park. The alignment would be elevated as it crosses the northeast corner of Des Moines Creek Park. The South Access Road interchange with SR 509 would be in the vicinity of South 208th Street and 24th Avenue South. The length of the SR 509 freeway extension, including the South Access Road, under Alternative C2 would be approximately 3.2 miles.

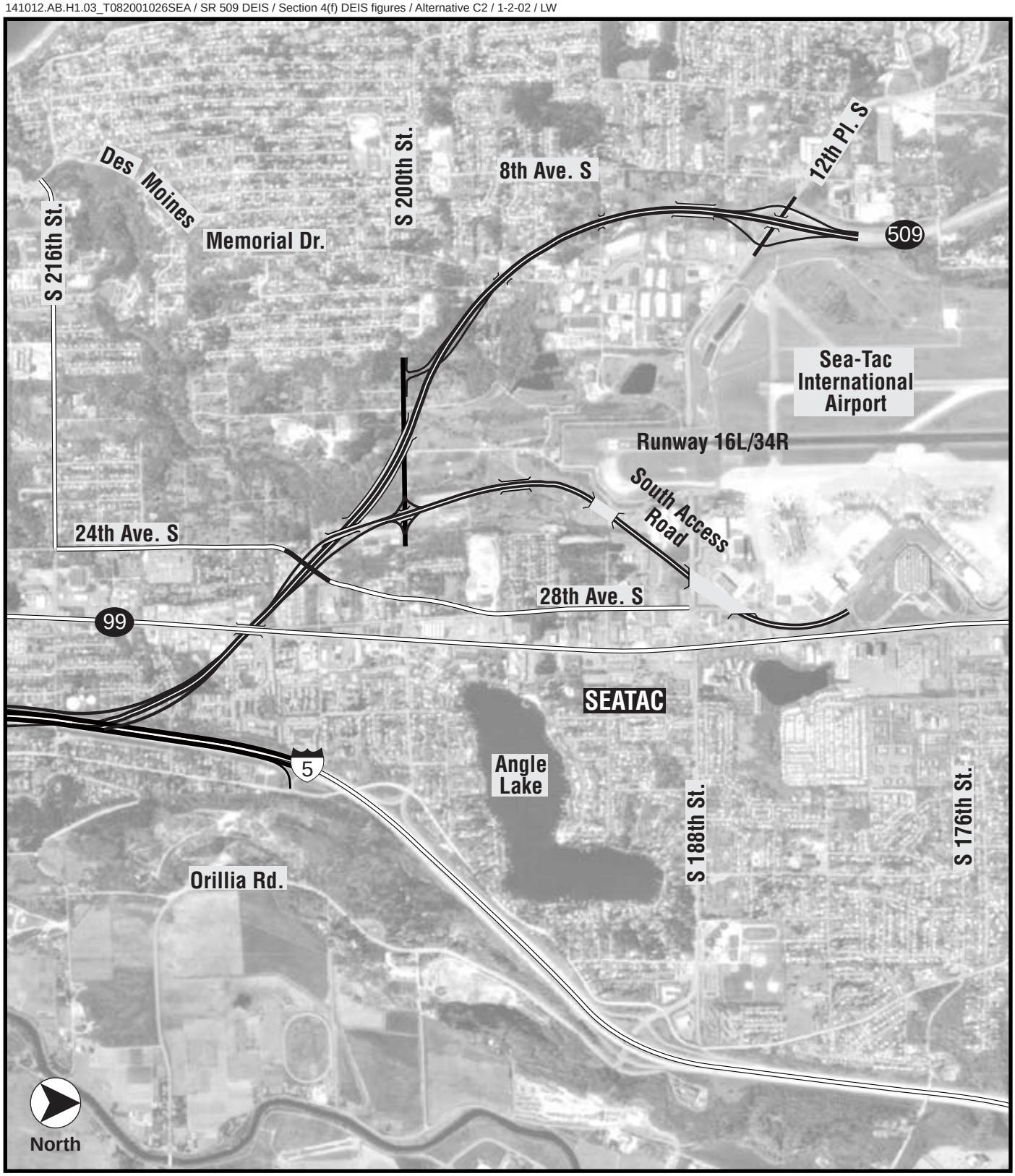
Alternative C3

Alternative C3 would begin at the existing SR 509 terminus at South 188th Street/12th Place South and intersect with I-5 in the vicinity of South 212th Street (Figure 4.1-8). Like Alternative C2, Alternative C3 would cross to the east on the north side of Des Moines Creek Park; however, it would encroach further into the park than Alternative C2. Alternative C3 would also be elevated as it crosses the northeast corner of Des Moines Creek Park. The South Access Road interchange would occur in the vicinity of South 204th Street and 24th Avenue South. Under Alternative C3, the length of the SR 509 freeway extension (including the South Access Road) would be approximately 3.5 miles.

4.2 Description of Section 4(f) Resources

During the course of conducting the impact analyses associated with this Revised DEIS, it was determined that no currently recorded historic or archaeological properties in the project area that may be impacted by the project are on, or determined to be eligible for, the NRHP (it has been a long-standing U.S. Department of Transportation/FHWA policy to apply Section 4(f) status only to historic or archaeological properties that meet that criteria). In addition, no designated wildlife or waterfowl refuges would be impacted by the project. As a result, this Section 4(f) Evaluation focuses exclusively on impacted publicly owned parks (none of the impacted parks were acquired or developed with Land and Water Conservation Funds [Section 6(f) of the Land and Water Conservation Act of 1965, as amended]).

There are five parks or recreational facilities that are expected to be impacted by one or more of the proposed build alternatives: Des Moines Creek Park, Midway Park, Linda Heights Park, Mark Twain School Playfield, and Tyee Valley Golf Course (see Figure 4.2-1). It is anticipated that all three build



0 1/4 1/2 3/4 1 MILES

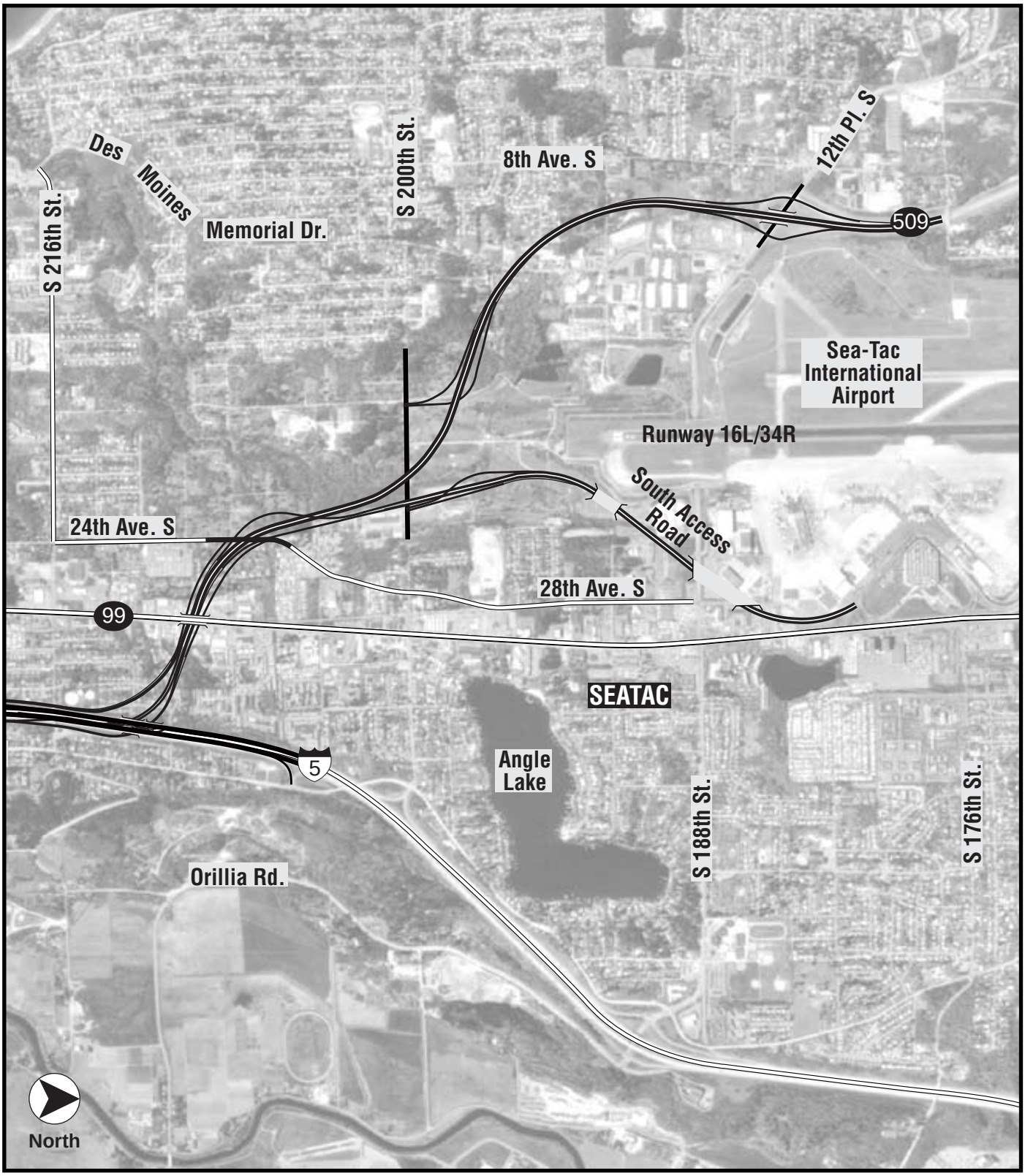
Legend

SR 509/South Access Improvements

FIGURE 4.1-7

Alternative C2 (Preliminary Preferred)

SR 509: Corridor Completion/I-5/South Access Road Environmental Impact Statement



0 1/4 1/2 3/4 1 MILES

Legend

SR 509/South Access Improvements

FIGURE 4.1-8

Alternative C3

SR 509: Corridor Completion/I-5/South Access Road Environmental Impact Statement

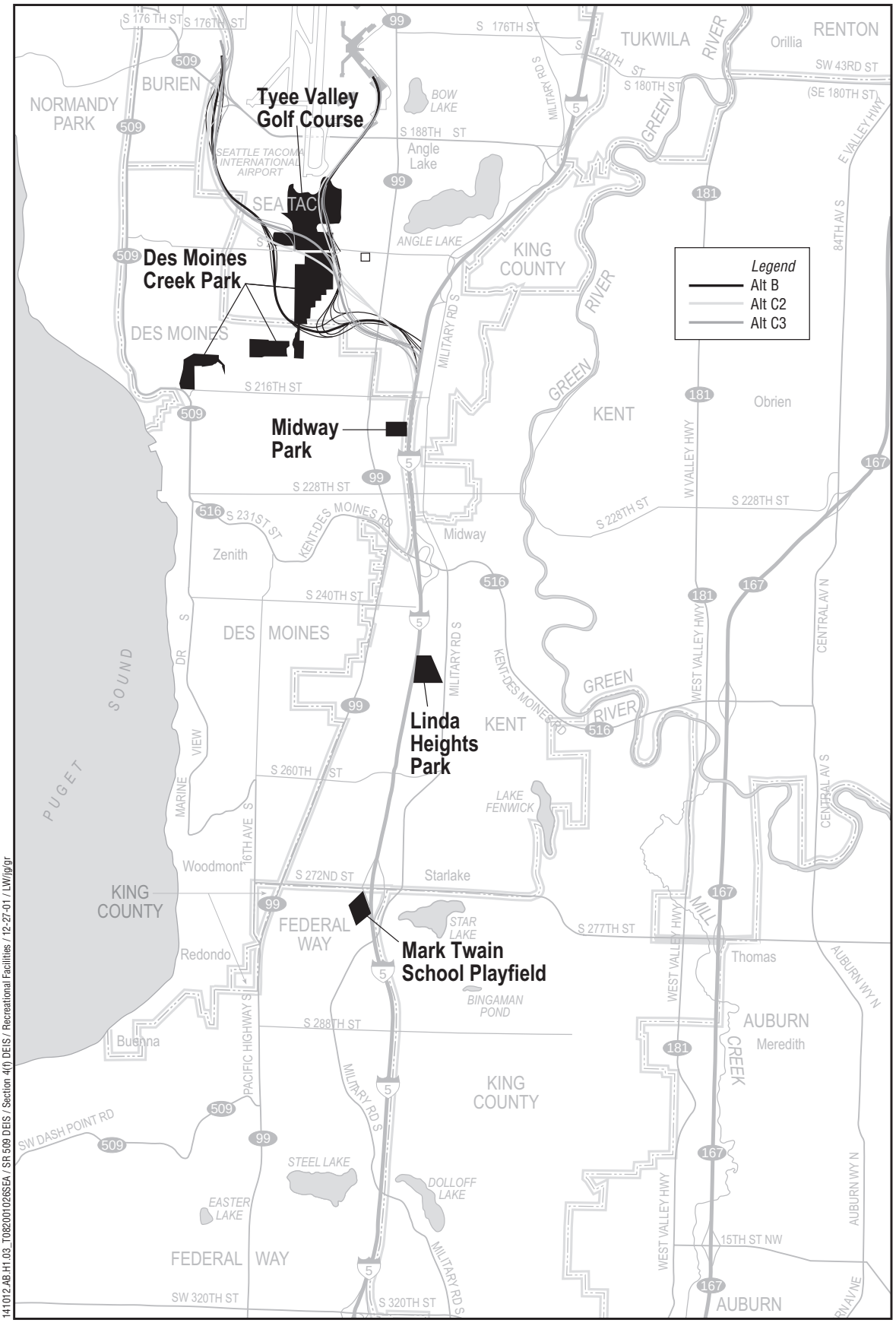


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FIGURE 4.2-1

Existing and Proposed Recreational Facilities Impacted by Project Alternatives

alternatives would directly impact Des Moines Creek Park; as such, those impacts are the primary focus of this Section 4(f) Evaluation. Midway and Linda Heights parks and the Mark Twain School Playfield would be expected to experience minor proximity (noise) impacts that would not substantially impair the use and enjoyment of these facilities, and are thus only briefly discussed later in this section. The fifth facility—the Tyee Valley Golf Course—is not considered a Section 4(f) resource. The golf course is located on property owned by the Port of Seattle but is managed as a private recreational facility through a lease between the Port and a private operator. The lease agreement is currently renewed on a monthly basis and stipulates that the lease may be terminated if the Port of Seattle requires the property for public or private use associated with the operation of its airport/ transportation-related business. It is anticipated that regardless of the impacts to the golf course as a result of the proposed project, the golf course may be closed, or reduced in size, as a result of the implementation of the Des Moines Creek Basin Plan or other Port of Seattle projects expected to be completed prior to construction of the SR 509 extension or South Access Road.

4.2.1 Des Moines Creek Park and Trail

Current Use and Values

Des Moines Creek Park encompasses the largest natural preserve of woodland environment within the SeaTac/Des Moines area. The park is composed of 95.8 undeveloped acres of forest and stream habitat (Figure 4.2-2). The park is located along a steep ravine that runs from northeast to southwest from South 200th Street in SeaTac to South 216th Street in Des Moines. Primary access to the park is via a parking and trailhead area at South 200th Street. Footpaths also access the park from adjacent residential areas at the north end of 15th Avenue South and the east end of South 211th Place. The park is characterized by a relatively secluded setting, enhanced by the fact that residential buildings in surrounding areas have been removed through the Sea-Tac Airport Noise Remedy Program. Despite its secluded setting, it should be noted that the park is substantially affected by aircraft noise; further discussion of that impact is provided below. The park boundaries are discontinuous, being divided by the existing SR 509 right-of-way and the Midway Sewer District Treatment Plant. The park is considered an important element of the local, community, and regional park systems.

Approximately 51.9 acres of the park lie within the City of SeaTac. While the City actively manages its portion of the park, King County is the current owner of the land. King County and the City of SeaTac are currently negotiating for the legal transfer of the property from the County to the City. Des Moines Creek Park is classified by the City of SeaTac as a "Community-Wide Resource." The primary management objective for such parks is to maintain their natural environment while providing recreational uses that do not adversely affect the setting. Approximately 43.9 acres lie within Des

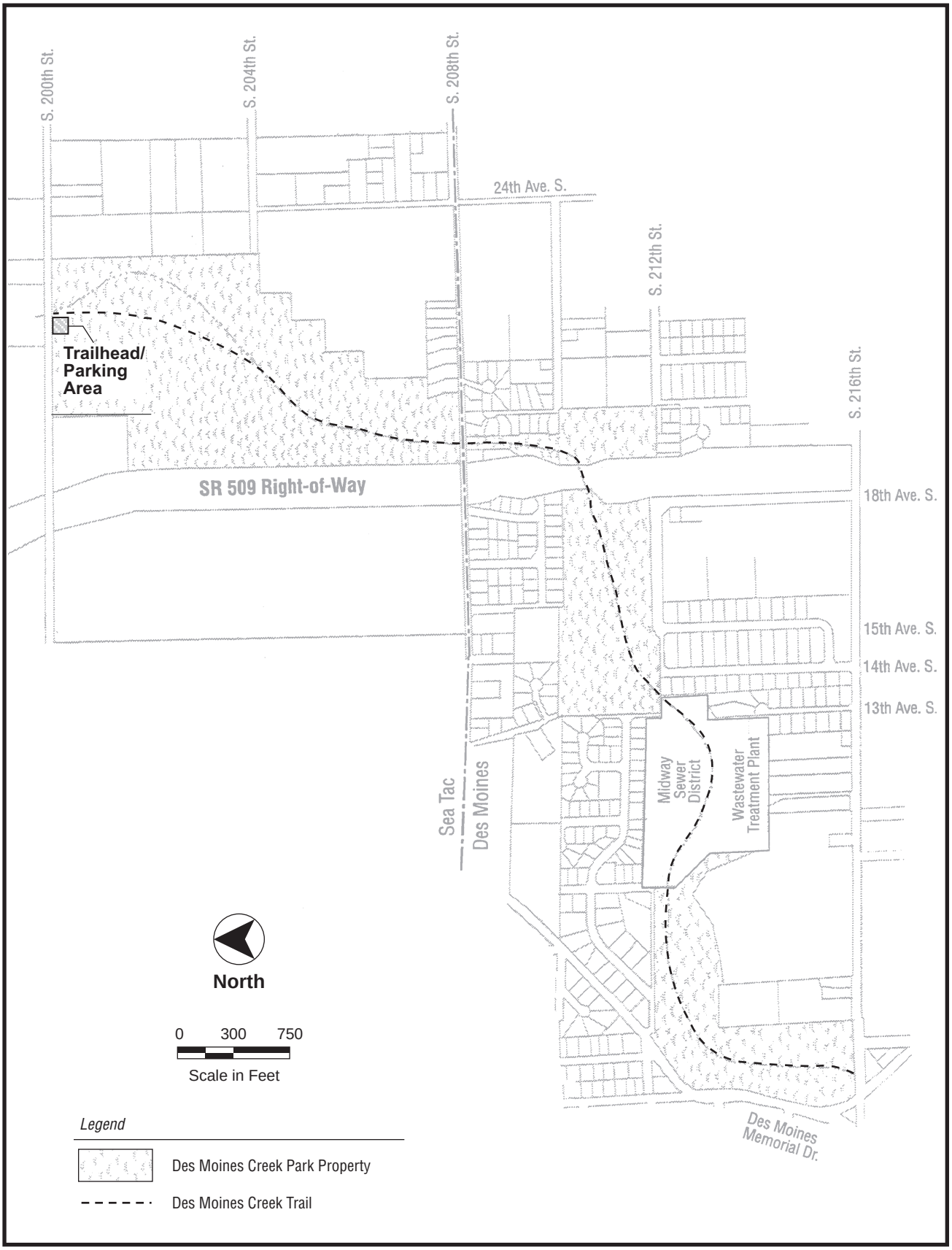

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FIGURE 4.2-2

Des Moines Creek Park

Moines, which classifies the park as a "Conservancy" and "Community" facility. Conservancy parks are intended for the protection and management of the natural/cultural environment, with recreation use as a secondary objective. Community parks—defined as including large passive areas, like Des Moines Creek Park—are intended to be "accessible to larger community populations on a managed basis, thus protecting the values that make the park an asset to the public."

Local planners and park administrators emphasize that the natural, undeveloped appearance is the primary characteristic that sets this park apart from other local parks in the vicinity, which makes the park very important to neighborhood, community, and regional populations. The park is seen by local planners, park administrators, and the public as a very important element to the future neighborhood, community, and regional park system in the project vicinity (Thorell pers. comm. 1995). The primary value of the park is embodied in specific natural features, such as:

- An approximately 16-acre wetland located along Des Moines Creek in the northeast corner of the park, which corresponds to Wetland A (see Section 3.6, *Wetlands*)

- The riverine wetland and riparian areas along the entire creek, including Wetland 9 (see Section 3.6, *Wetlands*)

- The potential fisheries values of Des Moines Creek, which is classified as a King County Class 2 stream with salmonids

- The park's overall ecological importance as the largest linear block of relatively intact natural habitat remaining in the SeaTac and Des Moines area

The park is rare in the project vicinity with respect to these values.

The interior of Des Moines Creek Park is accessed primarily via the Des Moines Creek Trail at South 200th Street. In July 1998, the City of SeaTac completed construction of the trail from South 200th Street downstream along the creek to the Midway Sewer District Treatment Plant. Improvements to Des Moines Creek Trail between the treatment plant and Marine View Drive will be made by the City of Des Moines following the construction of a new bridge at Marine View Drive South that will allow the trail and creek to pass through an existing embankment. The City is also expected to coordinate future construction of the trail with plans by the Midway Sewer District to complete an outfall line currently being constructed along the unimproved access road through Des Moines Beach Park.

Consistent with the undeveloped nature of the park, except for the trail along Des Moines Creek and adjacent benches, there are no other facilities within the park.

Use of the Des Moines Creek Park and Trail is substantially affected by noise from aircraft departing from and approaching Sea-Tac Airport. All of the park in SeaTac and the northern portion in Des Moines are located within the Acquisition and Relocation area of the Sea-Tac Airport Noise Remedy Program (see Figure 4.2-3). The western portion of the park in Des Moines (west of the Midway Sewer District Treatment Plant) is located in the Standard Insulation area or is outside the Noise Remedy Program area. Noise levels at locations near the park but farther away from the aircraft approach/ departure flight path exceed the 66 dBA NAC of both WSDOT and FHWA for Activity Category B land uses, which include picnic areas, recreation areas, and parks. Measured noise levels within the park show average levels of 71 to 75 dBA during periods when jet aircraft departures occur. In fact, based on the 1998 aircraft noise contours in the *Sea-Tac Airport Part 150 Study Update* (Port of Seattle 1998), aircraft noise exposure within the park is in the range of 70 dBA DNL. It should be noted, however, that passing airplanes are a distinct and episodic noise source. During times when aircraft are not passing overhead, noise in the park is quite low because of its secluded nature and the absence of constant background noise sources. During times when there are no flights, background noise levels are as low as near 50 dBA. This "silent period" is rare, however, especially in the peak summer air travel period (May through September), which coincides with highest park use. The Noise section of this Revised DEIS provides further details.

Future Use and Values

Future use of Des Moines Creek Park and Trail is formally guided by the Parks, Recreation, and Open Space elements of the *City of SeaTac Comprehensive Plan* (SeaTac 1994 with 1999 updates) and by the *Des Moines Park and Recreation Master Plan* (Des Moines 1997). The value of the park is largely dependent on the goals, strategies, and schedules for future park use as defined in these plans.

The Park, Recreation, and Open Space element of the SeaTac Comprehensive Plan includes specific policies, supportive discussion, and anticipated development timelines that place a high (short-term) priority on the development of the Des Moines Creek Trail and maintenance of the natural habitat values of the park. Retaining the "rich array of wildlife, wildflowers and access to water environment . . . is important to the quality of this park experience." Policy 9.9F directs the City to preserve the Des Moines Creek area while preserving the character and wildlife habitat and allowing for interpretive opportunities and linkage to regional trails. Policy 9.9G emphasizes a prohibition of vehicular traffic from the open space area south of South 200th Street.

The City of SeaTac’s Comprehensive Plan envisions the northward extension of the Des Moines Creek Trail through Port property north of South 200th

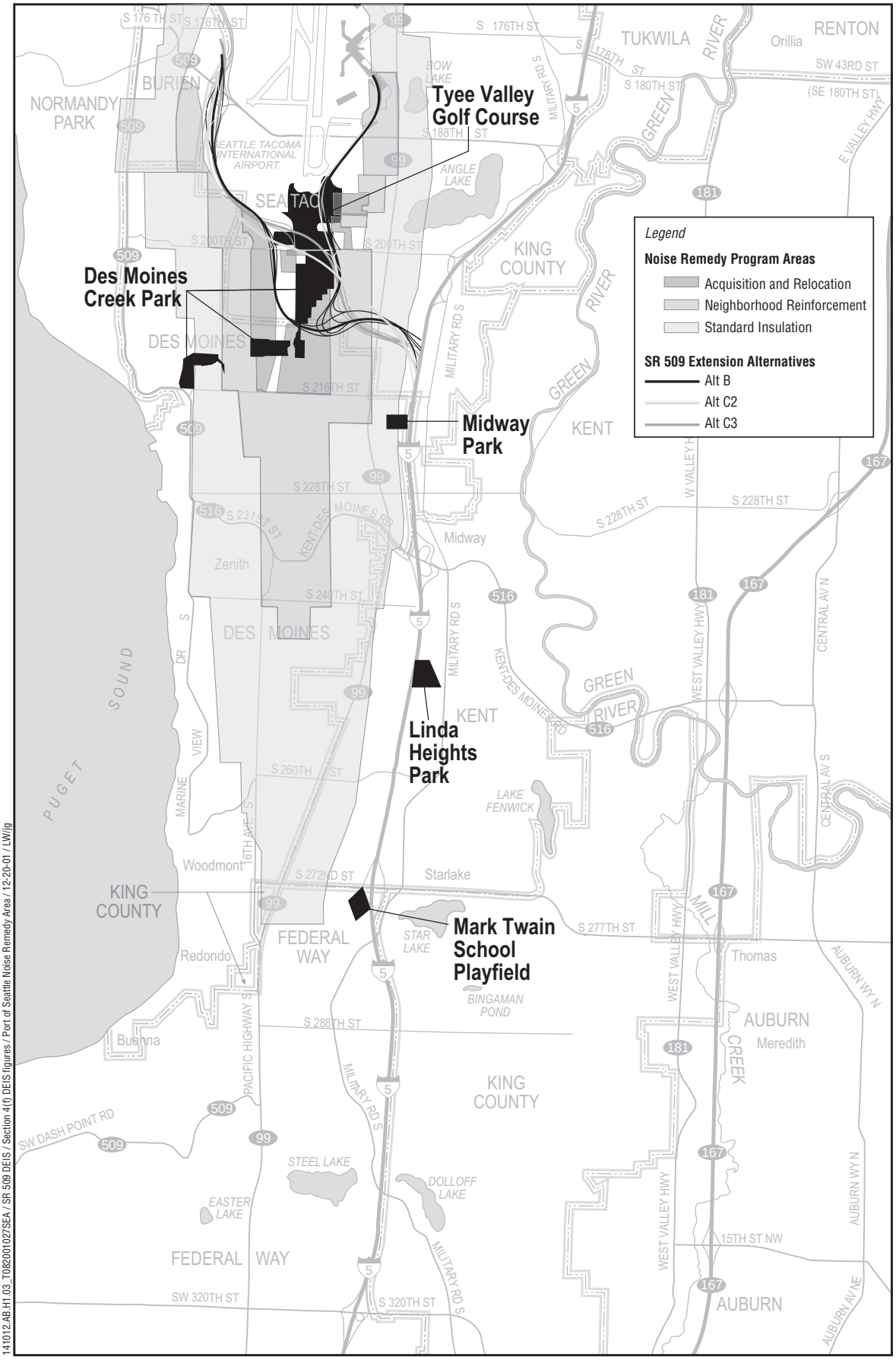

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FIGURE 4.2-3

Port of Seattle Noise Remedy Program Areas

Street. The extension would connect to a new trail along the west side of the proposed new third runway. As previously noted, the City of Des Moines intends to extend the existing Des Moines Creek Trail from the Midway Sewer District Treatment Plant to Marine View Drive in conjunction with the construction of a new bridge at Marine View Drive. The trail will eventually extend to Des Moines Beach Park on Puget Sound.

The Des Moines Creek Trail's purpose is to allow people to experience a primarily natural setting. Des Moines and SeaTac Park administrators and planners for SeaTac and Des Moines indicate that Des Moines Creek Trail will provide a north-south link in regional trail connections. The trail would provide pedestrian/bicycle (and possibly equestrian) linkage between Des Moines Beach Park, Saltwater State Park, and other recreational facilities in Federal Way (via the Barnes Creek Nature Trail or another route), and North SeaTac Park. It would potentially also link to recreational facilities in the Green River Valley east of the project vicinity.

Although no use projections have been developed for Des Moines Creek Park, both SeaTac and Des Moines park administrators and planning staff assume that the park will be a critical element in their attempts to meet recreational demand in the area. Consequently, the future recreational value of the park is considered important.

4.2.2 Midway Park

Midway Park is a 1.6-acre neighborhood park located along the south side of South 221st Street in the Pacific Ridge Community of the City of Des Moines and immediately adjacent to a Puget Sound Energy (PSE) substation. The property was acquired and developed in 1993 using King County Open Space bond funds and federal Community Development Block Grant funds. Currently, the park contains two small child play areas, a basketball court, an open playfield, and picnic tables.

The *Pacific Ridge Neighborhood Improvement Plan 2000* (Des Moines 2000), adopted by the City and incorporated into the Greater Des Moines Comprehensive Plan (Des Moines 1995) in July 2000, calls for the eventual expansion of Midway Park eastward into land currently owned by PSE and westward to Pacific Highway South. WSDOT and the City have been working together to ensure that the envisioned eastward expansion would not encroach into the widened I-5 right-of-way proposed as part of the SR 509 project. As a result, it is not anticipated that there would be any direct impact of the project on either the existing park or its eventual enlarged configuration.

Midway Park is dominated by noise from traffic on I-5. Current measured L_{eq} in the middle of the park were 70 dBA in the morning and 71 dBA in the afternoon. Such noise levels are above the FHWA NAC for parks of 67 dBA.

Because of the proposed westward shift of I-5 with the three build alternatives, peak hour traffic noise levels within the park in 2020 would be slightly more than 1 dBA above the No Action alternative noise level and would continue to exceed the FHWA NAC. An increase of less than 3 dBA is not noticeable. As a result, this minor proximity impact would not be considered a "constructive use" to the use and enjoyment of the park.

4.2.3 Linda Heights Park

Linda Heights Park is a 4.2-acre neighborhood park on a site owned by the City of Kent Public Works Department for its regional stormwater retention and sanitary sewer lift station. The park is located immediately adjacent to the east edge of the I-5 right-of-way at approximately South 248th Street in the City of Kent. The park was originally constructed in 1975 using federal Community Development Block Grant funds. Currently, the park contains a half basketball court, a picnic area, and a children's play area. Since 1995, renovations have included new play equipment, a seat wall around the play area, a new basketball court surface, improved pedestrian access, the placement of picnic tables closer to the play areas, extensive regrading to correct drainage problems and to open up view corridors into the park, and painting of the lift station.

The SR 509 project proposes to maintain the existing I-5 right-of-way boundary adjacent to the park. As a result, it is not anticipated that there would be any direct impact of the project on the park. I-5 traffic noise is a dominant feature of the park. The current measured L_{eq} within the park was 71 dBA. This is above the FHWA NAC for parks of 67 dBA. The proposed improvements along I-5 in the vicinity of the park (the additional northbound auxiliary lane) would bring roadway traffic closer to the right-of-way line and result in a slight, but unnoticeable increase in noise levels (1 dBA) within the park compared to the No Action Alternative. As a result, this minor proximity impact would not be considered a "constructive use" to the use and enjoyment of the park.

4.2.4 Mark Twain Elementary School Playfield

Mark Twain Elementary School is within the Federal Way School District. The school was opened in 1968 and currently has over 650 students enrolled in 25 kindergarten through sixth grade classrooms. To the northeast of the school building, immediately west of the I-5 right-of-way and south of South 272nd Street, is a large playfield that is used during school hours for the school's physical education program. After school hours, the playfield is available for public use; the Federal Way Youth Soccer League and others use the playfield on a frequent basis.

In addition to the SR 509 Corridor Completion/I-5/South Access Road project, there are two other projects planned in the vicinity of the Mark

Twain Elementary School: the proposed widening to South 272nd Street by the Cities of Kent and Federal Way and the Sound Transit I-5 at South 272nd Street In-Line Station. All three projects have been coordinated at the preliminary design level for consistency and to minimize impacts to the school property.

The combination of the cities' widening of South 272nd Street, along with the proposed I-5 southbound auxiliary lane south of South 272nd Street and the widening from the Inline Station, would result in the movement of the southbound I-5 ramp closer to the edge of the playfield. It is not anticipated, however, that there would be any direct impact of the project to the facility with the existing land berm that separates the playfield from the ramp remaining intact. I-5 traffic noise is a dominant feature. The measured average noise level was 67dBA, thus exceeding the FHWA noise abatement criteria for a school or park. Moving roadway traffic closer to the playfield would result in a slight but unnoticeable increase in noise levels (1 dBA) compared to the No Action Alternative. As a result, this minor proximity impact would not be considered a "constructive use" to the use of the playfield.

4.3 Impacts on Section 4(f) Resources

As previously mentioned, this analysis of impacts is focused exclusively on Des Moines Creek Park.

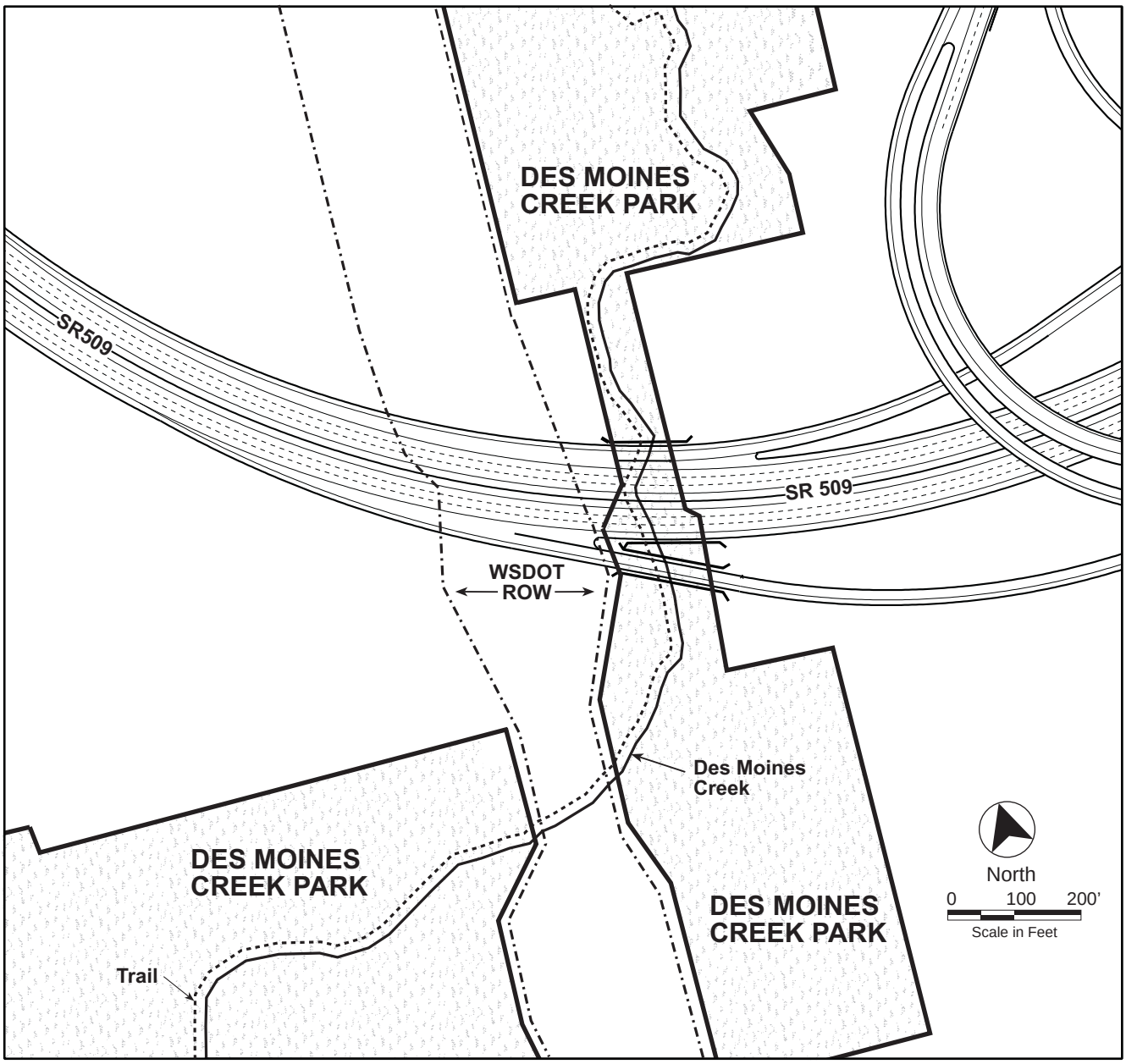
4.3.1 Alternative A (No Action)

The No Action Alternative assumes that several planned transportation improvements that are not a part of the proposed project would occur. The extent of the impacts potentially occurring to Des Moines Creek Park and other parks resulting from each project cannot be determined at this time, but will be evaluated in required environmental review documents or permit applications prepared by their proponents when these projects are proposed.

4.3.2 Alternative B

Des Moines Creek Park and Trail

Approximately 0.5 acre of Des Moines Creek Park would be required for roadway right-of-way under Alternative B, resulting in a conversion of public property from open space/park use to highway use. The new right-of-way would accommodate two proposed bridges over Des Moines Creek (a larger bridge for the mainline and northbound on-ramp and a second bridge for a southbound off-ramp). The amount of land required would be minimized by crossing the park at its narrowest point (Figure 4.3-1). Essentially, the park would be divided into two sections by the roadway (for this reason, the SeaTac and Des Moines parks directors have expressed their opposition to



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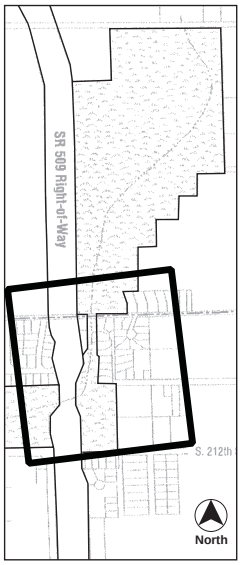


Legend

- Park
- Trail
- Des Moines Creek
- WSDOT Right-of-Way

FIGURE 4.3-1

Impacts on Des Moines Creek Park with Alternative B

SR 509: Corridor Completion/I-5/South Access Road Environmental Impact Statement

this alternative, as compared to Alternatives C2 and C3). The impacted area would constitute approximately 1 percent of the Des Moines Creek Park property in SeaTac and less than 1 percent of the total park area.

Because the roadway would cross the park on two bridges over the Des Moines Creek Trail, use of the trail after construction would not be impeded by this alternative. During actual construction of the bridges, the trail would likely need to be closed for safety reasons.

Aside from the acquisition of right-of-way, the primary impacts on the park would be the effects on visual quality and the intrusion of traffic noise. Users of the trail would have foreground and overhead views of the bridge structures for the new roadway with associated grading, removal of trees during construction, and additional shading created by the bridge structures. The visual continuity of the stream valley would be interrupted by these changes, creating a visual impact for trail users that might affect their enjoyment of the trail.

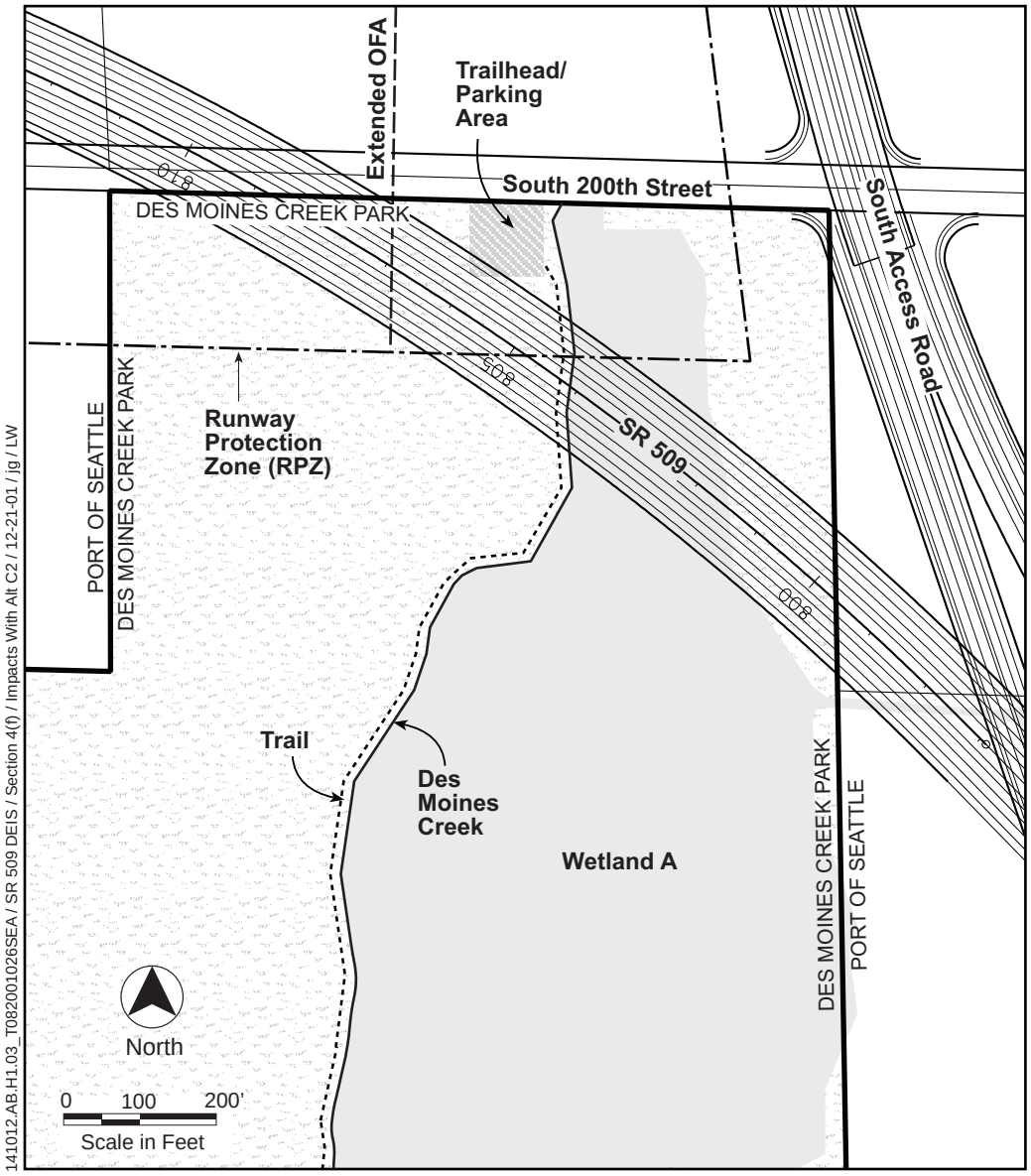
Alternative B would introduce higher traffic noise levels to certain portions of Des Moines Creek Park that are most removed from existing traffic noise. Airport noise levels within the park area are currently high and are expected to remain high in the future. Aircraft noise exposure notwithstanding, Alternative B would be expected to result in increases in noise levels at certain locations within the park. The sections of Des Moines Creek Park that would be affected by noise from project-related traffic would include the south/southeast part of the park in the vicinity of the proposed South Access Road interchange, the west part of the park along the east side of 15th Avenue South, and areas along the proposed South Access Road on the east side of the park. However, the existing trailhead facilities and the majority of the existing main trail would most likely be unaffected.

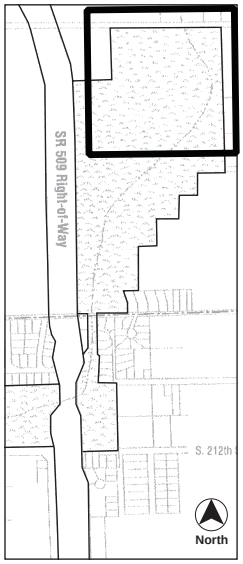
Alternative B would also affect a portion of Wetland 9, the riparian wetland along Des Moines Creek. Approximately 0.04 acre of Wetland 9 would be filled under this alternative. This wetland provides habitat for wildlife and fish, and constitutes a valuable natural feature for future interpretive opportunities for park users.

4.3.3 Alternative C2 (Preliminary Preferred)

Des Moines Creek Park and Trail

The SR 509 mainline would cross the northeast corner of Des Moines Creek Park (see Figure 4.3-2). The roadway would be on an elevated structure along the entire alignment within the park. The footprint of the proposed structure would require the acquisition of approximately 2.9 acres of Des Moines Creek Park. The impacted area would constitute approximately 3 percent of the total park area, and 5.6 percent of the portion of the park within the City





Legend

- Park
- Wetland
- Trail
- Des Moines Creek
- Runway Protection Zone (RPZ)
- Extended Object Free Area (XOFA)

FIGURE 4.3-2

Impacts on Des Moines Creek Park with Alternative C2

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of SeaTac. The existing trailhead parking area along South 200th Street would be immediately adjacent to the roadway structure; a small portion of this area (roughly 600 square feet or 6 percent of the total parking area) would actually be situated under the roadway structure. This structure would be well above the parking area (a minimum of roughly 35 feet high), which would allow for continued use of the entire parking area after construction. The height of the structure would also accommodate the continued use of the trail itself, although it would be covered for approximately 175 feet near its northern terminus. During actual construction of the elevated structure, the trailhead parking area and the northern end of trail would likely need to be closed for safety reasons. The roadway would separate a small 2.8-acre triangular area to the north (much of it wetland) from the remainder of the park to the south. Except for the trailhead parking area, this separated northern area is currently not used for recreation and is not planned for future recreational development. The project would not make this area any less usable than it currently is. The rest of the park would remain unaffected and contiguous (for this reason, the SeaTac and Des Moines parks directors prefer Alternative C2 and C3, as compared to Alternative B).

Alternative C2 would cross Wetland A within Des Moines Creek Park. Approximately 0.9 acre of the wetland would be covered by the elevated structure. Other than potential support piers in the wetlands and the shading effects created by the mainline structure (expected to be minimal because of the height of the structure), no other impacts on the wetland are anticipated. This wetland provides important habitat for wildlife and fish, and constitutes a valuable natural feature for future interpretative opportunities for park users.

The presence of the roadway 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. This impact, however, would only be experienced at the very northern limit of the trail. In addition to the visual presence of the structure, a number of trees would need to be removed during construction and that portion of the trail under the structure would be shaded.

Aircraft noise levels within the park are currently high and are expected to remain high in the future. Nevertheless, Alternative C2 would introduce noticeably higher traffic noise levels to the trailhead parking area and the northern extent of the trail (although increased noise in this localized area would be somewhat diminished due to the height of the roadway structure).

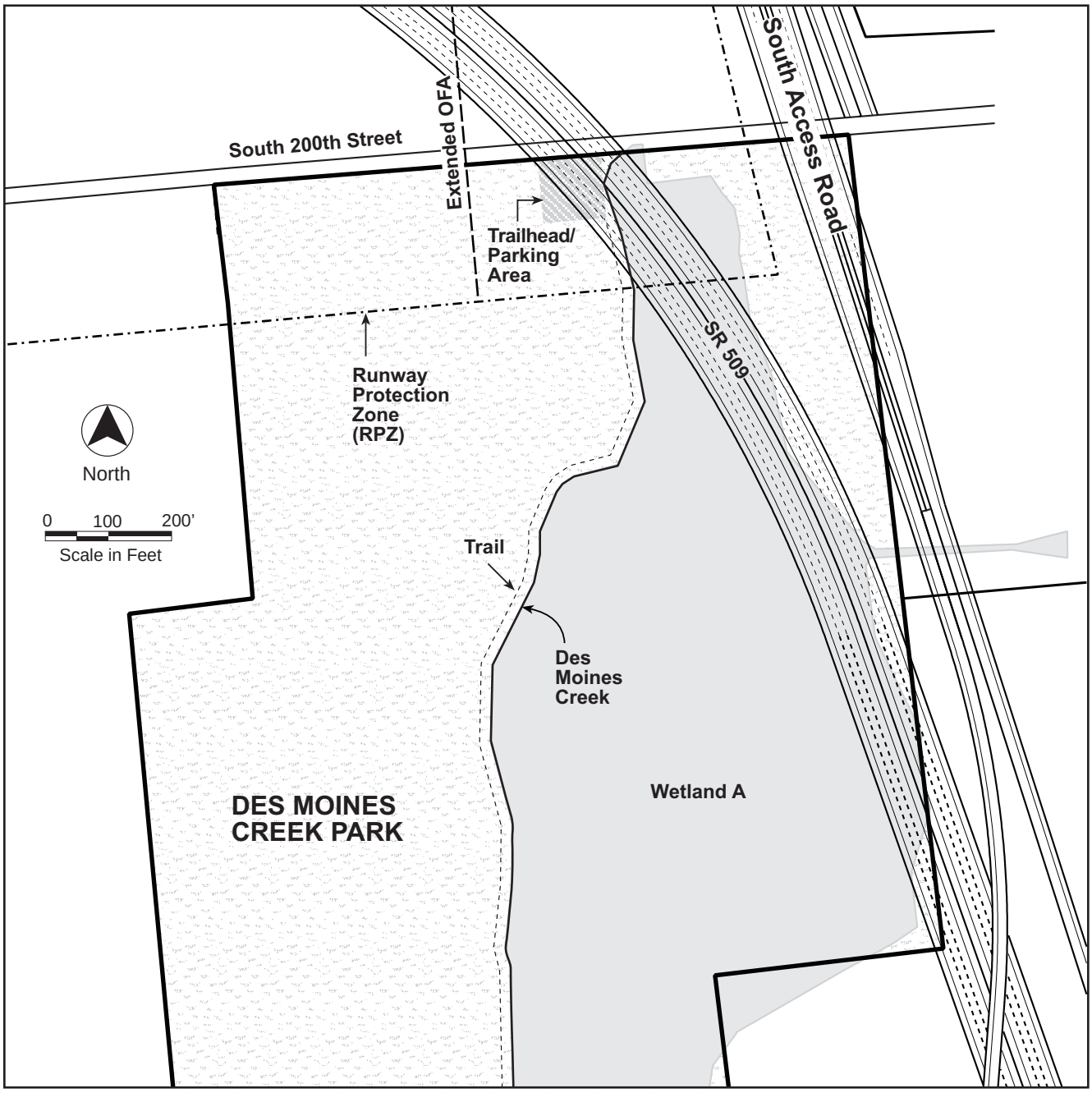
4.3.4 Alternative C3

Des Moines Creek Park and Trail

The SR 509 mainline would cross the northeast corner of Des Moines Creek (see Figure 4.3-3). The roadway would be on an elevated structure along the entire alignment within the park, similar to Alternative C2. The footprint of the proposed structure would require the acquisition of approximately 3.3 acres of parkland. Unlike Alternative C2, the South Access Road would also encroach into the extreme northeast corner of the park; a retaining wall along the western edge of the roadway would limit the amount of additional parkland to be acquired to 0.6 acre. The total area impacted (3.9 acres) would constitute approximately 4 percent of the total park area and 7.5 percent of the portion of the park in the City of SeaTac. The roadway structure would cover roughly 75 percent of the existing trailhead parking area. As with Alternative C2, however, the structure would be well above the parking area to allow for continued use after construction. The height of the structure would also accommodate the continued use of the trail itself; only about 80 feet of the trail would be covered near its northern terminus. During actual construction of the elevated structure, the trailhead parking area and the northern end of the trail would likely need to be closed for safety reasons. A small area of the park would be isolated between the SR 509 mainline structure and the South Access Road. This area is currently not used for recreation (some of it is wetlands) and is not planned for future recreational development. The project would not make this area any less usable than it currently is. The rest of the park would remain unaffected and contiguous (for this reason, the SeaTac and Des Moines parks directors prefer Alternatives C2 and C3, as compared to Alternative B).

Alternative C3 would cross Wetland A within Des Moines Creek Park. Approximately 3.3 acres of the wetland would be covered by the elevated SR 509 mainline structure and the South Access Road. Other than potential support piers in the wetland and the shading effects created by the SR 509 mainline structure (expected to be minimal because of the height of the structure), no other impacts on the wetland are anticipated. This wetland provides important habitat for wildlife and fish, and constitutes a valuable natural feature for future interpretative opportunities for park users.

The presence of the roadway 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. (This impact, however, would only be experienced at the very northern limit of the trail.) In addition to the visual presence of the structure, a number of trees would need to be removed during construction and that portion of the trail under the structure would be shaded.



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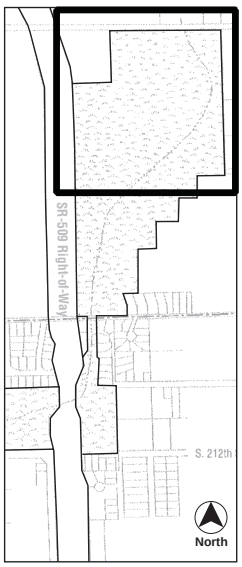

Legend

- Park
- Wetland
- Trail
- Des Moines Creek
- Runway Protection Zone (RPZ)
- Extended Object Free Area (XOFA)

FIGURE 4.3-3

Impacts on Des Moines Creek Park with Alternative C3

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Aircraft noise levels within the park are currently high and are expected to remain high in the future. Nevertheless, Alternative C3 would introduce noticeably higher traffic noise levels to the trailhead parking area and the northern extent of the trail (although increased noise in this localized area would be somewhat diminished due to the height of the roadway structure).

4.4 Section 4(f) Resource Avoidance Alternatives

The current build alternatives analyzed in this Revised DEIS and Draft Section 4(f) Evaluation were the result of a lengthy and exhaustive alternative development, evaluation, screening, and refinement process described in detail in Chapter 2 of the Revised DEIS. None of these build alternatives are avoidance alternatives in the context of Section 4(f). As previously described, each alternative would cause distinct direct impacts and minor indirect impacts to Des Moines Creek Park.

Section 4(f) requires that, if impacts to a Section 4(f) resource are anticipated, feasible and prudent avoidance alternatives need to be identified, evaluated, and if determined to be feasible and prudent, selected for implementation. Since 1991, over 70 alternatives have been developed, analyzed, and refined or discarded (see Figure 2.3-3, Chapter 2). Some of those alternatives did avoid Des Moines Creek Park but through the evaluation process, WSDOT concluded that while engineeringly feasible, they did not achieve the purpose of the project and/or caused social, economic and/or cost impacts of an extraordinary magnitude and thus could not be considered prudent. The following discussion provides the rationale for that conclusion.

As part of the preparation of the corridor-level Draft EIS in 1995 (FAA et al. December 1995), a number of avoidance alternatives were identified (see the Draft Section 4(f) Evaluation in the 1995 Draft EIS, pages 5-24 to 5-42). All but one of the 12 avoidance alternatives were eventually rejected because they failed to improve traffic conditions (a primary element of the purpose of the project), would have had a significant effect on the long-term economic sustainability of the SeaTac community, precluded development of the SASA, removed valuable developable land from the Port of Seattle's land base, and caused serious community disruption by displacing hundreds of residences.

During its review of the 1995 Draft EIS, the U.S. Department of the Interior contended that Avoidance Alternative 3DW was a feasible and prudent alternative to impacts to Des Moines Creek Park caused by Alternative 3 and that Alternative 3DW should be selected as the preferred alternative. As discussed in Chapter 2 of this Revised DEIS, Alternative 3A, developed in the early phase of the project-level analysis, was a refinement of Alternative 3DW. Alternative 3A was eventually redesignated Alternative D. Alternative D avoided impacts to Des Moines Creek Park by keeping the SR 509

roadway within the existing state right-of-way beyond the southern boundary of the park.

Alternative D continued to be considered a viable alternative for inclusion in the project-level Revised DEIS until WSDOT concluded, in consultation with other project partners and local agencies and resource permitting agencies, that Alternative D had clear conflicts with other essential regional projects important to the environment and economy of the dynamic project area, would cause substantial environmental impacts, and would conflict with FAA design standards. This analysis was presented in a WSDOT position paper entitled *Screening of Alternatives C2 and D* and dated June 21, 2001. With the concurrence of all relevant parties, WSDOT dropped Alternative D from further consideration in summer 2001.

In addition to the avoidance alternative of impacts caused by the 1995 Draft EIS Alternative 3, a number of other alternatives were also developed during the early phase of the project-level analysis that were avoidance alternatives to the Draft EIS Alternative 2. Many were subsequently rejected for a combination of reasons, including intrusions into the airport's RPZ, significant impacts to residential neighborhoods, wetlands impacts, impacts to SASA property, and poor traffic operations. The best alternatives were eventually designated Alternatives B and C. Alternative B minimizes impacts to Des Moines Creek Park by crossing the park at its narrowest point. Alternative C was a true avoidance alternative by traversing through the northern portion of the RPZ and a portion of SASA north of the park.

Subsequently, however, FAA expressed concerns about Alternative C and indicated that a tunnel would be required due to the location of the roadway within the northern portion of the RPZ. The costs associated with such a tunnel (estimated at roughly $12 million) and the associated safety concerns for motorists possibly trapped in the tunnel during an accident raised issues of the prudence of Alternative C. The USACOE and the Washington State Department of Ecology did not support the more than 3 acres of impact of Alternative C on a class one wetland. This same wetland is an essential component of the Des Moines Creek Basin; impacting the wetland would reduce its capacity as a proposed regional detention pond and water quality treatment facility. In addition, the Port of Seattle argued that the alignment proposed by Alternative C would render SASA unusable for its intended use.

A WSDOT VE study concluded in February 1999 that it would be feasible and appropriate to relocate SR 509 farther south than proposed by Alternative C. Two alternatives to Alternative C were developed—C2 and C3—both of which avoided the need for the tunnel and impacts to SASA, as well as impacts to the class one wetland and its use as part of the Des Moines Creek Basin Plan, but directly impacted the northeast corner of Des Moines Creek Park.

In July and August 1999, WSDOT met with FHWA, the Port of Seattle, and the park planners from SeaTac and Des Moines to discuss the fact that while Alternative C1 (redesignated from C at the same time as the development of C2 and C3) avoided Des Moines Creek Park, it was probably no longer a prudent avoidance alternative in light of cost and safety issues, impacts to SASA and implementation of the Des Moines Creek Basin Plan, and permitting difficulties related to wetland impacts that had been raised by a number of agencies and concerned parties. Significant from a Section 4(f) procedural perspective, FHWA concurred that even though Alternative C1 was a true avoidance alternative, it was not a prudent alternative and should not be carried forward in the project-level EIS process. FHWA and the local agencies also concurred that it was reasonable to include only non-avoidance alternatives—B, C2, and C3—in the Revised DEIS, as long as acceptable mitigation measures and other design efforts to minimize impacts were committed to by WSDOT as part of the overall project (see the *Measures to Minimize Harm* section below).

Based on this lengthy and exhaustive process, WSDOT has reasonably concluded that there are no other feasible and prudent avoidance alternatives and that the three build alternatives analyzed in this Revised DEIS reflect all possible planning to minimize harm to Des Moines Creek Park and are considered prudent because they do not cause extraordinary impacts and costs. Section 4(f) is clear that if there are no feasible and prudent avoidance alternatives, other alternatives which reflect all possible planning to minimize harm may be selected as the preferred alternative.

4.5 Measures to Minimize Harm

Highway design, engineering, and construction measures have been incorporated to the greatest extent possible to avoid or minimize right-of-way acquisition of the impacted parks. For example, Alternative B would minimize the acreage impacts on Des Moines Creek Park by crossing the park at its narrowest point. Alternatives C2 and C3 would minimize recreational impacts on Des Moines Creek Park by crossing a corner of the park not currently used for recreation and placing the SR 509 mainline on an elevated structure that would minimize impacts to the continued use of the trail and parking area and impacts to the wetlands. A retaining wall along the western edge of the South Access Road under Alternative C3 would minimize the amount of additional parkland that would need to be acquired. Where impacts are unavoidable, potential mitigation measures are listed below.

4.5.1 Des Moines Creek Park and Trail

- WSDOT is committed to replacing any lost parkland acreage with an equal amount of acreage adjacent to the park's boundary and of reasonably equivalent or greater recreational utility. The goal is that there

will be no net loss of parkland. The exact location of the replacement acreage will be determined through a coordinated land swap between WSDOT and the City of SeaTac.

- Depending upon the final design, both Alternatives C2 and C3 may require the relocation of the trailhead and associated parking area within Des Moines Creek Park. If so, as mitigation, a new trailhead/parking area and a connection to the existing trail would be developed slightly west of the existing trailhead.

- WSDOT is committed to financially assisting in the construction of the new Marine View Drive bridge over Des Moines Creek at the western edge of the park. This new bridge will include an underpass that will allow park trail users to reach the Puget Sound shoreline, thus expanding trail use opportunities. The new bridge is also one of five projects comprising the Des Moines Creek Basin Plan (to which WSDOT is a partner), and thus will help implement the water quality and fish habitat improvement goals of the plan which will, in turn, result in greater recreational value for the park.

- WSDOT and the SeaTac Parks Department director have agreed to integrating a northward extension of the Des Moines Creek Trail into the design of the SR 509 improvements. As described in the white paper *North Extension of Des Moines Creek Trail* (CH2M HILL July 2000), the trail would extend along the south side of South 200th Street to 18th Avenue South. The trail would then turn to the north with at-grade signalized crossings of South 200th Street and 18th Avenue South at the South 200th Street/18th Avenue South intersection. The trail would continue northward along the western edge of the proposed SR 509 fill slopes. The trail would terminate at South 188th Street with future segments with linkages to the regional trail network to be completed by others. The trail extension has received concurrence from the SeaTac City Council.

- If the trailhead parking area and trail (under Alternatives C2 and C3) or the trail only (Alternative B) need to be closed during construction for safety reasons, alternate facilities would be provided to ensure continued use of the park.

Other more general mitigation measures would include:

- Coordination with local municipal parks and recreation planners on how to maintain park functions and values

- Landscaping to minimize visual and noise impacts

- Special signage to direct park users to park access points

- Provision of park and trail enhancements, such as interpretive signage and/or viewing areas, consistent with local jurisdictions' plans for the facilities

4.6 Record of Coordination

The following discussion summarizes the coordination efforts between the WSDOT EIS team and local and federal agencies and jurisdictions related to this Draft Section 4(f) Evaluation.

Tier 1 Draft EIS Efforts (1992-1995)

October 5, 1992—Memo from Cheryl Eastberg (SeaTac Planner), to Christina Olson (WSDOT). Information regarding status of Des Moines Creek Park ownership, park values and City plans for park, and maps showing trail interconnections.

June 10, 1994—Meeting between Robert Ruth (Des Moines Senior Planner) and Michael Gallagher (CH2M HILL). Discuss overall land use issues associated with project.

June 10, 1994—Meeting between Michael Booth (Senior Planner), Jack Dodge (Principal Planner), Stephen Butler (Principal Planner), Michael Knapp (Planning and Community Development Department Director) of SeaTac, and Michael Gallagher. Discuss overall land use issues associated with project, and existing and future uses of Des Moines Creek Park.

June 13, 1994—Memo from Cheryl Eastberg (SeaTac Parks Project Coordinator) to Christina Olson. Information regarding Des Moines Creek Park values and plans, including SeaTac's Draft Comprehensive Plan, Parks, Recreation, and Open Space Element.

June 15, 1994—Telephone call from Michael Gallagher to Geraldine Poor (Port of Seattle Planner) to discuss the Port's lease agreement with the Tyee Golf Course operator.

June 16, 1994—Meeting between Jose Miranda (FHWA), Christina Olson, Larry Ross (WSDOT), Brent Campbell (CH2M HILL), Bob Swope (CH2M HILL) to review and discuss potential Section 4(f) issues. Concurrence reached that Barnes Creek Trail and Tyee Golf Course properties were not subject to Section 4(f) evaluation requirements because of existing lease agreements that clearly identified recreational uses as being contingent upon the properties not being needed for transportation-related purposes.

June 27, 1994—Transmittal from Geraldine Poor (Port of Seattle) to Michael Gallagher including POS lease agreement with Tyee Golf Course operators.

July 6, 1994—Telephone conversation between Michael Gallagher and Cheryl Eastberg (City of SeaTac) to clarify location of the existing and proposed trail system associated with Des Moines Creek Park or that might be affected by the proposed project. Also discussed overall existing uses, values and planned uses of the park.

Eastberg indicated that the highway and park might be able to coexist, but there might be substantial impairments to the park values resulting from noise and visual impacts to the natural setting. Providing trail crossings would help offset impacts.

July 13, 1994—Telephone conversation between Michael Gallagher to Jon Jainga (Des Moines, Assistant Parks and Recreation Director) to identify existing uses, values, and future plans for Des Moines Creek Park.

July 13, 1994—Telephone conversation between Michael Gallagher to Dale Shroeder (Des Moines Public Works Director), who is working with SeaTac on the Des Moines Creek Trail Project. The city has secured some funding in the CIP for the project. Provided information on Des Moines Creek Park size, and existing characteristics of the trail.

March 9, 1995—Meeting of the SR 509/South Access Road Steering Committee, to review the Section 4(f) Evaluation issues. Preliminary conceptual avoidance alignments reviewed and slightly modified for the evaluation by the Committee for each of the proposed build alternatives. Concept of screening (eliminating) some alternatives based on their relatively higher impacts than other similar alternatives, and choosing a representative alternative approved. Evaluation criteria to be used on a corridor level of analysis presented and approved.

March 10, 1995—Meeting between Michael Gallagher, Cheryl Eastberg, and Thomas Fus (SeaTac Assistant City Manager) to discuss the potential impacts of the proposed build alternatives, review avoidance alternatives, identify data needs for the evaluation, discuss significance of potential impacts, and identify minimization opportunities/limits. Conclusions included: Since public recreational opportunities are very limited in this portion of SeaTac, Des Moines Creek Park is quite important to neighborhood, community-wide, and even regional populations (due to trail's central function to regional trail system). The overall goals for the park focus on keeping the "pristine" nature of the park. Although airplane noise affects the park, constant highway noise could further impact park values.

March 10, 1995—Meeting between Michael Gallagher, Jon Jainga, and Corbitt Loch (Des Moines Planning Manager) to discuss the potential impacts of the proposed build alternative, review avoidance alternatives, identify data needs for the evaluation, discuss significance of potential impacts, and identify minimization opportunities/limits.

March 15, 1995—Telephone conversation between Mike Gallagher to Geraldine Poor (Port of Seattle) to discuss the avoidance and minimization options, particularly with respect to avoiding the Des Moines Creek Technology Campus site by moving the alignment as far west on the site as possible. Poor provided additional information about the airport safety clear zone expansion, and a (probable) large jurisdictional wetland located on POS and Des Moines Creek property. This call was followed by a FAX transmittal from Poor to Gallagher, showing the probable wetland location.

March 17, 1995—Transmittal from Denis Staab (Des Moines City Clerk) to Mike Gallagher of city ordinances defining boundary of Des Moines Creek.

March 20, 1995—Transmittal from Denis Staab (City of Des Moines) of exhibit showing official Des Moines Creek Park boundary.

March 21, 1995—Telephone conversation between Mike Gallagher to Cheryl Eastberg (City of SeaTac) to obtain clarification on acreage of Des Moines Creek Park.

March 22, 1995—Telephone conversation between Mike Gallagher to Patrice Thorell (Des Moines Parks Director) to review the project. She expressed concern about potential impacts to Des Moines Creek Park resulting from the build alternatives, particularly impacts to the natural setting.

June 16, 1995—Copies of the preliminary Section 4(f) Evaluation furnished to the City of SeaTac and the City of Des Moines for review and comments.

November 20, 1995—Meeting of FHWA, WSDOT, and park officials of SeaTac and Des Moines to discuss the status of planning for the Des Moines Creek Trail.

December 1995—*SR 509/South Access Road Corridor Project, Draft Environmental Impact Statement and Section 4(f) Evaluation* (FAA et al. December 1995) issued for public review and comment.

Revised DEIS Efforts (1996 to Present)

March 18, 1996—Letter from Willie R. Taylor (Director, Office of Environmental Policy and Compliance, U.S. Department of the Interior) to Gene Fong (Division Administrator, FHWA) with comments on the 1995 Draft EIS. The letter indicated that DOI considered Avoidance Alternative 3 DW to be the most feasible and prudent alternative because it avoided impacts on Des Moines Creek Park, SASA, and the proposed Airport Safety Zone Extension. The letter indicated that DOI had no objection to Section 4(f) approval if Alternative 3 DW was selected as the Preferred Alternative and that measures to minimize and mitigate for proximity impacts were coordinated with and approved by the Parks and Recreation Departments of both Des Moines and SeaTac.

September 29, 1998—Letter from Cayla Morgan (Airport Planner/ Environmental Specialist, FAA) to Susan Everett (WSDOT) outlining FAA's position regarding the alternative project alignments vis-à-vis designated RPZs in the vicinity of Sea-Tac International Airport. The letter strongly encouraged consideration of moving the alignments as far to the south end of the RPZ as feasibly possible; the FAA could accept such a proposal without requiring the construction of a roadway cover. The letter also indicated that FAA would likely discourage any alignment that may significantly impact SASA development.

July 19, 1999—Meeting between WSDOT, Port of Seattle, City of SeaTac and Des Moines parks departments, and FHWA representatives to discuss the effects of the build alternatives on Des Moines Creek Park. The consensus of this group was that despite the impacts to the park, Alternatives C2 and C3 appeared more feasible and prudent than the Avoidance Alternative C1. The City of SeaTac (within which most park impacts would occur) identified what it considered to be reasonable mitigation for the impacts, including replacing the impacted land with equivalent recreational land and extending the existing Des Moines Creek Trail north of South 200th Street. The meeting attendees also stated that they did not support Alternative B because the proposed alignment would bisect the park, in comparison to Alternatives C2 and C3, which would cross the relatively unused northeast corner of the park.

August 25, 1999—Voice mail message from Bryan Bowden (National Park Service) to Susan Everett (WSDOT). His message indicated that as long as the Section 4(f) Evaluation clearly demonstrates that other alternatives were considered but they are simply not viable or feasible and if there is adequate consultation with the local parks and recreation officials and they are satisfied with the review, conclusions, and proposed mitigation, the National Park Service will be satisfied.

August 26, 1999—Meeting between WSDOT and FHWA to review the build alternatives currently under consideration. FHWA concurred with the WSDOT conclusion that even though Alternative C1 was a true Section 4(f) avoidance alternative, it was probably not a prudent avoidance alternative. FHWA also concurred with the inclusion of the non-avoidance Alternatives C2 and C3 in the evaluation.

May 18, 2000—Letter from Cayla Morgan (Environmental Specialist, FAA) to Susan Everett (WSDOT) regarding FAA's position on the location of the proposed northern extension of Des Moines Creek Trail (part of the proposed Section 4(f) mitigation package). The letter indicated that FAA would support the trail alignment as long as it is located on the furthermost edge of the RPZ (along the west side of the SR 509 roadway).

June 15, 2000—Des Moines Trail Extension meeting attended by representatives from WSDOT, Port of Seattle, the Cities of SeaTac and Des

Moines, and FAA. In general, the proposed extension was acceptable to those present as mitigation for the impacts to Des Moines Creek Park. The City of SeaTac was concerned about how the trail would provide connectivity to the north. It was agreed that this was a coordination issue between SeaTac and the Port of Seattle, unrelated to the proposed SR 509 mitigation package.

June 29, 2000—Meeting between John White and Brian Roberts (WSDOT) and Tim Heydon and Corbett Loch (City of Des Moines) regarding possible impacts on the Pacific Ridge neighborhood and on Midway Park. The City staff indicated that the City might be willing to adjust the proposed eastern boundary of the park to avoid any direct impact on the future park boundary as a result of proposed improvements along I-5. In return, the City would seek assistance from WSDOT in enhancing the remaining park area.

November 16, 2000—Letter from Calvin Hoggard, City of SeaTac City Manager, to John White (WSDOT) indicating that the SeaTac City Council concurred with the proposed mitigation for impacts on the Des Moines Creek Park.

December 19, 2000—Letter from Connie Blumen, King County Park System, to Brian Roberts (WSDOT), indicating that because King County was negotiating with the City of SeaTac for the transfer of Des Moines Creek Park to the City of SeaTac, the City should have the primary role in determining adequate mitigation and compensation for impacts on the park.

May 5, 2001—Field visit of Midway Park by CH2M HILL staff.

May 30, 2001—Received faxes from Corbett Loch (City of Des Moines) with Midway Park master plan and relevant sections of the Pacific Ridge element of the Greater Des Moines Comprehensive Plan.

August 15, 2001—Field visit of Linda Heights Park by CH2M HILL staff.

September 11, 2001—Joan Broom (City of Kent Parks, Recreation, and Community Services) sent information to CH2M HILL on Linda Heights Park (master plan, written description, recent renovation).

October 14, 2001—Field visit of Des Moines Creek Park by CH2M HILL.

November 15, 2001—Meeting between Susan Everett (WSDOT) and Tim LaPorte and John Hodgson (City of Kent) regarding possible impacts to Linda Heights Park.

December 3, 2001—Letter from Bob Olander, City of Des Moines City Manager, to Susan Everett (WSDOT), concurring that the project would result in minor proximity impacts that would not affect the constructive use and enjoyment of Midway park.

December 5, 2001—Letter from Tim LaPorte, City of Kent Design Engineering Manager, to John White (WSDOT), with attached letter from John Hodgson, City of Kent Director of Parks, Recreation, and Community Services, indicating support of the project and recommending a combination of noise attenuating barriers and native plant buffers to mitigate for proximity impacts to Linda Heights Park.

January 15, 2002—Meeting between Susan Everett and John White (WSDOT) and Rod Leland, Federal Way School District, regarding the minor proximity impact to Mark Twain Elementary School Playfield.

SEA/4 sect 4(f).doc/020220065

DEPARTMENT OF PLANNING AND COMMUNITY DEVELOPMENT

MEMORANDUM

TO: CHRISTINA OLSON, WSDOT

FROM: CHERYL EASTBERG, PLANNER

DATE: OCTOBER 5, 1992

SUBJECT: DES MOINES CREEK PARK AND SR 509

This memo is in response to our telephone conversation Friday October 2, 1992. In researching your question of ownership of Des Moines Creek Park, I have ascertained that the transfer of Des Moines Creek park property from King County to City of SeaTac has not yet occurred. Apparently, this needs to be accomplished legislatively.

It is the intent of the City to follow through with the desired transfer, and to cooperate with the City of Des Moines in the construction and maintenance of a public recreation trail along Des Moines Creek from Puget Sound to S. 200th St. It would also be desirable to coordinate the public recreation use of this park with WSDOT and the planning for SR 509.

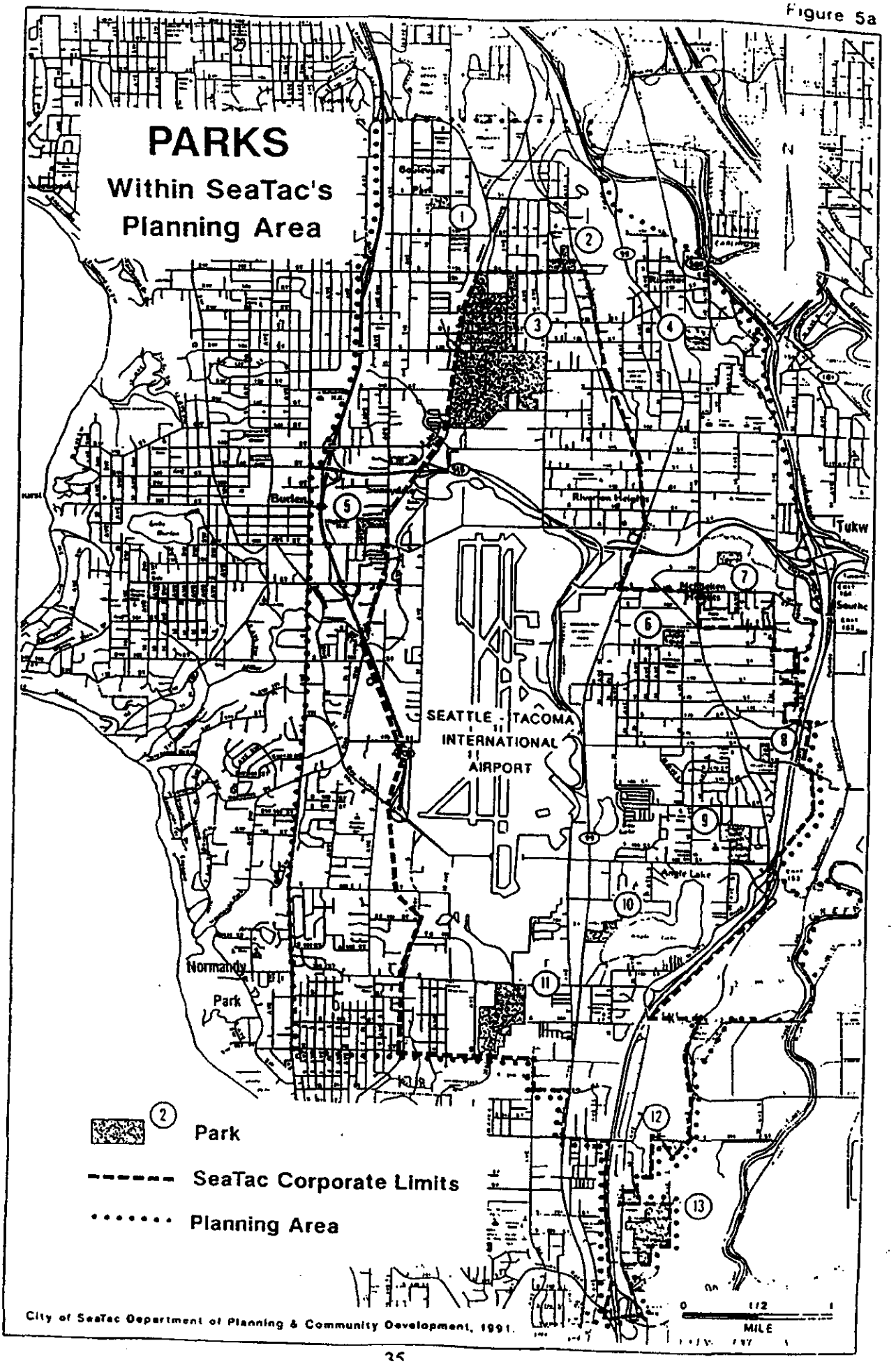
Enclosed please find copies from the Park and Recreation Comprehensive Plan Element for the City of SeaTac. The park matrix states that Des Moines Creek Park is from S. 200th to S. 216th. However, the City limit and therefore the management of park property south of 208th would not be handled by the City of SeaTac.

At this time, the park is best suited for passive recreation and wildlife enhancement through habitat preservation. It is difficult to notice you are in highly developed area when walking through the creek ravine. Housing is rarely visible, and typical dumping of trash in the ravine has been limited due to fencing.

The site is generally fenced from public access north of the sewer plant. Bootworn paths entering the creek corridor in this area show that public use exists. Along the entire length from S. 200th to Puget Sound, a gravel road follows the creek. This road is used to service the sewer line which also follows the creek. The road is open to foot traffic from Puget Sound inland to the sewer plant. At this time, circumnavigation of the sewer plant seems to be the missing link in the proposed paved path to be constructed by the City of Des Moines from Puget Sound to S. 200th. I believe this has been a point of discussion with utility management and Des Moines city staff.

Please let us know if we can be of further assistance.

Figure 5a


PARKS
Within SeaTac's
Planning Area
N
SEATTLE - TACOMA
INTERNATIONAL
AIRPORT
Normandy
Park
Burien
Tukw
Angle Lake
Park
SeaTac Corporate Limits
Planning Area
0
1/2
1
MILE
City of SeaTac Department of Planning & Community Development, 1991.

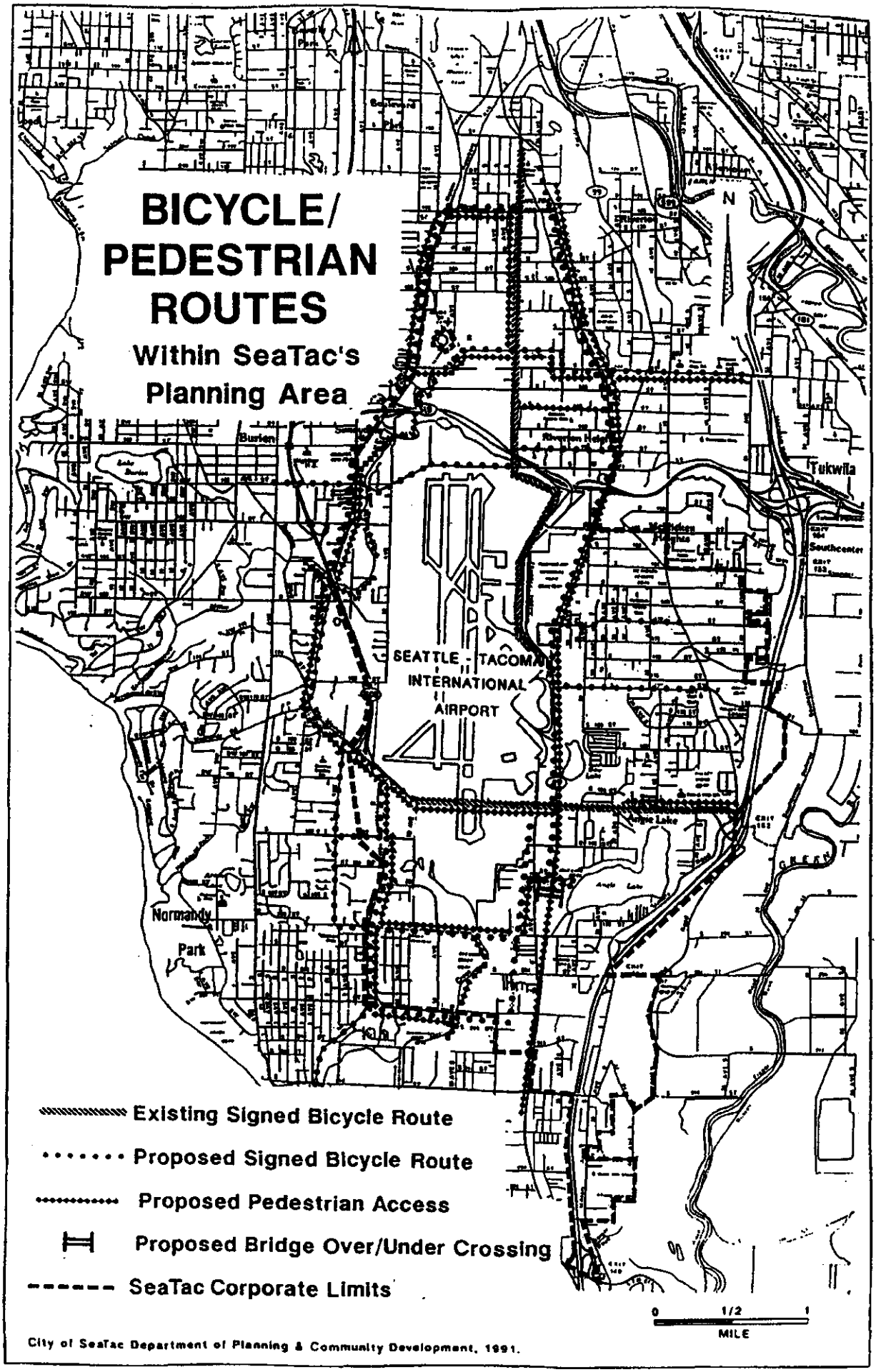

BICYCLE/
PEDESTRIAN
ROUTES
Within SeaTac's
Planning Area
N
Burien
Tukwila
Southcenter
SEATTLE - TACOMA
INTERNATIONAL
AIRPORT
Normandy
Park
Existing Signed Bicycle Route
Proposed Signed Bicycle Route
Proposed Pedestrian Access
Proposed Bridge Over/Under Crossing
SeaTac Corporate Limits
0 1/2 1
MILE
City of SeaTac Department of Planning & Community Development, 1991.

Figure 5b. RECREATION FACILITIES IN SEATAC PLANNING AREA PARKS

MAP REFERENCE	PARK NAME	ACREAGE	TYPE OF PARK	SOFTBALL FIELDS	BASEBALL FIELDS	FOOTBALL/ SOCCER FIELDS	SOCCER/ ALL-WEATHER FLDS	TENNIS COURTS	SWIM BEACH (SUMMER)	CONCESSIONS	FISHING	PICNIC TABLES	BARBEQUES	PLAY AREA	RESTROOMS	TRAILS	SPECIAL FEATURES	PICNIC SHELTER	EQUESTRIAN FACILITIES	BMX COURSE
1	Southern Heights Park S. 120th St. & 14th Ave. S.	3.3	NBR					2						1						
2	Hilltop Park S. 128th & 26th Ave. S.	6.9	NBR											1						
3	North SeaTac Park Sunset Playfield 13659 18th Ave. S.	200 18.2	COM	3	1	1	*1	2				2			1				1	1
4	Southgate Park 42nd Ave.S.&S.136th	5.7	NBR					2						1						
5	Mosher Park 430 S. 156th	15.17	COM	*3	*1	*2									1					
6	McMicken Heights Park 166th & 40th Ave. S.	2.42	NBR					2												
7	Crestview Park S.158th St.&51st Ave.S.	6	NBR									2		1						
8	Bow Lake Park S. 178th at 51st Ave. S	4	NBR																	
9	Valley Ridge Park 4644 S. 188th	27.8	COM	3	*1	1/ *1		3							1		A,I			
10	Angle Lake Park 19408 International Boulevard	10.5	COM						1	1	1	35	6	1	1		BL			
11	Des Moines Creek Park Along Des Moines Creek/200th to 216th	95.81	RSC																	
12	Earthworks Park 21600-37th Pl.	4	RSC														I			
13	Grandview Park S. 288th of Military Rd. S.	37.7	COM				*1 /1					3			1			1		1

KEY: Bolded parks indicate that they are within SeaTac City Limits, NBR=Neighborhood, COM=Community, RSC=Resource, * indicates lighted
Special features: A=Activity Center, I=Artwork, BL=Boat Launch

9B
6-12-95

M E M O R A N D U M

DATE: May 22, 1995

TO: Bob Olander

FROM: Patrice Thorell

RE: Significance of Des Moines Creek Park / Des Moines Creek Trail and Zenith Park

Des Moines Creek Park and Trail are significant to the Des Moines Parks, Recreation and Open Space System. It is an important connector linking the Des Moines Creek Trail from the City of SeaTac to the Puget Sound. The trail provides alternative transportation, and recreational opportunities (bicycling, walking, jogging, hiking, skating, picnicking, nature observance) and a natural buffer between two cities. The Des Moines Creek Park and Trail are a system made up of the creek, steep ravines, wetlands, mature trees and native vegetation that cannot be replaced or replicated elsewhere. The City of Des Moines has been developing a trail system following the creek over the past many years. This action was inspired by a 1986 petition from its citizens (503 signatures collected) as follows:

"We the undersigned request that the Des Moines City Council do everything in its power to preserve and protect Des Moines Creek, Massey Creek, Barnes Creek and Smith Creek. Furthermore, we urge that the City of Des Moines acquire land adjacent to these creeks as such land becomes available for purchase. The Creeks of Des Moines have been abused in the past and it is time that the City of Des Moines make this a Waterland Community the public can enjoy and be proud of."

The Trail is also a key component of the Des Moines Creek Basin Plan. Several public agencies (City of Des Moines, City of SeaTac, Port of Seattle, Midway Sewer District, Department of Fisheries, Washington State Department of Transportation) and Trout Unlimited are coordinating efforts to enhance the Creek's salmon and other natural habitats existing in this wildlife corridor.

The City of Des Moines places a high value on its urban wildlife habitat. The Comprehensive plan has numerous policies that reinforce the value of the Des Moines Creek (see attached Plan with highlighted elements). The Comp Plan states that Des Moines utilize a ratio of 8.5 acres of park land to 1,000 population. Des Moines currently has a park land deficit of 55 acres with few opportunities to acquire additional land due to land lock. Within the Des Moines planning area the land deficit is maintained at 32 acres.

The City of Des Moines currently manages and maintains Zenith Park (under contract with the Highline School District) for community recreation use. The cooperative relationship between the City and School District will continue when Zenith School is built so that existing recreational use continues.

Properties owned by the school district are increasingly important to the Des Moines open space inventory. They comprise 24% of the City's open space as identified in the Des Moines Comprehensive Plan.

The Greater Des Moines Comprehensive Plan policy states that recreational facilities of public schools be available for public use. Because the City of Des Moines currently has a sports field deficit, the loss of Zenith Park for community sports activities would have a severe impact on the community. Zenith Park is a prime practice field for Mt. Rainier High School soccer, football, and softball. The site is scheduled year round for community sports league play by the Little League, Youth Soccer Association, and community sports groups. The facility is used by the residents as a neighborhood park. Zenith field (a combined softball/soccer field) is one of only three total public sports fields available for the Des Moines community.

Because of the lack of available sports facilities, neighborhood parks and available land for future park development the park cannot be replaced elsewhere These factors make Zenith Park invaluable to the Des Moines Park System.

Approved: 6-5-95

Acting City Manager

City of SeaTac
17900 International Blvd., Suite 401 · SeaTac, Washington 98188-4236
City Hall: (206)241-9100 · Fax: (206)241-3999 · TDD: (206)241-0091

June 19, 1995

CH2M Hill
Attn: Wynlee Crist
777 108th Ave NE
Bellevue, WA 98004

RE: SR 509/SOUTH ACCESS ROAD SECTION 4F (Evaluation)

Dear Mr. Crist:

In response to Michael Gallagher's letter of approximately 1 May 1995, requesting the kinds of activities or functions within the Des Moines Creek Park and a determination of the significance of the park, the following comments are forwarded:

The Des Moines Creek Park, in the City of SeaTac, is comprised of a salmonids creek in a natural ravine with associated wetlands and uplands. The creek is parallelled by underground sewer and wastewater lines, upon which a gravel access road is built. A new trunk line is planned to be installed in the next one to two years. It will leave the existing trunk line route so as to avoid the approximate 10 acre wetland on either side of the creek south of S. 200th Street. These routes are designated to receive a paved recreation trail and boardwalks through wet areas in the next two years, as well as trailhead parking, interpretive signage and passive park development in the uplands off of S. 200th Street.

The current quality of the park is naturalistic with large fir, maple, alder, dogwood, and related plants forming a continuous greenbelt from Puget Sound up to the south airport area at S. 200th Street. The City of SeaTac's Comprehensive Plan supports the continuation of the trail along the SR 509 right-of-way north to North SeaTac Park, tying into the King County Regional Trail System. This park forms an important link in making the continuous connection from Puget Sound into and through the urban areas.

The naturalistic character of the park is rare in this highly urbanized area. Within this ravine, you can be visually unaware that the city surrounds you. The sound of urbanization is most obvious through aircraft traffic due to the proximity of the Seattle-Tacoma International Airport. The park lies within the flight path, and the silence is regularly broken by take-offs or landings, depending on the weather patterns. The sound level varies based on frequency and whether the planes are taking off or landing.

The greenbelt currently provides several miles of wildlife corridor which allows for bird and fish migration. The planned trail project will enhance the natural character through restoration of previously disturbed areas, directing public access, improving the stream channel for fish habitat, and creating a usable meadow for passive recreation and an equestrian rest area.

If you have any questions or wish to discuss this matter further, please advise.

Sincerely,

Bruce A. Rayburn

Bruce A. Rayburn, P.E.
Director of Public Works

cc: Correspondence File

United States Department of the Interior

OFFICE OF THE SECRETARY
Washington, D.C. 20240

ER-96/19

MAR 18 1996

Mr. Gene Fong
Division Administrator
Federal Highway Administration
711 South Capitol Way, Suite 501
Olympia, Washington 98133-9710

Dear Mr. Fong:

This is in response to the request for the Department of the Interior's comments on the Draft Environmental/Section 4(f) Evaluation for SR-509 South Access Road to Link with I-5, King County, Washington.

Section 4(f) Evaluation Comments

Avoidance Alternative 3DW appears to be the most feasible and prudent alternative because it will avoid impacts to both Des Moines Creek Park and Zenith Park. It will also avoid impacts to the South Aviation Support Area property and the proposed Airport Safety Zone Extension.

The Des Moines Creek Park, which is jointly owned and managed by Des Moines and SeaTac is classified as a "special use" and "conservancy" park and lies within the largest natural preserve of woodland environment. The future recreation value of the park is described as substantial for both Des Moines and SeaTac. Zenith Park, on the other hand, is invaluable to the Des Moines Park System because of the lack of available sports facilities, neighborhood parks and lands needed for future parks development.

As to measures to mitigate proximity impacts to the parks from Avoidance Alternative 3DW, we recommend that they be coordinated with, and approved by the Parks and Recreation Departments of both Des Moines and SeaTac. Evidence to that effect should be documented in the Final Section 4(f) Evaluation.

Environmental Statement Comments

The Environmental Statement adequately addresses other matters of concern to this Department, such as fish and wildlife resources.

Summary Comments

The Department of the Interior has no objection to Section 4(f) approval of this project by the Department of the Interior if Alternative 3DW is selected as the Preferred Alternative and measures to minimize proximity impacts to Des Moines Creek Park and Zenith Park are documented in the Final Section 4(f) Evaluation.

We appreciate the opportunity to provide these comments.

Sincerely,

Willie R. Taylor
Director, Office of Environmental
Policy and Compliance

cc: Mr. Ralph H. Nichols
Environmental Program Manager
Washington State Department
of Transportation
District 1
15700 Dayton Avenue North
Post Office Box 330310
Seattle, Washington 98133-9710

September 29, 1998

Ms. Susan Everett, P.E.
Project Engineer, Mailstop 135
Washington State Department of Transportation
P.O. Box 330310
Seattle, WA 98133-9710

State Route 509/South Access Road

Dear Ms. Everett:

This letter is written to outline the Federal Aviation Administration's (FAA) position relative to the road alignments that have been proposed in scoping for the Draft Supplemental Environmental Impact Statement (DSEIS) for the aforementioned project. We recognize the complexity surrounding the ultimate alignment and commend you in your efforts to reconcile the variety of issues. The FAA's primary concerns are relative to the impact any alignment may have on the safety of aircraft operations at Seattle-Tacoma International Airport as well as the people and property on the ground in the approach and departure paths of each of the runways.

As we have discussed in previous meetings, the FAA has designated several areas around the runways to be protected and kept clear of obstructions to ensure the safety of those in the aircraft as well as the people and property in the vicinity of the airport. These areas include the Runway Safety Area (RSA), Object Free Area (OFA) and the Runway Protection Zone (RPZ), which includes the Extended Object Free Area (XOFA) and the Controlled Activity Area (CAA). The dimensions and the amount of protection afforded to each of these areas are defined in FAA Advisory Circular (AC) 150-5300-13 "Airport Design" and Planning Guidance 98-19, "Roads in the RPZ". (see attached) For airport projects where Federal grant-in-aid assistance is utilized (such as the purchase of the RPZ land), the use of our design standards is mandatory.

The land for both the OFA and the RSA is owned by SeaTac Airport and was purchased with federal funds. Alternative D, in which the South Access Expressway travels through the OFA and the RSA, does not meet our design standards. We have not given this alternative any further review. With regard to Alternatives B and C, neither of the proposed roadway alignments have compromised these two areas, thus, we have focused our attention on the impact of any alignment on the RPZ and accordingly, the XOFA and CAA.

It is our understanding that there tends to be greater support for Alternative C which is called out as Alternative 2, Option 17 in the February, project newsletter. We may find

this to be an acceptable alternative with a few alterations. This support assumes that a roadway cover would be constructed through the extended OFA. The cover would be designed with structural integrity to protect the people under it from an errant landing of an aircraft in this location.

Although the road is effectively out of the XOFA by covering, it is also proposed to be constructed in the controlled activity area. While it is our preference that the road be kept entirely out of the RPZ, should you wish to pursue the alignment in the CAA, we will need documentation outlined in FAA Planning Guidance 98-19 (see attached) to justify the encroachment.

We strongly encourage consideration and further analysis to move the road as far to the south end of the RPZ as feasibly possible. If a new alignment could feasibly be constructed that would be out of the existing RPZ, or to the outer edges, we could accept such a proposal without requiring the construction of a roadway cover. We are also concerned with the south access alignment impacts to our Advisory Circular design standards, Federal Aviation Regulation, Part 77 and the viability of the proposed South Aviation Support Area (SASA). A balance between the use of the CAA and infringement on SASA is necessary. It is our understanding that there is a possible land exchange option with the City of SeaTac that may reduce the right-of-way need through the currently proposed SASA area. This may warrant further analysis, and require documentation for infringements into the CAA. It is important to note that the viability of the SASA development is important to us because it will support future aviation demand and make the airport more financially self-sustaining. Therefore, we will likely discourage any alignment that may significantly impact the SASA development.

Another alternative, worth considering may be alternative B. This alternative is clearly outside the RPZ. There are major concerns, however that this is a difficult option due to the 4(f) impacts, and greater costs to the Port of Seattle. Again, Port land holdings represent an opportunity to support future aviation demand. These are difficult issues in which we would like to continue to work closely with your agency and the Port of Seattle to find an alternative that balances all interests as equitably as possible.

Should you wish to discuss any of these matters further or have any questions, please do not hesitate to contact me at (425) 227-2653.

Sincerely,

Cayla D. Morgan
Airport Planner/Environmental Specialist

cc: Geri Poore, Port of Seattle
King Cushman, Puget Sound Regional Council

PLANNING GUIDANCE 98-19

SUBJECT: Roads in Runway Protection Zones (RPZs).

PURPOSE: This guidance is for use by Airports Division personnel who deal with RPZ planning issues and/or process airspace cases involving the RPZ. Its primary purpose is to help clarify how roads should be dealt with in the RPZ (the term "roads" used herein means surface roads and railroads).

BACKGROUND: Paragraph 212 of the Airport Design Advisory Circular (AC) 150-5300-13, through change 5, covers the RPZ. Paragraph 3 in the original cover page to this AC mentions that the airport design standards presented therein are recommended by Federal Aviation Administration (FAA) for use in the design of civil airports and that their use is mandatory for airport projects receiving Federal grant-in-aid assistance. These airport design standards, including those for RPZs, apply to airport projects under both the Airport Improvement Program (AIP) and the Passenger Facility Charge (PFC) Program. When dealing with roads as well as other land uses within the RPZs, it is important to fully understand the definition of certain terms that relate to the various airport design standards involving the RPZ (see attached Appendix 1).

DISCUSSION: Paragraph 212 of the Airport Design AC mentions that "The RPZ's function is to enhance the protection of people and property on the ground". However, this should be clarified in that the RPZs include the Runway Safety Area (RSA) and standard runway Object Free Area (OFA), and if applicable, OFA Extension and Obstacle Free Zone (OFZ) as well as any stopway, clearway, threshold obstacle clearance surface, or navaid critical area, where the function is to enhance the safety of aircraft operations. When dealing with land uses, including roads, within the RPZs, it is important to keep both of these functions in mind.

GUIDANCE: This guidance supplements the RPZ criteria presented in the Airport Design AC.

1. Proposed Roads in the Standard Runway Object Free Area (OFA): Proposed roads should not be permitted in the standard runway OFA within the RPZ, except proposed airport service roads found acceptable to FAA based on an aeronautical study.

2. Proposed Roads in the Permanent Object Free Area (OFA) Extension: Airport sponsors should be strongly encouraged by the Airports District Offices (ADOs) to establish a permanent OFA Extension to the maximum extent feasible to increase the safety of aircraft operations. To be realistic, such encouragement should take into account airport sponsor RPZ ownership and whether or not the area is clear of objects (or can be cleared of objects in a feasible and timely manner). Airport sponsors shall establish a permanent OFA Extension to the maximum extent feasible. Anything less than a full OFA Extension (i.e., from the end of the standard

runway OFA to the far end of the RPZ) requires documentation from the airport sponsor that is acceptable to the ADO. In this regard, nothing in this guidance is to be interpreted so as to discourage airport sponsor acquisition of the entire RPZ even when the establishment of any permanent OFA Extension may be infeasible. A permanent OFA Extension should be treated exactly like the standard runway OFA in terms of land use criteria and it should be shown on the approved airport layout plan (ALP). In short, proposed roads should not be permitted in an established permanent OFA Extension within the RPZ, except proposed airport service roads found acceptable to the FAA based on an aeronautical study.

3. Proposed Roads in the Controlled Activity Area: Every reasonable consideration should be given to clear the entire RPZ, including the Controlled Activity Area, of all objects per paragraph 212 and page 140 (paragraph 8 of Appendix 8) of the Airport Design AC. If an OFA Extension is not established on a permanent basis, then the area depicted as the OFA Extension in figure 2-3 of the Airport Design AC should be treated as part of the Controlled Activity Area except when specifically dealing with automobile parking facilities per paragraph 212a(2)(a) of the Airport Design AC. Proposed roads should not be permitted in the Controlled Activity Area (especially those that cross the runway centerline extended) unless the following conditions are met: (1) the proponent provides documentation to the ADO that shows it is not feasible to develop the proposed road entirely outside the Controlled Activity Area and further that all reasonable steps were taken to minimize the impact on the RPZ, (2) the proposed road is located entirely outside the standard runway OFA and any established permanent OFA Extension within the RPZ, and (3) the proposed road is found acceptable to the FAA based on an aeronautical study. Where it is determined to be impracticable for the airport sponsor to acquire and plan the land uses within the entire RPZ, the RPZ land use standards have recommendation status for that portion of the RPZ not controlled by the airport sponsor and this should be a consideration in the FAA aeronautical study, particularly if the proposed road involves only such portions of the RPZ.

4. Existing Roads in the RPZs: Whenever an airport master plan study (or ALP update study, if detailed) is undertaken, an evaluation of land uses in the RPZ should be a normal consideration of such studies, especially if there are existing objects in the RPZ, including roads. This evaluation should address pertinent RPZ issues, including the feasibility of removing existing roads from the RPZ and the development of a realistic removal plan of action in terms of priorities, costs, and funding considerations. If it is found that it is not feasible to remove an existing road in the RPZ, the study should clearly document this for the record.

5. Other Considerations on Roads in the RPZs: In applying the guidance herein, all other applicable requirements in paragraphs 211 (Object Clearing Criteria) and 212 (Runway Protection Zones) of the Airport Design AC and in Land Use Policy 97-02 should be followed. Also, any RPZ that was acquired under Federal grant-in-aid assistance programs should follow all applicable requirements and special conditions of these programs, including the clearing of objects per paragraph

602b(1) of FAA Order 5100.38A, Airport Improvement Program (AIP) Handbook. In addition, the term "proposed roads" used herein includes (1) proposed work that enhances or enlarges existing roads (but excludes normal road maintenance work) as well as (2) new roads (especially major ones) in the RPZ. Finally, road proposals that traverse the entire RPZ in a tunnel, where the cover or ground above on the surface is at the same grade as the surrounding terrain, are still subject to an aeronautical study by the FAA (e.g., to study items such as construction impacts and proposed tunnel cover strength versus weight of the critical aircraft using the runway in the event of an accident involving the RPZ).

REFERENCES:

FAA Airport Design Advisory Circular (AC) 150-5300-13, through change 5.
FAA Order 5100.38.A, Airport Improvement Program (AIP) Handbook.
Land Policy 97-02, FAA Northwest Mountain Region, Airports Division.

APPROVAL:

David A. Field
Manager, Planning, Programming,
and Capacity Branch
Northwest Mountain Region

6/17/98
Date

Attachment: Appendix 1, Definition and Clarification of Terms Involving the RPZ.

U.S. Department
of Transportation
**Federal Aviation
Administration**

Seattle Airports District Office
1601 Lind Avenue, S.W.
Renton, WA 98055-4056

May 18, 2000

Ms. Susan Everett, P.E.
Project Manager, Mailstop 250
Washington State Department of Transportation
P.O. Box 330310
Seattle, Washington 98133-4805

State Route 509/South Access Road Corridor EIS
North Extension of Des Moines Creek Trail

Dear Ms. Everett:

Pursuant to our discussion in the yesterday's Steering Committee meeting for SR 509/South Access Road, we would like to outline the Federal Aviation Administration's (FAA) position on the location of the North Extension of Des Moines Creek Trail.

Based upon recent discussions between Washington State Department of Transportation (WSDOT) and the Port of Seattle, it is our understanding that the new recommended alignment now places the trail in the SR 509 right-of-way on the Southwest side of the road. As we have indicated in previous discussions, we do not support trails on airport property or in the Runway Protection Zone (RPZ). Relative to this newly recommended alternative, we recognize that the trail is still within the RPZ, however, since the preferred alignment crosses the lower portion of the RPZ, we are comfortable with the trail doing the same as long as it is located on the furthermost edge of the RPZ. Therefore, we support the newly proposed alignment on the southwest side of State Route 509.

Should this not be the recommended alignment, there are other issues such as the receipt of Fair Market Value if the trail is on airport property, discussions about security, and possible lease agreements that would allow the property to be converted to airport use if needed in the future. Since these issues are moot if the alignment is in the southwest side of the road in the WSDOT right-of-way, we will not elaborate on such at this time.

Please feel free to contact me if you have any questions or comments at (425) 227-2653.

Sincerely,

Cayla D. Morgan
Environmental Specialist

Cc: Craig Smith, Port of Seattle

SR 509
25. Q

CITY OF SEATAC 1990 - 2000 10th Anniversary

"The Hospitality City"

NOV 20 2000

November 16, 2000

Mr. John H. White, P.E.
Washington State Department of Transportation
Northwest Region
6431 Corson Avenue South
Seattle, WA 98108

Dear Mr. White:

At the November 14, 2000, City Council meeting the Mayor and City Council moved to give Washington State Department of Transportation written concurrence from the City regarding its 4(f) mitigation proposal for impacts to Des Moines Creek Park due to construction of the SR 509 extension. This letter serves as that written approval.

Washington State Department of Transportation has proposed to replace the lost acreage (approximately 7.5 acres) with equal acreage adjacent to the existing park and west of the Des Moines Creek. The exact location of the additional acreage will be determined through a coordinated land swap between the City and WSDOT. In addition, WSDOT will relocate the trailhead parking lot westward, then extend the existing trail parallel to the new freeway northward from 200th Street to the existing interchange at 12th Pl. S. (S. 188th St.).

City of SeaTac looks forward to working with the WSDOT staff to work out the final details of the mitigation on the SR 509 project.

Sincerely,

Calvin Hoggard
City Manager

cor: 074.00

17900 International Blvd., Suite 401 • SeaTac, Washington 98188-4236
City Hall: (206) 241-9100 • Fax: (206) 241-3999 • TDD: (206) 241-0091

KING COUNTY PARK SYSTEM

DEC 26 2000

Program Development and Land Management Section

December 19, 2000

Brian H. Roberts, Transportation Engineer
Washington State Department of Transportation
Northwest Region
6431 Corson Avenue South
Seattle, WA 98108

RE: SR 509 / South Access Road

Dear Mr. Roberts:

This letter is in response from the Washington State Department of Transportation (WSDOT) for a letter providing documentation that King County Park System (KCPS) agrees in concept with WSDOT's Section 4(f) Evaluation and recommended mitigation plan for the SR 509 / South Access Road Proposal. The proposed project would require the use of property (approximately 7.5 acres) from the northeast corner of Des Moines Creek Park, currently within the KCPS. Although Des Moines Creek Park is owned by KCPS, it is at present, being maintained by the City of Seatac. Therefore, WSDOT is seeking written concurrence from KCPS that the proposed land replacement and trail extension is acceptable and considered full mitigation for the loss of the northeast corner of Des Moines Creek Park.

As Susan Strandberg and I discussed with you and John White during our meeting on November 30, KCPS is in the process of officially transferring title to Des Moines Creek Park to the City of Seatac. We hope to complete this transfer by February or March of next year. Transfer of park property to cities requires approval of an interlocal agreement by both the King County Council and the Seatac City Council.

We understand from speaking with you and Kit Ledbetter, Parks and Recreation Director with the City of Seatac, that WSDOT and Seatac have discussed the proposed mitigation plan. WSDOT has proposed to mitigate this impact to Des Moines Creek Park property: by replacing the land that would be required for the project with equivalent land on the western border of the park; relocating the existing trailhead facilities; and extending the Des Moines Creek Trail approximately two miles to the north along the route of the proposed SR 509 extension.

Luther Burbank Park • 2040 84th Ave SE • Mercer Island, WA 98040 • Tel: 206-296-4232 Fax: 206-205-5385

Since the goal of both King County and the City of Seatac is to accomplish the transfer of Des Moines Creek Park to City of Seatac we agrees that the City of Seatac should have a major role in determining adequate mitigation and compensation. However, should Des Moines Creek Park still be under King County's ownership at the time the land transfer would need to occur, such concurrence would require approval by the King County Council.

Thank you for the opportunity to provide these comments. If you need further clarification about the position of King County Park System, or need any other information, please contact me at (206) 296-4252.

Sincerely,

Connie L Blumen

Connie L. Blumen
Program Manager
Program Management and Land Development

cc: John H. White, P.E., Washington State Department of Transportation
Northwest Region, Corson Avenue South, Seattle, WA 98108
Kit Ledbetter, Director, Parks and Recreation Department, City of Seatac, 17900
International Boulevard, Suite 400, Seatac, WA 98188-4236
Ann Martin, Principal Transportation Planner, Transportation Planning, King County
Department of Transportation
Barbara Wright, Administrator, Program Management and Land Management,
King County Park System (KCPS)
Connie Blumen, Program Manager, KCPS
Robert Nunnenkamp, Property Agent KCPS
Susan Strandberg, Program Manager, KCPS
Joe Wilson, Property Manager, KCPS

City of Des Moines

DEPARTMENT OF PUBLIC WORKS
21650 11TH AVENUE SOUTH
DES MOINES, WASHINGTON 98198-6317
(206) 870-6522 FAX: (206) 870-6596

December 3, 2001

Ms. Susan Everett, P. E.
South King Engineering Manager
Northwest Region WSDOT
6431 Corson Avenue South
NB82-MS250
Seattle WA 98108-3445

Dear Susan:

Re: SR509 Draft Section 4(f) Evaluation Corridor Completion/I-5/South Access Road Project

The City of Des Moines has reviewed the November 2001 Draft Section 4(f) Evaluation for the SR509 Corridor Completion/I-5/South Access Road project. We concur that the WSDOT project will result in minor proximity impacts that would not affect the constructive use and enjoyment of the Midway Park.

We support WSDOT's decision to consider a noise barrier that would be placed between I-5 and the park. We look forward to working with WSDOT staff on the future noise study and evaluations for this area.

Sincerely,

Bob Olander
City Manager

cc: Tim Heydon, Public Works Director
Patrice Thorell, Parks/Recreation Director

KENT
WASHINGTON

PARKS, RECREATION & COMMUNITY SERVICES
John Hodgson
Director

Phone: 253-856-5100
Fax: 253-856-6050

220 Fourth Ave. S.
Kent, WA 98032-5895

November 19, 2001

Tim LaPorte
City of Kent Public Works Department
400 West Gowe Street
Kent, WA 98032

RE: I-5/SR 509 Between 272nd and Kent-Des Moines Road

Dear Tim:

Thank you for inviting us to the meeting with WSDOT to review the scope of this widening project.

Our concern with this project is the visual and noise impacts on Linda Heights Park. The Park is located on the north side of SE 248th Street. We share a common boundary with the I-5 Right-of-Way. The City has a sanitary sewer lift station on this site, also.

We recommend that WSDOT include a combination of noise attenuating barriers where appropriate and native plant buffers, for noise attenuating and visual barriers. Our preferred method for Linda Heights Park is native plantings, for both noise and visual impacts due to the extreme elevation change (25-35 feet) along the I-5 frontage.

We look forward to working with you and WSDOT on this project. Please keep us advised of the public input process scheduled for March 2002.

Sincerely,

John M. Hodgson, Director
Parks, Recreation & Community Services

C: Lori Flemm, Superintendent
Parks Planning & Development

JMH/jb

KENT
WASHINGTON

December 5, 2001

PUBLIC WORKS
Don E. Wickstrom, P.E.
Director of Public Works

Phone: 253-856-5500
Fax: 253-856-6500

220 Fourth Ave. S.
Kent, WA 98032-5895

Mr. John White, Project Engineer
Northwest Region Design, South King Area
6431 Corson Avenue South, MS 61
Seattle, WA 98108

DEC 06 2001

Re: SR-509 Preliminary Revised Draft EIS

Dear Mr. White:

Thank you for the opportunity to comment on the *Preliminary Revised Draft Environmental Impact Statement and Draft Section 4(f) Evaluation* (PRDEIS) for the SR-509 project. As you know, the City supports the SR-509 project and looks forward to partnering with WSDOT on its completion.

The PRDEIS was given to the Planning Department and Parks Department for review. The Planning Department has no comments at this time. The Parks Department took part in a meeting with WSDOT to discuss the impacts of the proposed auxiliary lanes on I-5 to Linda Heights Park. We would like to thank Susan Everett and Susan Bagley for attending this meeting. The Parks Department submitted a letter regarding these impacts – see attached.

Public Works Department comments are limited to the traffic volumes shown on Figures 1.3-1 and 1.3-3. The southbound volumes on Military Road, north of SR-516 are considerably lower, as shown in the figures, than our existing traffic counts indicate. The PRDEIS shows 400 vehicles in 1998 and projects 390 vehicles in 2020. Our counts indicate there are closer to 1000 vehicles existing and modeling for the S. 228th Street Extension project 1150 vehicles in 2020. This is one of the key intersections within the Kent portion of the study area, and we want to make sure that traffic operations are studied consistently.

If you have further questions please contact me at (253) 856-5515 or Chad Bieren at (253) 856-5534.

Sincerely,

Tim LaPorte, P.E.
Design Engineering Manager

Cc: Don Wickstrom, Public Works Director
Chad Bieren, Project Engineer

NCB01024.doc
Project Number: 87-3007E

Appendix A
Public and Agency Coordination

APPENDIX A

Public and Agency Coordination

Early Coordination Process

Steering and Executive Committees

The SR 509: Corridor Completion/I-5/South Access Road Project (SR 509 project) is guided by a Steering Committee and an Executive Committee composed of representatives from affected agencies and jurisdiction. The Steering Committee advises the project team and the Executive Committee. During the development of this project, the memberships of these two committees has evolved. Current membership is as follows:

- Executive Committee
    - Washington State Department of Transportation (WSDOT)
    - Port of Seattle
    - City of SeaTac
    - City of Des Moines
    - City of Kent
    - Metropolitan King County
    - 33rd District, Washington State Senate
    - 30th District, Washington State House of Representatives
- Steering Committee
    - Washington State Department of Transportation (WSDOT)
    - Port of Seattle
    - City of SeaTac
    - City of Des Moines
    - City of Kent
    - City of Federal Way
    - City of Burien
    - City of Normandy Park
    - Metropolitan King County
    - Sound Transit
    - Federal Highway Administration
    - Federal Aviation Administration
    - Citizen(s)

These committees provided review and guidance for all major decisions as noted elsewhere in this document.

Agency Involvement

A number of federal, state, regional, and local agencies and tribes have been involved in the development of the SR 509 project and the preparation of this Draft EIS.

Pre-EIS-Phase Agency Meeting

On May 7, 1992, a pre-EIS-phase agency meeting was held at SeaTac City Hall. The purpose of the meeting was for agency and jurisdiction representatives to ask questions and identify concerns related to the corridor alternatives identified for evaluation during preliminary screening. Representatives of the following agencies attended this meeting:

- Washington State Patrol
- Washington State Parks
- City of Des Moines
- City of Federal Way
- City of Normandy Park
- City of SeaTac
- Transportation Improvement Board
- Water District No. 54

EIS Agency Scoping and Coordination Meetings

The original Draft EIS for the SR 509 project was a Tier 1, or corridor-level, document. An EIS Agency Scoping Meeting on the original Draft EIS was held on October 1, 1992, at SeaTac City Hall. Representatives from the Port of Seattle, City of SeaTac, Highline School District, and the Transportation Improvement Board were present.

Resource agencies having permitting authority or other jurisdiction over environmentally sensitive resources in the project area participated in a special resource agency coordination meeting on April 25, 1994. The purpose of this meeting was to reach agreement on the level of detail needed for a "corridor-level" EIS that would satisfy the various agencies' needs. Representatives from U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and Washington Department of Fish and Wildlife (WDFW) attended.

A scoping meeting was not held to address the project-level alignments to be evaluated in a revised DEIS for a number of reasons. As noted above, agencies had already participated in scoping or coordination meetings for the corridor-level DEIS. In addition, the decision to prepare a revised DEIS addressing project-level alignments was in response to agency comments on the original, corridor-level DEIS and the sense that their environmental concerns could be best addressed in a project-level EIS. Furthermore, it was

felt that the agencies would have adequate opportunity to express their concerns during their participation in the NEPA/404 Merger Agreement process or through the Steering and Executive Committees.

Table A-1 lists contacts made with public agencies, jurisdictions, and organizations during preparation of the Revised DEIS.

Table A-1
Agency Contacts

Element of the Environment/ Environmental Review Process	Contact	Agency/Jurisdiction/Organization
Economics	Corr, C.	Kidder, Mathews, and Segner
	Craig, C.	City of Kent Finance Department
	Harris, S.	Northwest Corporate Real Estate Inc.
	McCarty, M.	City of SeaTac Finance Department
	Rabinovitz, E.	King County Department of Assessments
	Stoll, B.	Re/Max Realty West
Environmental Justice	Lamison-White, L.	U.S. Bureau of Census
	Ledbetter, K.	City of SeaTac, Parks and Recreation Department
	Spear, B.	U.S. Department of Transportation, Statistical Services Section
	Thorell, P.	City of Des Moines, Parks and Recreation Department
Hazardous Waste	Agid, P.	Port of Seattle
	Bahnick, Kathy	Port of Seattle
	Blasingame, J.	Manager Pizza Hut SubCo, Inc.
	Diggs, Don	Pacific Auto Brake & Muffler Service
	Duff, Ethel	Park of the Pines Church Conference Center
	Ellis, Doug	South Shore Fellowship
	Goodall G.	City of SeaTac Fire Department
	Heydon, Tim	City of Des Moines Public Works
	Nye, Roger	Department of Ecology
	Parmar, N.	Airport Plaza Hotel, SeaTac, WA
	Polhamus, Jim	Des Moines Fire Protection District No. 26
	Poor, Geri	Port of Seattle
	Riley, Benjamin A.	Des Moines Masonic Lodge No. 245.

Table A-1
Agency Contacts

Element of the Environment/ Environmental Review Process	Contact	Agency/Jurisdiction/Organization
NEPA/SEPA/404 Merger Process	Berg, Ken	U.S. Fish and Wildlife Service
	Brennan-Dubbs, Nancy	U.S. Fish and Wildlife Service
	Brower, Mike	Federal Highway Administration
	Darm, Donna	National Marine Fisheries
	Childers, Lynn	U.S. Fish and Wildlife Service
	Crouse, Michael	National Marine Fisheries
	Frederick, David	U.S. Fish and Wildlife Service
	Gibbons, Tom	National Marine Fisheries
	Hirsh, David	National Marine Fisheries
	Jackson, Jerry	U.S. Fish and Wildlife Service
	Kennedy, Jack	U.S. Army Corps of Engineers
	Landino, Steve	National Marine Fisheries
	Leonard, Jim	Federal Highway Administration
	Love, Sharon	Federal Highway Administration
	Lee, Judith Leckrone	U.S. Environmental Protection Agency
	Manning, Sandra	Washington Department of Ecology
	Parkin, Rick	U.S. Environmental Protection Agency
	Pratt, Cynthia	Washington Department of Fish and Wildlife Service
	Romano, Olivia	U.S. Army Corps of Engineers
	Randall, Loree	Washington Department of Ecology
	Robinson, Anne	U.S. Army Corps of Engineers
	Ryan, Bill	U.S. Environmental Protection Agency
	Suggs, Sarah	Washington Department of Ecology
	Swanson, Terry	Washington Department of Ecology
	Tonnes, Dan	National Marine Fisheries
	Teachout, Emily	U.S. Fish and Wildlife Service
	Thompson, Janet	Washington Department of Ecology
	Uhrich, Ann	U.S. Army Corps of Engineers
	Wood, Barb	National Marine Fisheries
Noise	Wells, Bob	Port of Seattle

Table A-1
Agency Contacts

Element of the Environment/ Environmental Review Process	Contact	Agency/Jurisdiction/Organization
Relocation	Chambers, Paula	Caldwell Banker Bain Associates
	Gut, Tom	City of SeaTac
	Hartson, Arthur (Ron)	Owner, Town and County Estates Mobile Home Park
	Korsgaard, Gary	John L. Scott Real Estate
	Mann, Sharon	Re/Max Real Estate
	Osborn, William	City of Kent
	Ramsaver, Teri	Washington State Office of Manufactured Housing
	Thornton, Tom	Owner, Tyee Valley Mobile Home Park
	Varacalli, Vincent	Varacalli Real Estate Co.
	Wietz, Dave	Manager, Town and Country Estates Mobile Home Park
Social	Booth, Michael	City of SeaTac
	Carr, Mary	Highline School District
	Catton, Bonnie	Kent School District Transportation Service
	Calhoon, Carolyn	Federal Way School District
	Keown, T.	Highline Water District
	Bowman, John	Lakehaven Utility District
	Hall, Chris	Lakehaven Utility District
	Kase, Ken	Midway Sewer District
	Yurovchak, Anita	Puget Sound Energy
Section 4(f)	Blumen, Connie	King County Park System
	Bowden, Bryan	National Park Service
	Broom, Joan	City of Kent, Parks and Recreation Department
	Eastberg, Cheryl	City of SeaTac, Department of Planning and Community Development
	Hoggard, Calvin	City of SeaTac City Manager
	Heydon, Tim	City of Des Moines
	Hodgson, John	City of Kent Parks Director
	Ledbetter, Kit	City of SeaTac Parks and Recreation Department
	Loch, Corbett	City of Des Moines
	Morgan, Cayla	Federal Aviation Administration
	Poor, Geri	Port of Seattle
	Rayburn, Bruce	City of SeaTac Public Works Department
	Taylor, Willie	U.S. Department of Interior
	Thorell, Patrice	City of Des Moines Parks and Recreation Department

Table A-1
Agency Contacts

Element of the Environment/ Environmental Review Process	Contact	Agency/Jurisdiction/Organization
Vegetation, Fish, and Wildlife	Berg, Ken	U.S. Fish and Wildlife Service
	Gloman, Nancy	U.S. Fish and Wildlife Service
	Grettenberger, John	U.S. Fish and Wildlife Service
	Guggenmos, Lori	Washington Department of Fish and Wildlife
	Kirkpatrick, Deeann	National Marine Fisheries Service
	Masters, Dave	King County Water and Land Resources
	Moody, Sandy S.	Washington Natural Heritage Program
	Murramatsu, John	Des Moines Chapter of Trout Unlimited
	Negri, Steve	Washington Department of Fish and Wildlife
	Nelson, Kitty	National Marine Fisheries Service
	Phillips, Chuck	Washington Department of Fish and Wildlife
	Schnieder, Phil	Washington Department of Fish and Wildlife
Visual Quality	Poor, Geri	Port of Seattle, Aviation Planning Department.
	Scarey, Michael	City of SeaTac Planning and Community Development
	Ward, Craig	City of SeaTac Planning and Community Development
	Monaghan, Donald	City of SeaTac Public Works
	Heydon, Tim	City of Des Moines Public Works
	Kilgore, Judith	City of Des Moines Community Development
Water Quality	Bartlett, C.	Highline Water Department
	Davis, M.	Highline Water Department
	Gibson, J.	Highline Water Department
	Johnson, K.	King County Department of Natural Resources
	Matthews, Wayne	City of Des Moines
Wetlands	Clarke, Steve	City of Burien
	Dodge, Jack	City of SeaTac
	Harris, Keith	Highline Water District
	Heydon, Tim	City of Des Moines
	Hubbard, Tom	Port of Seattle
	Leavitt, Elizabeth	Port of Seattle
	Ledbetter, Kit	City of SeaTac
	Masters, David	King County Department of Natural Resources
	Monahan, Don	City of SeaTac
	Rayburn, Bruce	City of SeaTac
	Reinhold, Loren	City of Des Moines
	Thorell, Patrice	City of Des Moines
	Wells, Robert	Port of Seattle

Interagency Working Agreement (NEPA/SEPA/404 Merger Agreement)

Discharges of dredged or fill material in waters of the United States, including wetlands, require permitting under Section 404 of the Clean Water Act. In June 1995, the Interagency Working Agreement to Integrate Special Aquatic Resources (Section 404 of the Clean Water Act) Permit Requirements into the National Environmental Policy Act (NEPA) and the State Environmental Policy Act (SEPA) in the State of Washington was signed. This agreement integrates the Section 404 permit processes and other related permitting and certification procedures into the NEPA and SEPA processes early in the project programming and project development stages.

The signatory agencies to this agreement are the Federal Highway Administration (FHWA), NMFS, U.S. Army Corps of Engineers (USACOE), U.S. Environmental Protection Agency (EPA), USFWS, Washington State Department of Ecology (Ecology), WDFW, and WSDOT.

During April 1997, WSDOT requested the signatory agencies' response to Concurrence Point 1. This concurrence point relates to the project's purpose and need, the criteria for alternative selection, and the role of all agencies. All signatory agencies, except NMFS, responded to the request for Concurrence Point 1. USACOE and WDFW concurred with no additional comments. USFWS, USEPA, and Ecology concurred with comments. The concurrence forms and accompanying letters, if any, for Concurrence Points 1 and 2 are presented at the back of this appendix.

Concurrence Point 2 addresses two items: (1) identification of alternatives to evaluate in the DEIS and (2) identification of the preliminary preferred alternative. WSDOT sent a letter during September 1999 requesting the signatory agencies' input on the alternatives to evaluate in the DEIS. NMFS and USFWS chose to waive the opportunity to provide comments on the alternatives. WDFW and EPA concurred with the alternatives without comment, and Ecology concurred with comments. During September 2001, the Signatory Agency Committee (SAC) agreed with WSDOT to eliminate Alternatives C1 and D from evaluation in the revised DEIS.

During August 2001, WSDOT sent a letter to the signatory agencies requesting their concurrence on the preliminary preferred alternative. USFWS, NMFS, and USACOE concurred without comment. WDFW and EPA concurred with comments.

Tribal Consultations

In addition to these meetings with interested agencies, a number of tribes were periodically contacted directly by letter or telephone for input on issues of concern. The tribes included:

- Muckleshoot Tribe
- Puyallup Tribe
- Duwamish Tribe
- Suquamish Tribe
- Lummi Nation
- Yakama Nation

Community Involvement

Community involvement with the SR 509 project has been ongoing since May 1992. Five public meetings were held regarding the previous, corridor-level EIS. The type, date, and purpose of those meetings are as follows:

Meeting	Date	Purpose
Open house/scoping	May 6, 1992	Give citizens an opportunity to identify issues associated with the proposed project that should be considered in the DEIS
Public meeting	June 1, 1992	Report results of first level screening
Open house/scoping	September 30, 1992	Identify alternatives
Open house	February 2, 1994	Receive comments on alternatives
DEIS public hearing	January 10, 1996	Receive comments on DEIS

Prior to the public meetings, a newsletter was sent out announcing the meetings and providing background information about the topics to be addressed at the meetings. A total of four newsletters were prepared regarding the corridor-level EIS. The newsletters were dated April 1992, September 1992, January 1994, and December 1995. In addition, advertisements were placed in regional and local newspapers announcing the meetings and their purpose.

Following receipt of public and agency comments on the DEIS, the Steering Committee, WSDOT, and FHWA concluded that the comments could be more fully addressed if details about the alternatives were developed. Once concurrence was given on the preferred corridor alignment, a decision was made to prepare a Revised DEIS that addressed specific project-level alignments.

The project-level EIS phase was initiated with a formal Public Scoping Meeting in February 1998. The intent of the federally mandated meeting was to solicit comments from the public on the proposed project, the specific EIS alternatives, and those issues that should be addressed in the EIS. Attendees were urged to provide comments on preprinted comment forms. The following summarizes the written and verbal issues raised at the hearing:

- Degree of land acquisition required, particularly residential land
- Infringement on Des Moines Creek Park
- Wetlands
- Des Moines Creek Drainage Basin
- Maintaining access for emergency service vehicles throughout area
- Bicycle and pedestrian facilities
- Noise impacts and mitigation
- Access to residential areas
- Traffic operations
- Airport and aircraft safety

Public meetings have been held throughout the development of the alternatives. The following table lists the formal public meetings that have been held regarding the project during development of the project-level EIS.

Meeting	Date	Purpose
Open house/scoping	February 26, 1998	Give citizens an opportunity to identify issues associated with the proposed project that should be considered in the DEIS
Open house	June 4, 1998	Provide project update, present of project-level alternatives, and inform residents of upcoming fieldwork
Open house	October 27, 1999	Provide results of value analysis and introduce new alternatives
Open house	January 10, 2001	Provide project update, present alternatives analysis, and introduce preliminary preferred alternative

In general, the majority of the comments at these public meetings have centered around preferences for a particular build alternative or more general comments about the alternatives being considered. The comments indicated a slight preference for Alternative C2, which was followed in order of preference by Alternatives D, C3, B, and C1 (with B and C1 having about the same level of preference). All of the people who preferred Alternative D were impacted by the other alternatives. A couple of comments also stated a preference to build nothing (Alternative A). Overall, opposition to the project or the preferred alternative represented a small minority of the comments received. People expressed concern about the amount of time project development was taking, particularly residents whose property might be affected by right-of-way acquisition. Concerns about project effects on traffic operations on local arterials and I-5 were also expressed. There were also some comments on noise, particularly the desire for noise barriers, and the need to minimize impacts to wetlands and to provide impact mitigation in the affected basins. The following summarizes the types of issues raised at the public meetings:

- Alternative selection and preferred alternative
- Timing of project construction and property acquisition
- Traffic operations
- Requests for maps, graphics and additional information
- Park impacts
- Cumulative impacts
- Relocation and property issues
- Noise
- Wetland impacts
- Impacts to water supply wells
- Cost
- Construction impacts to air quality

Prior to the public meetings, newsletters were distributed to inform the public about upcoming meetings and project activities. These newsletters focused on the topics addressed at the public meetings. The newsletters were dated February 1998, May 1998, October 1999, and November 2000. Another newsletter was also sent out in February 1999 describing the benefits of the project and anticipated funding requirements; this newsletter did not precede a public meeting. In addition, advertisements were placed in regional and local newspapers announcing the meetings and their purpose.

Meetings have also been held with interested groups and individuals, such as individual city councils, business owners and managers, and neighborhood groups.

Permits, Licenses, and Other Required Actions or Approvals

- U.S. Army Corps of Engineers
  - Section 404 of the Clean Water Act Permit
- Washington State Department of Ecology (Ecology)
  - Water Quality Certification, Section 401 of the Clean Water Act
  - National Pollutant Discharge Elimination System (NPDES) Stormwater Permit
  - NPDES Stormwater Site Plan—Individual
  - Coastal Zone Management Permit
- Washington Department of Natural Resources
  - Forest Practices Permit
- Washington State Department of Fish and Wildlife (WDFW)
  - Hydraulic Project Approval

- Cities of SeaTac, Des Moines, Federal Way, and Kent, and King County
  - Noise Variance
  - Clearing Permit
  - Critical Area Determination
- King County
  - Landfill Disturbance Permit (to be obtained by others)
- Federal Aviation Administration
  - Airport Highway Clearance

In addition to specific permits, other likely actions or approvals that will be required include:

- Section 4(f) Approval (related to impacts to parks and recreational land, wildlife refuges, and historic sites)—FHWA, U.S. Department of the Interior, and the Cities of Des Moines and Kent.
- Section 7 Consultation (related to impacts to threatened or endangered plant and animal species)—USFWS and NMFS
- Section 106 Review (related to impacts on historic properties)—Washington State Office of Archaeology and Historic Preservation (OAHP) and the Advisory Council on Historic Preservation

SEA/app a coordination_1103.DOC/020220039

Concurrence Point 1

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Mail Stop PV-11 • Olympia, Washington 98504-8711 • (206) 459-6000

February 5, 1996

Dale Morimoto, M.S.
Northwest Region Environmental
Dept. of Transportation
PO Box 330310
Seattle, WA 98133-9710

RE: Comments on DEIS, SR 509 Extension

Dear Mr. Morimoto:

Ecology has reviewed the Draft Environmental Impact Statement (DEIS), *SR 509 Extension/South Access Road Corridor Project,* received by Ecology in December, 1995. The proposed project will extend SR 509 to include two general-purpose travel lanes and a center high-occupancy vehicle lane in each direction, and to provide southern access to SeaTac Airport. The preferred alternative (Alternative 2) would impact 4.0 acres of wetlands, and cross several creeks and seismic hazard areas, and has the potential for crossing hazardous wastes and substances sites through the industrial sections of the proposed right of way. However, of the 3 build alternatives presented, Alternative 2 had the least amount of impact on the resources of the State.

Per the merger agreement, we have reviewed this document and provide the following comments. In general, we accept the purpose and need as stated in the DEIS, however we are concerned with the loss of wetlands and fish and wildlife habitat that would occur from this project as proposed. DOT should make every effort to avoid impacts to the wetlands and streams in the project area, especially for the category I and II wetlands, and Des Moines Creek.

For all unavoidable impacts, a detailed mitigation plan that is approved by Ecology will be required prior to permitting of the project. We would like to encourage DOT to consider a mitigation bank to compensate for the unavoidable impacts. DOT should combine impacts expected from this expansion with additional expected impacts from the future projects outlined on page S-4 in order to create a large bank for this and future projects. The use of a bank may allow for improved habitat and wetlands functions and values for the watershed. Please contact Ecology for information or assistance in the development of a mitigation bank proposal.

Specific comments to the plan are addressed below:

1. Proposed Alternative: DOT has selected Alternative 2 as their preferred alternative based on the lower cost and decreased environmental impacts of this alternative. Ecology supports this decision but recommends DOT consider additional avoidance or minimization on the impacts to the functions and values of the wetlands and streams to be crossed. If possible, Des Moines Creek and it's buffer should be bridged or avoided in some other way.

2. The final EIS should describe how the Category levels were assigned to each of the wetlands, and should define how the functions and values associated with each wetlands and creek will be replaced by the proposed mitigation.

3. The stormwater detention and treatment systems required for treating the additional runoff should be designed to include treatment of current road runoff. The systems should be located outside of wetland areas.

4. DOT should consult Ecology Hazardous Waste Section about cleanup requirements in the industrial areas prior to completion of the final EIS. The site should be tested and a cleanup plan prepared and presented in the EIS.

5. Table S-1: Under the Water Quality column of this table, information should be included about monitoring and maintenance requirements should be listed as part of the erosion control under mitigation.

6. Table S-1: Under the Wetlands column of this table, information should be included about erosion control around wetlands and wetland buffers as part of mitigation. Silt fences and other measures should be used to isolate the construction site from the mitigation site. Monitoring and maintenance requirements of the erosion control structures should also be included.

7. The information (second sentence) provided under Coastal Zone on page 4-30 and 31 is misleading. The exemption of the Shoreline management permit is only one criteria for meeting consistency requirements of the Coastal Zone Management (CZM) Act. This sentence should be removed or re-written to clearly state that it is only one criteria, and not "generally the State considers the project is in compliance" due to the shoreline exemption.

Mitigation:

8. Additional work needed to complete the goals of the *Des Moines Creek Restoration Project* (Herrara and Hall, 1989) as stated on page 3-18, may provide an opportunity for some of the project mitigation requirements.

9. Page 4-55 should include some information about the requirements of the DOT and Ecology Implementation Agreement for Wetland Mitigation.

10. Mitigation for the functions and values lost during bridging of creeks and wetlands should be included in the overall mitigation ratios and requirements.

If you have any questions please contact me at (206) 407-6912.

Sincerely,

Sandra L. Manning

Sandra L. Manning
DOT Liaison and Permit Reviewer
Environmental Review and Sediments

cc: DOT - Sandy Stephens
WDFW - Randy Carmon
Ecology - Ann Boeholdt, Bob Fritzen, Roger Nye
EPA - Richard Clark
Corps - Jack Kennedy

REC'D CH$_2$M SEA JUN 30 1997

Mirkwood
Meg Blower

for EIS
(FHWA didn't send the original
This should be good enough C.

U.S. Department of Transportation
Federal Aviation Administration

Seattle Airports District Office
1601 Lind Avenue, S.W.
Renton, WA 98055-4056

May 27, 1997

Mr. Gene K. Fong
Division Administrator
U.S. Department of Transportation
Federal Highway Administration Suite 501, Evergreen Plaza
711 South Capitol Way
Olympia, Washington 98501-1284

Dear Mr. Fong:

We have received your May 13, 1997 letter to Mr. Frederick Isaac requesting Federal Aviation Administration (FAA) participation as a Cooperating Agency on the Supplemental Draft Environmental Impact Statement (SDEIS) for the State Route 509 Extension/South Access Road project. We would like to reconfirm our participation in the cooperating agency role. We understand that our involvement will be limited to those areas under the FAA jurisdiction or special expertise as was the case in the corridor level Draft EIS for the project that was completed in December of 1995.

We look forward to working with you on the SDEIS. Should you have any questions, please contact Cayla Morgan at (206) 227-2653.

Sincerely,

J. Wade Bryant

J. Wade Bryant
Manager,
Seattle Airports District Office

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

P.O. Box 47600 • Olympia, Washington 98504-7600
(360) 407-6000 • TDD Only (Hearing Impaired) (360) 407-6006

June 10, 1997

Dale Morimoto, M.S.
Northwest Region Environmental
Dept. of Transportation
PO Box 330310
Seattle, WA 98133-9710

RE: Request for Cooperating Agency Status, SR 509 Extension
Concurrence Point #1 per Merger Agreement

Dear Mr. Morimoto:

I have reviewed your April 25th letter requesting Ecology act as a cooperating agency in development of environmental documentation for the SR 509 Extension/South Access Road Corridor Project. The proposed project will extend SR 509 to include two general-purpose travel lanes and a center high-occupancy vehicle lane in each direction, and to provide southern access to SeaTac Airport. We decline your offer to act as a cooperating agency for this project.

In Ecology's February 5th, 1996 comment letter on the Draft Environmental Impact Statement (DEIS), Ecology provided concurrence per the Merger Agreement on concurrence point number 1. Please accept this letter as confirmation that we agree with the stated purpose and need, but recommend that the criteria for improving regional mobility and safety should be included in the purpose and need statement. We also agree with the criteria for selecting the range of alternatives as presented in DOT's April 25th summary letter.

If the Supplemental DEIS has the same purpose and need (along with safety), and the criteria for selection that are stated in the April 25th summary, then Ecology will consider this letter the approval for concurrence point number 1, unless additional information is provided that warrants comments.

As stated in Ecology's February letter, we are still concerned with the loss of wetlands and fish and wildlife habitat that would occur from this project as proposed. DOT should make every effort to avoid impacts to the wetlands and streams in the project area, especially for the category I and II wetlands, and Des Moines Creek. All other comments as stated in the February letter (attached) should be addressed in the SDEIS.

If you have any questions please contact me at (360) 407-6912.

Sincerely,

Sandra L. Manning

Sandra L. Manning
DOT Liaison and Permit Reviewer
Environmental Review and Sediments

cc: DOT - Sandy Stephens
WDFW - Randy Carmon
NMFS - Dennis Carlson
USFWS - Nancy Brennan-Dubbs
EPA - Richard Clark
Corps - Jack Kennedy

State of Washington
DEPARTMENT OF FISH AND WILDLIFE

Mailing Address: 600 Capitol Way N • Olympia, WA 98501-1091 • (360) 902-2200, TDD (360) 902-2207
Main Office Location: Natural Resources Building • 1111 Washington Street SE • Olympia, WA

June 16, 1997

Mr. Dale Morimoto
Northwest Region Environmental
Department of Transportation
P.O. Box 330310
Seattle, Washington 98133-9710

Subject: SR 509 Extension/South Access Rd. Request for Cooperating Agency Status.

Dear Mr. Morimoto:

I have reviewed the information that accompanied the April 25, 1997 letter and have no comments and concur with the projects purpose and need and with the range of alternatives to be discussed in the supplemental DEIS. The alternatives that were chosen seem to have the least impacts to fish and wildlife habitat. Habitat loss and impacts that result from this project will need to be mitigated.

I will be reviewing the Hydraulic Project Application for this project and would also like to be kept informed on fish and wildlife issues, wetlands, and stomwater issues. I will also be available as time permits to provide input on these issues.

If you have any questions please call me at (425) 391-4365.

I would like to thank you for your cooperation in our effort to protect and perpetuate our state's fish and wildlife resources.

Sincerely,

Philip Schneider
Habitat Biologist

cc Jane Banyard
Ted Muller

Merger Agreement Concurrence Form

Project Title	SR#	Region	County
SR 509/South Access Road	509	Northwest	King

WRIA
0377 / 0380

Environmental Document Classification
Joint NEPA/SEPA EIS

Date Concurrence

- [x] Project purpose & need
- [x] Criteria for alternatives selection
- [x] Role of all agencies
- [ ] Project alternatives to be evaluated in DEIS
- [ ] Preferred alternative/Least environmentally damaging alternative
- [ ] Detailed mitigation plan
- [ ] Preliminary preferred alternative when known.

WSDOT Contact Person Dean Torkko

Environmental Summary

The proposed project would improve regional travel by extending the existing State Route 509 from its current terminus with a City of SeaTac arterial (S. 188th St.) southward to a connection with Interstate 5 and improve southerly access to and from Seattle/Tacoma International Airport by means of a new South Access Road which would connect the airport drive system with the new SR 509 extended roadway.

Concurrence Request

Having discussed the above concurrence point(s), the agency representative, by his/her signature to this document, signifies one of the following:

- [ ] Concurrence as presented [1]
- [x] Concurrence with comments [3]
- [ ] Nonconcurrence [2]
- [ ] Waived [4]

Comments/Reasons for Nonconcurrence

Although we concur with the above points, we request the removal of the last part of the last sentence of the purpose & need statement, which says, "... by means of a new South Access Road which would connect the airport drive system with the new SR509 extended roadway."

Additional Information Needed

Agency:	Title:	Signature:	Date:
EPA	NEPA Team Leader	John Bregar	12/24/97

[1] Definition of Concurrence - "Written determination by the agency that information to date is adequate for this stage, and the project may proceed to the next stage without modification."

[2] Definition of Nonconcurrence - "Written determination by the agency that information to date is not adequate for this stage, or the potential adverse impacts of the project are so substantial that permits would probably be denied, or the project should be modified to reduce the impacts."

[3] Definition of Concurrence with Comments - "Written determination by the agency that the project can advance to the next stage and comments will be addressed in the next submittal."

[4] Definition of Waiver - "Written determination by the agency that they voluntarily give up their opportunity to provide comment on that prticular concurrence point(s). Agencies which waive agree not to revisit that concurrence point."

United States Department of the Interior

FISH AND WILDLIFE SERVICE
North Pacific Coast Ecoregion
Western Washington Office
510 Desmond Drive SE, Suite 102
Lacey, Washington 98503
Phone: (360) 753-9440 Fax: (360) 753-9008

June 19, 1997

Gene Fong
Washington Division
Washington State Department of Transportation
711 South Capitol Way
Suite 501 Evergreen Plaza
Olympia, Washington 98501-1284

Subject: SR 509 Extension/South Access Road, NEPA/404 Merger and Request for Cooperating Agency Status

Dear Mr. Fong:

The U. S. Fish and Wildlife Service (Service) is responding to the above document regarding Concurrence Point Number 1 as part of the Merger Agreement, as well as the request for our agency to act as a cooperator. We decline your offer to act as a cooperating agency for this proposed project. Please find enclosed the signed Merger Agreement Concurrence Form. The Service has the following comments regarding the purpose and need, and range of alternatives to be addressed in the Supplemental Draft Environmental Impact Statement (SDEIS).

1. The SDEIS should address the need for the project if the proposed third runway expansion for SeaTac Airport does not go forward.

2. Alternative selection and screening criteria included assessing impacts to threatened and endangered species, and loss of wetlands due to filling and vegetation removal. Impacts to other wildlife species and wetland impacts due to shading, fragmentation, and changes in hydrology (i.e., decreasing flows) need to also be considered in the assessment of alternatives.

Please contact Nancy Brennan-Dubbs, of my staff, at (360) 753-5835 or at the above address in the future regarding this project.

Sincerely,

for David C. Frederick
Supervisor

nbd/jmc
Enclosure
WSDOT/SR509/King
c: EPA, Seattle (Roy)
EPA, Lacey (Clark)
NMFS, Lacey (Carlson)
COE, Seattle (Kennedy)
WDE, Lacey (Manning)
WDFW, Region 4
WSDOT, Olympia (Stephens)

wdoe\sr509p13

Merger Agreement Concurrence Form

Project Title	SR#	Region	County
SR 509	509	Olympic	King

WRIA	Environmental Document Classification	Date Concurrence Due
WRIA	$ DEIS Fiber	6-28-97

- ☒ Project purpose & need
- ☒ Criteria for alternatives selection
- ☐ Role of all agencies
- ☐ Project alternatives to be evaluated in DEIS
- ☐ Preferred alternative/Least environmentally damaging alternative
- ☐ Detailed mitigation plan
- ☐ Preliminary preferred alternative when known

WSDOT Contact Person José Miranda

Environmental Summary

Concurrence Request

Having discussed the above concurrence point(s), the agency representative, by his/her signature to this document, signifies one of the following:

- ☐ Concurrence as presented[1]
- ☒ Concurrence with comments[3]
- ☐ Nonconcurrence[2]
- ☐ Waived[4]

Comments/Reasons for Nonconcurrence	See attached Cover letter
Additional Information Needed	

Agency:	Title:	Signature:	Date:
US FWS	Acting Supervisor	Allen D Ratzlaff	6/20/97

[1] Definition of Concurrence - "Written determination by the agency that information to date is adequate for this stage, and the project may proceed to the next stage without modification."

[2] Definition of Nonconcurrence - "Written determination by the agency that information to date is not adequate for this stage, or the potential adverse impacts of the project are so substantial that permits would probably be denied, or the project should be modified to reduce the impacts."

[3] Definition of Concurrence with Comments - "Written determination by the agency that the project can advance to the next stage and comments will be addressed in the next submittal."

[4] Definition of Waiver - "Written determination by the agency that they voluntarily give up their opportunity to provide comment on that particular concurrence point(s). Agencies which waive agree not to revisit that concurrence point."

DEPARTMENT OF THE ARMY
SEATTLE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 3755
SEATTLE, WASHINGTON 98124-2255

REPLY TO ATTENTION OF
Regulatory Branch

JUL 30 1997

To: Christina Olson

Gene Fong
Division Administrator
Federal Highway Administration
711 South Capitol Way, #501
Olympia, Washington 98501

Reference: SR 509 EIS

Dear Mr. Fong:

The Seattle District, U.S. Army Corps of Engineers, concurs with your agency's decision to proceed to project-level documentation for extension of State Route 509, from its current terminus south of Seattle Tacoma International Airport near South 188th Street, eastward to Interstate 5. As we understand it, the documentation is to be a Supplemental Draft Environmental Impact Statement. It would supplement the corridor-level Draft Environmental Impact Statement Impact Statement entitled *SR 509/South Access Road Corridor Project and Draft Environmental Impact Statement and Section 4(f) Evaluation*. We accept your offer to be a cooperating agency in the preparation of the Environmental Impact Statement (EIS) pursuant to the NEPA/SEPA/Section 404 Merger Agreement.

In our February 29, 1996 letter on this project, we concurred with the Draft EIS Purpose and Need statement. We still do. We also concur with your selection of alternatives to be forwarded for further consideration. The concerns and other observations expressed in that February 1996 letter remain current.

Jack Kennedy remains the Corps staff contact person for this project. If you have any questions, please contact him at (206) 764-6907.

Sincerely,

Ann R. Uhrich

Ann R. Uhrich
Chief, Environmental and
Processing Section

Concurrence Point 2
Project Alternatives

Merger Agreement Concurrence Form

Project Title	SR#	Region	County
Extension and South Access Road	509	Northwest	King

WRIA	Environmental Document Classification	Date Concurrence Due
WRIA 09 Streams 0377 & 0380	Joint NEPA/SEPA EIS	11/15/99

- P Project purpose & need
- 1 Criteria for alternatives selection
- 1 Role of all agencies
- X 1 Project alternatives to be evaluated in DEIS
- 1 Preferred alternative/Least environmentally damaging alternative
- 1 Detailed mitigation plan
- 1 Preliminary preferred alternative when known

WSDOT Contact Person: Susan Powell

Environmental Summary

The purpose of the proposed action is to improve regional highway connections with an extension of SR 509 to serve future transportation needs in southwest King County and to enhance southern access to Seattle-Tacoma International Airport.

Concurrence Request

Having discussed the above concurrence point(s), the agency representative, by his/her signature to this document, signifies one of the following:

- 1 Concurrence as presented [1]
- 1 Concurrence with comments [3]
- 1 Nonconcurrence [2]
- X 1 Waived [4]

Comments/Reasons for Nonconcurrence

Additional Information Needed

NMFS — Agency: | Fishery Biologist — Title: | Dan Guy — Signature: | 12/29/99 — Date:

[1] Definition of Concurrence - "Written determination by the agency that information to date is adequate for this stage, and the project may proceed to the next stage without modification."

[2] Definition of Nonconcurrence - "Written determination by the agency that information to date is not adequate for this stage, or the potential adverse impacts of the project are so substantial that permits would probably be denied, or the project should be modified to reduce the impacts."

[3] Definition of Concurrence with Comments - "Written determination by the agency that the project can advance to the next stage and comments will be addressed in the next submittal."

[4] Definition of Waiver - "Written determination by the agency that they voluntarily give up their opportunity to provide comment on that prticular concurrence point(s). Agencies which waive agree not to revisit that concurrence point."

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
P.O. Box 47600 • Olympia, Washington 98504-7600
(360) 407-6000 • TDD Only (Hearing Impaired) (360) 407-6006

March 30, 2000

Susan Powell
Northwest Region Environmental
Dept. of Transportation
PO Box 330310
Seattle, WA 98133-9710

RE: SR 509 Extension - Concurrence Point #2 per Merger Agreement, Project Alternatives to be Evaluated

Dear Ms. Powell:

I have reviewed your November 15th letter requesting Ecology's concurrence for the alternatives identified by DOT to be evaluated in the environmental documentation for the SR 509 Extension/South Access Road Corridor Project. The proposed project will extend SR 509 to include two general-purpose travel lanes and a center high-occupancy vehicle lane in each direction, and to provide southern access to SeaTac Airport.

In the attached form, we have stated our decision to be concurrence with comments. We have the following comments on the alternatives:

1) All of the alternatives proposed have significant aquatic impacts in an area where mitigation opportunities are limited. We continue to be concerned with the loss of wetlands and fish and wildlife habitat that would occur from this project as proposed. DOT should make every effort to avoid impacts to the wetlands and streams in the project area, especially for the category I and II wetlands, and Des Moines Creek. We recommend DOT form a technical committee with the resource agencies and the FAA to assist in determining additional avoidance requirements early on, and potential mitigation sites that will be needed for project mitigation. It is essential that these areas are identified early, and agreed on by all the permitting agencies because of the limited mitigation areas, many of which are being proposed for mitigation by the SeaTac third runway expansion needs.

2) It is essential for DOT to continue to work with SeaTac to make certain that areas proposed for expansion on SR 509 do not impact the Port's proposed mitigation areas. Also, the two project's documents should be coordinated so that if there is an area that DOT is avoiding, but will be filled by the Port (or visa versa), it should not be presented as avoidance in the EISs. The areas that will eventually be filled by either project should be documented in the EIS, so that the Port or DOT are not getting credit for avoidance measures in their EIS document, or in the mitigation sequencing requirements of the 401/404 Clean Water Act review.

3) DOT should consider combining mitigation efforts and requirements with the Port, in order to obtain a better mitigation strategy for the area.

4) The impacts that will occur to the East Fork of Des Moines Creek, between Bow Lake and the Tyee Golf Course, and approximately 5 acres of associated wetland adjacent to the Creek are unclear. The maps provided by DOT show impacts different from the maps in the Corps public notice for the SeaTac expansion #96-4-02325R and in the EIS for the SeaTac expansion. It would be very helpful to have a single map showing the impacts that 509 will have to this area, and how the runway expansion has been coordinated with DOT for the creek and wetlands located under the proposed bridge that the Port of Seattle is building for the SeaTac expansion.

If you have any questions please contact me at (360) 407-6912.

Sincerely,

Sandra L. Manning

Sandra L. Manning
DOT Liaison and Permit Reviewer
Environmental Review and Assistance

cc:
WDFW –	Cynthia Pratt
NMFS -	Dennis Carlson
USFWS -	Nancy Brennan-Dubbs
EPA -	Richard Clark
Corps -	Jack Kennedy
Ecology –	Sarah Suggs, Janet Thompson, Tom Luster, Erik Stockdale, Sandra Lange

Merger Agreement Concurrence Form

Project Title	SR#	Region	County
Extension and South Access Road	509	Northwest	King

WRIA
WRIA 09
Streams 0377 & 0380

Environmental Document Classification
Joint NEPA/SEPA EIS

Date Concurrence Due
~~11/15/99~~ 2/22/00 info. received by Ecology on 1/6/00 SM

- P **Project purpose & need**
- 1 **Criteria for alternatives selection**
- 1 **Role of all agencies**
- X 1 **Project alternatives to be evaluated in DEIS**
- 1 **Preferred alternative/Least environmentally damaging alternative**
- 1 **Detailed mitigation plan**
- 1 **Preliminary preferred alternative when known**

WSDOT Contact Person Susan Powell, fax 440-4805

Environmental Summary

The purpose of the proposed action is to improve regional highway connections with an extension of SR 509 to serve future transportation needs in southwest King County and to enhance southern access to Seattle-Tacoma International Airport.

Concurrence Request

Having discussed the above concurrence point(s), the agency representative, by his/her signature to this document, signifies one of the following:

- 1 **Concurrence as presented** [1]
- X 1 **Concurrence with comments** [3]
- 1 **Nonconcurrence** [2]
- 1 **Waived** [4]

Comments/Reasons for Nonconcurrence: see attached

Additional Information Needed:

Agency:	Title:	Signature:	Date:
Ecology	DOT Liaison	Sandra L. Manning	3/30/00

[1] Definition of Concurrence - "Written determination by the agency that information to date is adequate for this stage, and the project may proceed to the next stage without modification."

[2] Definition of Nonconcurrence - "Written determination by the agency that information to date is not adequate for this stage, or the potential adverse impacts of the project are so substantial that permits would probably be denied, or the project should be modified to reduce the impacts."

[3] Definition of Concurrence with Comments - "Written determination by the agency that the project can advance to the next stage and comments will be addressed in the next submittal."

[4] Definition of Waiver - "Written determination by the agency that they voluntarily give up their opportunity to provide comment on that prticular concurrence point(s). Agencies which waive agree not to revisit that concurrence point."

Concurrence Form

Project Title	SR#	Region	County
Extension and South Access Road	509	Northwest	King
WRIA	**Environmental Document Classification**		**Date Concurrence Due**
0377/0380	Joint NEPA/SEPA EIS		11/15/99

- Project purpose & need
- Criteria for alternatives selection
- Role of all agencies
- X Project alternatives to be evaluated in DEIS
- Preferred alternative/Least environmentally damaging alternative
- Detailed mitigation plan
- Preliminary preferred alternative when known

WSDOT Contact Person Susan Powell

Environmental Summary

The proposed project would improve regional travel by extending the existing SR 509 from its current terminus with a city arterial southward to a connection with Interstate 5 and improve southerly access to and from Seattle-Tacoma International Airport by means of a new South Access Road which connect the airport drive system with the new SR 509 extended roadway.

Concurrence Request

Having discussed the above concurrence point(s), the agency representative, by his/her signature to this document, signifies one of the following:

- X Concurrence as presented [1]
- Nonconcurrence [2]
- Concurrence with comments [3]
- Waived [4]

Comments/Reasons for Nonconcurrence

Additional Information Needed

Agency: Corps of Engineers **Title:** Regulatory Project Manager **Signature:** Jack Kennedy **Date:** 12/21/99

[1] Definition of Concurrence - "Written determination by the agency that information to date is adequate for this stage, and the project may proceed to the next stage without modification."

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Merger Agreement Concurrence Form

Project Title	SR#	Region	County
Extension and South Access Road	509	Northwest	King

RECEIVED
NOV 19 1999
SOUTH KING COUNTY AREA ADMINISTRATION

WRIA	Environmental Document Classification	Date Concurrence Due
WRIA 09 Streams 0377 & 0380	Joint NEPA/SEPA EIS	11/15/99

- P Project purpose & need
- 1 Criteria for alternatives selection
- 1 Role of all agencies
- X 1 Project alternatives to be evaluated in DEIS
- 1 Preferred alternative/Least environmentally damaging alternative
- 1 Detailed mitigation plan
- 1 Preliminary preferred alternative when known

WSDOT Contact Person Susan Powell

Environmental Summary

The purpose of the proposed action is to improve regional highway connections with an extension of SR 509 to serve future transportation needs in southwest King County and to enhance southern access to Seattle-Tacoma International Airport.

Concurrence Request

Having discussed the above concurrence point(s), the agency representative, by his/her signature to this document, signifies one of the following:

- X 1 Concurrence as presented [1]
- 1 Nonconcurrence [2]
- 1 Concurrence with comments [3]
- 1 Waived [4]

Comments/Reasons for Nonconcurrence

Additional Information Needed

Agency:	Title:	Signature:	Date:
WDFW	NEPA/SEPA Coordinator	Cynthia R. Pratt	11/12/99

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
North Pacific Coast Ecoregion
Western Washington Office
510 Desmond Drive SE, Suite 102
Lacey, Washington 98503
Phone: (360) 753-9440 Fax: (360) 753-9008

DEC 3 1999

Susan Powell
Northwest Region Environmental
Washington Department of Transportation
PO Box 330310
Seattle, Washington 98133-9710

Re: SR 509 Extension and South Access Road, Concurrence Point 2

Dear Ms. Powell:

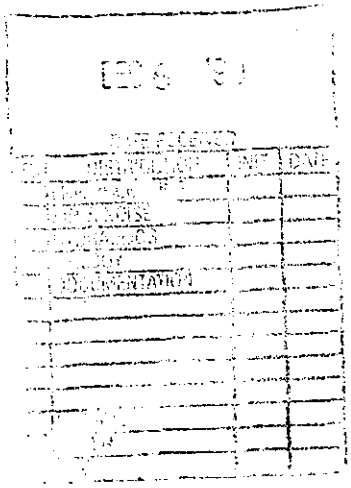
We have received your request for concurrence on the project alternatives to be evaluated in the Draft Environmental Impact Statement (Concurrence Point 2 of the NEPA/404 Merger Process) for the above proposed project. Due to staffing constraints, we are waiving our concurrence on this point.

Should you have any comments, please contact Nancy Brennan-Dubbs, of my staff, at (360)753-5835 or at the above letterhead address.

Sincerely,

Gerry A. Jackson, Manager
Western Washington Office

nbd/jk
c: EPA, Seattle (Roy)
DOE, Lacey (Manning)
WDFW, Region 4 (Schneider)
Corps, Seattle (Kennedy)



Concurrence Point 2
Preliminary Preferred Alternative

State of Washington
DEPARTMENT OF FISH AND WILDLIFE
Mailing Address: 600 Capitol Way N - Olympia, Washington 98501-1091 - (360) 902-2200, TDD (360) 902-2207
Main Office location: Natural Resources Building - 1111 Washington Street SE - Olympia, WA

August 24, 2001

Washington State
Department of Transportation
Northwest Region
Attention: Ms. Susan Powell
P.O. box 330310
Seattle, Washington 98133-9710

Dear ~~Ms. Powell~~ *Susan*:

SUBJECT: SR 509, South Access Road, 404 Merger Concurrence Point #2, Preliminary Preferred Alternative, Des Moines Creek, WRIA 09.377, and Massey Creek, WRIA 09.0380

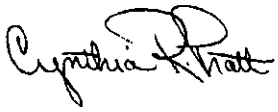
Washington Department of Fish and Wildlife (WDFW) has reviewed the SR 509 South Access Road project and the request for concurrence with the Preliminary Preferred Alternative (Concurrence Point #2). We have the following comments.

We concur with the C2 alternative and believe this is the best choice overall to balance fish and wildlife impacts with 4(f) impacts. Our agency still would like to see cumulative impacts of the closely related projects in this area viewed together, if possible. This analysis could then be analyzed for amount of mitigation needed to overcome overall impacts, which may be severe.

We want to iterate that there are chum and coho salmon, steelhead and cutthroat trout in Des Moines Creek. We understand that there might be a tributary to Des Moines Creek which enters the large wetland at the upper end of the project. No mention of this stream is found on your maps or in the discussion. This would be another good opportunity for enhancement of this stream reach, which has been straightened to flow again the road, and at times flows through a culvert.

Thank you for the opportunity to participate in this project. If you have any questions about this letter, please call me at (360) 902-2575. If you have specific questions concerning the area, please call Deborah Cornett, the Regional Habitat Program Manager, at (425) 775-1131, Extension 114, for the Area Habitat Biologist for the SR 509 South Access project.

Sincerely,



Cynthia R. Pratt
SEPA/NEPA Coordinator
Regulatory Services Section
Environmental Services Division
Habitat Program

cc: Stephen Kalinowski, Reg. Services
Gayle Kreitman, RSSM
Deborah Cornett, RHPM, Reg. 4

Merger Agreement Concurrence Form

Project Title	SR#	Region	County
Extension and South	509	Northwest	King

WRIA	Environmental Document Classification	Date Concurrence Due
WRIA 09 Streams 0377 and 0380	Joint NEPA/SEPA EIS	9/24/2001

- ☐ Project purpose & need
- ☐ Criteria for alternatives selection
- ☐ Role of all agencies
- ☐ Project alternatives to be evaluated in DEIS
- ☐ Preferred alternative/Least environmentally damaging alternative
- ☐ Detailed mitigation plan
- ☒ **Preliminary Preferred Alternative**

WSDOT Contact Person: Susan Powell

Environmental Summary

The purpose of the proposed action is to improve regional highway connections with an extension of SR 509 to serve future transportation needs in southwest King County and to enhance southern access to Seattle-Tacoma International Airport.

Concurrence Request

Having discussed the above concurrence point(s), the agency representative, by his/her signature to this document, signifies one of the following:

- ☐ Concurrence as presented [1]
- ☒ Concurrence with comments [3]
- ☐ Nonconcurrence [2]
- ☐ Waived [4]

Comments/Reasons for Nonconcurrence

Additional Information Needed

Agency:	Title:	Signature:	Date:
WSDOT	SEPA/NEPA Coordinator	Cynthia R. Pratt	8/24/01

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Western Washington Office
510 Desmond Drive SE, Suite 102
Lacey, Washington 98503
Phone: (360) 753-9440 Fax: (360) 753-9008

SEP 24 '01

SEP 18 2001

Susan Powell, Environmental Specialist
Washington State Department of Transportation
MS 138
Post Office Box 330310
Seattle, Washington 98133-9710

Reference: SR509 South Access Road: 404 Merger Concurrence Point 2 (Preliminary Preferred Alternative)

Dear Ms. Powell:

Our office received a letter and concurrence package from your agency dated August 9, 2001, requesting our concurrence on "C2" as the "preliminary preferred alternative" for the SR 509 Extension and South Access Road project; and our consent to proceed with the Supplemental Draft Environmental Impact Statement presenting "C2" as the preliminary preferred alternative according to the NEPA/SEPA/Section 404 Merger Agreement.

As you know, our agency could not concur with the above request in the past because of concerns regarding potential conflicts with proposed mitigation sites, and potential impacts to riparian and wetland habitat.

However, the concurrence package mentioned above, and a recent presentation by your project staff at the August 29, 2001 Signatory Agency Committee meeting, provided the necessary additional information, and demonstrated that our previous concerns have been adequately addressed for this stage of the process. As such, we are able to provide our concurrence with your request at this time.

If you have any questions please contact Emily Teachout at (360) 753-9583.

Sincerely,

for Ken S. Berg, Manager
Western Washington Office

Enclosure

cc: COE (A. Robinson)
EPA (T. Conner)
NMFS (T. Gibbons)
WDOE (T. Swanson)
WDFW (C. Pratt)
WDOT (B. Brown)

Merger Agreement Concurrence Form

Project Title	SR#	Region	County
Extension and South	509	Northwest	King

WRIA	Environmental Document Classification	Date Concurrence Due
WRIA 09 Streams 0377 and 0380	Joint NEPA/SEPA EIS	9/24/2001

- [ ] Project purpose & need
- [ ] Criteria for alternatives selection
- [ ] Role of all agencies
- [ ] Project alternatives to be evaluated in DEIS
- [ ] Preferred alternative/Least environmentally damaging alternative
- [ ] Detailed mitigation plan
- [x] Preliminary Preferred Alternative

WSDOT Contact Person **Susan Powell**

Environmental Summary

The purpose of the proposed action is to improve regional highway connections with an extension of SR 509 to serve future transportation needs in southwest King County and to enhance southern access to Seattle-Tacoma International Airport.

Concurrence Request

Having discussed the above concurrence point(s), the agency representative, by his/her signature to this document, signifies one of the following:

- [x] Concurrence as presented [1]
- [ ] Concurrence with comments [3]
- [ ] Nonconcurrence [2]
- [ ] Waived [4]

Comments/Reasons for Nonconcurrence

Additional Information Needed

Agency:	Title:	Signature:	Date:
US Fish and Wildlife Service	Division Manager	Lynn A. Childers	9/6/01

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Extension and South	509	Northwest	King

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WSDOT Contact Person **Susan Powell**

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Comments/Reasons for Nonconcurrence

Additional Information Needed

Agency:	Title:	Signature:	Date:
Corps of Engineers	DOT Liaison - Project Mgr	Renee M. Robinson	9/21/01

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Merger Agreement Concurrence Form

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WSDOT Contact Person: Susan Powell

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Comments/Reasons for Nonconcurrence

Additional Information Needed

Agency:	Title:	Signature:	Date:
NMFS	Habitat Biologist	Barb Ward	9/28/01

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8/8/2001

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, WA 98101

Reply To
Attn Of: ECO-088

SEP 24 2001

Ref: 96-003-FHA

Susan Powell
Washington State Department of Transportation
P.O. Box 330310, MS 138
Seattle, Washington 98133-9710

Dear Ms. Powell:

We have completed our review of the concurrence package for the proposed **SR 509, Extension and South Access Road** project, pursuant to the provisions of the NEPA/SEPA/404 Merger Agreement.

Based on the information reviewed, EPA concurs with the desire of the Washington State Department of Transportation (WSDOT) to include a preliminary preferred alternative in the Supplemental Draft Environmental Impact Statement (SDEIS) for the proposed project. In concurring with the inclusion of Alternative C2 as the preliminary preferred alternative in the SDEIS, we are agreeing that it is appropriate for WSDOT to identify the alternative that is presently favored by your agency, based on the work you have conducted to date. We believe that identifying a preliminary preferred alternative in the SDEIS, as part of the larger NEPA process, will provide an appropriate focus for the public review of the document/project.

Our concurrence does not, however, represent an endorsement of Alternative C2 as the alternative that we believe best addresses all of the issues related to the proposed project. At this point in time, we do not believe that we have a sufficient understanding of the analyses that have been conducted to make such a determination. EPA still has concerns surrounding aquatic and fisheries resources, environmental justice, especially for members of the community that reside within mobile homes or rental units, and the indirect and cumulative impacts from neighboring or related projects within or adjacent to the proposed project. We expect that information presented in the SDEIS and any subsequent analyses will allow us to make a determination of the preferred alternative that we would endorse prior to publication of the final EIS.

With this concurrence, we agree with WSDOT's request to proceed with the publication and release of the SDEIS for public review. We have enclosed a completed version of the Concurrence Form that was included in your concurrence package. Should you have any questions, please contact Tom Connor of my staff at (206) 553-4423.

Sincerely,

Judith Leckrone Lee, Manager
Geographic Implementation Unit

Enclosure

cc: Carrie Berry - Ecology; Tom Gibbons - NMFS; Anne Robinson - Corps of Engineers; Cynthia Pratt - WDFW; Emily Teachout - USFWS; Sharon Love - FHWA

Merger Agreement
Concurrence Form

Project Title	SR#	Region	County
Extension and South	509	Northwest	King

WRIA	Environmental Document Classification	Date Concurrence Due
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WSDOT Contact Person **Susan Powell**

Environmental Summary

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Concurrence Request

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- [ ] Waived [4]

Comments/Reasons for Nonconcurrence

Additional Information Needed

Agency:	Title:	Signature:	Date:
USEPA, Region 10	Manager, Geographic Unit	Judith Leckwee	9-24-01

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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
P.O. Box 47600 • Olympia, Washington 98504-7600
(360) 407-6000 • TDD Only (Hearing Impaired) (360) 407-6006

September, 24, 2001

Ms. Susan Powell, Environmental Specialist
Washington State Department of Transportation
P.O. Box 330310 MS – 138
Seattle, WA 98133-9710

Dear Ms Powell:

Re: SR-509 South Access Road 404 Merger Concurrence Point #2 Preliminary Preferred Alternative

The Department of Ecology has reviewed the SR-509 South Access Road project and the request for concurrence with the Preliminary Preferred Alternative (Concurrence Point #2). We concur with the Preliminary Preferred Alternative, "Alternative C-2" because it appears preliminarily to be the least environmentally damaging alternative for the SR-509 Extension and South Access Road project. With our concurrence, we consent to the Department of Transportation's moving forward with the Supplemental Draft Environmental Impact Statement (SDEIS) in accordance with the NEPA/SEPA/Section 404 Merger Agreement.

Ecology remains concerned with the wetland and stream impacts. For example, while the conflict between Alternative C-2's spanning of Tyee Pond and the Port of Seattle's Third Runway permit application has been resolved, it remains crucial to make every effort to minimize the span coverage to Tyee Pond and avoid any permanent excavation or fill impacts to the Pond. Additionally, the Department of Ecology will work with you to develop solutions aimed at avoiding direct impacts to other wetlands in the area (e.g. spanning).

Towards that end, we recognize that WSDOT will be proposing wetland mitigation and selective stream restoration and enhancement in the upland as part of the mitigation package. We look forward to reviewing and commenting on that package.

Thank you for the opportunity to participate in this project. If you have any questions, please contact me at 360.407.6789 or tswa461@ecy.wa.gov.

Sincerely,

Therese Swanson
Ecology-WSDOT Liaison

Cynthia Pratt, WDFW
Sarah Suggs, Ecology NWR
Ann Kenny, Ecology NWR
Ann Robinson, ASACE
Emily Teachout, USFWS

Merger Agreement Concurrence Form

Project Title	SR#	Region	County
Extension and South	509	Northwest	King

WRIA	Environmental Document Classification	Date Concurrence Due
WRIA 09 Streams 0377 and 0380	Joint NEPA/SEPA EIS	9/24/2001

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WSDOT Contact Person Susan Powell

Environmental Summary

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Concurrence Request

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- [ ] Waived [4]

Comments/Reasons for Nonconcurrence

Additional Information Needed

Agency:	Title:	Signature:	Date:
Ecology	Ecology-DOT Liaison	Theresa Swanson	09-24-01

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Appendix B
References

APPENDIX B

References

Chapter 1

Federal Aviation Administration (FAA), Washington State Department of Transportation (WSDOT), Port of Seattle, King County, City of SeaTac, and City of Des Moines. *SR509/South Access Road Corridor Project, Draft Environmental Impact Statement and Section 4(f) Evaluation*. Olympia, WA. December 1995.

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Chapter 3

Air Quality

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Energy

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SEA/app b refs.doc/020220040

Appendix C
List of Preparers

APPENDIX C

List of Preparers

Preparer/Role	Education	Years of Experience	Technical Expertise
CH2M HILL			
Mark Assam Environmental Justice	Community Planning Certificate B.S., Biology	10	Environmental Planner
James C. Bard/SOPA/ Cultural Resources	Ph.D., Anthropology M.A., Anthropology B.A., Anthropology	19	Archaeology
Mike Behn Social, Relocation, and Land Use	B.A., Planning, Public Policy, and Management	4	Land Use Planning
Sharon Feldman Geology and Soils and EIS Task Manager	M.S., Soils Science B.S., Soils Science	12	Geology and Soils
Farshad Farhang Noise	M.A., Business Administration B.S., Electrical Engineering	13	Noise
Craig Grandstrom Transportation	B.S., Civil Engineering	3	Transportation Planning
Kurt Playstead Economics	B.S., Economics and Statistics	7	Economics
Bob Swope Section 4(f) and EIS Task Manager	M.S., Urban Planning B.A., Political Science	27	Environmental Planning Project Management
HWA			
Michelle Ramos Geology and Soils	B.S., Geologic Engineering M.S., Geological Sciences	5	Geology and Soils
Kobayashi & Associates			
Bill Blair Visual Quality	M.L.A., Landscape Architecture B.A., Architecture	24	Visual Resources
Koyichi Kobayashi Visual Quality	M.L.A., Landscape Architecture	30	Visual Resources
Shapiro & Associates, Inc.			
Calvin Douglas Vegetation, Fish, and Wildlife	B.S., Wildlife Biology	4	Biology
Jack Gouge Energy	M.S., Biological Sciences and Residential Development B.S., Geology and Cultural Anthropology	30	Regulatory Compliance

Preparer/Role	Education	Years of Experience	Technical Expertise
Rick Pratt Wetlands	M.S., Oceanography and Coastal Science B.S., Ecology	7	Ecology
Felix Kristanovich, P.E. Water Quality	Ph.D., Civil Engineering M.S., Civil Engineering B.S., Civil Engineering	15	Hydrology
Washington State Department of Transportation			
Lawrence Spurgeon Air Quality	M.S., Electrical Engineering	9	Environmental Engineering
Jennifer Wilson Hazardous Materials	M.S., Environmental Science	4	Hazardous Materials

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Appendix D
Distribution List

APPENDIX D

Distribution List

Federal Agencies

U.S. Department of Defense
- Army Corps of Engineers

U.S. Environmental Protection Agency

U.S. Department of Interior
- Office of Environmental Policy and Compliance
- Fish and Wildlife Service
- Bureau of Indian Affairs
- National Park Service

U.S. Department of Commerce, National Oceanic and Atmospheric Administration
- National Marine Fisheries Service

U.S. Department of Transportation
- Federal Aviation Administration
- Federal Transit Administration
- Federal Highway Administration

Tribes

Muckleshoot Tribe
Suquamish Tribe
Duwamish Tribe
Puyallup Indian Tribe
The Yakama Indian Nation

State Agencies

Office of Archaeology and Historic Preservation
Office of the Attorney General
Community Development
Department of Ecology
Fish & Wildlife Service
Department of Natural Resources
Department of Social and Health Services
Interagency Committee for Outdoor Recreation
Parks and Recreation Commission
Washington State Patrol

Utilities and Transportation Commission
Puget Sound Water Quality Authority
Governor's Office – Salmon Recovery Funding Board

Regional Agencies

Northwest Indian Fisheries Commission
King County
- Public Works Roads and Engineering Division
- Development and Environmental Services Department
- Department of Public Health Fire Districts 2, 26, 39
- Sheriff, Federal Way Precinct No. 5
- Metro Environmental Planning

Puget Sound Clean Air Agency
Puget Sound Regional Council
Port of Seattle
Regional Transit Authority
Sound Transit

Local Agencies

City of SeaTac
- Fire Department
- Police Department
- Public Works
- Planning and Community Development
- Parks & Recreation Department

City of Des Moines
- Public Works
- Planning
- Police Department
- Parks Department

City of Federal Way
- Planning
- Public Works

City of Burien
- Planning
- Public Works

City of Normandy Park
- Planning
- Public Works

City of Kent
Planning
Public Works

City of Tukwilla
Planning
Public Works

Public Officials

Representative Eileen Cody, 11th District
Representative Velma Veloria, 11th District
Representative Mark Miloscia, 30th District
Representative Maryann Mitchell, 30th District
Representative Shay Schual-Berke, 33rd District
Representative Joe McDermott, 34th District
Representative Erik Poulsen, 34th District
Representative Doug Erickson, Vice-Chair House Transportation Committee
Representative Mike Cooper, Vice-Chair House Transportation Committee
Representative Ruth Fisher, Co-Chair House Transportation Committee
Representative Maryann Mitchell, Co-Chair House Transportation Committee
Representative John Lovick, Co-Chair House Transportation Committee
Representative Shirley Hankins, Vice-Chair House Transportation Committee

Senator Margarita Prentice, 11th District
Senator Tracey Eide, 30th District
Senator Karen Keiser, 33rd District
Senator Dow Constantine 34th District
Senator Mary Margaret Haugen, Chair Senate Transportation Committee
Senator Georgia Gardner, Vice-Chair Senate Transportation Committee

Mayor Sally Nelson, City of Burien
Burien City Council

Mayor Scott Thomasson, City of Des Moines
Des Moines City Council

Mayor Michael Park, City of Federal Way
Federal Way City Council

Mayor Jim White, City of Kent
Kent City Council

Mayor Charlie Harris, City of Normandy Park
Normandy Park City Council

Mayor Shirley Thompson, City of SeaTac
SeaTac City Council

Mayor Steven Mullet, City of Tukwila
Tukwila City Council

Libraries

King County Library System
Boulevard Park, Burien, Des Moines, Federal Way-320th Street, Kent, Seattle Public Library (Downtown), Tukwila, Valley View, and White Center Regional Branches
Suzzallo Library, University of Washington
Highline Community College
Wilson Library, Western Washington University
WSDOT Library

Schools

Highline School District
Federal Way School District
Highline Community College

Utilities

Highline Water District
King County Water District 54
Federal Way Water District
Midway Sewer District
Federal Way Sewer District
Puget Sound Energy
Olympic Pipeline Co.
AT & T
Qwest

Organizations

Southwest King County Chamber of Commerce

News Media

Seattle Post Intelligencer
Seattle Times
Valley Daily News
Highline Times
Des Moines News
Federal Way News
The Facts
La Voz
The Hispanic News
NW Asian Weekly
South County Journal

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Appendix E
Right-of-Way Acquisition Process

APPENDIX E

RIGHT-OF-WAY ACQUISITION PROCESS

Once right-of-way plans are approved and funding is made available for a highway project, the Washington State Department of Transportation (WSDOT) can begin to acquire the necessary right of way from property owners. The year-long acquisition process includes presentation of an offer to purchase and relocate people or personal property displaced by the project.

The price offered for property being acquired by WSDOT is established by appraisal. The appraiser's task is to determine "just compensation" for affected properties based on "fair market values." When total acquisition is required, the property owner receives the current market value. Compensation for a partial acquisition is the difference between the fair market value of the original property and that of the remainder.

Upon completion of the appraisal process, a WSDOT representative will offer to purchase the property. The representative will answer any questions individuals may have about procedures, rights, and impacts associated with the project.

When a settlement is reached, the representative will collect the required signatures and complete the necessary paperwork. Only after these details have been completed will payment for the acquisition be processed.

If you are the occupant (tenant or owner) of a structure that is to be acquired by WSDOT, or if you own personal property located within the area to be acquired, you may be eligible for certain relocation services. Eligibility complies with federal and state regulations (Public Law 91-646, RCW 8.26.010 to 8.26.910). Typically, these benefits may include advisory services, replacement dwelling supplements, and reimbursement for moving expenses incurred as a result of the project.

Since each property, ownership, and occupancy is unique, there may be considerable variation in procedures and time requirements. Including the reviews that are necessary during the process, it will normally take up to nine months from the appraisal start date to the date when the owner receives payment for the acquisition. Ownerships involving relocation can take about three months in addition to the acquisition time frame.

In all cases, WSDOT will initiate contact with owners and tenants. Should questions arise about the schedule or process, please call WSDOT, Northwest Region, Real Estate Services Office (206) 440-4163.

After the project is completed, WSDOT may identify and dispose of surplus real property. Frequently these properties are created when right of way is vacated because a roadway is moved or when small uneconomic pieces are purchased during the acquisition process. Disposal of these pieces of land are offered to governmental agencies, abutting owners, or other interested individuals subject to established legal and standard policy procedures.

Appendix F
Environmental Justice

APPENDIX F

Environmental Justice

Summary

The SR 509: Corridor Completion/I-5/South Access Road Project build alternatives were evaluated for compliance with Presidential Executive Order (EO) 12898 and Federal Highway Administration (FHWA) Order 6640.23. These orders establish that it is federal policy to avoid, to the extent practicable, disproportionately high and adverse human health or environmental impacts on minority or low-income populations. For purposes of this analysis, National Environmental Policy Act (NEPA) significant adverse impacts are considered synonymous with high and adverse impacts as described in EO 12898 and FHWA Order 6640.23. As reported in the series of discipline reports prepared for the SR 509: Corridor Completion/I-5/South Access Road Revised Draft Environmental Impact Statement and Section 4(f) Evaluation (Revised DEIS), and further confirmed through discussions with the report authors, no significant adverse impacts are expected as a result of this project after proposed mitigation measures are implemented. Consequently, no project impacts can be described as high and adverse in the context of EO 12898 or FHWA Order 6640.23. Because no high and adverse impacts are expected to result from this project, this analysis concludes that no high and adverse human health or environmental effects are expected to fall disproportionately on minority or low-income populations. Therefore, the SR 509: Corridor Completion/I-5/South Access Road Project can be considered to be consistent with the policy established in EO 12898 and FHWA Order 6640.23.

Introduction

This report was prepared in compliance with Presidential EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, dated February 11, 1994; and FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (FHWA Order 6640.23), dated December 2, 1998. The purpose of this report is to determine whether or not disproportionately high and adverse human health or environmental effects of the proposed SR 509: Corridor Completion/I-5/South Access Road Project are likely to fall on minority and/or low-income populations. This report focuses on the populations that are located within the area potentially affected by the project build alternatives. In accordance with EO 12898 and FHWA Order 6640.23, this report documents where minority and low-income populations reside and examines where the high and adverse impacts (as reported in the various discipline reports that support the Revised DEIS) fall relative to these

populations. This report also discusses the specific outreach efforts made to involve minority and low-income populations in the decision-making process.

Description of the Proposed Action

The Federal Highway Administration (FHWA), the Washington State Department of Transportation (WSDOT), the Port of Seattle, King County, and the Cities of Des Moines and SeaTac propose to improve regional highway connections with an extension of SR 509 to serve future transportation needs in southwest King County and to enhance southern access to and from Seattle-Tacoma International Airport (Sea-Tac Airport) by means of a new South Access Road. (Figure F-1 shows the location of the project area and Figure F-2 shows the project vicinity.) To accommodate an interchange at I-5 and SR 509, improvements to I-5 between approximately South 210th Street and South 310th Street are also proposed. The SR 509: Corridor Completion/I-5/South Access Road Project would improve regional highway connections, enhance southern access to and from Sea-Tac Airport, and improve related local traffic circulation patterns.

Description of Project Alternatives

Three build alternatives (Alternatives B, C2, and C3) and a No Action Alternative (Alternative A) are considered in this Revised DEIS.

Alternative A (No Action)

The No Action Alternative (Figure F-3) represents the baseline conditions assumed to exist in the future regardless of whether the proposed project is constructed. Under the No Action Alternative, the SR 509 freeway extension, the South Access Road to Sea-Tac Airport, and the improvements to I-5 would not be built. This alternative, as well as the other alternatives, is defined in Chapter 2.

Features Common to All Build Alternatives

Each alternative for the SR 509 freeway extension would originate at approximately South 188th Street/12th Place South. The northern terminus of the South Access Road would be at the south end of the airport terminal drives. The southern terminus of the South Access Road would connect with the SR 509 freeway extension; the location and design of this connection would vary with each alternative. There would be interchanges at South 200th Street and 28th/24th Avenue South, but not at SR 99. Improvements to I-5 would be the same for all build alternatives.

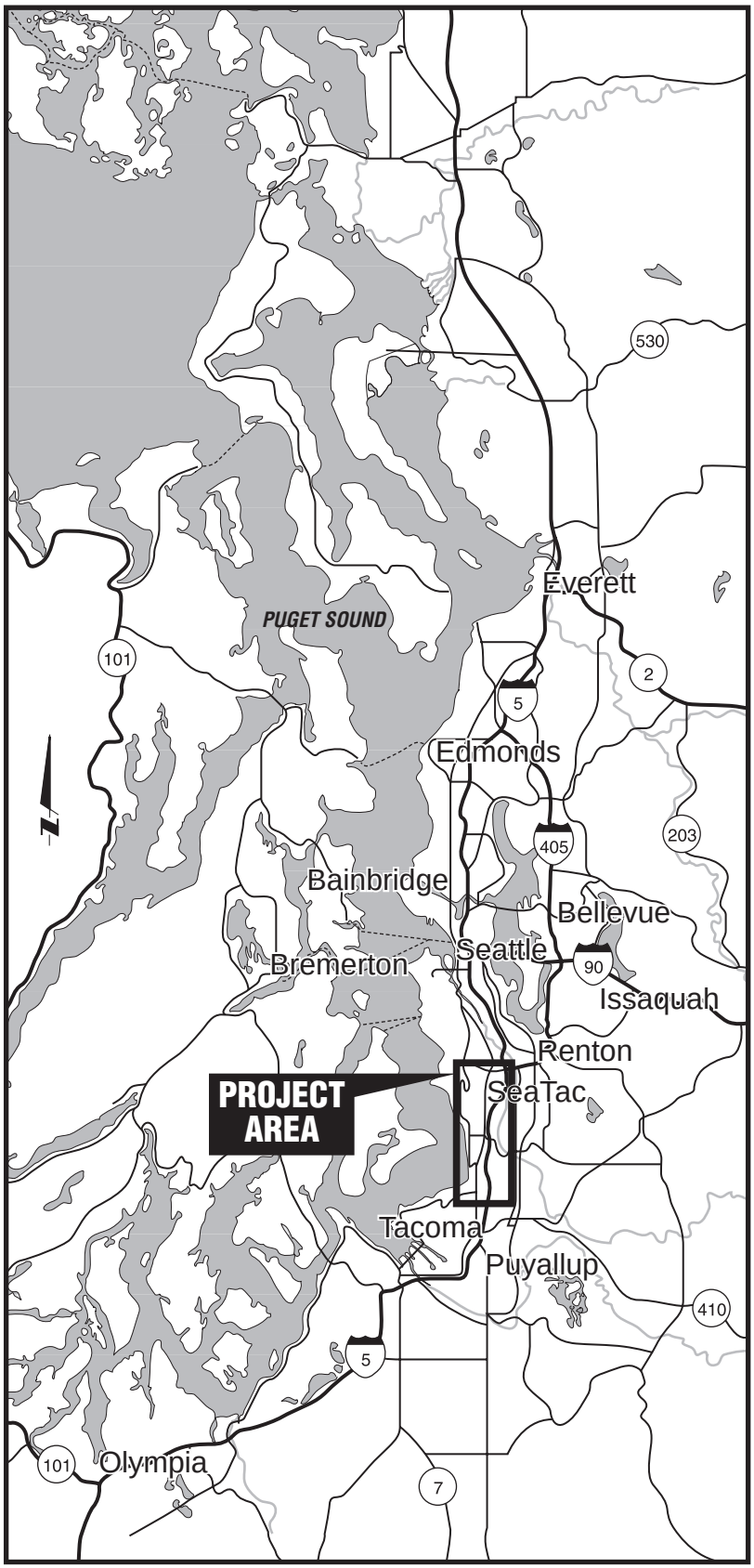
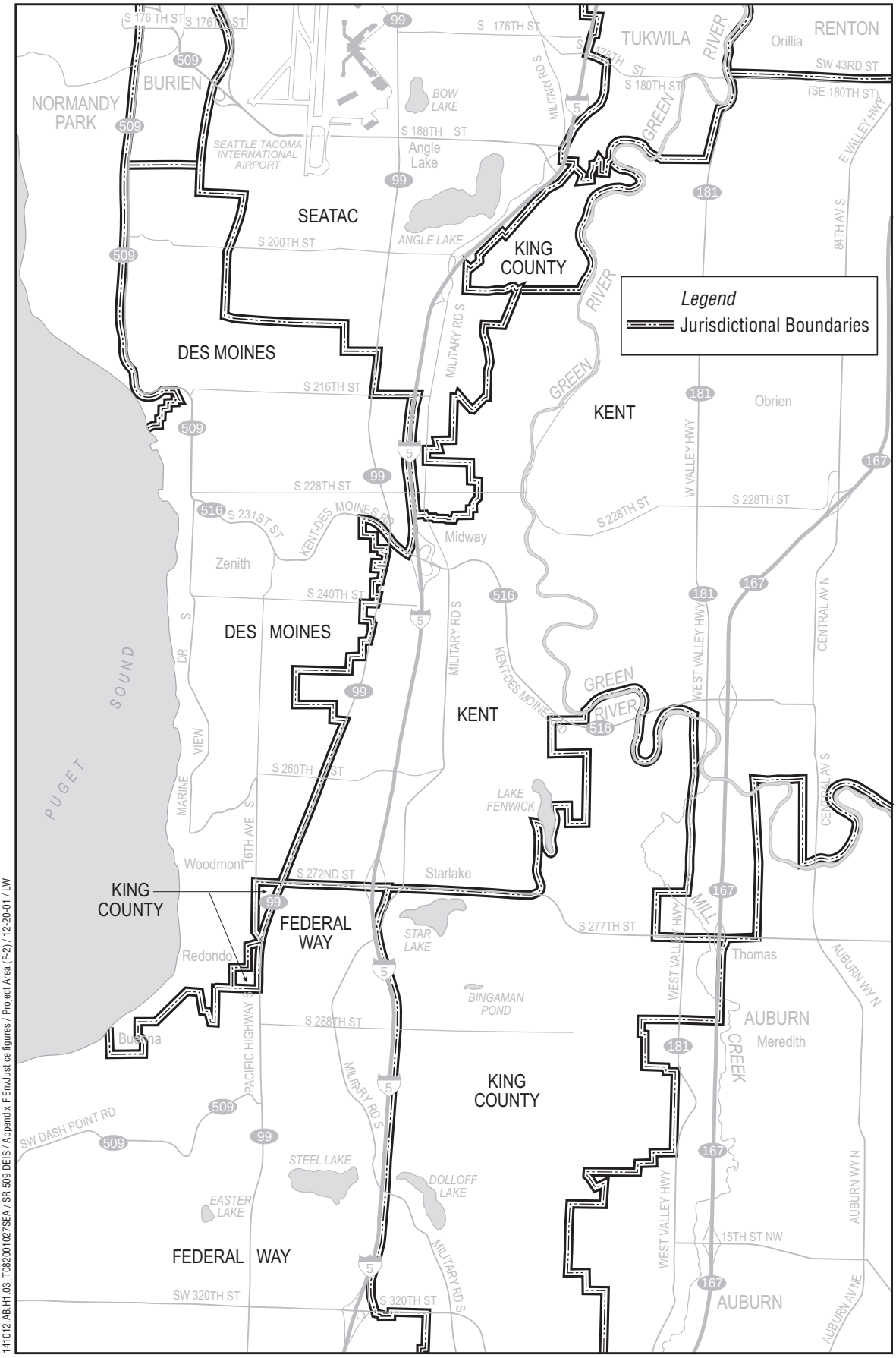


FIGURE F-1

Project Area Location Map

SR 509: Corridor Completion/
I-5/South Access Road
Environmental Impact Statement



141012.AB.H1.03_T08200102?SEA / SR 509 DEIS / Appendix F EnvJustice figures / Project Area (F-2) / 12-20-01 / LW

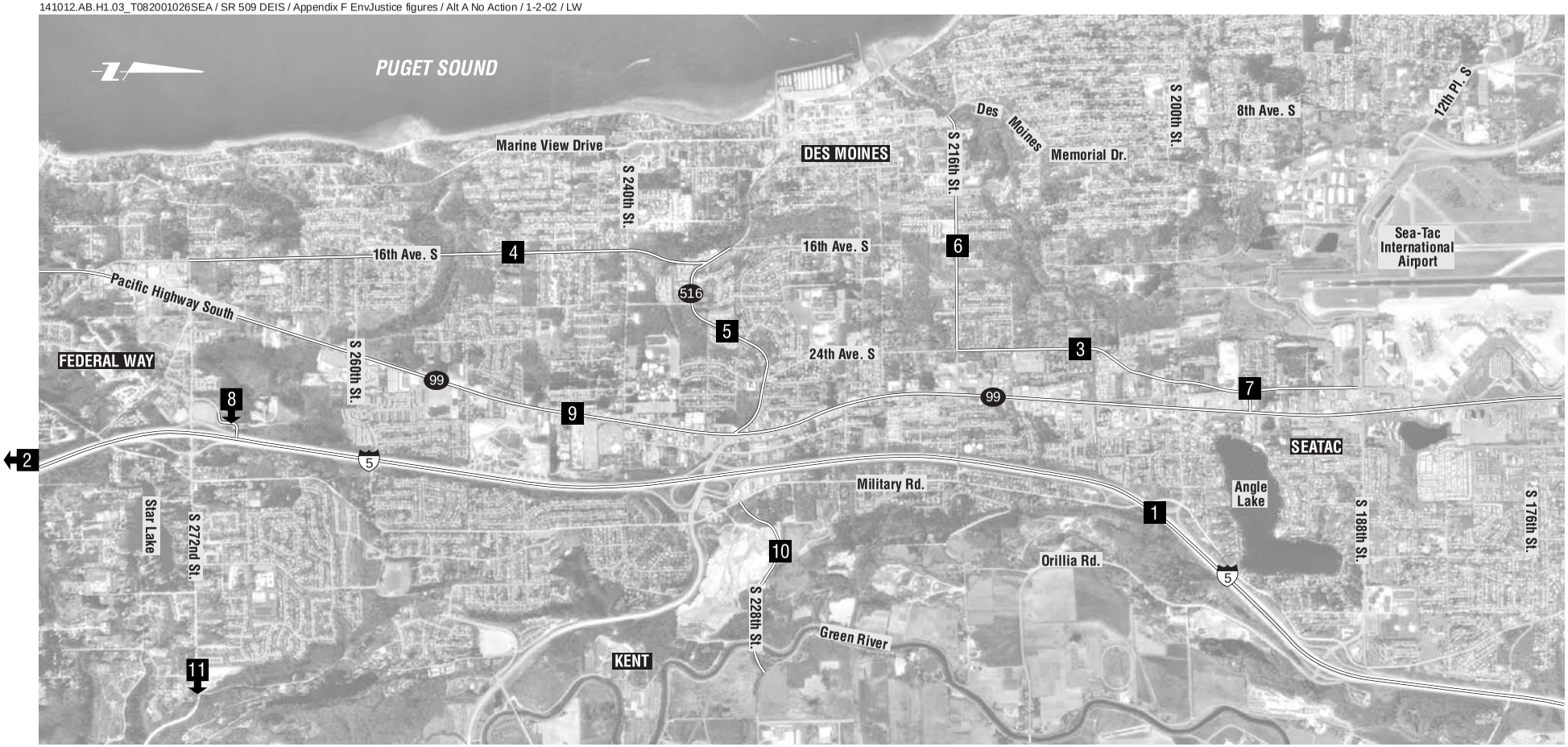
0 1900 3800
Scale in Feet

North

FIGURE F-2

Project Area

SR 509: Corridor Completion/I-5/South Access Road
Environmental Impact Statement



Legend

Baseline Projects by others

0 1/4 1/2 3/4 1 MILES

Baseline Projects Assumed for No Action Alternative.

1. I-5 HOV Lanes
2. I-5 @ S. 317th Street Direct Access Ramp
3. 28th/24th Avenue S. Arterial (Phase 1 completed – S. 188th to S. 204th Streets)
4. 16th Avenue S.
5. Kent-Des Moines (SR 516) Road
6. S. 216th Street
7. S. 195th Street
8. I-5 @ S. 272nd Street In-Line Station
9. Pacific Highway S./International Boulevard (SR 99) (Phases 1 and 2 completed – S. 170th to S. 200th Streets)
10. S. 228th Street
11. S. 272nd/S. 277th Street Corridor

FIGURE F-3

Alternative A (No Action)

SR 509: Corridor Completion/I-5/South Access Road Environmental Impact Statement

SR 509 Mainline/South Access Road

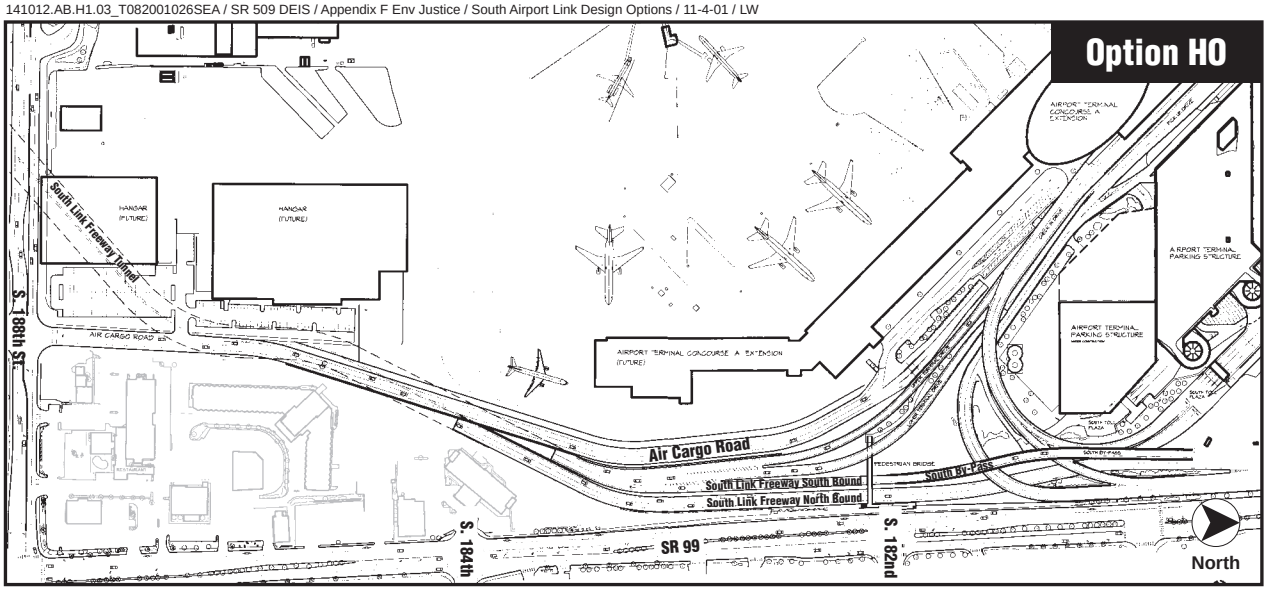
The configuration of the SR 509 freeway extension would be six lanes: two general purpose travel lanes and an inside high-occupancy vehicle (HOV) lane in each direction. The South Access Road would consist of two general purpose lanes in each direction, for a total of four lanes. In general, right-of-way widths would be at least 200 feet for the SR 509 freeway extension and at least 120 feet for the South Access Road. The SR 509 freeway extension would be designed to level of service (LOS) D and a speed of 70 miles per hour (mph). The South Access Road would be designed to LOS D and a speed of 35 to 45 mph.

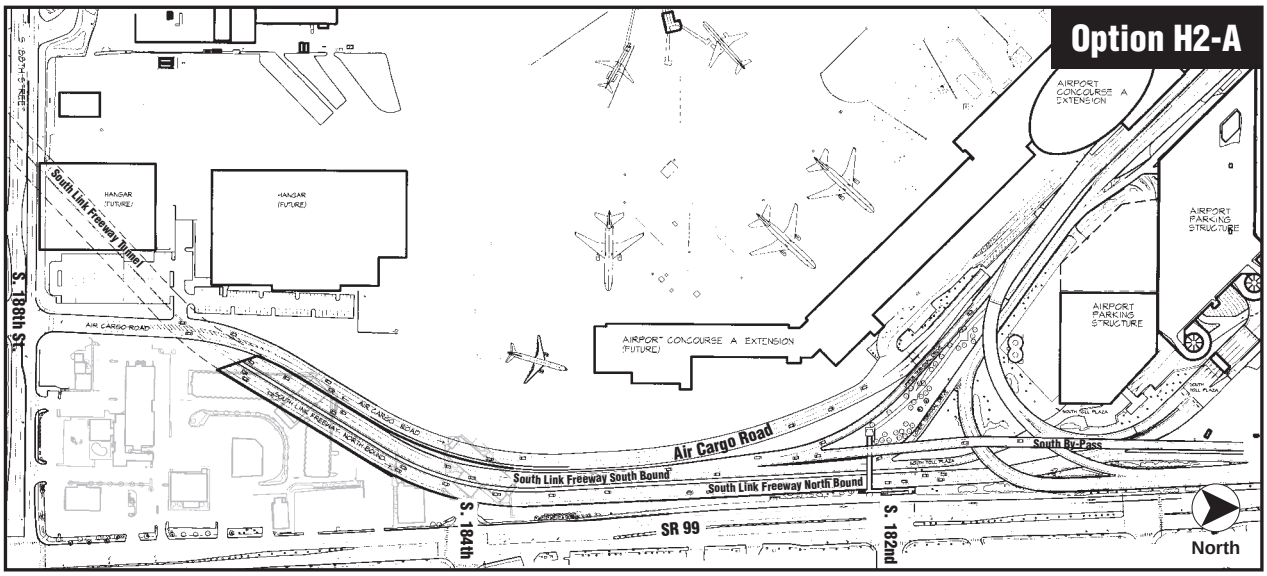
South Airport Link

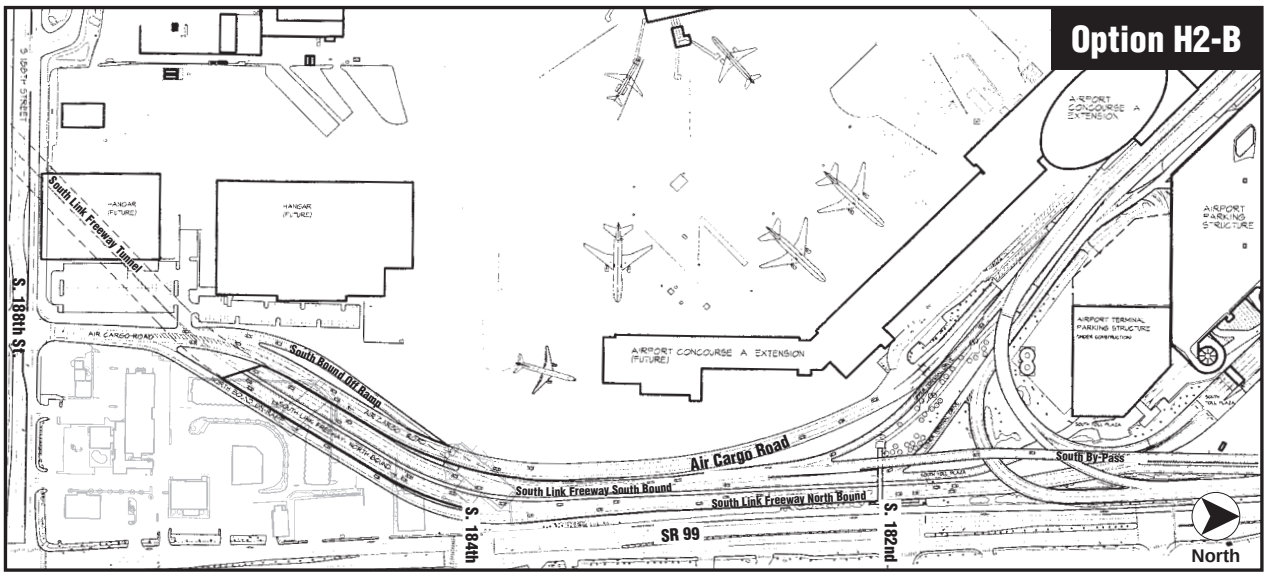
The South Airport Link, the last 1,000 feet of roadway connecting the South Access Road to the existing airport roadways, has three design options. At the south end, each design option crosses beneath South 188th Street and the southeast corner of Sea-Tac Airport via a tunnel. At the north end, the design options would maintain both southbound and northbound connections from the upper and lower terminal drives. Under Design Option H0, Air Cargo Road and the South Access Road would be "stacked" via an extended “S”-curve tunnel structure (Figure F-4). Under Design Option H2-A, Air Cargo Road and the South Access Road would generally parallel each other and would be separated by medians (Figure F-4). Design Option H2-B would be essentially the same as Design Option H2-A, except that it would provide local access routes for northbound and southbound traffic at the intersection of South 188th Street and 28th Avenue South (Figure F-4).

Improvements to I-5

The southbound improvements to I-5 would include two new collector-distributor (C/D) lanes between the SR 509 convergence and SR 516, two new auxiliary lanes from SR 516 to South 272nd Street, and a new auxiliary lane from South 272nd Street to approximately South 310th Street, where the proposed project would match with an auxiliary lane to be constructed for the Sound Transit I-5 @ South 317th Street Direct Access Ramp project. On northbound I-5, a new auxiliary lane would extend between South 272nd Street and the SR 516 interchanges, and two new C/D lanes would start at the SR 516 interchange to serve I-5 traffic exiting to SR 509 and SR 516 traffic entering I-5. In addition, a South 228th Street extension and underpass would be constructed, providing a direct connection to northbound I-5 from South 228th Street and from southbound I-5 to South 228th Street. Figure F-5 presents a schematic of the I-5 improvements. These improvements would cover approximately 6.7 miles.







0 100 200
Approx.
Scale in Feet

FIGURE F-4

South Airport Link Design Options

SR 509: Corridor Completion/I-5/South Access Road
Environmental Impact Statement

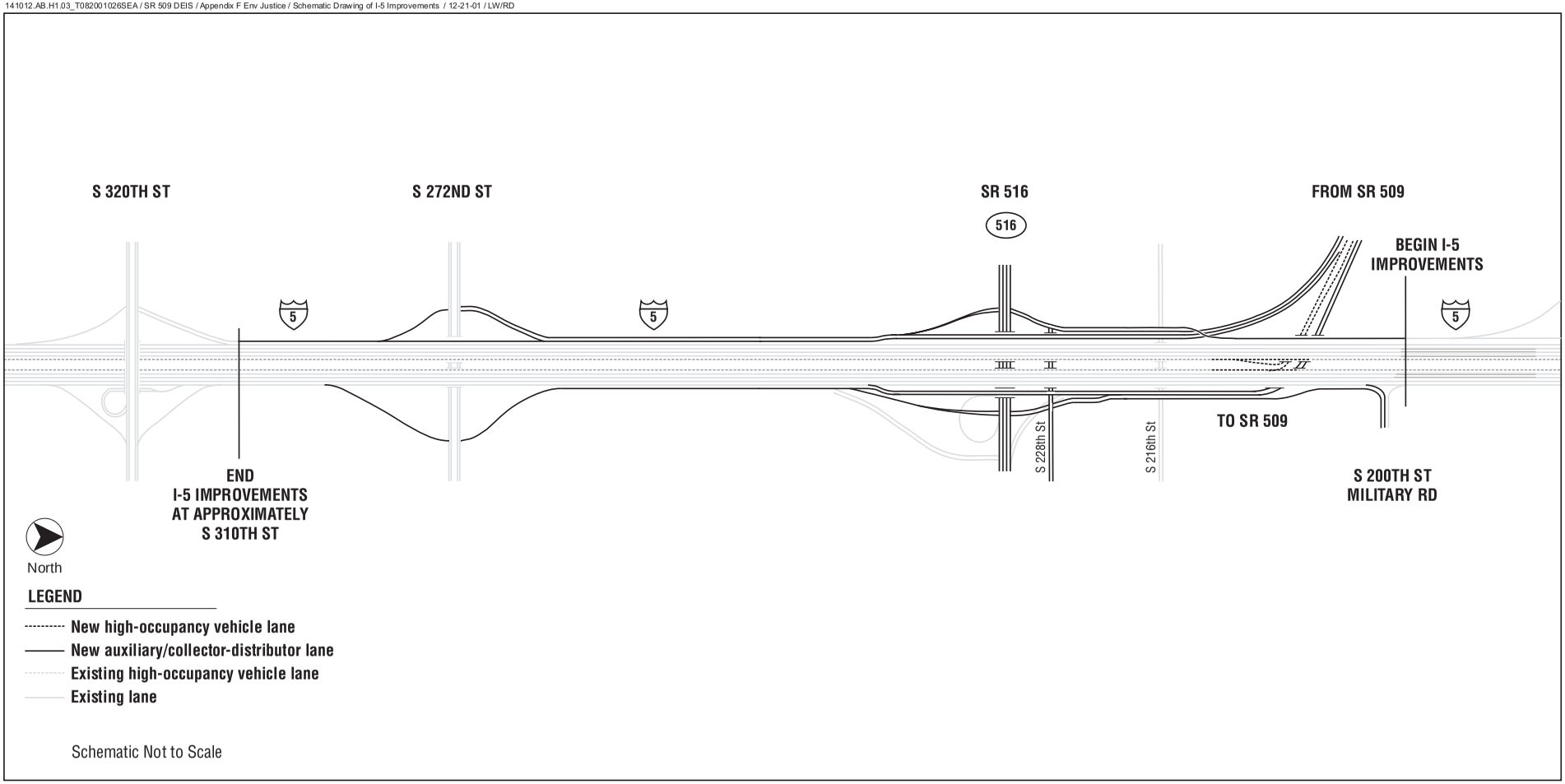


FIGURE F-5

Schematic Drawing of I-5 Improvements

SR 509: Corridor Completion/I-5/South Access Road Environmental Impact Statement

Alternative B

Under Alternative B, the SR 509 mainline would extend southward from its existing terminus at South 188th Street/12th Place South and intersect with I-5 in the vicinity of South 211th Street (Figure F-6). The freeway extension and the South Access Road would generally parallel each other in a north-south orientation on the west and east sides of Des Moines Creek Park, starting in the vicinity of South 208th Street and 24th Avenue South. The alignment would cross over Des Moines Creek and through Des Moines Creek Park at its narrowest point. The length of the SR 509 freeway extension (including the South Access Road) under Alternative B would be approximately 3.8 miles.

Alternative C2

Alternative C2 would begin at the existing SR 509 terminus at South 188th Street/12th Place South and intersect with I-5 in the vicinity of South 212th Street (Figure F-7). Alternative C2 would cross to the east on the north side of Des Moines Creek Park. The alignment would be elevated as it crosses the northeast corner of Des Moines Creek Park. The South Access Road interchange with SR 509 would be in the vicinity of South 208th Street and 24th Avenue South. The length of the SR 509 freeway extension (including the South Access Road) under Alternative C2 would be approximately 3.2 miles.

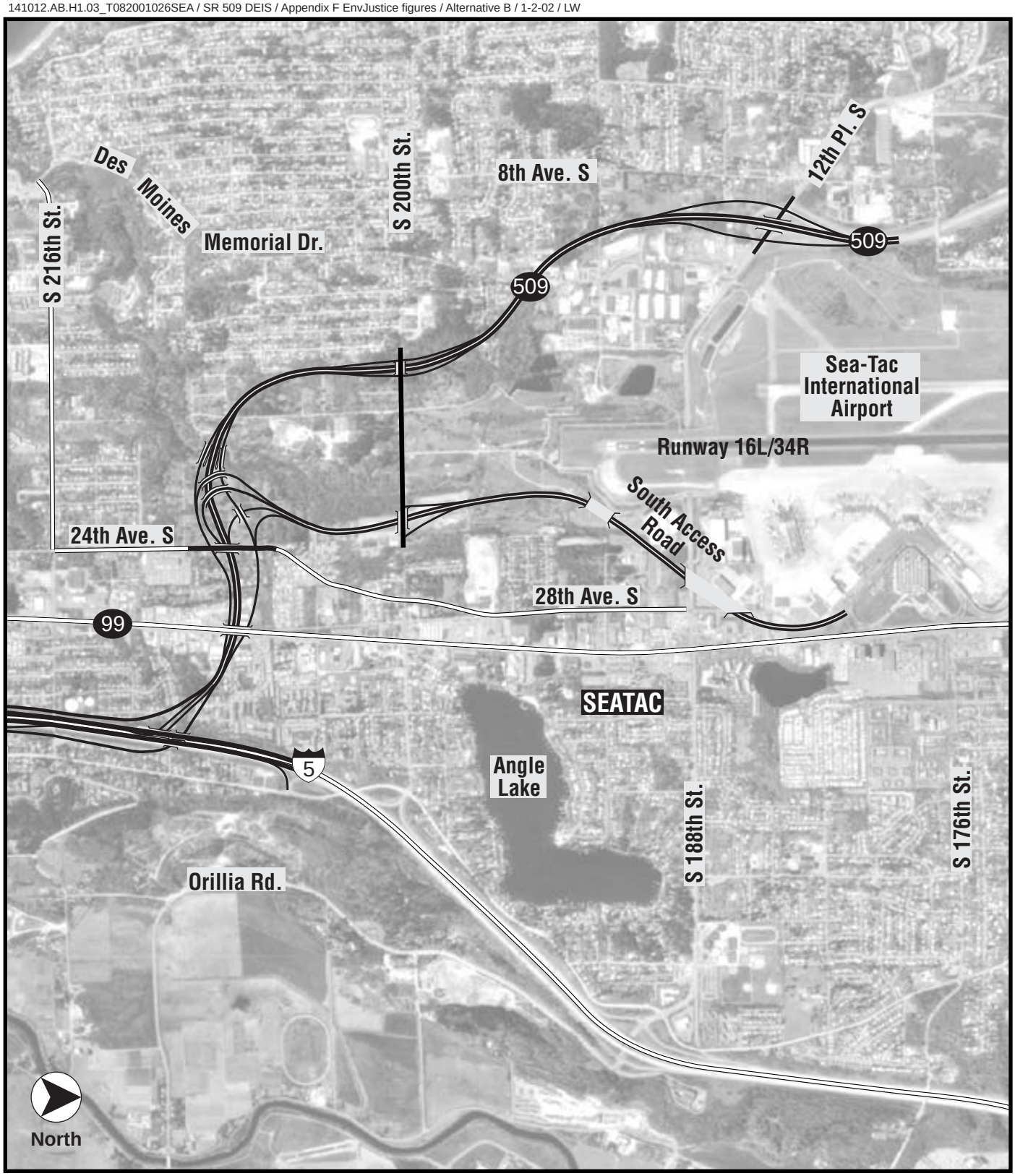
Alternative C3

Alternative C3 would begin at the existing SR 509 terminus at South 188th Street/12th Place South and intersect with I-5 in the vicinity of South 212th Street (Figure F-8). Like Alternative C2, Alternative C3 would cross to the east on the north side of Des Moines Creek Park; however, it would encroach further into the park than Alternative C2. Alternative C3 would also be elevated as it crosses the northeast corner of Des Moines Creek Park. The South Access Road interchange would occur in the vicinity of South 204th Street and 24th Avenue South. Under Alternative C3, the length of the SR 509 freeway extension, including the South Access Road would be approximately 3.5 miles.

Studies Performed and Coordination Conducted

Overview of EO 12898 and FHWA Order 6640.23

EO 12898, issued by President Clinton in 1994, requires that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations…." In his



0 1/4 1/2 3/4 1 MILES

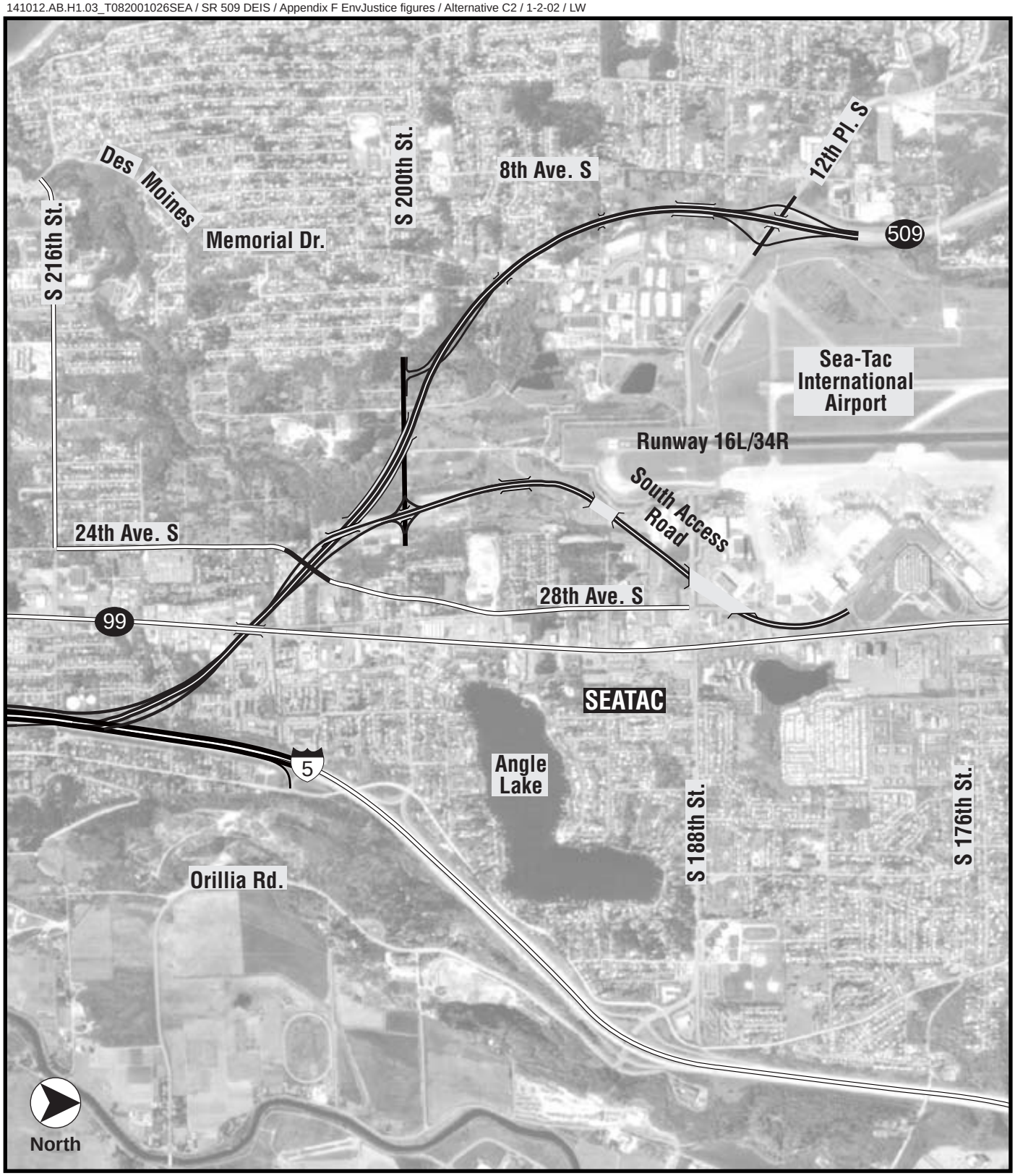
Legend

SR 509/South Access Improvements

FIGURE F-6

Alternative B

SR 509: Corridor Completion/I-5/South Access Road Environmental Impact Statement



0 1/4 1/2 3/4 1 MILES

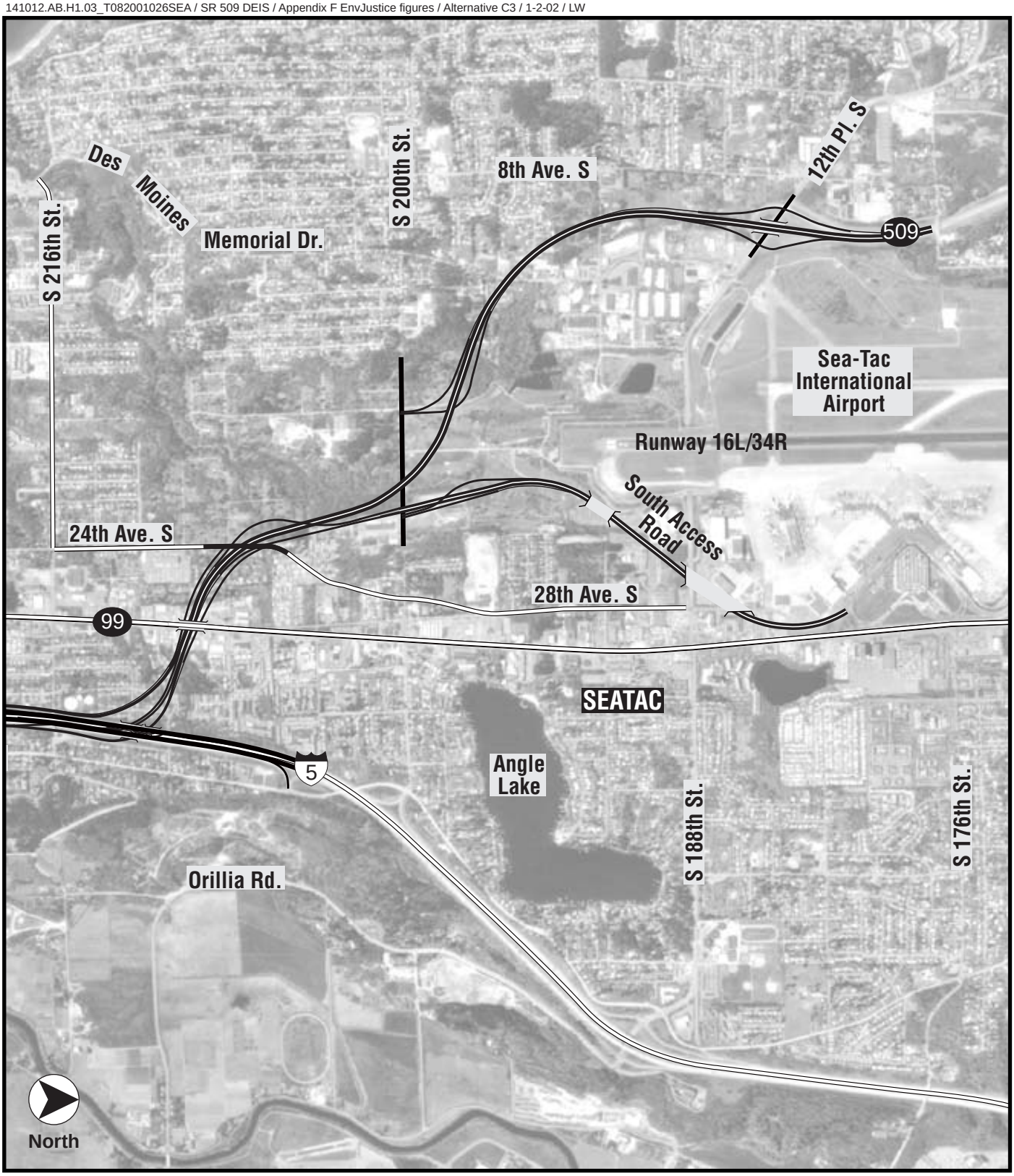
Legend

SR 509/South Access Improvements

FIGURE F-7

Alternative C2 (Preliminary Preferred)

SR 509: Corridor Completion/I-5/South Access Road Environmental Impact Statement



0 1/4 1/2 3/4 1 MILES

Legend

SR 509/South Access Improvements

FIGURE F-8

Alternative C3

SR 509: Corridor Completion/I-5/South Access Road Environmental Impact Statement

memorandum transmitting EO 12898 to federal agencies, President Clinton further specified that, "each Federal agency shall analyze the environmental effects, including human health, economic and social effects, of Federal actions, including effects on minority communities and low-income communities, when such analysis is required by the National Environmental Policy Act of 1969."

Guidance on how to implement EO 12898 and conduct an environmental justice analysis has been issued by the President's Council on Environmental Quality (CEQ 1997) and several federal agencies, including the U.S. Department of Transportation (DOT Order 5610.2) and the FHWA (FHWA Order 6640.23).

FHWA Order 6640.23 provides guidance on determining when a disproportionately high and adverse impact is likely and how to respond if such a finding is made. When determining whether a particular program, policy, or activity

> "...will have disproportionately high and adverse effects on minority and low-income populations, FHWA managers and staff should take into account mitigation and enhancement measures and potential offsetting benefits to the affected minority or low-income populations. Other factors that may be taken into account include design, comparative impacts, and the relevant number of similar existing system elements in non-minority and non low-income areas. FHWA managers and staff will ensure that the programs, policies, and activities that will have disproportionately high and adverse effects on minority populations or low-income populations will only be carried out if further mitigation measures or alternatives that would avoid or reduce the disproportionately high and adverse effects are not practicable. In determining whether a mitigation measure or an alternative is "practicable," the social, economic (including costs) and environmental effects of avoiding or mitigating the adverse effects will be taken into account. FHWA managers and staff will also ensure that any of their respective programs, policies or activities that have the potential for disproportionately high and adverse effects on populations protected by Title VI ("protected populations") will only be carried out if:
>
> (1) a significant need for the program, policy or activity exists, based on the overall public interest; and
>
> (2) alternatives that would have less adverse effects on protected populations have either:

(a) adverse social, economic, environmental, or human health impacts that are more severe; or

(b) would involve increased costs of an extraordinary magnitude.

Any relevant finding identified during the implementation of this Order must be included in the planning or NEPA documentation that is prepared for the activity."

Methodology and Approach

The proposed project alternatives were evaluated for compliance with EO 12898 and FHWA Order 6640.23. For this type of analysis, three fundamental evaluation measures are used.

1. *A determination is made as to which impacts of the alternatives are high and adverse.*

   The series of discipline reports prepared for the Revised DEIS were reviewed, and discussions with discipline report authors were conducted to determine which environmental or human health impacts could reach the level of high and adverse after proposed mitigation measures were implemented. Since there is no official guidance on the definition of "high and adverse" in any environmental justice order or guidance document, for purposes of this analysis, NEPA significant adverse impacts, as identified by the professional analysts working on this Revised DEIS, were considered to be synonymous with high and adverse impacts as described in EO 12898 and FHWA Order 6640.23.

2. *A determination is made as to whether minority or low-income populations exist within the high and adverse impact zones.*

   For information on the distribution of minority and low-income populations in the SR 509: Corridor Completion/I-5/South Access Road project area, both 2000 and 1990 U.S. Census data were used. Race and income data were reviewed at the finest level available from the U.S. Census Bureau (i.e., U.S. Census Block for race, and U.S. Census Block Group for income). At the time of this analysis, race data from the 2000 U.S. Census were available and reviewed. Income data from the 2000 U.S. Census were not scheduled to be released until April 2002. In lieu of these newer data, 1990 U.S. Census data on income were reviewed. For additional background, other sources of demographic information were also reviewed. These sources included school enrollment data and anecdotal information from discussions with local officials, business owners, and public meeting attendees.

3. *The spatial distribution of high and adverse impacts is reviewed to determine if these impacts are likely to fall disproportionately on the minority or low-income population.*

   Since there is no specific guidance in EO 12898 or FHWA Order 6640.23, the test of disproportionality is made on the basis described in the U.S. Environmental Protection Agency's (EPA) *Draft Revised Guidance for Investigating Title VI Administrative Complaints Challenging Permits* (U.S. EPA June 2000). This guidance suggests using two to three standard deviations above the mean as a quantitative measure of disparate effect.

While the first two elements of this approach were conducted, no detailed distribution analysis was required to make a final determination. This was because professional analysts in each environmental and human health discipline determined that no high and adverse (i.e., NEPA significant) human health or environmental effects were expected to remain after implementation of proposed mitigation measures.

Outreach to Minority and Low-Income Populations

A public involvement program has been conducted in the project area over a period of more than eight years. As a consequence, the project is well known to residents in the project area. Because none of the initial sources of demographic information used for this analysis (such as 1990 U.S. Census data, school enrollment, and discussions with local officials, business owners, and residents who participated in numerous public meetings) indicated the existence of high minority or low-income populations, the outreach was not targeted to reach any specific group. The exception was an effort to specifically inform and involve residents (and owners) of mobile home parks in the project area. Because of the advanced age of many of the mobile homes, the potential for low-income residents was believed to be high. More recently, with the release and examination of 2000 U.S. Census data, and in light of observations made at the January 2001 public meeting, WSDOT has committed to publish future meeting announcements in Spanish and Vietnamese, as well as in English.

Outreach and involvement efforts focused on the general public have included the following:

- Six newsletters mailed to residents, their political representatives, and local officials
- Individual letters mailed to potentially affected residences and businesses
- Two public scoping meetings

- Six public open houses
- Multiple news releases to newspapers of general circulation and the minority press
- Newspaper articles, including interviews with mobile home owners
- One public hearing

In addition, attempts were made to conduct special information exchange meetings within the mobile home parks, using their community rooms; the park owners declined. Another attempt was made to conduct a special information exchange meeting at the nearby fire station, targeted at residents of the mobile home park that would be impacted by the build alternatives. When it was learned that using the fire station's community room is not permitted during evening hours (which are most convenient time for working residents), this attempt was abandoned. Nevertheless, mobile home park residents have participated in the general open houses and hearings. During the open houses, project staff talked informally with participants. The general consensus of mobile home park residents, like that of most residents who have expressed an opinion, is favorable to the project. The findings that emerged from the public meetings were corroborated by a *Seattle Post-Intelligencer* article in March 1999 (see Appendix B in CH2M HILL September 2001), which was based on an interview with residents of the mobile home park that would be substantially displaced.

Affected Environment

Distribution of the Minority Population

Based on the 2000 U.S. Census, the total population of the area within approximately one-half mile from the build alternatives is approximately 67,410. The minority population comprises approximately 33 percent of this total population. Figures F-9 and F-10 identify the minority population percentages of U.S. Census Blocks in the vicinity of the build alternatives based on 2000 U.S. Census data. As shown in Figures F-9 and F-10, many U.S. Census Blocks in the project area are below 50 percent minority; however, several U.S. Census Blocks west of I-5 and others east of Sea-Tac Airport are above 50 percent minority. These latter U.S. Census Blocks have minority population densities high enough (i.e., greater than 50 percent) to be considered minority populations based on the guidance contained in CEQ (1997).

Distribution of the Low-Income Population

Based on the 1990 U.S. Census (the most recent U.S. Census for which income data are available), the total population of the area within

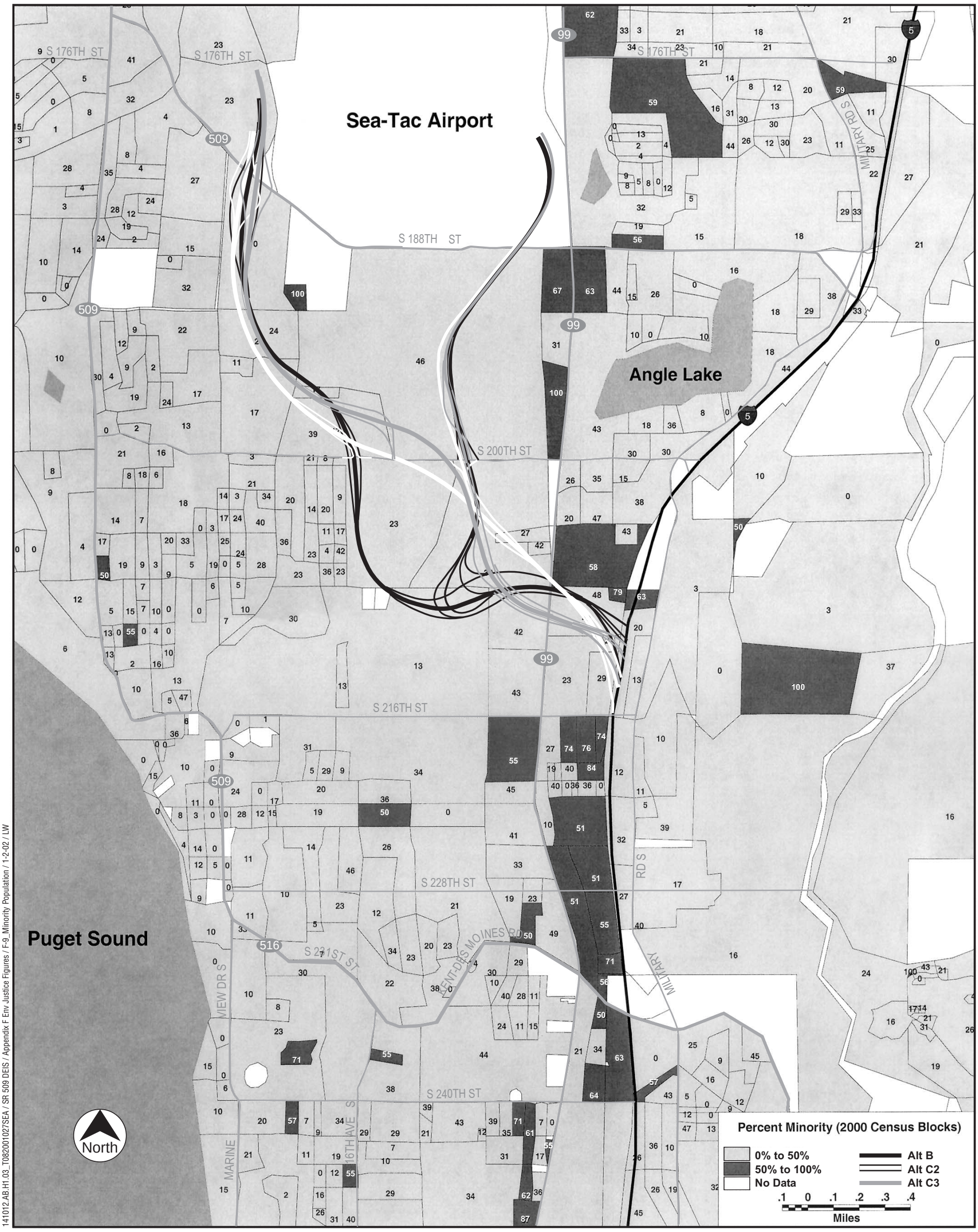


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FIGURE F-9

Minority Population in the SR 509 Build Alternatives Area

SR 509: Corridor Completion/I-5/South Access Road Environmental Impact Statement

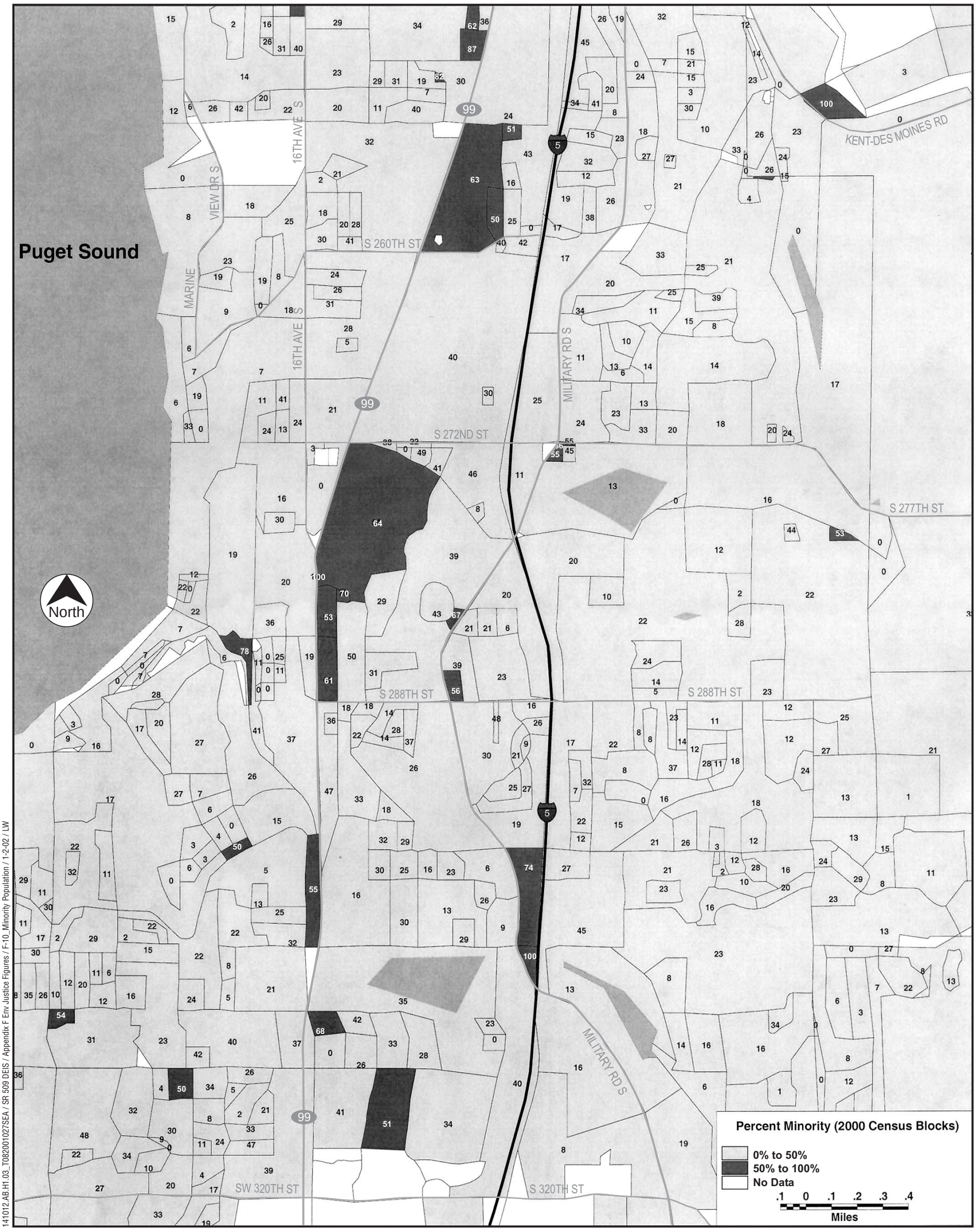

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FIGURE F-10

Minority Population in the I-5 Corridor Area

SR 509: Corridor Completion/I-5/South Access Road Environmental Impact Statement

approximately one-half mile from the build alternatives was approximately 60,656. The low-income population comprised approximately 7 percent of this total population. Figures F-11 and F-12 identify the low-income population percentages of U.S. Census Block Groups in the vicinity of the build alternatives based on 1990 U.S. Census data. As shown in Figures F-11 and F-12, most of the U.S. Census Block Groups in the project area have low-income population percentages in the single digits; however, several U.S. Census Block Groups adjacent to I-5 have low-income population percentages of 10 percent or higher.

Unlike the CEQ (1997) guidance on minority population, no environmental justice order or guidance document contains a quantitative definition of how many low-income individuals it takes to compose a low-income population. In the absence of guidance, for this analysis the density used to identify minority populations (i.e., 50 percent or greater) was also used to identify low-income populations. There is no U.S. Census Block Group in the project area with 50 percent or more low-income population.

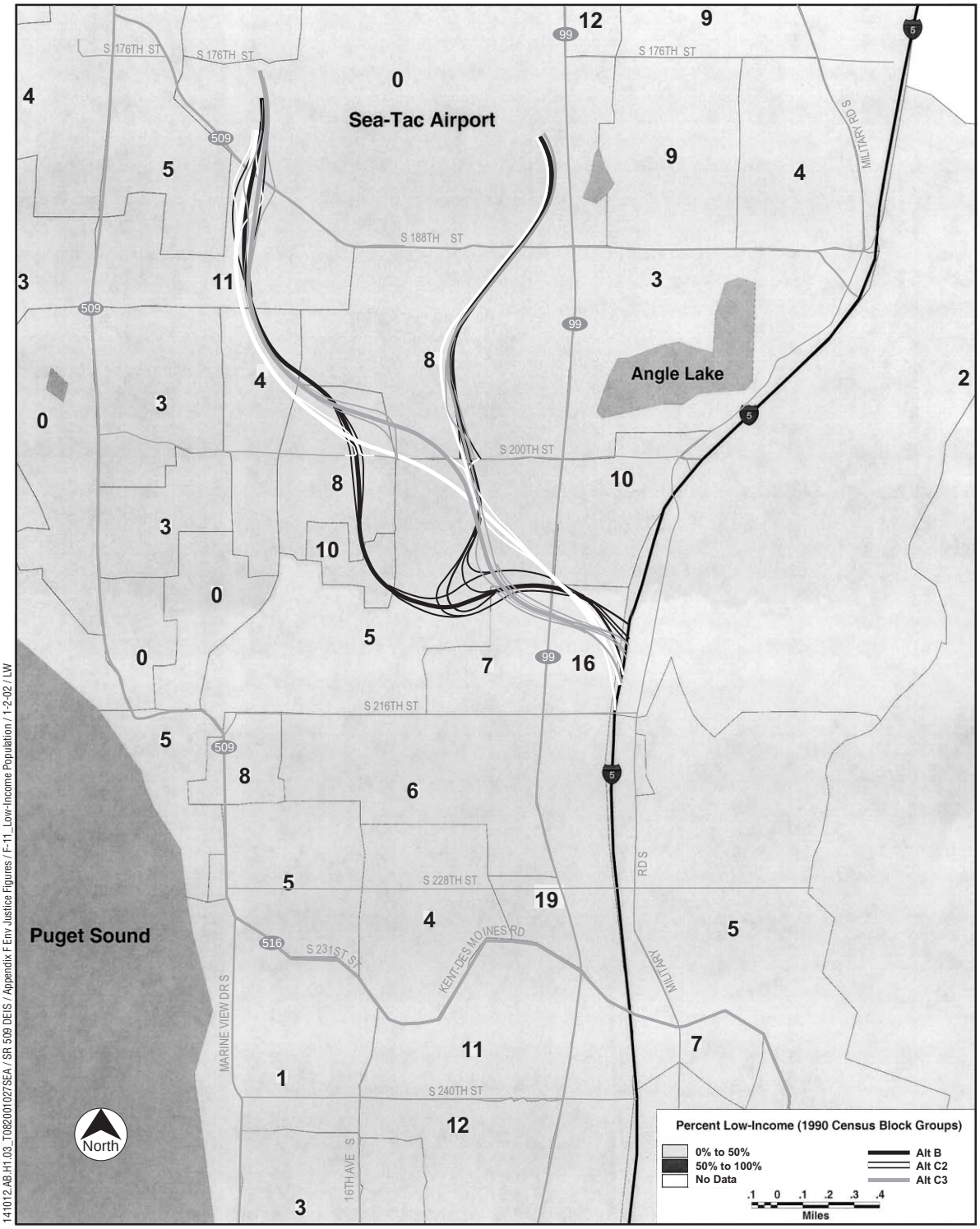
Environmental Consequences and Conclusion

As discussed in the *Methodology and Approach* section above, for purposes of this analysis, NEPA significant adverse impacts are considered synonymous with high and adverse impacts as described in EO 12898 and FHWA Order 6640.23. As reported in the series of discipline reports prepared for the Revised DEIS, and further confirmed through discussions with the report authors, no significant adverse impacts are expected as a result of this project after proposed mitigation measures are implemented. Consequently, no project impacts can be described as high and adverse in the context of EO 12898 or FHWA Order 6640.23. As there are no high and adverse impacts expected as a result of this project, this analysis therefore concludes that no high and adverse human health or environmental effects of this project are expected to fall disproportionately on minority or low-income populations. The SR 509: Corridor Completion/I-5/South Access Road Project can therefore be considered to be consistent with the policy established in EO 12898 and FHWA Order 6640.23.

Bibliography and References

CEQ (Council on Environmental Quality). *Environmental Justice; Guidance Under the National Environmental Policy Act*. Executive Office of the President, Washington, D.C. December 10, 1997 [released July 1998].

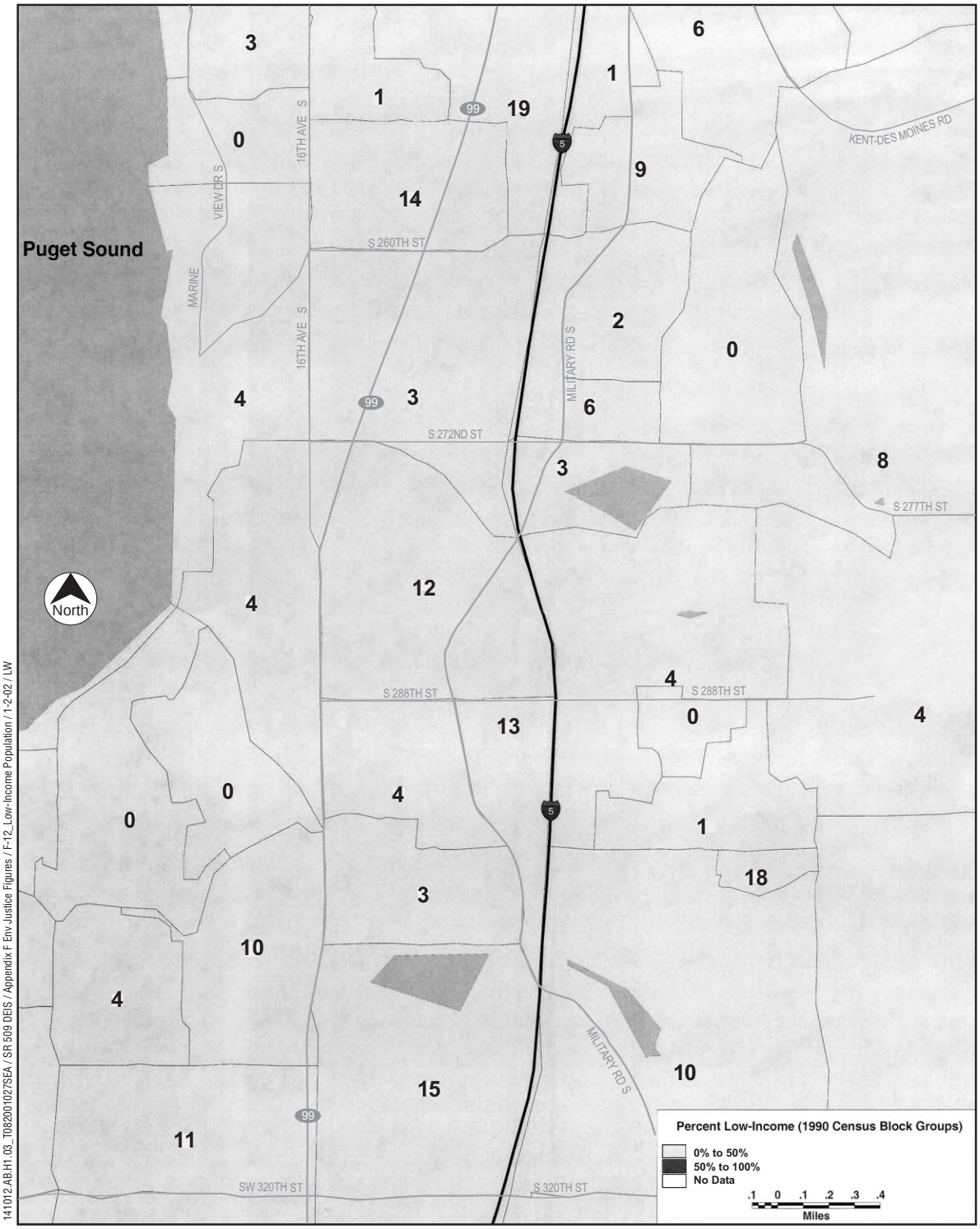
CH2M HILL. *SR 509/South Access Road EIS Discipline Report: Environmental Justice.* Prepared for Washington State Department of Transportation, Seattle, WA. September 2001.



141012.AB.H1.03_T08200102?SEA / SR 509 DEIS / Appendix F Env Justice Figures / F-11_Low-Income Population / 1-2-02 / LW

FIGURE F-11

Low-Income Population in the SR 509 Build Alternatives Area



141012.AB.H1.03_T082001027SEA / SR 509 DEIS / Appendix F Env Justice Figures / F-12_Low-Income Population / 1-2-02 / LW

FIGURE F-12

Low-Income Population in the I-5 Corridor Area

CH2M HILL. *Technical Memorandum: SR 509/South Access Road Alternative C2 Minimized*. Prepared for Washington State Department of Transportation, Seattle, WA. September 2001.

Clinton, William J., President of the United States. *Executive Order 12898. Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. Federal Register, Vol. 59, No. 32, Wednesday, February 16, 1994, 7629-7633. Washington D.C. February 11, 1994.

U.S. Department of Transportation. *Order 5610.2, DOT Order to Address Environmental Justice in Minority Populations and Low-Income Populations*. Federal Register, Vol. 62, No. 72, Tuesday, April 15, 1997, 18377-18381. Washington, D.C. April 15, 1997.

U.S. Department of Transportation, Federal Highway Administration. *Order 6640.23, FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. Federal Register, December 2, 1998.

U.S. Department of Transportation, Federal Highway Administration. *Draft Title VI Guidance for EPA Assistance Recipients Administering Environmental Permitting Programs (Draft Recipient Guidance) and Draft Revised Guidance for Investigating Title VI Administrative Complaints Challenging Permits (Draft Revised Investigation Guidance)*. Federal Register Volume 65, Number 124, pages 39649-39701. Washington, D.C. June 27, 2000.

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Appendix G
Coordination and Consultation with Tribes

APPENDIX G

Section 106 Coordination and Consultation with Tribes

An extensive tribal involvement program has been in progress for a decade as part of the Washington State Department of Transportation's (WSDOT's) compliance with federal regulations regarding public, agency, and government-to-government contact. Tribal involvement has occurred in two forms:

1. Through the public involvement process, in which the tribes were invited to participate in the Draft EIS scoping and development process starting in 1992

2. Through Section 106 tribal consultation efforts

The information presented here focuses on the Section 106 tribal consultation efforts.

Revised Section 106 Tribal Consultation Regulations

Section 106 requires federal agencies to account for the effects of their undertakings on historic properties, and to afford the Advisory Council on Historic Preservation an opportunity to comment. The Federal Highway Administration (FHWA) and WSDOT seek to ensure that each tribe has the opportunity to identify and address any concerns regarding identification and evaluation of cultural resources and potential effects of the undertaking upon such resources.

In 1999, a Section 106 consultation was initiated pursuant to 36 CFR 800.2(a)(4). These requirements were modified in 2000 to incorporate Presidential Executive Order 13175 regarding "Consultation and Coordination with Indian Tribal Governments." These modifications established a process and timeline in an effort to ". . . strengthen the United States government-to-government relationships with Indian Tribes, and to reduce the imposition of unfounded mandates upon Indian Tribes."

Contacted Tribes

WSDOT contacted the following tribes throughout the environmental process:

- Muckleshoot Tribe
- Duwamish Tribe
- Lummi Nation
- Puyallup Tribe
- Suquamish Tribe
- Yakama Nation

WSDOT identified these tribes by reviewing the Usual and Accustomed Area maps (originally dated May 1987, as updated) available through the Governor's Office of Indian Affairs.

Section 106 Contact Procedures

WSDOT initiated consultations in 1999with the tribes regarding the SR 509/South Access Road EIS Discipline Report: Archaeological and Historical Preservation (CH2M HILL February 1999). FWHA initiated formal consultation with the tribes in March 2000, implementing the Presidential Executive Order.

Consultation Request

The cultural resources survey was initiated to identify and evaluate the impacts of the proposed alternatives upon Tribal Resources within the Area of Potential Effect. FHWA initiated Section 106 in March 2000 with a contact letter requesting tribal consultation and delegating responsibility to WSDOT to coordinate the report of findings with the State Historical Preservation Officer (SHPO) for concurrence pursuant to 36 CFR 800.4(d)(1).

Comments

The tribes were provided 30 days to comment beginning from the date of the letter. Following transmittal of the request letter and approximately 15 days prior to the end of the comment period, the tribes were contacted by telephone to seek additional information.

Comments were received from the Duwamish, Muckleshoot, and Suquamish Tribes, and the Yakama Nation. Concerns were expressed regarding cultural resources. In November 2000, the SR 509 Test Drilling Cultural Resources Survey was completed. The tribes' concerns were addressed prior to the cultural resources reports being submitted to SHPO.

SHPO Concurrence

Completed cultural resources reports were sent to the SHPO seeking concurrence on February 12, 2001, and copies were sent to the tribes for their information. SHPO concurred on October 12, 2001, with its recommendations and findings that no historic properties would be affected by the proposed project.

As part of the WSDOT public involvement process, the tribes continue to be notified of project activities.

Washington State Department of Transportation
Sid Morrison
Secretary of Transportation

Transportation Building
P.O. Box 47300
Olympia, WA 98504-7300

24 January 2001

Allyson Brooks, Ph.D.
State Historic Preservation Officer
Office of Archaeology and Historic Preservation
P.O. Box 48343
Olympia, WA 98504-8343

Re: SR 509 Extension and South Access Road Project, King County

Dear Dr. Brooks:

Enclosed please find a copy of the cultural resources report (AHS EWU Letter Report DOT00-37, by Charles T. Luttrell, dated 13 November 2000) recommending monitoring for cultural resources at four geotechnical test hole locations in the project area. As you will note in the report, no known historic properties will be affected by the proposed drilling. No traditional cultural properties have been identified, nor have other cultural resources been recorded with the Washington State Office of Archaeology and Historic Preservation. FHWA initiated formal consultation with the Yakima Nation, Suquamish Tribe, Puyallup Tribe, Lummi Nation, Duwamish Tribe, and the Muckleshoot Tribe on 9 March 2000; to date, the Muckleshoot Tribe has expressed concern (see attached).

I look forward to receiving your comments on our determination of no historic properties affected. Please call me at 360-570-6639, or FAX me at 360-570-6633, if you have questions or concerns. Thanks very much.

Sincerely,

Craig Holstine
Cultural Resources Specialist

Enc.

Cc: Kevin Stuber

STATE OF WASHINGTON

OFFICE OF COMMUNITY DEVELOPMENT

Office of Archaeology and Historic Preservation

420 Golf Club Road SE, Suite 201, Lacey • PO Box 48343 • Olympia, Washington 98504-8343 • (360) 407-0752

Fax Number (360) 407-6217

January 30, 2001

RECEIVED

JAN 3 1 2001

ENVIRONMENTAL AFFAIRS - POINT PLAZA

Mr. Craig Holstine
Department of Transportation
Transportation Building
PO Box 47300
Olympia, Washington 98504-7300

Re: SR 509 Extension and South Access Road
Log No: 012601-19-FHWA

Dear Mr.Holstine;

Thank you for providing a copy of the cultural resources survey of the proposed SR 509 extension and access road by AHS of Eastern Washington University. We concur with their recommendations and your findings that no historic properties will be effected by the proposed project.

These comments are based on the information available at the time of this review and on the behalf of the State Historic Preservation Officer. Should additional information become available, our assessment may be revised. In the event that archaeological or historic materials are discovered during project activities, work in the immediate vicinity should be discontinued, the area secured, and this office notified.

Thank you for the opportunity to comment and a copy of these comments should be included in subsequent environmental documents.

Sincerely,

Robert G. Whitlam, Ph.D.
State Archaeologist
(360) 407-0771
email: robw@cted.wa.gov

Washington State Department of Transportation
Sid Morrison
Secretary of Transportation

Transportation Building
P.O. Box 47300
Olympia, WA 98504-7300

7 February 2001

Allyson Brooks, Ph.D.
State Historic Preservation Officer
Office of Archaeology and Historic Preservation
P.O. Box 48343
Olympia, WA 98504-8343

Re: Cultural Resources Monitoring, SR 509 Extension and South Access Road Project, King County
Log No: 012601-19-FHWA

Dear Dr. Brooks:

Enclosed please find a copy of the cultural resources report (AHS EWU Short Report DOT01-01, by Charles T. Luttrell, dated 29 January 2001) summarizing the results of monitoring drilling and excavation for cultural resources at 16 geotechnical test holes and pits in the project area. On 30 January 2001, Rob Whitlam of your office concurred with the findings and recommendations of the preceding report (DOT00-37) that identified locations warranting the monitoring that is the subject of this report.

As you will note in the enclosed report, no known historic properties have been affected by the test drilling and excavating. No traditional cultural properties have been identified, nor have other cultural resources been recorded with the Washington State Office of Archaeology and Historic Preservation. FHWA initiated formal consultation with the Yakima Nation, Suquamish Tribe, Puyallup Tribe, Lummi Nation, Duwamish Tribe, and the Muckleshoot Tribe on 9 March 2000; to date, the Muckleshoot Tribe has expressed concern (see attached).

I look forward to receiving your comments on our determination of no historic properties affected. Please call me at 360-570-6639, or FAX me at 360-570-6633, if you have questions or concerns. Thanks very much.

Sincerely,

Craig Holstine
Cultural Resources Specialist
Enc.
Cc: Kevin Stuber

STATE OF WASHINGTON
OFFICE OF COMMUNITY DEVELOPMENT
Office of Archaeology and Historic Preservation
420 Golf Club Road SE, Suite 201, Lacey • PO Box 48343 • Olympia, Washington 98504-8343 • (360) 407-0752
Fax Number (360) 407-6217

February 12, 2001

Mr. Craig Holstine
Department of Transportation
Transportation Building
PO Box 47300
Olympia, Washington 98504-7300

Re: Cultural Resource Monitoring: SR 509
Log No: 020901-12-FHWA

Dear Mr.Holstine:

Thank you for providing a copy of the cultural resources monitoring report by AHS of Eastern Washington University. We concur with their recommendations and your findings that no historic properties will be effected by the proposed project.

These comments are based on the information available at the time of this review and on the behalf of the State Historic Preservation Officer. Should additional information become available, our assessment may be revised. In the event that archaeological or historic materials are discovered during project activities, work in the immediate vicinity should be discontinued, the area secured, and this office notified.

Thank you for the opportunity to comment and a copy of these comments should be included in subsequent environmental documents.

Sincerely,

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email: robw@cted.wa.gov